

**HYPHEN Hydrogen Energy (Pty) Ltd**  
Unit 3, 2nd Floor, Dr Agostinho Neto Road  
Ausspann Plaza,  
Windhoek, Namibia

Reg No. 2021/0412  
info@hyphenafrika.com  
www.hyphenafrika.com



# HYPHEN GREEN HYDROGEN PROJECT ENVIRONMENTAL MANAGEMENT PLAN FOR LUDERITZ SITE 2 WIND MAST, //KARAS REGION

08.03.2024 Doc. No. HSD-SLR-Z-GEN-EN-REP-0007

Revision 1

## REVISIONS

1	06.03.2024	Issue for Approval	Christians		
0	01.12.2023	Issue for Review	Christians	Blood	
<b>REV.</b>	<b>DATE</b>	<b>ISSUE, MODIFICATION</b>	<b>PREPARED</b>	<b>CHECKED</b>	<b>APPROVED</b>

## TABLE OF CONTENTS

1	INTRODUCTION.....	4
2	OBJECTIVES OF THE OPERATIONAL EMP .....	4
3	APPROACH TO IMPACT MANAGEMENT .....	5
4	POLICY AND LEGISLATIVE FRAMEWORK .....	5
5	DESCRIPTION OF ACTIVITIES TO BE UNDERTAKEN .....	8
6	ROLES AND RESPONSIBILITIES .....	10
7	CONSTRUCTION AND OPERATIONAL EMP .....	12
8	ENVIRONMENTAL MONITORING AND AUDITING .....	18
9	NON-CONFORMANCE PROCEDURES DURING OPERATIONS .....	18
10	SUB-CONTRACTOR MANAGEMENT .....	18
11	DOCUMENTATION, RECORD KEEPING AND REPORTING PROCEDURES.....	18
12	CONCLUSIONS AND RECOMMENDATIONS .....	19

## TABLES

Table 1: Site and Project details

Table 2: Approaches to Impact Management

Table 3: Legislative Requirements which are Applicable to the Construction and Operation of this Project.

Table 4: The following Activities are Associated with the Construction and Operation of the Wind Energy Facility and their Associated Potential Impacts

Table 5: The following Roles and Responsibilities have been identified as it pertains to this project:

Table 6: Environmental Management Plan for Construction and Operation

## 1 INTRODUCTION

Namibia Power Corporation (Pty) Ltd (NamPower) received an Environmental Clearance Certificate (ECC) for the Lüderitz Site 2 Wind Mast on 25 March 2021. The met mast has been constructed and NamPower has been collecting meteorological data (including wind, solar and weather data) since its installation in August 2021.

NamPower has agreed to transfer all rights of the this met mast to Hyphen Hydrogen Energy (Pty) Ltd (Hyphen) and, as part of the application to transfer the ECC to Hyphen, the existing approved Environmental Management Plan (EMP) has been converted into a Hyphen document in order to reflect the updated roles and responsibilities. The remainder of the document remains as previously approved and included both the construction and operations phases.

The purpose of this document is to manage the anticipated impacts of the construction and operation of the Lüderitz Site 2 Wind Mast. This EMP document will ensure sound environmental performance by all contractors and Hyphen employees during the construction and operation of the mast.

**Table 1: Site and Project details**

<b>Location (coordinates)</b>	<b>Latitude: Longitude:</b>
Site location	Tsau//Khaeb (Sperrgebiet) National Park, 55km from B4 National Road along the Rotkop-Oranjemund road.
Footprint area of the Mast including guy wire/ropes	1.5 Hectare
Wind Mast Height	100m Wind Mast

## 2 OBJECTIVES OF THE OPERATIONAL EMP

The aim of this construction and operation EMP is to detail the management actions and mitigation measures require to ensure that any construction and operational phase activity is carried out in a manner that takes cognisance of environmental protection and is in line with National legislation. This EMP has the following objectives:

To ensure that the activities associated with the construction and operation of the mast do not result in undue or reasonably avoidable adverse environmental impacts.

Minimise negative impacts.

Stipulate specific actions to assist in mitigating the environmental impact of the project.

To identify key personnel who will be responsible for the implementation of the measures and outline functions and responsibilities.

Create management structures that address the concerns and complaints of Interested and Affected Parties (I&APs) with regards to the operation of the meteorological mast.

