



An Updated
**Environmental Management Plan
(EMP)**

To Support an Application for the Renewal of an **Environmental Clearance Certificate** (ECC) to Permit the Subdivision, Rezoning and Installation of Related Infrastructure on the Remainder of Portion 137, of the Farm Brakwater No. 48

Windhoek, Khomas Region

April 2024

<p>PROJECT NAME</p>	<p>An Updated Environmental Management Plan (EMP) to Support an Application for the Renewal of an Environmental Clearance Certificate (ECC) to Permit the Subdivision, Rezoning and Installation of Related Infrastructure on the Remainder of Portion 137, of the Farm Brakwater No. 48, Windhoek, Khomas Region</p>
<p>ECC APPLICATION NO.</p>	<p>APP – 003202</p>
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LIST OF ACRONYMS

Acronym	Expansion
BAT	Best Available Technology
BID	Background Information Document
CoW	City of Windhoek
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
GPS	Global Positioning System
GRN	Government of the Republic of Namibia
HPP	The Harambee Prosperity Plan
IAPs	Interested and Affected Parties
KRC	Khomas Regional Council
m ²	square meters
m ³	cubic meters
MAWLR	Ministry Agriculture, Water and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
NAMPOWER	Namibia Power Corporation Pty Ltd
NAMWATER	Namibia Water Corporation Ltd
NHC	National Heritage Council
NSI	Namibia Standards Institute
PPE	Personal Protective Equipment
RA	Roads Authority
SHE	Safety, Health & Environment
URPB	Urban and Regional Planning Board

DEFINITION OF TERMS

Term	Expansion
Activity	Means a physical work that a proponent proposes to construct, operate, modify, decommission or abandon or an activity that a proponent proposes to undertake;
Anthropogenic Impact	Human impacts on the environment which includes changes to the biophysical environments, ecosystems, biodiversity and natural resources caused directly or indirectly by human activities including global warming, environmental degradation, etc.
Assessment	A process of collecting, organizing, analyzing, assessing and communicating information for the purpose of making an informed decision.
Biodiversity	The variability among living organisms from all sources including terrestrial marine and other aquatic ecosystem and ecological complexes which they are part of.
Competent Authority	A person or organization that has the legally delegated or invested authority, capacity or power to perform a designated function, e.g. Ondangwa Town Council or the Environmental Commissioner in granting an ECC or refusing to grant an ECC.
Construction Activity	A construction activity is any action taken by the Contractor, its subcontractors, suppliers or personnel employed by such a contractor during the construction process as defined in the Roads Authority Act (Act No. 17 of 1999)
Cumulative Impacts	In relation to an activity means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertaking.
Developer or Promoter	A promoter or developer remains responsible for ensuring that the project or development is implemented in compliance of the provisions and guidelines as provided for in the EMP - throughout all phases of the project – construction, operational and decommissioning.
Ecology	The study of the interrelationship between the organisms and their environments.
Environment	All physical, chemical and biological factors and conditions which influence an object and or organism. It is also defined as the surroundings within which human beings exist and is made up of the land, water, atmosphere, plants and animal life (micro and macro) including interrelationships between the factors and the physical or chemical conditions that influence human health and well-being
Environmental Impact	Any change to the environment whether adverse or beneficial, wholly or partially, resulting from human activities, products or services.
Environmental Impact Assessment	A process of evaluating and assessing the likely environmental impacts that a proposed project or development will have on the environment taking into account the inter-related socio-economic, cultural and human-health impact, both beneficial and adverse.
Environmental Management Plan	An EMP is a legal bidding document which stipulates environmental and socio-economic mitigation measures which must be implemented and complied with by several parties responsible for proposed development throughout the duration of the said development.
Hazard	Anything that has the potential to cause damage to life, property and/or the environment. The hazard of a particular material or installation is constant, that is, it would present the same hazard wherever it was present.
Hazardous Substance	Means any pesticide, herbicide or other biocide, radioactive substance, chemical or other substance and any micro-organism or energy form that has properties that, either by themselves, or in combination with any other thing, make it hazardous to human health or safety, or to the environment.
Indigenous	An indigenous species is a species which occurs or has historically occurred, naturally in a free state within the borders of Namibia. Species which have been introduced to Namibia as a result of human activity are excluded.
Interested and Affected Parties	Any person, group of persons or organisation interested in or affected by an activity contemplated in an application for Environmental Clearance Certificate, or any organ of state that may have jurisdiction over any aspect of the activity.
Land Use	As defined by the Urban and Regional Planning Act, 2018 (Act No. 5 of 2018), means the purpose for which land is used or may lawfully be used in terms of a condition of approval, a zoning scheme or the Act.

Listed Activity	Means an activity listed in terms of section 27(1) or 29 of the Environmental Management Act ;
Mitigation	The implementation of practical measures to reduce adverse impacts to the environment
Proponent	Any person who submits on intends to submit an application for an authorisation as legislated by the Environmental Management Act No. 7 of 2007, to undertake an activity or activities identified as a listed activity or listed activities, or in any other notice published by the Minister of MEFT.
Public	Citizens are people having diverse cultural, educational, political and socio-economic characteristics. The public is not a homogenous and unified group of people with a set of agreed common interests and aims. There is no single public. There are a number of publics, some of whom may emerge at any time during the process depending on their particular concerns and or issues at hand.
Public Participation Process	A process through which interested and affected parties are informed about the proposed development and are afforded the opportunity to provide their inputs and comments as well as to voice any concerns or objections which they might have on the proposed development
Rezoning	Means the change/amendment of a zone/ use of land, as defined per the Urban and Regional Planning Act, 2018 (Act no. 5 of 2018)
Significant Effect	Means having, or likely to have, a consequential qualitative or quantitative impact on the environment, including changes in ecological, aesthetic, cultural, historic, economic and social factors, whether directly or indirectly, individually or collectively;
Species	Means a kind of animal, plant or other organism which does not normally interbreed with individuals of any kind. The term 'species' include any sub-species, cultivar, variety, geographic race, strain or hybrid
Sustainable development	Means human use of a natural resource, whether renewable or non-renewable, or the environment, in such a manner that it may equitably yield the greatest benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations including the maintenance and improvement of the capacity of the environment to produce renewable resources and the natural capacity for regeneration of such resources;
Township Development	Means the planning and design (including the subdivision, surveying, registration and construction of services) of a portion of land owned by the Council, private owner or any other legal entity, planned as a harmonious extension to existing urban development or a new town in the Council area and established in terms of the provisions of the Urban and Regional Planning Act, 2018 (Act 5 of 2018).
Vulnerable	A species is 'vulnerable' when it is not critically endangered or endangered but is not facing a high risk of extinction in the wild in the medium term.
Warehouse	Means a building used or intended to be used for the storage of goods other than goods which will be used on or sold by retail from the premises on which they are stored. Should the purpose of the building no longer apply, such building must meet the structural requirements as per the "industrial building" definition for the operation of any workshop; lighting, ventilation, drainage and storage.
Watercourse	A river or spring; a natural channel in which water flows regularly or intermittently; a wetland, lake or dam into which, or from which, water flows; and any collection of water. A reference to a watercourse includes where applicable its bed and banks.

