

ENVIRONMENTAL MANAGEMENT PLAN (EMP)

EXISTING AND OPERATIONAL SERONDELA LODGE IN KABULABULA CONSERVANCY OF
KABULABULA COMMUNAL AREA IN ZAMBEZI



Proponent: Serondela Lodge cc
P.O Box 881
Mariental
Namibia

July 2024

Title	Environmental Management Plan (EMP) for the existing and operational Serondela Lodge (Measuring 4.54 Hectares)
EAP	Nyepez Consultancy cc
Reviewer	Mr. Erongo Consulting cc
Client	Serondela Lodge CC (Serondela Lodge)
Status	Final Updated Environmental Management Plan (AEMP)
Issue Date	July, 2024

Definitions and abbreviations

DEA	Directorate of Environmental Affairs
ECC	Environmental Compliance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
I&APS	Interested and affected parties
MAWF	Ministry of Agriculture Water and Forestry
MEFT	Ministry of Environment, Forestry and Tourism

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1. INTRODUCTION

This document presents an amended and updated Environmental Management Plan (EMP) to manage the existing and operational Serondela Lodge, a Lodge that operates within Kabulabula conservancy situated in Kabulabula Communal area along the banks of the Chobe River some 40 kilometers east of Ngoma in the Zambezi Region. The size of the land parcel for the lodge is 4.54 hectares.

Serondela Lodge cc are the developers and operators that manages and operates the Serondela lodge within the Kabulabula Conservancy in Kabulabula Communal area. Kabulabula Conservancy (KC), situated on the eastern floodplains of the Zambezi Region, has identified tourism as a key revenue stream that will allow it to deliver benefits. These benefits include direct revenue that would be used for operational costs and cash benefits to members. More importantly, tourism has the potential to provide employment in an area that is characterized by remoteness and the lack of employment and training opportunities.

The proponent Serondela Lodge cc is obliged by the competent authority to seek to acquire an environmental clearance certificate for compliance of the existing and operations of the Lodge against the environment its operating. The Lodge requires a valid ECC based on eco-tourism business principle and conservation of environment. Given the need and requirements of the needed clearance certificate, and in order to ensure compliance to the Environmental Management Act of 2007, the proponent is obliged bylaw to apply for a Clearance certificate that informs the general public and operating management of the existing lodge operation activities and mitigation measures put in place to ensure sustainability and effective environmental protection of the tourism Lodge.

Thus, minor changes in the operation of the Lodge have not change the scope of the physical environment, the physical characteristics of the project area, no change in the extent or size of land where the first scoping study of the lodge was conducted and the subsequent approval of the environmental clearance certificate. It is therefore required as per the Environmental Act no. 7 of 2007 that an updated Environmental Management Plan detailing such changes in project activities be compiled and submitted to the environmental commissioner for approval.

2. OPERATIONAL ACTIVITIES & OPERATION MODEL

Kabulabula Conservancy had partnered with Nkasa Lupala Lodge (NLL) to develop a small and exclusive lodge, adhering to strict “eco” principles, on the banks of the Chobe River. The lodge is serving as a specialty provider of excellent “bush” accommodation and wildlife-related tourism services for upper-market clients.

The lodge’s components consist of eight accommodation units that are built from sand bags and rip-stop canvas. Each unit have an en suite ablution facility of a shower and toilet and a private deck. There is a central hospitality area consisting of a lounge and dining area as well as a shaded outside area. There is a simple tented manager’s “house” as well as a few tents for key staff (guides and duty chef). Staff are often drawn from nearby villages and commute by transport (boat or vehicle) provided by the lodge.

In addition, there is a communal viewing platform that provides a commanding view over the Chobe River and the Chobe National Park. The national park and Namibian wetlands and associated wildlife are the main attractions of the lodge. *Activities for guests at Serondela Lodge include boat cruises, game drives, mountain biking and walks.* Angling is also offered on a strict “catch & release” basis. There is also emphasis on cultural tourism that seeks to share the daily lives of cattle herders, fishermen etc. Access during the flood season is difficult and hence the lodge is usually serviced by boat. However, during the dry months access is possible by 4x4 vehicle.

3. AVAILABLE LODGE UTILITY SERVICES

Rational for this development is that the eastern floodplains of the Zambezi Region were and/or are little known by tourists and indeed just about everybody not living in the region. The tourism potential of the wetland assets has largely been ignored due to difficult access as well as challenges of developing tourism circuits. This is however, changing with the region being recognized as a destination and not merely as stopover.

