RED-DUNE CONSULTING CC

APP: 240911004682

Environmental Management Plan (EMP) For the Proposed Drilling of Boreholes for Water Supply at Kasenu and Kasikili Villages in Kasika Conservancy, Zambezi Region

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ACRONYMS

CCFN	Community Conservation Fund Namibia
DEA	Department of Environmental Affairs
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental Management Act (No. 7 of 2007)
EMP	Environmental Management Plan
EMP	Environmental Management Plan
GRM	Grievance Redress Mechanism
HWC	Human Wildlife Conflict
IWRMP	Integrated Water Resource Management
KfW	Kreditanstalt für Wiederaufbau
m^3	Cubic meter
MAWLR	Ministry of Agriculture Water and Land Reform
MEFT	Ministry of Environment Forestry and Tourism
PPE	Personal Protective Equipment
RDC	Red-Dune Consulting CC
SM	Site Manager
WC	Wildlife Crime

1 THE ENVIRONMENTAL MANAGEMENT PLAN

1.1 Purpose of the EMP

This Environmental Management Plan (EMP) is a risk strategy that contains logical framework, monitoring programme, mitigation measures, and management control strategies to minimize environmental impacts. It further stipulates the roles and responsibility of persons involved in the project. These strategies are developed to reduce the levels of impacts for the projects. Lastly, the EMP further aims to develop mitigation measure of social and environmental risk that the project may cause as identified int eh Environmental Social Management Framework (ESMF) of the project.

1.2 Compliance to the EMP

This EMP is a legally binding document under the provisions of the Environmental Management Act, 2007 (Act No. 7 of 2007) (EMA). The Conservancy with support with from CCFN and contractors should adhere to the framework of this document.

1.3 Roles and Responsibility

1.3.1 Proponent

The proponent, Kasika Conservancy with support with from CCFN shall take overall responsibility for implementation of the EMP. It remains the responsibility of the proponent to appoint key personnel such as Site Manager and ensure that all employees and contractors are conversant with the EMP.

1.3.2 Site Manager

The Site Manager (SM) represents the proponent on site. He/she shall be responsible for daily activities in ensuring environmental protection. All communication with regard to the implementation of EMP must be channelled through the SM

1.3.3 Employees

It shall be responsibility of employees to always adhere to the provision of EMP when on site

1.3.4 Environmental Compliance Officer

Compliance to EMP is enforced by the designated government officials.

1.3.5 Ministry of Agriculture Water and Land Reform

This ministry as mandated through the Water Resources Management Act 11 of 2013 to ensure adequate management, protection, development, use and conservation of water resources; to provide for the regulation and monitoring of water services and to provide for incidental matters. MAWLR will be responsible to ensure to that the allocated abstraction by the water permit is not exceeded to ensure a health aquifer.

1.4 Disciplinary Action

This EMP is a legally binding document, non-compliance to the EMP is punishable in accordance to the provision of EMA

2 THE EMP TABLE

This EMP is divided into two parts; i) Construction and ii) Operation in addressing issues of Socio-Economic, Bio-Physical Environment, Pollution and Waste Generation and Heritage Resources . This is a living document that is subject to amendment when the needs arises to ensure environmental protection. Thus, aspects that may not necessarily be covered during its development could be added on.

2.1 Part I: Construction Phase

2.1.1 Socio-Economic Consideration

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
Staff induction	To ensure that all staff / employees are familiar with the requirements of the EMP	1. All employees must go through an induction course for the provision of the EMP. 2. Ensure that a copy of the EMP is kept on site	• Induction Minutes and Attendance Register, Physical verification of the EMP on site.	Contractor
Employment Socio-Economic advancement for local	To ensure that general work created during the project is reserved for local people	1. Ensure that all general work is reserved for local people 2. Fair compensation and labour practise as per Namibian Labour Laws must be followed	• Employee register • Wages for employee • Complains about payment	Contractor