1. INTRODUCTION

1.1 Background

The proponent (Mr Heinz Schulze) owns Portion 137 of Farm Brakwater No. 48 which covers a geographical footprint of 21.5616 ha. In terms of the Windhoek Planning Scheme, the land use of Portion 137 is residential with a density of one dwelling unit per 5 hectares.

Over the years, the land use of Portion 137 has been overtaken by events in that the bulk of surrounding land portions making up Farm Brakwater No. 48 have become more industrial than residential.

1.2 Location

Taking the Windhoek Municipality Building in the CBD as a reference point, Portion 137 is exactly 21 km away, adjacent and to the west of B1 highway between Windhoek and Okahandja. Access to the land is provided via a panhandle from a gravel district road to the west.



Figure 1: Project Location from the Windhoek CBD



Figure 2: Portion 137 in Relation to B1 Highway and Access via a Panhandle

1.3 The Environmental Clearance Certificate

The Environmental Clearance Certificate (ECC) permitting the subdivision, rezoning and installation of related infrastructure on Portion 137. The ECC was granted following an Environmental Impact assessment (EIA) and an Environmental Management Plan (EMP) handled by Green Earth Environmental Consultants. The said ECC-011050 was granted on 5 January 2021, and has since expired on 5 January 2024. (Fig.)

1.4 Project Status

The project was not implemented during the validity period of the ECC, primarily because of subdued economic activities especially in the local construction subsector. In fact, there is still no layout prepared for the subdivision. However, the promoter is still keen to pursue the subdivision and rezoning of Portion 137 and would like to retain the ECC valid and active so as to proceed with the project implementation when the market conditions are conducive .

1.5 This Document

This document is essentially an updated EMP prepared to accompany the ECC renewal application for consideration by the Environmental Commissioner (EC). The aspects covered in the EMP are:

- The planning phase
- Construction phase (installation of services, etc.)
- Decommissioning
- A brief overview of all components and related operations of the hotel establishment.
- A summary of the legal instruments in which the establishment operates
- Management measures/actions aimed at mitigating, avoiding or eliminating such impacts.



Figure 3: View of Portion 137 Seen from B1 to the West



Figure 4: View of Industries to the East of Portion 137 Seen from B1 Highway



REPUBLIC OF NAMIBIA
MINISTRY OF ENVIRONMENT, FORESTRY AND TOURISM
OFFICE OF THE ENVIRONMENTAL COMMISSIONER

ENVIRONMENTAL CLEARANCE CERTIFICATE

ISSUED

In accordance with Section 37(2) of the Environmental
Management Act (Act No. 7 of 2007)

TO

Heinz Joachim Schulze
P O Box 11806, Klein Windhoek

TO UNDERTAKE THE FOLLOWING LISTED ACTIVITY

PROPOSED INDUSTRIAL TOWNSHIP AND ASSOCIATED
INFRASTRUCTURE, ON THE REMAINDER OF PORTION 137,
OF THE FARM BRAKWATER NO. 48, WINDHOEK, KHOMAS REGION

Issued on the date: 2021-01-05
Expires on this date: 2024-01-05

(See conditions printed over leaf)

This certificate is printed without erasures or alterations



Figure 5: The Expired ECC

2. PROJECT DESCRIPTION

2.1 Proposed Subdivision and Rezoning

The project entails two core activities - the subdivision of Portion 137 into a number of erven and the rezoning of those erven. The proposed plan is to subdivide the land into 16 or 20 erven for industrial use. At this stage, the exact industrial activity for each individual erf is not yet known and is left to the future owner to define such industrial use and where required to conduct EIA and to obtain an ECC prior to implementation.

2.2 Current Activities

In the past, manufacturing of building materials (IBR roofing) was conducted on the property, but the production has since ceased, and the moment no activities are taking place.

The main activities conducted on neighbouring properties are predominantly of industrial nature as more and more businesses outgrow their premises, relocating on the outskirts of Windhoek in search of bigger and better premises. Traffic congestion is also a serious consideration.

2.3 Available Infrastructure and Services

Brakwater is not an established township of CoW. The provision of municipality services such as electricity, water, sewer, roads, etc.) is therefore limited in the Brakwater location.

2.3.1 WATER SUPPLY

The property has two sources of water supply – water sourced from Namwater and water sourced from a borehole drilled to the west section of the plot.



Figure 6: View looking to the West with a Borehole in a Circle



Figure 7: Looking northwest of the property with a Transformer in a Circle

2.3.2 ELECTRICITY SUPPLY

Many properties in Brakwater are supplied with electricity by Nampower – the bulk electricity supplier and not by CoW. An electricity substation is situated to the west of the property and a transformer was observed in the middle of the property (Fig. 7).



Figure 8: The Property has been cleared of vegetation

2.3.3 SEWERAGE

There is no sewerage network installed in Brakwater and residents there are reliant on the use of septic and french drains. The same applies to these properties.