### 3 APPROACH TO IMPACT MANAGEMENT

Table 2: Approaches to Impact Management

Approach	Impact Management
Avoidance	Avoiding activities that could result in adverse impacts and/or resources or areas considered sensitive.
Prevention	Preventing the occurrence of negative environmental impacts and/or preventing such an occurrence having negative impacts.
Preservation	The process of working to protect something valuable so that it is not damaged or destroyed (i.e. environmental resources)
Minimization	Limiting or reducing the degree, extent, magnitude or duration of adverse impacts through scaling down, relocating, redesigning and/or realigning elements of the project.
Mitigation	Measures taken to minimize adverse impacts on the environmental and social aspects.
Enhancement	Magnifying and/or improving the positive effects or benefits of a project.
Rehabilitation	Repairing affected resources to their original state.
Restoration	Restoring affected resources to an earlier (possibly more stable and productive) state, typically 'background' condition, where identified to be appropriate and reasonable. These resources may include soils and biodiversity.

### 4 POLICY AND LEGISLATIVE FRAMEWORK

Table 3: Legislative Requirements which are Applicable to the Construction and Operation of this Project.

Legislation:	Section(s) applicable:	Implications:
Environmental Management Act no 7 of 2007	Section 3	All activities performed should be in line with the following principles:  Interested and affected parties should have an opportunity to participate in decision making.  Polluter should pay for rehabilitation.  Pollution should be minimized
EMA Regulations 28-30(GG4878) (February 2012)	Listed activity:  Infrastructure  10.1 The construction of  (j) masts of any material or type and of any height, including those used for  telecommunication broadcasting and radio transmission,  EIA Process Sections: 5.16.– 9; 13; 15; 21 -24	These sections details the process to be followed in terms of producing an Environmental Assessment and this process should be adhered to during the generation of information for this document.

Legislation:	Section(s) applicable:	Implications:
Labour Act no 11 of 2007	Section 3 Section 4 Section 9 Section 39 – 42	Children under the age of 16 may not be employed Forced labour may not be used during any construction activities.  Basic conditions of employment as stipulated by the law must be met.  The employer shall ensure the health and safety of all employees and non-employees on site. Employees must fulfil their duties in order to ensure their own health and safety and that of other employees and persons. Employees may leave the work site if reasonable measures to protect their health are not taken.
Water Act no 54 of 1956	Section 21 and 22 Section 23	Conditions in terms of the disposal and management of effluent are to be adhered to.
Public Health Act no 36 of 1919	Section 122	It is an offence to cause any form of a nuisance which includes water pollution.
Water Resources Management Act no 24 of 2004	Section 56	No discharge of effluent may take place without a permit.  Effluent is defined under this Act as any liquid discharge  that occurs as a result of domestic, commercial, industrial or agricultural activities.
Nature Conservation Ordinance no 4 of 1975	Section 74	Protected plants may not be removed or damaged without a permit.
National Heritage Act No 27 of 2004	Section: 46, 48, 55	All heritage resources are to be identified and either protected or removed/mitigated with a permit from the National Monuments Council, before any development may take place  A chance find procedure should be followed in case of  discovery of a heritage resource.
Park Rules and Management Plan		Park permit requirements and Park rules
Diamond Act 13 of 1999 and regulation	Regulation 13 And 14	Whenever any person is required to perform a security check on an employee or a natural person in terms of section 48(I) (a) of the Act.  Access permit requirements.

Legislation:	Section(s) applicable:	Implications:
		Records of employees ,contractors and sub-contractors.
Civil Aviation Act 6 of 2016	Section 55	Regulation relating to safety and security.



## 5 DESCRIPTION OF ACTIVITIES TO BE UNDERTAKEN

**Table 4: The following Activities are Associated with the Construction and Operation of the Wind Energy Facility and their Associated Potential Impacts**

ACTIVITY	ACTIVITY DESCRIPTION	ASSOCIATED ENVIRONMENTAL ASPECTS AND IMPACTS
Site Establishment and clearing	Increased vehicular movement	Loss of biodiversity Soil and water contamination Creation of deep tracks or additional tracks in the area Employment opportunities
Construction	Construction include the following activities: Access road grading Minor excavations for support guy ropes/ wire. Excavation for foundation of the Mast. Packaging material of the mast	Noise emissions Dust emissions Increased interaction between people and biodiversity in this area. Introduction of new people in the area leading to the spread of diseases such as HIV/AIDS Waste generation Employment of casual workers Loss of biodiversity Support local economy
General functioning	Physical presence and functional characteristics of the Wind Mast. Height of the tower	Visual impact Bird collision on the guy support wire and Mast Tower. May interfere with safe movement of air traffic in the area by introducing a potential obstacle to pilots flying at low levels.





