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CLEANERGY SOLUTIONS NAMIBIA POWER GRID CONNECTION PROJECT WALVIS BAY ENVIRONMENTAL MANAGEMENT PLAN

ENVIRONMENTAL MANAGEMENT PLAN

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ACRONYMS AND ABBREVIATIONS

ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ErongoRED	Erongo Regional Electricity distributor Company (Pty) Ltd
HLPCD	Horizontal Line Post Compact Delta
MEFT	Ministry of Environment, Forestry and Tourism

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1 INTRODUCTION

This Environmental Management Plan (EMP) has been drafted as part of the Environmental Impact Assessment (EIA) which was conducted for the construction and operation of a the 11kV transmission line for the Cleanergy Hydrogen Pilot Plant Project, Walvis Bay. Its content has been tailored according to the Regulations of the Environmental Management Act, 2007 (Act No 7 of 2007). It aims to provide management measures to address the effects on the biophysical and social environment that have been identified in the EIA.

2 ROLES AND RESPONSIBILITIES CONCERINING THE IMPLEMENTATION OF THE EMP

The roles and responsibilities of all parties involved in effectively managing the environment are set out below:

Table 1: Roles and responsibilities for EMP Implementation

Position	Responsibility	Frequency	Reporting
Client	Accountable for all aspects of EMP compliance	Continuous	Government
Contractor	Accountable for implementation of EMP	Weekly	Client
Environmental Control Officer	Responsible for implementation and monitoring	Continuous	Contractor

Client

The client will take full responsibility for compliance to the EMP and will keep records to be submitted to the Directorate of Environmental Affairs (DEA), as part of the three-year renewal cycle of the ECC. The records will show the results of compliance with this EMP, areas of non-compliance and areas of importance for the next three- year cycle.

Environmental Coordinator

The Environmental Coordinator (EC) (as appointed by Cleanergy) will inspect the site, or as practically determined, to ensure that all specifications are met. The duties of the environmental coordinator will be the following:

- Audit contractor environmental policies and procedures,
- Advise the construction team in respect of implementation of the environmental specifications,
- Conduct visits to ensure all work is aligned to the EMP,
- The environmental coordinator shall inspect the site during the site visits.
- Conduct inspections of the rehabilitation area and give guidance regarding rehabilitation measures where required.

The Construction Manager / Contractor

The duties of the Construction Manager (CM) or his nominated authority are as follows:

- Familiarize themselves with the requirements of the EMP,
- Develop environmental policies and procedures to comply with the EMP,
- Monitor employees' and contractors' compliance with the environmental specifications and enforce adherence,
- Maintain a record of activities relevant to environmental management,
- The construction manager shall be responsible for monitoring and the enforcement of the environmental management specifications on a day-to-day basis. Any violation of the environmental specifications shall be recorded and the agreed on disciplinary measures taken.

Environmental Control Officer

The Environmental Control Officer will report directly to the Construction Manager regarding the day-to-day implementation of the EMP as well as all reporting all environmental incidents. The following lists his/her main duties:

- Effect all environmental policies and procedures to comply with the EMP,
- Report all possible environmental incidents and rectification measures to the Construction Manager,
- Communicate all environmental related incidents with the environmental coordinator and distribute inter

3 ENVIRONMENTAL MANAGEMENT REQUIREMENTS

The following are management actions that should be adhered to by the proponent, Cleanergy Solutions (Pty) Ltd at all times. These management requirements cover all actions of the construction and operational phases. All construction and maintenance activities should be carried out in line with this Environmental Management Plan (EMP), as may be applicable to the specific phase and activities carried out.

Table 2 below is a summary of the pertinent permit and other active legal requirements needed.