Figure 9: Access to the B1 & an Existing Workshop

2.3.4 ACCESS

The property is accessed via a panhandle which leads to a district gravel road to the west (Fig. 2). There is an access to the east leading to the B1 highway (Fig. 9). It is uncertain if access to the B1 highway will be allowed by Roads Authority and the Urban and Regional Planning Board (URPB) when the proposed layout is presented to such institutions.

2.3.5 SOLID WASTE REMOVAL

Waste removal is a service offered by CoW to all business establishments operating at Brakwater. Adequate and suitable waste bins should be procured and ideally colour coded. Discarded food items should be kept in bins with lids such that domestic and wild animals (dogs and cats) do not gain access.

Employees should be well trained and encouraged to maintain a high standard of hygiene and cleanliness by keeping the facility clean and spotless.

3. THE LEGAL FRAMEWORK

In this section, the legislations, policies and guidelines that are relevant and applicable to the development are presented in a table format. The overall objective here is to ensure that the developer is acquainted with the legal requirements as laid out in such legal instruments that have to be fulfilled for the wellbeing of the employees /workers who will be employed during the development, stakeholders and the general public.

3.1 The Laws

The Republic of Namibia has five tiers of law and a number of policies relevant to environmental assessment and protection which include the following:

- The Namibia Constitution;
- Statutory Law;
- Common Law;
- Customary Law, and
- International Law.

3.2 Applicable Legislations

The legislations applicable to this activity are listed in **Table 1**, below.

Table 1: Laws, Policies and Regulations

Legislations & Policies	Applicable Legislation												
	A	B	C	D	E	F	G	H	I	J	K	L	
The Constitution of Namibia													
The Environmental Management Act													
Hazardous Substance Ordinance													
The National Heritage Act													
Local Authorities Act													
Namibia Tourism Board Act													
Public & Environmental Health Act													
The Labour Act (as amended)													
Atmospheric Pollution Prevention Ordinance													
Road Traffic and Transport Act													
The Electricity Act of 2007													
Urban and Regional Planning Act													
Water Resources Management Act													
Legend													
A	Use of Natural Resources				H	Biodiversity							
B	Emissions Impact (Air & Odour)				I	Archaeological, Cultural and Heritage							
C	Emissions (to land & hazard)				J	Social-economic Impacts							
D	Noisy Impacts				K	Health and Safety Impacts							
E	Visual Impacts				L	Energy Resources							
F	Vibrations												
G	Land Use												

4. THE ENVIRONMENT BASELINE

A summarised baseline environment is presented in Table:

Particulars	Brief Description	Potential Impacts
Project Site Location	Brakwater, Windhoek, Khomas Region	
GPS	-22.39996 South 17.06708 East	
Land Size	215 616 square meters (m ²) or 21.5616 ha	The proposed development involves the creation of between 16 and 20 individual erven.
Current Land Use	Residential with one dwelling unit per five (5) hectare	The proposed land use (zoning) is industrial and is in line with the majority of activities conducted on neighbouring properties.
Current Activity	No activities are currently performed but manufacturing of building materials was performed on the premises in the past.	The subdivision and rezoning will be done without disturbance to neighbouring residents or businesses in the surroundings
Locality & Surrounds	The project site is sandwiched between B1 to the east and a district gravel road to the west. It is surrounded by business buildings, industrial activities with few residential units with densities of one dwelling unit per 5 ha.	The proposed activities (industrial) on the erven to be created is a positive development and has the potential to be supported by URPB. Furthermore, the activities involved in the rezoning will be done without disturbance to existing residents and business
Accessibility	Access to the site is via a panhandle leading to the gravel road to the west.	Access from B1 highway is unlikely to be granted by RA.
Topography and Drainage	The topography of the site is generally flat but it has a gentle fall to the west.	Drainage will be from east to west.
Climatic Conditions	Semi-arid with summer rainfalls. Highest temperatures occur between October and February. Rainfall: Average annual rainfall is in the region of 400 mm with precipitation occurring between November and April. Temperatures: Maximum recorded was 40 °C and Lowest average is 22 °C.	The project has little bearing on climatic conditions
Geology and Soils	The project lies in the Khomas Valley in which rocks from the Damara Supergroup and Gariiep Complexes are the primary bedrock.	The project has no impact on and from the geology of the area
Flora	The site has been largely cleared of most vegetation while some big trees having been preserved.	Firewood harvesting does occur in the area. The envisaged activities involved will have low impacts to vegetation, trees and plants.
Fauna	Wild animals and livestock are quite common in the area	Poaching of both wild animals and livestock during the construction phase is a potential risk. The planned activities will have low impacts on habitats.
Water resources - Surface and groundwater	No permanent surface water sources were observed on the site. A boreholes has been drilled on the site from which water is supplied. The quality of the water is good but the depth of the water aquifer has not been established.	Contamination of groundwater is a potential risk from the activities but the amount of the hazardous products involved is minimal to reach the groundwater table in the event of a leak.
Cultural, Heritage & Archaeological Resources	The site is not known to any historical significance before or after Independence in 1990. There are also no record of any cultural or historical importance or graveyard attached to the specific project site.	Items or cultural and heritage importance are protected under the National Heritage Act and measure have been recommended what to do in the event of such items being uncovered during the construction phase.
Demographic and Socio-economic environment	Based on the recent census results announced by NSA, as 2023, Windhoek has a population of 486 169 which is 13 831 short of 500 000 people.	The proposed land utilisation will have positive impacts in that it will lead to increased economic activities and hence creation of businesses which offer employment opportunities.

5. ENVIRONMENTAL MANAGEMENT PLAN

This EMP has been updated to serve as a management tool to use during the planning and implementation phases of the proposed town planning process related to Remainder 137 of Farm Brakwater No. 48. The EMP is intended to provide guidance during these developmental phases:

- **Planning Phase** – layout for the proposed erven (subdivision of 137) including layout for associated infrastructure, e.g. water, electricity, roads, access, etc. as well as for the subsequent rezoning
- **Construction Phase** – physical installation of infrastructure – water, electricity, roads, sewerage, including management and supervision of construction activities
- **Decommissioning Phase** – rehabilitation and restoration post construction activities.