The Kabulabula conservancy already has a hunting enterprise and this delivers reasonable revenues. Trophy hunting, however, does not deliver many employment opportunities. Employment opportunities are especially important for people who live in remote areas far from conventional employment and capacity-building opportunities. Besides the additional

The objectives of this plan are to:

- a) Describe all environmental safeguards and mitigation measures;
- b) provide a monitoring tool for the Operator and the Joint Management Committee (JMC);
- c) minimise negative impacts of the development and operational phases of this project;
- d) enhance the positive impacts;
- e) provide a tool which allows a succession of managers to have a consistent approach to managing the lodge and associated activities;
- f) meet the requirements of relevant legislation;
- g) allow the operator to monitor environmental impacts; and
- h) mainstream sound environmental practices in lodge.

6. PROJECT DESCRIPTION

The lodge consists of eight accommodation units that are built of sand bags and rip-stop canvas. Each unit has an en suite ablution facility of a shower and toilet and a private deck. There is a central hospitality area consisting of a lounge and dining area as well as a shaded outside area. There is a simple tented manager's "house" as well as a few tents for key staff (guides and duty chef). Staff are drawn from nearby villages and commute by transport (boat or vehicle) provided by the lodge.

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7. LEGAL FRAMEWORK THAT AREA RELEVANT TO THE EMP

In addition to the EMA and the Environmental Assessment Policy, Namibia has a host of legal and policy documents and guidelines that govern environmental management as indicated in Table 1 below. Wildest Logistics cc has the responsibility to ensure that NO restricted Lodge activities will be conducted and will be carried out during any

preparation, construction and operation phase of the existing and operational lodge development.

Table 1: Relevant legislation and the applicability

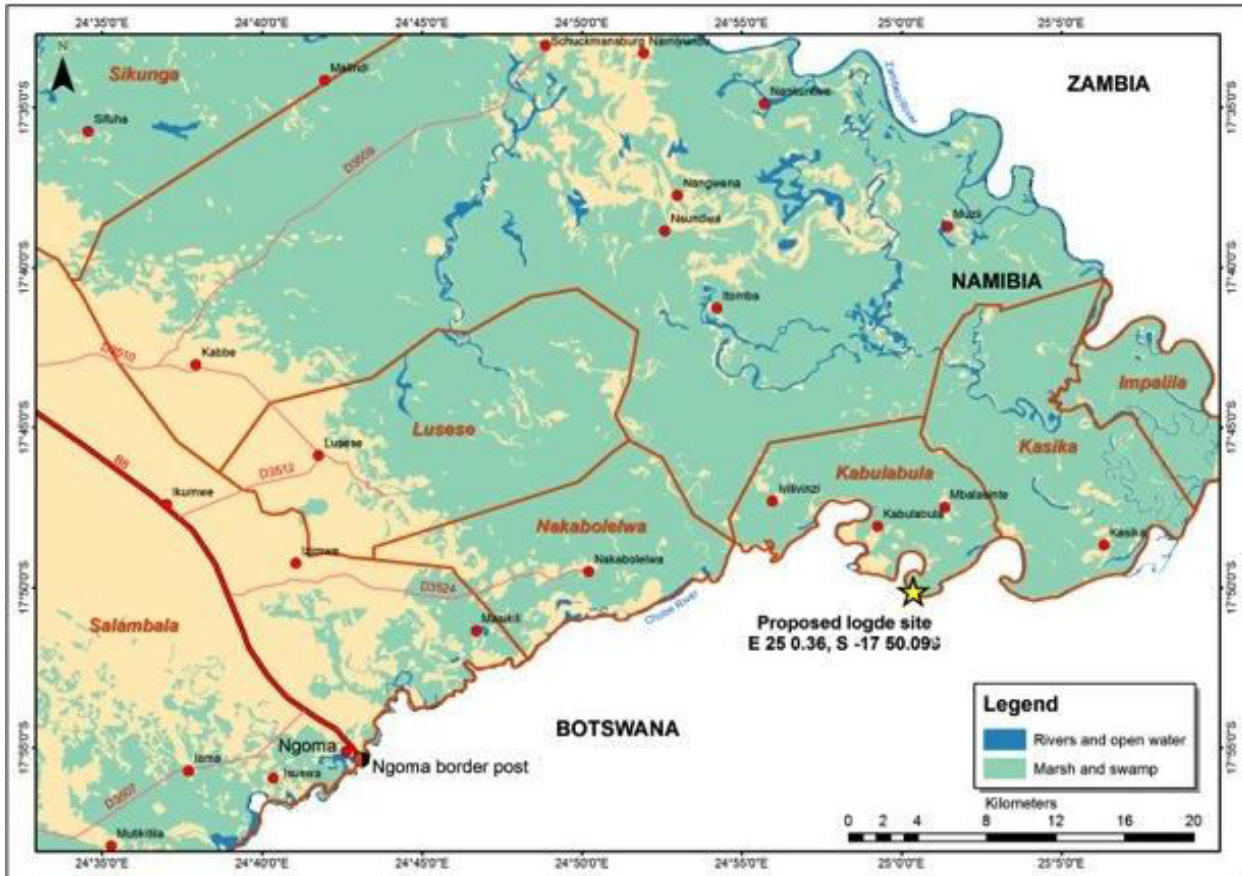
Legislation considered	Aspect of Project
Regional Councils Act, 1992 (Act No. 22 of 1992)	The Regional Councils Act legislates the establishment of Regional Councils that are responsible for the planning and coordination of regional policies and development. The main objective of this Act is to initiate, supervise, manage and evaluate development in respective regions. Zambezi Regional Council is an I&AP to this project and they have No objection to the proposed project proposal. Rights shall be reserved to them should they wish to review the EMP.
Water Resources Management Act (Act No. 11 of 2013)	This Act provides a framework for managing water resources based on the principles of integrated water resources management. It provides for the management, development, protection, conservation, and use of water resources. Furthermore, any watercourse on/or in proximity to the site and associated ecosystems should be protected in alignment with the listed principles. Construction activities pose danger to surface and underground water resources through the inappropriate use of fuels and lubricants. The proponent shall ensure adequate handling of hazardous substances that could pollute water sources.
Pollution Control and Waste Management Bill (in preparation)	This Bill serves to regulate and prevent the discharge of pollutants to air and water as well as providing for general waste management. The Bill will repeal the Atmospheric Pollution Prevention Ordinance (11 of 1976) (below) when it comes into force. The Bill also provides for noise, dust or odour control that may be considered a nuisance. The Bill would repeal the Atmospheric Pollution Prevention Ordinance (11 of 1976) (below) when it comes into force. Furthermore, the Bill advocates for duty of care with respect to waste management affecting humans and the environment