		If the collected data indicate the potential for the development of renewable energy in the area, this may result in increased investment in the area and the potential for job creation.
Maintenance of the Wind Mast.	The maintenance of the Wind Mast entails: General equipment repairs Data download. Servicing batteries Construction or repairing of access roads	Soil and water contamination Waste generation Loss of biodiversity Social issues related to the introduction of new workers in the area, e.g. HIV/AIDS spreading
General site inspection	Site inspection conducted by the technical and SHEW teams	Waste generation Improve compliance Enables identification of non conformances and stakeholder complaints



## 6 ROLES AND RESPONSIBILITIES

It is the responsibility of Hyphen to ensure that all management actions are carried out. The successful implementation of the EMP is, however dependant on clearly defined roles and responsibilities by several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during each phase of the project.

**Table 5: The following Roles and Responsibilities have been identified as it pertains to this project:**

RESPONSIBLE PERSON	RESPONSIBILITIES	PHASE/ACTIVITY
Hyphen Project Manager	Is responsible for the enforcement of the EMP. To ensure that environmental requirements are adequately covered in any external service providers contracts. To ensure that SHE requirements are included in the tender documents sent to the contractors. A copy of this EMP should also form part of the tender documents. To ensure that corrective actions are implemented for non- compliances. To ensure that appropriate records and information regarding compliance with environmental requirements are maintained. To ensure that the Wind Mast remains in compliance with the requirements of this EMP, through regular communication and monitoring. To ensure that all incidents, accidents and complaints are reported the project manager. The contractor to ensure that incidents and accidents are investigated to prevent re-occurrence. Must ensure that the contractor remains in compliance with the requirements of this EMP, through regular communication and monitoring.	Construction and Operation of the Wind Mast
Hyphen SHEQ	To ensure that all requirements with regards to this EMP are fulfilled. To assist the Project Manager in ensuring that the contractor remains in compliance with this EMP. Provides SHEW inductions to Hyphen and contractor employees as well other stakeholders working or visiting the site.	All phases of the project



RESPONSIBLE PERSON	RESPONSIBILITIES	PHASE/ACTIVITY
	<p>Organize and implement monitoring and audit functions, in consultation with the Project Manager.</p> <p>Document and communicate monitoring, audit and inspection findings to project manager.</p> <p>Communicate the final inspection report to the Project manager on contractor compliance to the EMP before the project close-off and final payment is made to the contractor.</p>	
Contractor	<p>Is responsible for the implementation of the EMP.</p> <p>To appoint as SHE officer responsible for the implementation of this EMP.</p> <p>To ensure that all tasks undertaken under the scope of work, are in accordance both with Hyphen's SHEW policies and procedures as well as to the requirements of this EMP.</p> <p>Ensure staff members are regularly trained and awareness built relating to environmental and social management.</p> <p>To ensure that all incidents, accidents, and complaints are reported the project manager. The contractor to ensure that incidents and accidents are investigated to prevent re-occurrence.</p> <p>Ensuring that all employees receive a SHEW induction before the start of the project.</p> <p>Ensuring that the work being done does not create a nuisance within the immediate surroundings of the site.</p>	



## 7 CONSTRUCTION AND OPERATIONAL EMP

Table 6: Environmental Management Plan for Construction and Operation

ASPECT	MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS	PHASE/ACTIVITY	RESPONSIBLE PERSON
Personnel and Environmental awareness	<p>All employees, both internal and external to receive environmental awareness training and refresher environmental awareness training to be available when required.</p> <p>All contractor employees to receive induction before any work is commenced on the site.</p> <p>All employees are to be made aware of their individual roles and responsibilities in achieving compliance with the EMP.</p> <p>Environmental toolbox talks to be conducted by the contractors and records to kept onsite.</p> <p>The Contractor shall take all necessary precautions against trespassing on private properties.</p> <p>Warning signs must be placed on and around the site as per the Occupational, Health and Safety requirements.</p> <p>Adequate first aid services must be provided by the contractor at the contractor's camp.</p> <p>The contractor will be responsible for his own security arrangements and shall comply will all site security instructions.</p> <p>Basic firefighting equipment must be available on site.</p> <p>PPE to be provided and well maintained at contractor's camp; and</p>	All phases	<p>Project manager</p> <p>Contractor Safety Health, Environment and Wellness Department representative (SHEW)</p>