It should be kept in mind that the EMP is a living document that has to be updated as new information, policies, authority guidelines and technologies are developed and become available.

5.1 Management Actions

The developer or Project Manager will be required to develop guidelines and clear procedures to govern the implementation of its management actions. Guidelines and procedures should be developed by management to cover:

- The planning and design of the proposed erven
- The implementation of the EMP during the construction phase
- Standard operating procedures which employ the best available technology, and
- Management action that addresses the health and safety aspects.

5.2 Implementation of the EMP

There are various role players involved in the implementation of the EMP. These are statutory stakeholders and the developer as well as the civil construction company that may be hired to install the required services and infrastructure.

5.2.1 ROLES AND RESPONSIBILITIES

5.2.1.1 STATUTORY STAKEHOLDERS

In **Table 1**, the roles, functions and responsibilities of statutory stakeholders are presented. The number of statutory stakeholders are actually many (Ministry of Finance, Ministry of Labour, etc.), but for the purpose of this EMP only three statutory stakeholders are presented:

- MEFT,
- CoW
- URPB,
- RA, and
- MAWLR.

Table 2: Statutory Role Players & Responsibilities

Role Player	Responsibilities
The Environmental Commissioner (EC)	EMA is implemented by MEFT specifically by the EC, a statutory office responsible for ensuring and enforcing compliance with the relevant environmental legislations and regulations. Amongst the roles and responsibilities of the EC are the following: <ul style="list-style-type: none"> • granting (or refusing) the ECC and renewals thereof;

Role Player	Responsibilities
	<ul style="list-style-type: none"> • ensuring overall compliance with the provisions of the EMP; • reviewing EIA compliance reports submitted to MEFT; • undertaking site audits at their discretion; • reviewing of major environmental related incidents and or accidents, and • enforcing legal mechanisms for contraventions to the EMP.
City of Windhoek (CoW)	<p>As the local authority, CoW is responsible for amongst others, the following:</p> <ul style="list-style-type: none"> • To ensure that buildings plans (for houses, businesses, hotels shopping malls, factories, etc.) submitted to council for approvals meet the minimum requirements as set out in the local authority bylaws. • To oversee all building construction activities taking place within the town boundaries. • To ensure that businesses and all trading activities within the local authority are conducted in a clean environment that is hazardous-free, clean and safe. • To issue licenses (Certificates of Fitness) to all types of businesses operated within the jurisdiction of the local authority that meet the minimum standards set by council. • To provide services such as potable water to houses and all business, refuse removal and disposal, recreational facilities for the residents, community infrastructure (parks and gardens), etc. • To construct street roads, provide street lighting, and to keep the streets and the entire town clean and habitable. • To levy and collect rates and taxes from residents in lieu of the services provided.
Urban and Regional Planning Board (URPB)	<p>The Board (URPB) was formed when the Urban and Regional Planning Act was signed into law on 5 April 2018 to consolidate the laws relating to urban and regional planning. The law provides for:</p> <ul style="list-style-type: none"> • the legal framework for spatial planning in Namibia including the preparation, approval and review of all national spatial development framework; • the subdivision and consolidation of land • establishment of urban and regional planning board; • the decentralisation of certain matters related to spatial planning • the approval and review of the national spatial development framework, regional structure plans and urban structure plans • approval, review and amendment of zoning schemes • alterations of boundaries of approved townships including the change of name of approved townships, etc.
Roads Authority (RA)	<p>The Roads Authority (RA) is a statutory institution created by an Act of Parliament, Roads Authority Act No 17 of 1999 to, amongst others:</p> <ul style="list-style-type: none"> • To undertake the management of the national road network including the planning, designing, construction and maintenance of roads which are part of the national road network • The quality control of materials required for the proper construction and the maintenance of roads; • The supervision of work contracted out in terms of applicable section of the act; • The operation of road management systems and subject to any laws, the prevention of the excessive damaging of roads by road users or any other parties

Role Player	Responsibilities
Ministry of Agriculture, Water and Land Reform (MAWLR)	<p>MAWLR is responsible for the administration of agricultural land, the management of water resources (surface and groundwater) as well as water abstraction related matters including drilling of boreholes.</p> <p>The bulk of plots in the Brakwater area are reliant on water sourced from boreholes drilled on their properties. Amongst the roles and functions of MAWLR with respect to his project are:</p> <ul style="list-style-type: none"> • Safety of water supply • Reliability of water supply • Reservation of water resources • Abstraction of water for domestic use • Hand-dug well for abstraction of water for domestic use • Use of water supplied by bulk water supplier or local authority • Right to collect rainwater • Prohibition to abstract or use water without licence • Application for licence to abstract and use water • Consideration of application for licence to abstract and use water • Criteria upon which licence to abstract and use water may be issued • Contents of licence to abstract and use water • Terms and conditions of licence to abstract and use water • Combined licence to abstract and use water and to discharge effluent • Duration of licence to abstract and use water

5.2.1.2 THE DEVELOPER OR PROMOTOR

The successful implement of the EMP depends on defined roles and responsibilities allocated to individuals and teams who have to carry out the required management actions. As such the promotor has to appoint a person who is suitably qualified and well experienced in the civil construction sector to assume the overall management of the development who should be referred to as a Project Manager (PM).

The functions and duties of a PM are presented in **Table 3**, below:

Table 3: Roles and Responsibility of Project Manager

Designation	Roles and Functions
Promoter or Project Manager (PM)	<p>The Promoter or the Project Manager (PM) has:</p> <ul style="list-style-type: none"> • To comply with the conditions attached to the ECC once granted by the EC. • The overall responsibilities for the implementation of the EMP. • To ensure that any drawings that maybe required for the installation of services and infrastructure. • To manage the day-to-day operational activities during the construction phase in compliance with all relevant rules and bylaws of CoW • To ensure that environmental requirements are adequately covered in any contract entered into with any service provider. • To ensure that any significant environmental incidents and emergencies are reported to the relevant authorities and corrective action taken to prevent re-occurrence. • To ensure that a copy of the EMP is provided to any third party contracted to install the required infrastructure and services. • To ensure that corrective actions are implemented for any non-compliance. • To ensure that appropriate records and information regarding environmental compliance requirements are maintained and are kept on file. • To maintain good open communications with all stakeholders and authorities. • To ensure that any complaint received from any stakeholders and or interested and affected parties (IAPs) is recorded, investigated and corrective action taken.