. The EMP is laid out as follows:

- Planning and Design and tender documentation;
- Construction Contract Preparation Management Requirements;
- Construction Mitigation Requirements; and
- Permit and Legal Requirements;

Table 2: Legislation Management Requirements

Theme	Legislative vInstrument	Management Requirements	Contact Person
Environmental	Environmental Management Act 7 of 2007 EIA Regulations (EIAR) GN 57/2007 (GG 3812)	The amendment, transfer or renewal of the Environmental Clearance Certificate	Damion Nchindo 2842717
Labour	Labour Act 11 of 2007 Health and Safety Regulations (HSR)	Adhere to all applicable provisions of the Labour Act and the Health and Safety regulations.	Labour Law Advice: Tel: 061-309 957

Theme	Legislative vInstrument	Management Requirements	Contact Person
	GN 156/1997 (GG 1617).		
Archaeology	National Heritage Act 27 of 2004	All protected heritage resources (e.g. human remains etc.) discovered, need to be reported immediately to the National Heritage Council (NHC) and require a permit from the NHC before they may be relocated.	Ms. Erica Ndalikokule Tel: (061) 244375
Parks	Nature Conservation Ordinance 4 of 1975	Access permission to conduct construction and operational activities in the Dorob National Park (note: area managed by the Walvis Bay Municipality, according to proposed new Town Boundaries).	Manie Le Roux Tel: (061) 284 2523

3.1 PLANNING, DESIGN AND TENDER DOCUMETATION

This phase contains elements that should be considered during the planning and design, and tender documentation phase. These management requirements are important to ensure that safe management of the environment is planned for the proposed construction activities.

Table 3: Management requirements for the Planning and Design phase

ASPECT	MANAGEMENT REQUIREMENT
EMP Implementation	Develop an effective strategy to accurately carry out the mitigation actions relevant to the construction activities in this environment. Ensure this EMP is included in the construction contract tender documents and that adequate provision is made for it in the contracts.
Financial Provisions	Allocate appropriate budgetary allowances to develop proper construction planning and environmental rehabilitation actions through the compulsory development of plans and strategies to mitigate negative environmental and social impacts. Ensure sufficient insurance provisions for consequential environmental losses.
Design: Bird Electrocution prevention	Design and implement standard electrocution mitigation measures (e.g. insulation of live sections: provision of an air space safety gap 300 mm below the lowest phase (conductor) on wooden poles and the earth wire [Figure 8]; offsetting of 'jumpers' on strain poles; appropriate insulation of transformer structures and stay wires (Figures i and ii).
Recruitment	Adhere to the legal provisions for the recruitment of labour. The recruitment process must be formal and organised.

ASPECT	MANAGEMENT REQUIREMENT
	Should new recruitments be made, preference should be given to recruit those who live within the project area (Walvis Bay) and are fit to work.
Stakeholder Communication and agreements	Sign a suitable legal agreement with all stakeholders on neighbouring properties affected by the 11kV servitude of the transmission line traversing their property, i.e. that they agree to keep this area void of any structures. Communicate planned activities with stakeholders of this project.
Health and Safety	Adhere to all legal requirements pertaining to health and safety; and consider in designs. Compile a health and safety plan (See Section B).
Borrow Pits	Consider the need for borrow pit material. Only existing commercial borrow pits shall be used, which have Environmental Clearance from the Ministry of Environment and Tourism (MEFT). Should any new borrow pits be made, these will require a separate ECC application.

Figure ii Example of "gapping" of vertical earth wire on 11 horizontal line post compact delta (HLPCD) pole (arrow shows upper limit of the earth wire).

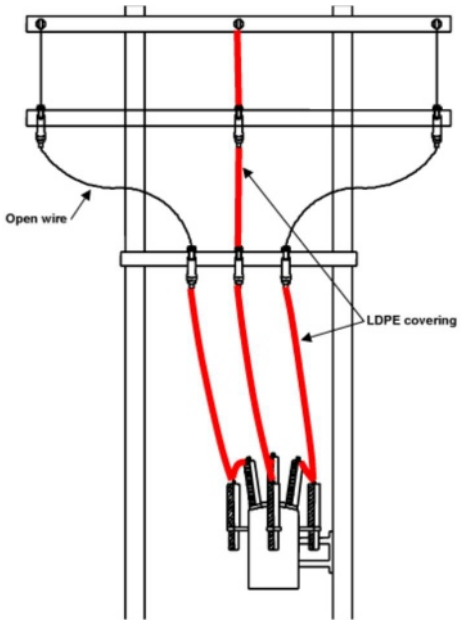

Figure ii:Example of use of Low Density Polyethylene (LDPE) pipe used on jumpers to insulate selected live components of transformers and switch gears.