	All incidents should be reported to ECO, investigated, documented, and kept in safety file.		
Park Rules and Namdeb Requirements	<p>All incidents should be reported to, ECO, investigated, documented and kept in safety file.</p> <p>Park rules to be adhered at all times.</p> <p>Namdeb Induction and permit requirements to be adhered to all the time.</p> <p>Work closely with Parks representative in the identification of special plants onsite.</p>	All phases	Project manager Contractor SHEW.
Vegetation	<p>Plant material may not be collected and removed from site</p> <p>Areas with a high density of vegetation growth shall be avoided when access routes are planned.</p> <p>Herbicides may not be used on site</p> <p>Protected and endemic plants shall be identified within the proposed site and along the access route and Ministry and Environment and Tourism Lüderitz Office or Botanical Garden to be consulted for guidance.</p> <p>Identified plants shall be replanted in an area outside the work area by officials from the Ministry of Environment and Tourism in Lüderitz.</p> <p>Rehabilitation must be carried out prior to the contractor leaving the site and in the manner prescribed in this document.</p> <p>A speed limit of 30 km/h shall be maintained on site.</p> <p>Trucks and larger vehicles shall have a designated turning point.</p>		Contractor SHEW
Health and Safety Management	<p>All staff should undergo a general health and safety induction.</p> <p>Only medically fit personnel to be employed.</p> <p>Enforce general health and safety rules onsite.</p>	All phases	Project manager Contractor SHEW



	<p>Develop and implement an occupational health and safety system that comprises key elements such as risk assessment and safe working procedure.</p> <p>All work activities to be done under the supervision of a competent person.</p> <p>Personal protective equipment must be worn by all employees and contractors.</p> <p>Employees must receive proper training before receiving PPE.</p> <p>Erect physical barriers to ensure there is no unauthorised access to site.</p> <p>Maintain an incident and complaint register.</p> <p>All unattended open excavations shall be adequately demarcated (fencing shall consist of a minimum of three strands of wire and made clearly visible).</p> <p>Adequate protective measures must be implemented to prevent unauthorised access to and climbing of partly constructed towers and protective scaffolding.</p> <p>No firearms shall be permitted on Site.</p> <p>Airplane warning lights to be in place on the tower.</p>		
<p>Dust Management</p>	<p>Control dust in the during construction e.g by wetting the surface if necessary.</p> <p>Excavation, handling and transport of erodible materials shall be avoided under high wind conditions or when a visible dust plume is present.</p> <p>Dust generation from all activities will be minimised wherever possible.</p> <p>A maximum speed limit of 20 km/h will be enforced to control dust emissions and minimize incidents onsite.</p> <p>Transport of construction material will ensure measures to prevent fugitive dust emissions.</p>	<p>All phases</p>	<p>Project manager Contractor</p>



	<p>Dust suppression measures shall be implemented if necessary. Dust may be controlled by damping of the road with water when necessary to minimise nuisance dust.</p> <p>Construction machinery and equipment will be maintained in good working order in order to minimise exhaust fumes.</p>		
Resources Efficiency	<p>Minimise water use.</p> <p>Avoid wasteful use of materials.</p> <p>Source goods and services locally where possible.</p> <p>Minimise the generation of waste by applying the waste hierarchy.</p>	All phases	<p>Project manager</p> <p>Contractor</p>
Waste Management	<p>The site to be kept free of waste.</p> <p>No burning, burying or dumping of any waste materials, vegetation, litter or refuse shall be permitted onsite.</p> <p>Labelled waste bins with lids must be provided onsite for all waste streams and ensure that waste is disposed at nearest approved waste disposal site.</p> <p>Ensure that waste segregation is done at source.</p> <p>Hazardous waste shall be disposed of at a registered waste disposal site.</p> <p>Safe disposal certificates for hazardous waste must be kept in the SHE file.</p> <p>No material shall be left on site that could be of harm to humans and animals.</p> <p>Broken, damaged and unused nuts, bolts and washers shall be picked up and removed from site.</p> <p>Waste shall be removed from site on a daily basis and disposed of at the appropriate waste management site.</p>	All phases	<p>Project manager</p> <p>Contractor</p>