	and calls for a waste management licence for any activity relating to waste or hazardous waste management.
Atmospheric Pollution Prevention Ordinance (Act No.11 of 1976)	This Ordinance serves to control air pollution from point sources, but it does not consider ambient air quality. Any person carrying out a 'scheduled process' which are processes resulting in noxious or offensive gases typically pertaining to point source emissions have to obtain a registration certificate from the Department of Health. Although we do not anticipate the mining activities to generate excessive dust particles, the proponent should implement the necessary mitigation measures to limit dust emissions to air.
Public Health Act (Act No. 36 of 1919)	The Act serves to protect the public from nuisance and states that no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health. The proponent should ensure that the site workers are provided with protective gear to safeguard their wellbeing. The activities should also be conducted in a manner that does not pose any danger to the public and that any emissions which could be considered a nuisance remain at acceptable levels.
Labour Act (Act No. 6 of 2007)	The 1997 Regulations relating to the Health and Safety of employees at work sets out the duties of the employer, welfare and facilities at the workplace, safety of machinery, hazardous substances, physical hazards, medical provisions, construction safety and electrical safety. Specifically, no employer shall require or permit an employee to work in an environment that is deemed unfit without protective measures in place. The proponent as the employer should adhere with all the requirements of the Act and the associated Regulations.