3.2 CONSTRUCTION MITIGATION DETAILS

SECTION A: WASTE MANAGEMENT

ASPECT	MITIGATION MEASURE
1. Hazardous waste	1. Maintenance and washing of construction vehicles should take place only at a designated workshop area. – The workshop floor should be lined with concrete. – The workshop should have an oil-water separator for collect run-off from washing. 2. Spilled concrete (wet or dry) should be treated as hazardous waste and disposed of by the end of each day in the appropriate hazardous waste containers. 3. All hazardous substances (e.g. fuel or chemicals) should be stored, according to safety regulations in a specific location on an impermeable surface which is bunded.
3. Sewage and grey water	1. Chemical toilets shall be provided for male and female staff separately. 2. Do not allow the sewage (black water) to be discharged directly onto open soil. 3. All sewage must be removed regularly and disposed of at a recognised (municipal) sewage treatment facility. 4. If grey water cannot be recycled it should be removed along with the black water on a regular basis.
4. General waste	1. The construction site should be kept tidy at all times. All domestic and general construction waste produced on a daily basis should be cleaned and contained daily. 2. No waste may be buried or burned. 3. Waste containers (bins) should be emptied regularly and removed from site to a recognised (municipal) waste disposal site. All recyclable waste needs to be taken to the nearest recycling depot. 4. A sufficient number of separate waste containers (bins) for hazardous and domestic/general waste must be provided on site. These should be clearly marked as such. 5. Construction labourers should be sensitised to dispose of waste in a responsible manner and not to litter. 6. No waste may remain on site after the completion of the project.

SECTION B: HEALTH AND SAFETY

ASPECT	MITIGATION MEASURE
1. Health and Safety Standards	1. The Contractor should familiarise themselves with the Health and Safety Regulations of Namibia and ensure that these standards are incorporated into their construction process. 2. The contractor shall be required to submit a SHE file, in accordance to tender specifications. These files must be approved by the proponent before construction may begin on site.
2. Road Safety	1. Develop and maintain a road safety management plan. 2. Communicate with the Walvis Bay Municipal Traffic Department and the Roads Authority concerning the construction times and the management of Traffic on the main roads. 3. Demarcate construction routes clearly. 4. Off-road (outside the footprint area) driving should not be allowed. 5. All vehicles that transport materials or staff to and from the site must be road worthy. 6. Drivers that transport materials should have a valid driver's license and should adhere to all traffic rules. 7. Loads upon vehicles should be properly secured to avoid items falling off the vehicle.
3. Safety Around Work Areas	5. Clearly demarcate construction areas with danger tape and mark clearly to indicate ''Construction Site, access prohibited''. 6. Work areas must be set out and isolated with danger tape on a daily basis. 7. All building materials and equipment are to be stored only within set out and demarcated work areas. 8. Only construction personnel will be allowed within these work areas. 9.
4. Ablutions	10. Ablutions (toilet and hand basin with soap) should be available for men and women separately and should clearly be indicated as such. 11. Portable toilets (i.e. easily transportable) should be available along construction site that are in line with health and safety Regulations. 12. Sewage waste needs to be removed on a regular basis to an approved (municipal) sewage disposal site. 13. Workers responsible for cleaning the toilets should be provided with latex gloves and masks.
5. Open fires	14. No open fires may be made anywhere on site. 15. No wood may be collected within or near the project area. The Contractor must supply wood (or other fuel) for cooking or heating purposes.

ASPECT	MITIGATION MEASURE	
6. Personal Protective Equipment, etc	16.	Risk based and fitted Personal Protective Equipment should be provided for each position.
	17.	Dust protection masks should be provided to workers if required when working in dusty environment
	18.	Adequate and safe potable water should be provided to workers.
	19.	No person should be allowed to smoke close to any fuel storage facilities or portable toilets (if toilets are chemical toilets – the chemicals are flammable). Designated smoking areas must be established.
	20.	No workers should be allowed to drink alcohol during work hours.
	21.	No workers should be allowed on site if under the influence of alcohol or any other intoxicating substance.