Designation	Roles and Functions
<p>The Civil Contractor (CC) appointed to carry out the work</p>	<p>The appointed Civil Contractor (CC) is expected to assume these roles:</p> <ul style="list-style-type: none"> • Is responsible for the implementation of the EMP during the construction phase. • To ensure that all tasks undertaken under the scope of the work, are performed in a safe and hazardous free and secure environment. • To ensure that all employees who are hired to work on the project receive an induction on the provisions of the EMP and all safety and health aspects. • To ensure that employees are regularly trained and made aware of their environmental obligations during the construction phase. • To ensure that all incidents, accidents and complaints are recorded in a complainant book kept on the construction site office. • To ensure that the work being done does not create a nuisance or danger to the local residents, livestock grazing around in the area or to the adjacent properties and infrastructure and to the immediate surrounds. • To ensure that all employees hired to work on the project are provided with suitable PPE.

5.3 Management of Impacts

Management measures to mitigate each potential negative impact are presented in **Table 4** in this document. The implementation plan is given for the operational phase only, because all construction works have been completed. The three headings of the implementation plan are discussed here:

5.3.1 ENVIRONMENT ASPECT OR NATURE OF IMPACT

Possible impacts on a feature or function of the environment are identified. Description of the potential risk sources (impacting activities) and the mechanism through which an impact may occur are described.

5.3.2 MITIGATION

Mitigation measures are proposed for each identified impact. These measures consist of specific management actions that need to be carried out in order to avoid, minimise or remedy negative impacts, together with adjustments to respond to unforeseen impacts.

5.3.3 TIMING

The timing when an intervention for the management action is required is also presented.

5.3.4 RESPONSIBLE PARTY

In all cases the HM will be the party responsible for ensuring that the recommended management measures are implemented. The HM is expected to delegate certain duties and functions to the civil construction company during the implementation phase.

5.4 EMP for the Planning or Pre-Construction Phase

This is the phase when the project plans are documented, the project deliverables and requirements are defined, and the project schedule created. It serves as the basis to determine aspects related to cost, quality and risk management throughout the execution of the project.

Table 4: Management Measures for the Pre-Construction Phase

Activity/Aspect	Management Measures	Party Responsible
Planning	<ul style="list-style-type: none"> Where possible, efforts should be made to ensure that the design and appeal of any visible infrastructure/structures fit into the surroundings and natural environment without becoming a nuisance. The designer must strive to ensure that the sense of place is kept in accordance with the surroundings areas including the adjacent B1 highway. 	Promotor/ Developer
Decarbonisation Initiative	<ul style="list-style-type: none"> Use of green technology should be considered and enhanced during the implementation of the project. Consideration should be given for: Consideration for complete off-grid by using solar or wind energy as alternative to conversional grid power or diesel powered generator sets The use of water recycling facilities should be enhanced and implemented Reliance on the use of natural day lighting for warehouse, workshops, etc. including the use of energy saving bulbs. 	PM
Compliance Requirements	<ul style="list-style-type: none"> Ensure that the necessary permits and licenses are obtained and kept on file prior to starting with the project implementation. These are: <ul style="list-style-type: none"> ECC from MEFT Water Abstraction Permits This EMP Approved building plans must be approved by the local authority, where applicable. 	PM
Communication with stakeholders	<ul style="list-style-type: none"> Keep all stakeholders informed about the progress being made with the project in an open and transparent manner. Ensure that opportunity is provided to stakeholders to continue raising any concerns (complainants) about any aspects of the project that they are not happy with. Record complaints received from IAPs, investigate such complainants and take corrective actions. Provide feedback where warranted. 	PM CC
Health and Sanitation	<ul style="list-style-type: none"> Develop a sanitation management plan for the road upgrading activities which includes setting up adequate sanitation facilities at the campsite and providing mobile toilets facilities along the road being upgraded and at all the construction sites. Develop eco-friendly sanitation facilities with capability to recycle water and reuse of the sludge. Under no circumstances should employees resort to the use of 'natural bush toilet'. 	PM CC

5.5 EMP for the Construction Phase

In the context of this project, the construction phase of this project involves the physical process of installation of services and infrastructure, as well as all other associated activities such as site clearance, landscaping and rehabilitation. Management measures for potential impacts that are likely to occur during the construction phase are presented in the table below.

Table 5: EMP for the Construction Phase

Activity/Aspect	Management Measures	Party Responsible
Site Preparation and Safety Aspects	<ul style="list-style-type: none"> The site where construction activities are to take place must be clearly demarcated and preferably surveyed before any construction work starts. 	PM/ Developer