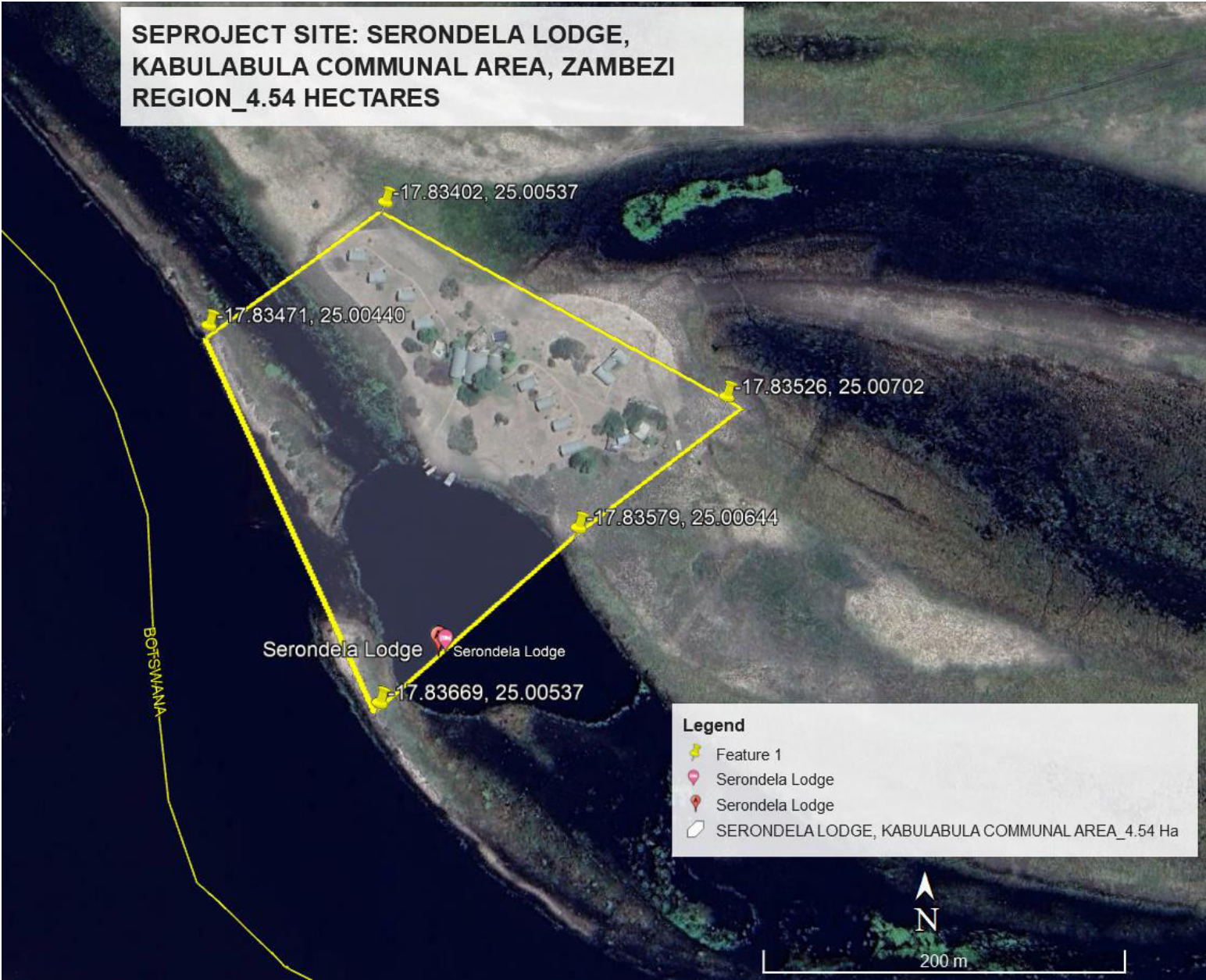
8. PROJECT DESCRIPTION

8.1 Project Locality

The Serondela Lodge development is situated within Kabulabula Conservancy on the banks of the Chobe River some 40 kilometres east of Ngoma in the Zambezi Region on 4.54 hectares of land. The coordinates of the site are S 170 50.099' and E 250 00.360.



**SEPROJECT SITE: SERONDELA LODGE,
KABULABULA COMMUNAL AREA, ZAMBEZI
REGION_4.54 HECTARES**



8.2 Lodge activities & facilities

The development shall consist of:

- a)** Eight guest accommodation units
- b)** Central hospitality area incorporating bar, dining area, lounge and outdoor area (including a small plunge pool)
- c)** A modest manager cottage
- d)** Two modest accommodation units for staff – most staff shall be transported daily from nearby villages
- e)** Service centre (store room)
- f)** Water tank tower
- g)** Game viewing platform.



Lodge amenities & infrastructures

The laundry shall be done off-site at a nearby village.

During the development phase, which is anticipated to last about three months, the labour force will vary between eight and 15 people but this will depend upon the nature of the activity. The staff shall be housed in tents and meals shall be provided from a communal kitchen. All units shall be located on the island and each shall be sited to have minimum impact on vegetation with no large trees being removed.

Features of the tents and services:

- a) Accommodation units shall be built from sand bags (hence reducing significantly the need for cement), steel beams (required because of termites) canvas and decks constructed from composite wood.
- b) The units shall be positioned within existing shrubs.
- c) Footpaths shall connect bungalows to the central area and shall be illuminated by solar lights that are focused on the path and not upwards. This shall minimize light pollution.
- d) There shall be a secure area for the temporary storage of waste.
- e) A Fusion© sewerage management system (or an equivalent system that shall meet discharge requirements) shall be used

The following further activities are also conducted:

- a) Guided game viewing from boats
- b) Guided walks
- c) Guided canoeing
- d) Guided cultural tours and Mountain biking

8.3 Associated Infrastructure

8.3.1 Water

Serondela lodge utilises use of water through a “GEM” ON-SITE SEWAGE TREATMENT PLANT. This the mini “Gem consists of two tanks, one being an anaerobic tank and the other being an aeration tank, whereas the maximum consists of four tanks. It incorporates an up-front anaerobic tank with a specialised form of snubbing of the volumetric flow into the secondary anaerobic tank, with a special feature to accommodate a short-term overload in excess of 1.000 litres in the primary tank. Thus, the effluent passing from the first to the second anaerobic tank becomes broken down almost to a silky-like fluid, on average, and then, final digestion takes place in the second tank before passing on to the aeration tank.



“GEM” on-site sewage treatment plant



8.3.2 Electrical Services

The site is relatively far from the grid and solar energy will be used to heat water and generate power for lights, fridges etc. Panels will be secured to harvest as much solar energy as possible. Although they will be situated to minimize impact, most tourists view solar power as an attraction that lowers the carbon footprint of the operation.