	<p>Hazardous waste shall be disposed of at the location indicated by the Town Council of Lüderitz. Record shall be kept of all hazardous waste disposed of.</p> <p>No waste material shall remain on site once the project has been completed.</p> <p>Surplus concrete may not be dumped indiscriminately on site, but shall be removed from site when nearing completion of the different stages of work.</p> <p>Concrete trucks shall not be washed on site unless adequate washing and concrete collection facilities be introduced to site.</p> <p>Bins and containers must be made available by the contractor for the storage of construction waste.</p> <p>No burning of cleared vegetation shall be allowed on site.</p>		
Wastewater management	<p>Water containing environmental pollutants shall be collected and removed from site.</p> <p>No waste water runoff or uncontrolled discharges from the site/working areas shall be permitted.</p> <p>Mobile toilets or septic tanks should be used and be regularly emptied.</p>	All phases	Project manager Contractor
Cultural resource	<p>Any chance finds must be reported to Hyphen environmental section.</p> <p>In an event of discovery of human remains or other artefacts the work shall cease. A professional archaeologist is to be consulted and carry out investigation.</p>	All phases	Project Manager Contractor SHEW
Protection and handling of fauna on site.	<p>The contractor must ensure that the site is kept clean and free of rubbish that could potentially attract animal pests, and that rubbish bins are scavenger proof.</p> <p>The contractor must report problem animals or vermin to the SHEW.</p>	All phases	Project Manager Contractor SHEW





	<p>Ensure that domesticated and livestock animals belonging to the local community are kept away from the construction works.</p> <p>The contractor may under no circumstances make use of pesticide or poison to control unwanted animals.</p> <p>Workers should be educated so as not to kill any fauna found onsite.</p> <p>The footprint of disturbance should be kept to a minimum</p> <p>No hunting or trapping is permitted along the alignment.</p> <p>Excavations must be checked on a regular basis for any signs of wildlife which may have fallen in.</p>		
Site Rehabilitation	<p>A post construction inspection 1 week before the Contractor has moved off site.</p> <p>SHEW to sign site close off or take over certificate once remedial corrective action is implemented.</p>	Construction and Decommissioning Phase	Project Manager Contractor SHEW
Decommissioning	<p>During decommissioning, especially at the time when the mast is dismantled, a member of the Hyphen SHEW section shall be on site for the entire duration of this activity.</p> <p>A revised decommissioning plan will be developed prior to decommissioning the project in order to ensure that the plan is in line with conditions at that time.</p>	Decommissioning Phase	Project Manager Contractor SHEW

## 8 ENVIRONMENTAL MONITORING AND AUDITING

Environmental monitoring, audits and inspections must be conducted by SHEW personnel and SHE representatives during construction and operational phases. The environmental monitoring and audits conducted at the meteorological mast will cover all management procedures and the requirements of this plan. It is proposed that before and after construction photographic evidence is captured and recorded.

## 9 NON-CONFORMANCE PROCEDURES DURING OPERATIONS

In the event of non-compliance, the following recommended process shall be followed:

Non-compliances will be identified during inspections or audits carried out by the SHEW Section and reported to the project manager for corrective actions.

Project manager shall notify both internal and external employees about the non-compliance.

Corrective and preventative actions must be implemented on an agreed timeframe.

Follow-up inspections shall be conducted to assess whether the corrective and preventative actions were implemented effectively.

Hyphen has the right to ban any employee from the site, which have not attended a SHEW induction, until the time that they receive induction. Hyphen also has the right to stop all construction activities if it is found that a gross violation of the EMP is taking place.

## 10 SUB-CONTRACTOR MANAGEMENT

The contractor shall in writing inform its sub-contractors and issue them a copy of this EMP and SHE Plan. Sub-contractors shall indicate in writing their commitment to comply with these plans. The Contractor has the overall responsibility of ensuring that all its sub-contractors comply with both plans.

## 11 DOCUMENTATION, RECORD KEEPING AND REPORTING PROCEDURES

The following documents must be kept on site, during the construction phase, in an accessible place, and maintained by the Contractor and district personnel:

- Copy of the Environmental Clearance Certificate.
- SHE file.
- Induction records.
- Environmental monitoring and inspection reports.
- Site Locality Plan.
- Site instructions.
- Records of the quantities of general and hazardous waste generated on site and disposal certificates or details of volumes of waste recycled. Water consumption.
- Incidents and accidents (spills, impacts, complaints, legal transgressions).
- Corrective and preventive actions taken to rectify incidents and accidents.

## **12 CONCLUSIONS AND RECOMMENDATIONS**

The purpose of this document is to provide guidelines for environmental best practice during the construction and operation of the Wind Mast. This document shall be seen as part of all contracts related to the Wind Mast.