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
Skill and Knowledge transfer	To build local capacity	1. Identify and train competent people (Preferable youth) to do basic maintenance of the borehole and its supporting infrastructure	• Training report	Contractor
General waste	To manage solid waste To prevent littering, pollution, contamination of water and general environmental health hazards	1. Provide well labelled waste drums 2. No onsite burying / dumping or burning of waste material is permitted. 2. Ensure appropriate waste collection and removal from the site and effective disposal	• Physical verification of waste drums • Report of waste disposal	Contractor

2.1.2 Health and Safety of employees

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
HIV and AIDS, Alcohol and Drug abuse	Prevent alcohol and drug use at workplace. Provide awareness of dangers on HIV/AIDS	1. Ban the employees against the use of alcohol during working hours. 2. Provide awareness on the dangers and health impacts of alcohol and drug use. 3. All employees must be screen with the breathalyser to avoid intoxicated personnel on site.	• Monitor presence of alcohol at construction site • Awareness meeting attendance registers • Breathalyser report • Disciplinary reports	Contractor

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
		4. Adopt a disciplinary system to discipline staff for non-compliance. 5. Provide Condoms to employees.	• Physical assessment and logs of condom procurement	
Health	To ensure employees and community health	1. Abide to the Occupational Health and Safety and Labour Act of Namibia and other statutory requirements such as International Labour Practise Organization (ILO). 2. Ensure adequate first aid kit equipped with anti-venoms. 3. Supply clean drinking water to the site.	• Complaints of health issues by employees • First aid kit available	Contractor
Safety	To ensure employees and community safety	1. Develop a safety plan. 2. Ensure that every employee goes through an induction course about safety. 3. Provide appropriate Personal Protective Equipment (PPE) which includes helmets, overalls, safety shoes, safety glasses, gloves, etc. 4. Train employee elephant behaviour and predators	• Safety plan / pamphlets • Training minutes and attendance register • Physical verification of PP	Contractor
Noise Pollution	To prevent noise nuisance	1. Maintain low speed 2. All vehicles must be well serviced to prevent excessive noise	• Noise complaints / reports by tourist / community • Vehicle service books	Contractor

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
		3. Do not hoot unnecessary 4. Do not rev the vehicle engines 5. Do not play loud music / radio		

2.1.3 Safety of borehole / water infrastructures

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
Destruction of water infrastructure by elephant	To prevent destruction of boreholes and associated infrastructure by elephants.	1. Construct an elephant proof fence around the borehole and its supporting infrastructures	• Physical verification of elephant proof fence	Contractor

2.1.4 Bio-Physical Consideration

Environmental / Social Impact	Objective	Proposed Mitigation Measure	Monitoring Indicator	Responsibility
Biodiversity	To protect plant and animals (The proposed drilling sites are free of vegetation and animals (unless crawling animals)	1. Do not cut down trees unnecessary. 2. Do not kill animals. 3. Poaching strictly forbidden.	• Physical verification • Report of poaching	Contractor
Land degradation Uncontrolled movement of drill rig at the project	To prevent soil disturbance / erosion	1. Movement of vehicles / trucks must be well coordinated to ensure minimal soil disturbance	• Physical observation of tracks outside designated areas	Contractor

Environmental / Social Impact	Objective	Proposed Mitigation Measure	Monitoring Indicator	Responsibility
site may cause land degradation.				
Water pollution Heavy vehicle and machinery may pollute water sources from leakages of oils, hydraulic fluids, lubricants, and greases.	To prevent surface and groundwater pollution	1. Fuelling of heavy vehicle on site must be well coordinated at designated places. 2. Stationary vehicles must be provided with drip tray to capture oil, lubricants, and hydraulic fluids leakages. 3. All vehicle and machinery must be well service to avoid leakages. 4. Provide and train employees on oil spill emergency response. 5. Soils contaminated with grease, oils and hydrocarbons must be collected and disposed of at an approved site;	• Physical observation of drip trays, oil marks etc • Vehicles service report / service books • Training report on emergency response • Reports of disposal of contaminated soils	Contractor
General waste	To manage solid waste To prevent littering, pollution, contamination of water and general environmental health hazards	1. Provide well labelled waste drums. 2. No onsite burying / dumping or burning of waste material is permitted. 3. Ensure appropriate waste collection and removal from the site and dispose at appropriate waste disposal site.	• Physical verification of waste drums • Report of waste disposal at approved sites	Contractor