8.3.3 Sewerage Disposal

The developer was requested to present his approach for sewerage management and disposal with the following being proposed. The Fusion© system conforms to the required Namibian discharge standards.

Application:
Residential/commercial wastewater secondary treatment
Treatment Unit Types:
5250-0001 → 450 GPD
5250-0003 → 800 GPD

Waste strength reduction*:
9 mg/l CBOD₅
9 mg/l TSS

*Based upon residential strength waste and NSF/ANSI Std 40 performance evaluation.

Material:
Materials will not corrode in the septic environment.
Media never needs to be removed or replaced.

Easy to install or retrofit:
Fusion® Series Treatment Systems are compact, efficient, and designed to be installed in a typical residential/commercial environment.

Maintenance:
The system requires semiannual maintenance and will be provided with maintenance contract information. Maintenance provider is dependent upon geographical location.

Chambers	Actual Values	
	ZF450	ZF800
Model Number		
Sedimentation Chamber	130	258
Anaerobic Chamber	262	526
Aeration Chamber	80	132
Storage Chamber	73	129.5
Total	545	1046
Inflow in gallons/day	450	800
Size: Width in inches	44	56
Length in inches	85	99
Height in inches	62	74
Weight in pounds	504	882

8.3.4 Waste Removal

Waste shall be stored in animal-proof areas as there is a variety of wildlife, including predators that could be attracted to it. All waste attractive to either predators or scavengers shall be stored in such a manner that these animals do not have access to the site. All solid waste shall be disposed of at the appropriate site in Katima Mulilo.

8.3.5 Roads

There is an existing 4x4 track to the site and this shall be used. There are a number of existing tracks connecting villages and these are seasonally waterlogged but shall be used for cultural activities when possible. During periods of flood canoes and shall draft motorised boats shall be used.

8.4 Employment and Skills Development

The Proponent (Serondela Lodge cc) hires and have hired local residents (Namibians) from Kabulabula communal area and other surrounding villages as a way of empowering and uplifting local residents' livelihood by through provision of jobs. The main objectives of this Employment and Skills Development Plan are to:

- Clarify employment and recruitment procedures of local community members
- Clarify and adhere to Employment targets
- Formulate plans for the development of skills of local employees, and
- Develop a framework for regulating Social Responsibility efforts, assistance programs, donation and community welfare efforts

9. PROJECT ACTIVITIES ASSESSMENT CRITERIA

According to Pastakia (1998) the Rapid Environmental Assessment method can be used to assess projects related to the guesthouse development project and Pastakia's method will be used during the assessment. The ranking formulas are calculated as follows;

$$A=A1 \times A2$$

$$B=B1 +B2+B3$$

$$\text{Environmental Classification (ES) } =A \times B$$

Table 5: Environmental Classification of Impacts according the Rapid Impact Assessment Method of Pastakia 1998

Environmental Classification (ES)	Class Value	Description of Class
108 to 72	5	Major positive change/impact
71 to 36	4	Significant positive change/impact
35 to 19	3	Moderate positive change/impact
10 to 18	2	Positive change/impact
1 to 9	1	Slight positive change/impact
0	0	No change/status quo/not applicable
-1 to -9	-1	Slight negative change/impact
-10 to -18	-2	Negative change/impact
-19 to -35	-3	Moderate negative change/impact
-36 to -71	-4	Significant negative change/impact
-72 to -108	-5	Major negative change/impact

The EMP will have specific targets for each year that will be evaluated by the annual Environmental audit. The audit can make recommendations which will necessitate Changes in the EMP. The EMP will be reviewed on an ongoing basis as new environmental challenges arise or targets/objectives are achieved. The Operations Manager will ensure that this review occurs in a timely manner.

Criteria	Score
Importance of condition (A1) –Assessed against the spatial boundaries of human interest it will affect	
important to national/international interests	4
important to regional/national interests	3
important to areas immediately outside the local condition	2
important only to the local condition	1
No importance.	0
Magnitude of changes /effects (A2) –measure of scale in terms of benefits of an impact or condition	
Major positive benefits	3
Significant improvement in the status quo	2
Improvement in status quo	1
No change in status quo	0

Negative change in the status quo	-1
Significant negative disbelief or change	-2
Major disbelief or change	-3
Permanence (B1) –defines whether the condition is permanent or temporary	
No change/not applicable	1
Reversible	2
Permanent	3
Cumulative (B3) –reflects whether the effects will be a single direct impact or will include cumulative impacts over time, or synergistic effect with other conditions. It is a means of judging the sustainability of the condition-not to be confused with the permanence criterion	
Light or No cumulative Charater /Not applicable	1
Modern Cumulative character	2
Strong Cumulative character	3