Activity/Aspect	Management Measures	Party Responsible
	<ul style="list-style-type: none"> • Construction activities such as excavations must be confined to such demarcated sites. • Areas not demarcated for construction activities must be off-limits and marked as no-go areas. • Disturbance and risks associated to siting and construction should be minimised at all times. • Construction activities must comply with design specifications and standards and carried out by using best available technology. • Adequate measures such warning signs should be clearly displayed around the construction site to warn members of the public of potential dangers. • Ensure that construction is performed in safe and efficient manner without causing obstruction to the neighbouring residents. 	
Sourcing and Storage of Construction Materials	<ul style="list-style-type: none"> • Source construction materials that are supplied in bulk such as sand, stones and bricks from local suppliers whose operations are ECC compliant. • Construction materials must be transported to the construction site in a safe manner without overloading and causing of spills on public roads. • Construction materials may not be stored in close proximity to ecologically sensitive areas, i.e. water streams, slopes, etc. • Construction materials should be stored on site in a safe and secure manner without such materials becoming nuisance to the neighbouring residents. • The predominant wind direction should be taken into account when storing sand. To avoid wind erosion, sand stockpiles may not exceed a height of 2.5 m. • Ensure that all hazardous substances (chemicals, oils, etc.) are stored in appropriate, tamper proof containers. • Petroleum, chemical, harmful and hazardous materials must be stored in enclosed, bunded areas. The bunded areas shall be clearly marked. • The bund must have a volume of 10% of the volume of the largest tank in the storage area plus 10% of the volume of all other tanks. • Fuel for construction machinery and vehicles must be procured in a lawful manner. (By law not more than 200 litres of fuel may be stored without a Consumer Installation License) 	<p>PM</p> <p>CC</p>
Concrete and Cement Mixing	<ul style="list-style-type: none"> • Concrete and cement works must be undertaken in specified areas only, if not sourced from third parties (ready mix suppliers). • Ensure that all operations that involve the use of cement and concrete are carefully controlled. Water and slurry from concrete mixing operations must be contained to prevent pollution of the ground surrounding the mixing points. • Use plastic trays or liners when mixing cement and concrete. Do not mix cement and concrete directly on the ground. • Excess concrete from mixing must be deposited in a designated area awaiting removal to an approved landfill site. • All visible remains of excess concrete shall be physically removed immediately and disposed of as waste. Washing the visible signs into the ground is not acceptable. All excess aggregate shall also be removed. • Cement bags must be treated as hazardous waste and disposed of in a responsible manner. 	<p>PM</p> <p>CC</p>
Soil and Water Pollution	<ul style="list-style-type: none"> • Minimise risks of accidental spillage and clear the area immediately once a spill occurs. • Maintain a high standard of housekeeping by ensuring that soil contamination is avoided or kept to the minimum. 	<p>PM</p> <p>CC</p>

Activity/Aspect	Management Measures	Party Responsible
	<ul style="list-style-type: none"> • Waste should be segregated, biodegradable composted or sold to locals and others collected in containers and disposed of periodically. • Under no circumstances should non-biodegradable waste be buried at the construction sites. • All sanitary facilities must be properly maintained and satisfactorily decommissioned at the end of the construction period. • Servicing and maintenance of construction machinery, equipment and vehicles should be done in a workshop with an impervious floor and bunded. 	
Protection of Vegetation	<ul style="list-style-type: none"> • Limit disturbance of natural vegetation to a minimum by confining construction activities to sites that are clearly demarcated. • Removal of large trees must be avoided. Where removal is unavoidable, prior permission must be obtained from Forestry Department. • The clearing of vegetation must be kept to a minimum and remain within the footprint of the particular activity being undertaken. • Disturbed areas must be rehabilitated immediately after construction has been completed in that particular areas. • Monitor all sites disturbed by construction activities for potential colonisation by exotics or invasive plants and control these as they emerge. • Implement fines for the damage or destruction of marked and protected specimens. • Harvesting of fire wood is not allowed. 	PM CC
Protection of Fauna and Habitat	<ul style="list-style-type: none"> • A speed restriction of 30km/hr within the project construction site must be sat and complied with at all times. • Any temporary roads made to accommodate traffic during construction activities should be planned in such a way that sensitive areas are avoided. • Poaching of livestock and wildlife on neighbouring properties is strictly forbidden. • All staff and employees of the contractor including those of any third parties must undergo an environmental induction workshop on the protection of fauna and habitat. • The spatial extent of construction activities must be minimized, and restricted to the footprint of the construction sites. • Any bird nestling that are found during the construction period must not be disturbed. • Movement of construction vehicles and workers beyond the boundary of the site must be minimized. 	PM CC
Erosion and Sedimentation	<ul style="list-style-type: none"> • Do not allow erosion to develop on a large scale before taking action. • Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction sites. • Leave as much natural vegetation as possible intact during construction activities. • Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks activities in that specific area. 	PM CC

Activity/Aspect	Management Measures	Party Responsible
	<ul style="list-style-type: none"> Once construction is complete, obsolete roads should be obliterated by breaking the surface crust and erecting earth embankments to prevent erosion. 	
Storage and handling of hazardous materials	<ul style="list-style-type: none"> Storage of hazardous materials should not be allowed in close proximity to ecologically sensitive areas. All hazardous substances should be handled by qualified personnel and kept on bunded surfaces. No hazardous products should be discharged into the natural environment. Gas and liquid fuel may not be stored in the same storage area. No smoking is allowed in the vicinity of hazardous products such as fuel. Fuels and chemicals may not be stored under trees. Vehicles and machinery may not veer from the dedicated internal roads on the property. 	<p>PM</p> <p>CC</p>
Visual Impacts	<ul style="list-style-type: none"> Locate the construction campsite out of sight of the general public using the adjacent B1 highway. The construction campsite and construction areas must be kept neat and tidy at all times. All waste products must be removed from the site. Dust suppression measures must be implemented during earthworks so as to minimise the impact of dust clouds. Any signage used during the construction activities should be non-intrusive but clear. Security lights should be directed from the perimeter wall towards the center of the campsite with a down angle. Lighting up of structures should be avoided. Light should be directed downwards and focused on the object requiring illumination. Avoid directing the light towards the areas from where it would become offensive to external receptors. Light spill must be minimised. All security lighting should have 'blinkers' or be specifically designed to ensure light is directed downwards while preventing side spill. Lighting for security and safety purposes must be directed downwards and towards building structures and plant, to reduce light spill beyond the property boundary. Structures must be well maintained to avoid any visual decay. Consideration should be given to making use of structures that blend in well with the natural surroundings. Ensure that dust does not escape from the any stored materials into the atmosphere becoming a visual annoyance. Waste around the facility such as windblown papers and plastics should be regularly picked up to avoid visual annoyance. 	<p>PM</p> <p>CC</p>
Solid Waste Handling & Disposal	<ul style="list-style-type: none"> Litter generated during the construction activities must be collected in rubbish bins and disposed of weekly at registered waste disposal sites. Litter bins must be equipped with a closing mechanism to prevent their contents from blowing out or being scavenged on by wild animals in the surrounding. All building rubble, solid and liquid waste etc. must be disposed of at an appropriately licensed refuse facility. Ensure that no refuse waste are burnt on the premises or on surrounding premises. 	<p>CC</p>