SECTION C: HEALTH, SAFETY AND ENVIRONMENTAL, TRAINING AND AWARENESS

ASPECT	MITIGATION MEASURE
1. Health, Safety and Environmental Induction (Training)	1. The Contractor should have, as part of their HSE Policy, awareness raising and training of Health and Safety requirements, per the Health and Safety Regulations, which shall also include awareness raising of HIV/AIDS, TB and other communicable diseases, as may be necessary at the time of the Contract. 2. All construction workers are to undergo health, safety and environmental induction (training) which should include as a minimum the following: - Explanation of the importance of complying with the EMP. - All safety procedures, together with provision of appropriate PPE, tools and equipment; - Discussion of the potential environmental impacts of construction activities. - Employees' roles and responsibilities, including emergency preparedness. - Explanation of the mitigation measures that must be implemented when particular work groups carry out their respective activities. - Explanation of the specific mitigation measures within this EMP especially unfamiliar provisions. 22.

SECTION D: ENVIRONMENTAL CONSERVATION

ASPECT	MITIGATION MEASURE
1. Conservation Soil and water	1. Contaminated water) should not be allowed to be disposed of on open soil or within excavated areas. 2. Chemical Spills should be cleaned using emergency spill procedure: isolate the contaminated soil as soon as possible into a hazardous container and disposed with hazardous waste.
2. Materials cam and lay-down areas	1. Suitable locations for the materials camp and lay-down areas should be identified with the assistance of the Client and the following should be considered in selecting these sites: • The areas designated for the proposed services infrastructure should be a site already in use, • Second choice should be degraded land, • Avoid areas with hummocks, depressions, rocky outcrops
3. Habitat preservation	1. The area is significantly disturbed. Pockets do exist that are undisturbed and these should be avoided. All construction activities should be defined to a minimum area of disturbance, avoiding undisturbed terrain.

SECTION E: EMPLOYMENT/RECRUITMENT

ASPECT	MITIGATION MEASURE
1. Legislation	1. Adhere to the legal provisions in the Labour Act for the recruitment of labour (target percentages for gender balance, optimal use of local labour and SME's, etc.) in the Contract.
2. Recruitment	1. The Contractor should compile a formal recruitment process including the following provisions as a minimum: • The local authority (town council) should assist with the recruitment process. • Recruitment should be conducted at the site offices in a formal manner only. • Ensure that all sub-contractors are aware of recommended recruitment procedures and discourage any recruitment of labour outside the agreed upon process. • Contractors should give preference in terms of recruitment of sub-contractors and individual labourers to those from the project area if new recruitments are made (Walvis Bay). • Clearly explain to all job-seekers the terms and conditions of their respective employment contract (e.g. period of employment etc.) – make use of interpreters when necessary.

SECTION F: STAKEHOLDER COMMUNICATION

ASPECT	MITIGATION MEASURE
1. Disclosure and Communication plan	1. Cleanergy shall ensure that all relevant stakeholders, as per this EIA process, in addition to any new stakeholders, shall be informed of the construction details as appropriate. 2. Cleanergy shall make provision for grievance mechanisms – i.e. how concerns can/ will be lodged/ recorded and how feedback will be delivered as well as further steps of arbitration in the event feedback is deemed unsatisfactory.
23. 2. Generalcommunication matters	1. The Contractor shall report on the status of the implementation of all provisions of the EMP at site meetings. 2. The Contractor should implement the environmental awareness training as stipulated. 3. A copy of the EMP must be available at the site office and should be accessible to all stakeholders as required.

	4. A procedure should be put in place to ensure that concerns raised have been followed-up and addressed. 5. The Contractor shall keep record of all incidents and keep these on record, including the date, time, place and nature of the incident, how the incident was resolved and follow up required.