Summary of expected operational phase impacts prior to mitigation

BE=Biological/Ecological EO=Economical/Operational PC=Physical/ Chemical SC= Sociological/Cultural

Impact Category	Impact Type	Class Value
BE	Waste pollution	-1
BE	Ecosystem and Biodiversity impact	-1
EO	Fire	-2
PC	Groundwater, surface water and soil contamination	-1
SC	Skills, Technology and development	2
SC	Employment	2
SC	Cumulative	-2

10. ENVIRONMENTAL MANAGEMENT PLAN

An EMP is a tool used to take pro-active action by addressing potential problems before they occur. This should limit the corrective measure needed. The Environmental Management Plan (EMP) provides management options to ensure impacts of the Sun Hotel development project operations are minimized. The EMP acts as a stand-alone document, which can be used during the various phases (operational and decommissioning) of the guesthouse project. All personnel

taking part in the operation of the guesthouse project should be made aware of the contents of the EMP, so as to plan the relevant activities accordingly in an environmental suitable way.

10.1. Objectives And Targets

Environmental objectives for the operations of the Lodge are as follows:

- Zero pollution incidents
- Minimize waste sent to landfill or being burnt
- Protect local flora and fauna and minimize disruption
- Minimize light and noise pollution, and
- Use natural resources effectively and efficiently.

Procedures for monitoring processes against the project environmental objectives will be agreed with the Environmental officer

10.2 General Requirements for Implementation of the EMP

10.2.1 EMP Administration

The lodge operator and staff, including the construction team, are required to familiarise themselves with the content of the document while the Lodge Manager is tasked with overall responsibility for implementation once the lodge is operational. The operator, however, shall carry responsibility for compliance with the EMP. Representatives from Kabulabula Conservancy shall be acquainted with the document and they (or their appointed agent) shall monitor during the construction phase.

10.2.2 Environmental Awareness Training

a) Construction Phase

The operator ensured that all his/her staff were and are aware of the importance and implications of the EMP and the need to commit to the relevant provisions contained in the document.

b) Operational Phase

The operational phase requires that roles and responsibilities for all employees need to be established while the **reasons and importance** of mitigation measures shall be clearly explained. This shall be an on-going process. The positive socio-economic and biodiversity impacts involve a number of external stakeholders and these relationships require close and

regular interventions. This governing strategy requires regular meetings with the conservancy through meetings of the JMC.

Tour Guiders shall receive specialist training in big game guiding and boat handling. It is also important for all staff to understand the context of the lodge development and the links between the operator and conservancy. Furthermore, the membership shall be kept informed of the operation through an annual report submitted to the AGM. The development of appropriate materials for guests shall also ensure that the lodge and the activities are understood within the conservancy context. This should underpin the lodge “branding” while there is a need to acknowledge the conservancy for their role in identifying wildlife and tourism as a valid form of land-use.

The proponent Serondela Lodge cc is responsible for:

- Ensuring all members of the Project Team, including contractors and consultants comply with the procedures set out in this EMP
- Ensuring that all persons are provided with sufficient training, supervision and instruction to fulfil this requirement, and
- Ensuring that any persons allocated specific environmental responsibilities are notified of their appointment and confirm that their responsibilities are clearly understood.

10.3 Ecological and Social Impacts Identified

10.3.1 Introduction

The construction and operating of the proposed lodge shall have an impact on the socioeconomic and biophysical environment. An explanation is given on what these impacts are likely to be in terms of the nature, extent, intensity (magnitude) and duration of potential impacts. Actions to avoid, minimise or mitigate impacts are addressed in the Environmental Management Plan (EMP).

10.4 Biophysical Impacts

10.4.1 Geology, Soils, Archaeology & Drainage

The soils in the immediate vicinity of the project area are either loam or sandy-clay. The actual site is on well-drained sandy soil. Access to the site through the park traverses better-drained

soils. These areas may be waterlogged during the flood season but during these periods' boats shall be used. There are no indications of undue run-off from rain and this is due to the very flat terrain. There are no indications of any sites of archaeological significance in the immediate area. The result is that potential risk is **zero**.

The Chobe River experiences some boating traffic and hence there is an initiative from both Botswana and Namibian authorities to develop common protocols for the use of the river. The proponent has indicated a strong willingness to contribute and support sensitive and sustainable use of the river.

- *Impacts description*

Storm water run-off in the immediate area of the lodge development site is minimal. The magnitude of increased run-off caused by this development is small. The viewing deck and accommodation units are on flat terrain. The track network is very limited on the site and traverses sandy soils and the run-off is negligible and the threat **not significant**.

During the construction phase there shall be heavier traffic, as building supplies required to be transported. However, given the largely sandy substrate additional impact shall be **not significant**. Tourist access is by boat.