Activity/Aspect	Management Measures	Party Responsible
	<ul style="list-style-type: none"> The construction site must be kept in a clean and orderly state at all times. No litter, refuse, waste, rubbish, rubble, debris and builders waste generated on the construction site should be placed or dumped on adjacent/surrounding properties. 	
Storm water Management	<ul style="list-style-type: none"> No stockpiles or construction materials may be stored or placed within any drainage lines. Storm water around the construction site must be managed so as to reduce silt loads into the ecological environment. Measures must be implemented to distribute storm water as evenly as possible and to avoid point sources of erosion. The site must be managed in a manner that prevents pollution of drains, downstream watercourses or groundwater, due to suspended solids, silt or chemicals. Do not allow surface water or storm water to canalize or be concentrated. Runoff from construction sites must be managed to avoid erosion and pollution problems. Monitor all rehabilitated areas for at least a year following the completion of rehabilitation works for failure of vegetation to establish and / or erosion. Immediately implement remedial measures as required 	<p>PM</p> <p>CC</p>
Noise Management	<ul style="list-style-type: none"> Construction activities must be limited to normal da-light hours of 07h00 to 17h00. Ensure that noise levels around the construction site remain within acceptable limits. The operational layout should be designed to control noise at source. Appropriate directional and intensity settings should be maintained on hooters and sirens. Silencer units on plant and vehicles should be maintained and kept in good working order. Ensure that employees and staff conduct themselves in an acceptable manner while on site, both during work hours and after hours. No loud music is permitted on site. 	<p>PM</p> <p>CC</p>
Dust Control Management	<ul style="list-style-type: none"> Wet all unprotected cleared areas and stockpiles with water to suppress dust pollution during dry and windy periods. Prevailing wind directions should be taken into account when selecting sites where to store construction materials that are prone to wind erosion such as gravel and sand. Avoid handling of dusty materials (such as sand, gravel and cement) during heavy wind conditions. Provide suitable PPEs to employees working in areas where dust levels are higher. 	<p>CC</p> <p>PM</p>
Crime, Safety and Security	<ul style="list-style-type: none"> Ensure that construction personnel is provided with suitable PPEs. Construction machinery and equipment must be handled by personnel who are suitably trained to operate such machinery. Equipment and materials must be handled by staff that have been adequately trained. Staff must be regularly updated about the safety procedures. Emergency facilities must be available and adequately supplied for use by staff and guests. 	<p>CC</p> <p>PM</p>

Activity/Aspect	Management Measures	Party Responsible
	<ul style="list-style-type: none"> Limit access to the construction campsite only to the workforce. Visitors should report to the site office before proceeding to the construction sites. Appropriate notification signs must be erected, warning both the workers and visitors of heavy machinery and equipment. Persons entering the site where machinery and equipment are working must be have suitable PPE. 	
Fire Prevention	<ul style="list-style-type: none"> All the necessary precautions must be taken to ensure that fires are not started as a result of activities on site. No open fires will be permitted on the premises. Personnel and staff who may be residing on the premises must be provided with gas for cooking purposes in demarcated, safe areas within the construction campsite. The contractor has to ensure that construction related activities that pose potential fire risk, such as welding, are properly managed and confined to areas where the risk of fires may be reduced. Suitable firefighting equipment must be provided during the construction period. Ensure that the firefighting equipment are functional and employees are trained on how to use such equipment on the event of a fire outbreak. 	<p>CC PM</p>
Heritage Resources	<ul style="list-style-type: none"> Should archaeological or cultural items be exposed during construction work, it must immediately be reported to NHC so that an investigation and evaluation of the finds can be made. Upon receipt of such notification, the NHC will arrange for the excavation to be examined by an Archaeologist as soon as possible. Under no circumstances shall archaeological artefacts be removed, destroyed or interfered. Any archaeological sites exposed during construction activities may not be disturbed prior to authorisation by NHC or Archaeologist. 	<p>CC PM</p>
Sewerage and Effluent	<ul style="list-style-type: none"> Any sewage system installed on any section of the property must meet the standards specifications by CoW. Ensure that the sewage system installed is not overloaded, and that it functions within its design capacity. Take action to reduce output or increase capacity if necessary and ensure that measures are put in place to prevent all leaks and spills. Repairs to the sewage system must be done immediately by qualified and experienced personnel. In the event of a failure or overflow situation at the sewage system, a back-up system should be available to ensure that no sewage is discharged into the environment. Regular removal of sludge from the septic tanks by a licenced contractor (if required). Ensure that all treated effluent meets or exceeds the water quality regulations prior to discharge or reuse. 	<p>PM CC</p>
Hazardous Waste	<ul style="list-style-type: none"> Avoid the generation of hazardous waste wherever possible through procurement processes e.g. purchasing of less toxic / environmentally friendly products. Petroleum, chemicals, harmful and hazardous waste must be stored in enclosed, banded areas that are clearly marked. Such waste shall be disposed of offsite at a licensed hazardous waste disposal site. Hazardous waste may be temporarily stored on site in vessels equipped with secondary containment structure to prevent contamination of soil, groundwater and surface water due to accidental spill or releases. 	<p>PM CC</p>