SECTION G: SOCIO-ECONOMIC AND MISCELLANEOUS

ASPECT	MITIGATION MEASURE
1. Archaeology	1. Should a heritage site or archaeological site be uncovered or discovered during the construction phase of the project, a ''chance find'' procedure should be applied in the order they appear below: – If operating machinery or equipment stop work; – Demarcate the site with danger tape; – Determine GPS position if possible; – Report findings to foreman; – Report findings, site location and actions taken to superintendent; – Cease any works in immediate vicinity; – Visit site and determine whether work can proceed without damage to findings; – Determine and demarcate exclusion boundary; – Site location and details to be added to the project's Geographic Information System (GIS) for field confirmation by archaeologist; – Inspect site and confirm addition to project GIS; – Advise the National Heritage Council (NHC) and request written permission to remove findings from work area; and – Recovery, packaging and labelling of findings for transfer to National Museum. 2. Should human remains be found, the following actions will be required: – Apply the chance find procedure as described above; – Schedule a field inspection with an archaeologist to confirm that remains are human; – Advise and liaise with the NHC and Police; and – Remains will be recovered and removed either to the National Museum or the National Forensic Laboratory.

3.3 OPERATION AND MAINTENANCE PHASE

The operational phase mitigation measures are focussed on maintenance procedures of the transmission line.

Table 4: Operation and maintenance phase mitigation measures

ASPECT	MITIGATION MEASURE
EMP implementation	If any construction is to be conducted as part of maintenance works for the services infrastructure within the project area please refer to the construction mitigation measures of this EMP.
Power line operation	Regular maintenance and monitoring of the line should be undertaken to detect and prevent degradation and bird collisions and electrocution risks (see bird monitoring section).
Post-construction environmental training and awareness	All contractors appointed for maintenance work must ensure that all personnel are aware of necessary health, safety and environmental considerations applicable to their respective work, according to especially the Health and Safety Regulations.
Birds	Bird nesting activities should be discouraged early in the cycle, before any eggs are laid; the Ministry of Environment, Forestry and Tourism (MEFT) should be contacted for specific guidelines to discourage and manage such activities, e.g. by removing nests at a stage when this is acceptable. Bird strike reporting shall be done as described in Section 4 below. Food wastes should be avoided to prevent scavengers on site.
Closure/removal of line	Should the removal of the line be considered, a plan should be devised to determine the disposal options of all the project components, in line with best practice principles of avoid, reduce, re-use and recycle. Should the line be replaced, the service road will remain for future use. Should the line serve no further purpose, and no new line will be construction along the route, then the road and all other
Waste, health and safety	Waste during operation will be none to minimal, and should be handled in terms of the Company overall waste management procedures. Health and Safety measures during operation should be in line with Company overall Health and Safety Policy, which should, as a minimum, adhere to the Namibian Health and Safety Regulations.

4 MONITORING

Continued monitoring of the implementation of the EMP should be conducted during the construction and operational phases. Specific monitoring requirements relate to the prevention of bird-power line collisions and electrocutions, the details of which are as follows.

- The need for reporting power line incidents should be stressed. Cleanergy should coordinate the monitoring, setting up a reporting channel and clarifying monitoring and reporting procedures to all partners.
- Ensure that the entire (selected) power line route is monitored in an acceptable way for any signs of bird mortalities resulting from the construction and operation of the line; ideally, regular dedicated monitoring patrols should be carried out once a month for at least the first year after construction, and thereafter at least once per quarter. If required, the avifauna specialist can be contacted for assistance with monitoring procedures.
- Indicated sensitive areas such as the small seepage areas in the northern part of the servitude should receive particular attention, as well as step-down/transformer structures. Existing power lines in the area should also be inspected from time to time if possible, for cumulative impacts.
- Record all bird mortalities on a standardised form, with the GPS coordinates and power line structure and other details, and photographs of the carcass (especially the head of the bird), power line structure and general habitat. Records of collision incidents should be reviewed periodically, with an adaptive management approach.
- Should repeat collision incidents involving aquatic species, or any other group of birds, occur at a specific site, then retro-fitting of marking mitigation should be considered in conjunction with a bird specialist. Replace mitigation devices as and when necessary.

Bi-annual reports shall be submitted to the MEFT, as per the requirements of the ECC. Monitoring results shall also be submitted with the application for renewal of the ECC, in a three-year cycle.