- *Mitigation*

The developer has ensured that track network within existing site is used and that minimum additional tracks are made. The access track along the floodplain, which may have small patches seasonally waterlogged, low impact modifications may be required. Boat drivers need to receive training to ensure that they understand the impacts of wakes on exposed banks as well the approaches employed to reduce their impact.

10.5 Water Resources

10.5.1 Baseline Description

The area is sub-humid and receives between 500 and 600 mm per year although this is variable. Most of the rain falls between December and April. The mean annual evaporation is about 2,500

mm that is four to five times higher than the annual rainfall. The adjacent backwater is fed by the Chobe system.

- *Impacts Description*

Potentially the greatest impact on the adjacent backwater and ground water shall come from sewerage and the risk is rated at **moderately negative**. Vehicles shall not be serviced on site hence potential risk from oils is **zero**. There shall be two motorboats and these shall be serviced on site by an external service-provider. The service agreement shall stipulate that old oils shall be sealed in watertight containers and disposed of at an approved location. Impact of water extraction from the backwater is **not significant**.

At 100% occupancy the average daily demand (ADD) shall amount to less than 3,800 litres per day while at average occupancies the ADD shall be in the region of 2,400 litres per day. During the construction phase the ADD is unlikely to exceed 6,000 litres per day, as very little concrete shall be used.

- *Mitigation*

1. Management of Sewerage

- a. Sewerage treatment plants such as the one proposed by the developer should be used: <http://www.clarusenvironmental.com/en-na/product/397-fusion-series-treatment-systems#technical-data>
- b. Shower water, rather than entering the septic tank, should be directed to soak-ways/French drains.
- c. “Environment friendly” detergents and soaps should be used.
- d. Reminders should be provided to guests and staff using the facilities explaining the system and the adverse impacts of flushing anything other than the normal sewerage.
- e. Should de-sludging of septic tanks be required, the contents should be sealed in appropriate drums and disposed of at an appropriate site.

2. Management of Grey Water

- a. The scullery waste pipes must be fitted with grease traps that must be checked regularly.
- b. Sludge from grease traps must be stored in sealed containers and disposed of at an appropriate site.
- c. Water from showers to feed into soak-aways/French drains.
- d. All soaps and detergents must be “eco-friendly”.

3. Management of Oils & Fuel

- a. Vehicles shall be serviced off site hence very little possibility of spillage of used oils or risks associated with disposal.
- b. Should outboard motors be serviced on-site the agreement with the service provider **MUST** include the removal of used oil.
- c. Should a diesel or petrol driven engine be used to extract water from the backwater it should be located to minimise possibility of spillage into the water body.

4. Water Demand Management

- a. Although water is seemingly plentiful, low volume showers should be used while water awareness should be a priority for both staff and guests.
- b. Water consumption should be measured and used to set benchmarks.
- c. Ornamental gardens, other than a few shade trees, shall not be developed nor should a lawn be planted although the existing *Cynodon dactylon* grass cover can be encouraged to grow in small areas outside the chalets, by gentle watering with the discharge from the sewerage plant during the dry months.
- d. A maintenance plan needs to be developed and implemented whereby there is early detection of leaks or malfunctions in the water reticulation system.

10.6 Biodiversity

10.6.1 Baseline Description

Serondela Lodge is located on a small “island” within the Zambezi floodplain grassland of the Chobe wetlands. There is no tall tree stratum other than a single *Faidherbia albida*. There is a shrub layer dominated by *Disopyros lycioides* and *Combretum mossambicensis* while *Capparis tomentosa* is also found.

10.7 Vegetation at Serondela Lodge

Wildlife in the Chobe National Park on the opposite bank in Botswana is bountiful and represents a unique selling point for the lodge. Wildlife using the river includes elephant, buffalo, impala, hippo, wildebeest, giraffe, zebra and warthog. Large predators include leopard, lion and spotted hyena. A number of wildlife species are found on the Namibian floodplains with the most common being elephant, buffalo and hippo. Large predators, especially lion and spotted hyena, prey on domestic stock and present a real problem for stock farmers.

The development area is not fenced and elephant and hippo are occasional visitors to the site. The site is located within the KAZA transfrontier area and one of the objectives of this initiative concerns wildlife corridors between and within countries. In the Zambezi region Namibia, through a network of protected areas and conservancies, has received acknowledgment for pioneering and innovative approaches. Elephants from Namibia and Botswana use the eastern floodplains as a corridor and this at present there are no impediments as human densities are low.