Activity/Aspect	Management Measures	Party Responsible
	<ul style="list-style-type: none"> • Certain hazardous waste such e-waste, batteries and light bulbs, can be recycled through reputable agents. Where possible, all hazardous waste, including hydrocarbon waste, should be recycled either by a recognized recycling company or returned to the supplier. • Loading and unloading any solid hazardous materials should be done in a manner that reduces potential spills. 	
Spill Prevention and Handling Measures	<ul style="list-style-type: none"> • If a spill does come, efforts must be made to stop spill at the source as soon as possible using suitable equipment. • Recovered spill materials should be temporarily stored in leak-proof containers and disposed of at an approved offsite landfill. • It is advisable to keep a spill kit with the following items such as protective clothing, (e.g. overalls, gloves, etc.); absorbent materials suitable for the chemical being handled; and heavy duty plastic bags, etc. • When any small repairs or maintenance activities are being undertaken, reasonable precautions must be exercised to avoid spills by making use of spill trays and or making use of impervious sheet. • Adequate training should be provided to all personnel at the construction site. • Machinery, equipment and vehicles must be regularly serviced to minimise oil and fuel leaks. • Any major petroleum spill (spill of more than 200 litres per spill) should be reported to MME. 	<p>PM</p> <p>CC</p>
Socio-economic Impacts	<ul style="list-style-type: none"> • Where possible, the PE should make it a requirement for the MC and subcontractors to implement an indigenous 'first policy' for construction, specifically for semi and low-skilled job categories. (For the purpose of this report, the Hai//om people are considered as the indigenous people). • Maximise the use of local labour from surrounding communities for low – semi skilled jobs as far as possible. • Implement mitigation measures to monitor and control the activities of construction workers and for the control of nuisance impacts. • Access to the construction site must be strictly controlled. • Where feasible, training and skills development programme for surrounding community locals should be run throughout the construction period. • The Contractor shall provide sanitation facilities in the form of chemical toilets, at all camps, offices, workshops and construction sites for staff and visitors. No other form of sanitation will be permitted unless a connection with a local sewer main is possible. The provision o 	<p>CC</p>

5.6 Monitoring

It is imperative that the promoter (or Project Manager) ensures that compliance to the EMP is monitored on a regularly basis. In **Table 6**, key simplified environmental monitoring performance indicators, that should be checked and monitored, are provided. The indicators listed in the table should be considered as guidelines only and are intended to assist the project developer in the early detection of environmental impacts. The developer has the prerogative to add to such parameters and to delegate certain functions to staff members for the efficient implementation of the construction activities.

5.6.1 MONITORING OF CONSUMABLES

For the efficient management of construction activities, it imperative that consumables such as fuel used by construction machinery and vehicles are measured and the use thereof monitored and kept within budgeted parameters. Measuring the any electricity used during the development

will make cost comparisons and justification whether to switch to solar powered units, more easier.

5.6.2 COMPLIANCE INSPECTION

An EMP compliance inspection should be carried out at least annually to ensure that management continues to comply, and to improve its obligations and commitments made in the EMP. It is important for the developer to keep records of environmental monitoring data and for such data to be included in the annual report.

Table 6: Mitigation Components to be Monitored

Aspect to be Monitored	What to Check/Monitor	Frequency	By Who
Petroleum Products (petrol, diesel, grease, etc.)	Petroleum products are measured in litres (petrol, diesel, etc) and mass for grease and lubricants. The cost is based on the specified unit. It is important that correct records of products utilised are kept and consumption determined on a regular basis.	Record fuel products used per day or week and related costs	PM, CC or as delegated
Waste	Onsite secure storage of solid waste before removal	Weekly	PM, CC or as delegated
	Removal of all waste type from workshop area	Daily	
	Site office area	Daily	
	Waste sorting (recyclable and non-recyclables)	Daily	
	Inspection of waste bins	Weekly	
Water	Compare water usage over a period of time and determine approximate volume of water used by the development.	Monthly	PM or CC during construction
	Where huge discrepancies in usage are recorded, check any leaks from the tanks	Monthly	
	Water installation – check all steel structures for stability and integrity.	Quarterly	
	Check and inspect any water storage tanks and distribution pipes for any leaks.	Monthly	
	Check and inspect all taps for leaks	Monthly	
	Water pipes – check and inspect for leaks	Monthly	
	Sanitation – check and inspect for cleanliness and any leaks	Weekly	
Clean rainwater gutters and downpipes of leaves before the wet season	Yearly		
Sewage System	Check and inspect onsite sewerage connections for any leaks	Quarterly	PM or as delegated
	Check and inspect all toilets for cleanliness, hygiene and functionality.	Quarterly	
	Check and repair any leaks from toilets, taps, etc.	Yearly	
Machinery, Equipment & Vehicles	Check for any oil leaks under machinery, equipment & vehicles	Daily before starting	PM or as delegated
	Check for water level/coolant in the radiator	Daily prior to use	
	Check engine oil levels	Daily before use	
	Check tracks and or tyres pressure	Daily	
	Check general cleanliness of machinery & vehicles	Daily	
	Check for vehicle license validity & roadworthiness	Yearly	
Check and inspect the spare wheels on vehicles	Monthly		
Infrastructure	Check and inspect the condition of the walkways	Weekly	PM or as delegated
	Check and inspect the driveways	Weekly	

Aspect to be Monitored	What to Check/Monitor	Frequency	By Who
	Check and inspect boundary fence of the property	Weekly	
	Check and inspect the motor gates to the property	Daily	
	Check and inspect that the gates, hinges, latches, etc. are free from rot	Monthly	
Flora (Vegetation)	Where any vegetation replanted occurred post construction	Monthly	PM or as delegated
	Check and monitor plant growth	Quarterly	

5.7 Decommissioning Plan

There are no consideration to decommission the project. In fact, the project intends to subdivide Portion 137 into smaller individual land portions to accommodate industrial activities. There is no provision made for decommissioning.

6. CONCLUSIONS AND RECOMMENDATION

6.1 Conclusions

This EMP has described the management measures that have to be implemented for the purpose of preventing and or minimising the negative environmental impacts that are likely to be associated with the installation of bulk services on individual land portions that are to be subdivided from Portion 137. Measures aimed at enhancing positive impacts which will accrue from the development such as employment and stimulation of economic activities in the local economy have also been suggested.

The EMP is a legal document which commits the developer to comply with all the management measures, monitoring and other plans presented in this document. In essence, the EMP is a practical, working protocol to be used in accordance with the principles of adaptive management. It must be amended when new information, new technology, new legislation and management measures become available.

Management has the flexibility to adjust the management measures suggested in this EMP in order to conform with the current best practice guidelines, while remaining within the economic means of the business.

6.2 Recommendation

It recommended that the ECC be renewed to allow for the subdivision and rezoning of Portion 137 of Breakwater No. 48