2.1.5 Heritage Resources

Heritage Resource	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Responsibility
Heritage and Archaeology	The proposed area does not have known Heritage site or archaeological material. Regardless and as standard practise, a chance find is developed. to ensure protection of artefacts, heritage and archaeological materials.	1. Employee must be trained on the possible find of heritage and archaeological material in the area. 2. Implement a chance find and steps to be taken for heritage and archaeological material finding (Heritage (rock painting and drawings), human remains or artefacts) are unearthed by; i. Stopping the activity immediately ii. Informing the operational manager or supervisor iii. Cordoned of the area with a danger tape and manager to take appropriated pictures. 3. Manager/supervisor must report the finding to the following competent authorities, National Heritage Council of Namibia (061 244 375) National Museum (+264 61 276800) or the National Forensic Laboratory (+264 61 240461).	• Training records and attendance registers	Contractor

2.1 Part B: Operational Phase

2.1.1 Part III: Aquifer Conservation

This aspect is critical part of this EMP owing to the low yield fractured aquifers and known over-abstraction which led to degraded water quality especially increase in salinity in the area. Therefore, this EMP put strong emphasis on monitoring to ensure the aquifer healthy.

Environmental / Social Aspect	Objective	Action Required	Monitoring Indicator	Party responsible
Water abstraction	To conserve the aquifer	1. Do not abstract more than what is allocated by the permit. 2. Develop and implement a ground water monitoring plan. 3. Install automatic measuring gauge to monitor abstraction. 4. Carry out periodic pumping yield to assess aquifer sustainability. 5. Monitor local vegetation and report their unusual health status. 6. Undertake systematic water quality assessment.	• Abstraction reports • Ground water monitoring plan • Report of test pumping • Physical verification of vegetation • Water quality	Proponent

Environmental / Social Aspect	Objective	Action Required	Monitoring Indicator	Party responsible
Ecology	Rangeland Management	1. Monitor the vegetation health condition during abstraction and vice versa.	• Vegetation monitoring	Proponent
Skill and Knowledge transfer	To build local capacity	1. Identify and train competent people (Preferable youth) to do basic maintenance of the borehole and its supporting infrastructure.	• Training report	Proponent
Risk of water infrastructure destruction buy elephant	To prevent infrastructure destruction by elephant	1. Build high and thick enough that will prevent elephants access to the water tank and solar infrastructures.	• Elephant incident report	Proponent
Conflict of water use buy the communities	To prevent conflict among communities of the borehole	1. Raise awareness of the indented purpose of the borehole. 2. Ensure no one is made to be entitled to owning or have controlling power on who should use the borehole	• Community consultation and awareness raising report	Proponent
Corrosion of borehole metal casing	To ensure the casing are not corroded that could affect pump	1. Use non-corrosive casing.	• Corrosion monitoring reports	Proponent

Environmental / Social Aspect	Objective	Action Required	Monitoring Indicator	Party responsible
	yields and water quality			

3 DECOMMISSIONING AND REHABILITATION PLAN

Decommissioning is normally the reverse of construction where all installed equipment / structure must be removed. Supply of water has an infinite timeframe. Unless otherwise of a pressing issue national issue, such as degraded water quality, that would necessitate decommissioning, the borehole is aimed to outlive generations to come. Aging equipment that required replacement should be done by qualified Namibians to ensure smooth operation of the borehole.

As mentioned above, Zambezi region is known to have corrosive underground water. It is critical to develop a strategy for periodic rehabilitation to ensure that the borehole yields are not affected.

4 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusions

This Social Environmental Management Plan was developed for drilling of the boreholes. During site inspection, there were no concern on how few trees and shrubs were cleared to create working space on site and make way for the drilling vehicle. This study was undertaken with high degree of certainty and no impacts was observed which could not be minimized at insignificant levels.

4.2 Recommendations

It is recommended to the approving authority for the issuance of the ECC. Strong emphasis on ensuring on water quality to protect the health of human and animals.