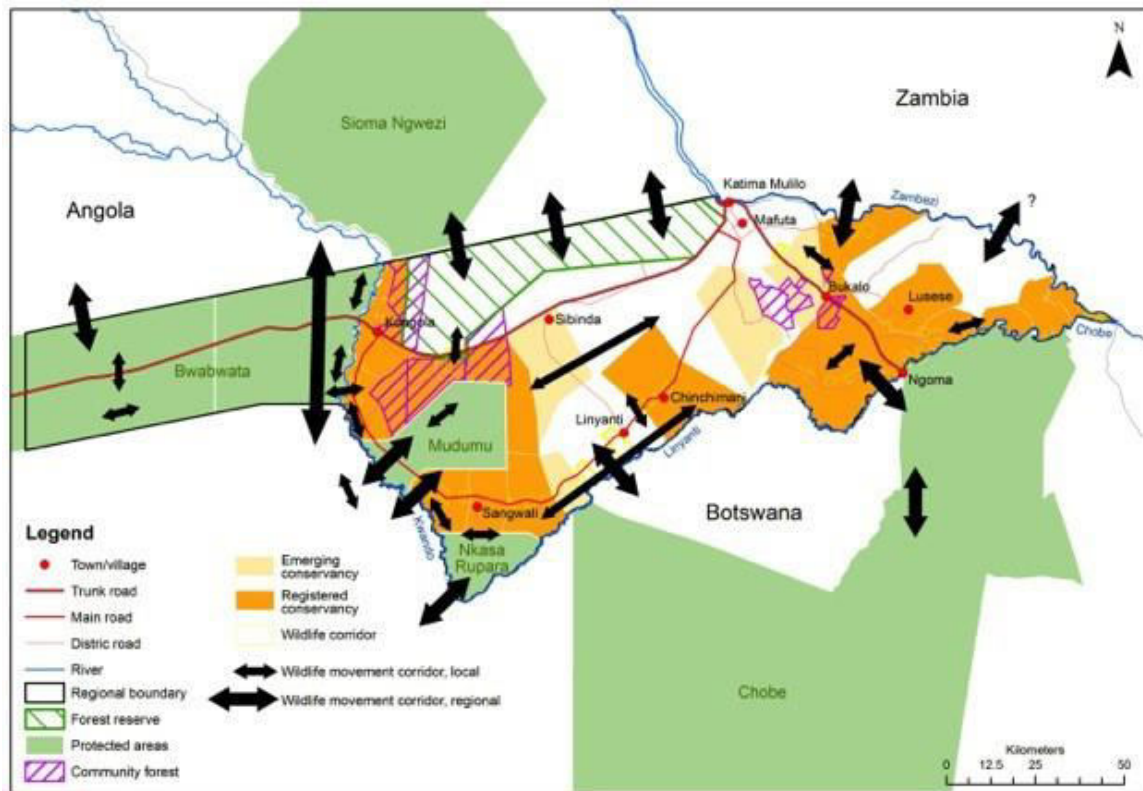


- *Impacts Description*

The Lodge development have **negligible** impact on the relatively sparse vegetation. However, there are **significant positive impact** on wildlife in the area. It is recognised that the presence of tourism enterprises reduces illegal activities by presence in the area. This allows MET staff to focus their law enforcement activities in areas not frequently visited by tourists or operators. The area is range to high densities of elephant and given that this species is a target for poachers, the presence of the lodge and its associated activities plays an important role as a deterrent. Lodge staff provides MET with information of any suspicious movements in the area.

Although the small sample of collared animals does not show a major corridor, anecdotal evidence suggests that the area does have a corridor function. Data from collared animals were used and this was supported by anecdotal evidence from seasoned field workers. It is evident

from these findings that the site in question does not fall within a critical corridor. The impact of the lodge development on wildlife corridors is thus considered **not significant**.



The conservancy receives generous income from this partnership and a part of this supports the efforts of the community game guards. This includes game counts and law enforcement in the conservancy hence there is a **positive biodiversity** impact for Kabulabula Conservancy.

- *Mitigation*

The single large tree is not and/or shall **NOT** be felled and the existing shrubs are either avoided or integrated into the design of infrastructure. Because of the lack of shade planting of trees that occur naturally within the area may be planted. No exotic or invasive plants is to be or shall be introduced.

Trees and shrubs suitable for planting include: *Trichelia emitica*, *Philenoptera violacea*, *Azelia quanzensis*, *Disopyros lycioides*, *Combretum mossambicensis* and *Baphia massaiensis*.

The above list is not complete and the developer may not include species that do not occur in the area. Prior to offering guided boat rides, guides should be trained to minimise the disturbance for animals. The surrounding area has little woody vegetation hence NO firewood shall be collected and shall be procured from a sustainable source (e.g. Community Forest) elsewhere in the

Zambezi region. Staff shall need to receive training on the issues regarding illegal harvesting of wood, illegal hunting or purchase of game meat while there shall also be a disciplinary procedure, based on zero tolerance, which shall be used to deal with illegal activities of staff. These shall be outlined in a code of conduct.

10.8 Landscape & Visual Impacts

10.8.1 Baseline Description

The site is opposite the Chobe National Park wildlife management station. This was previously a public lodge site but now used by park staff. To the west of this site are a few tourists tracks but the lodge not conspicuously in the skyline for tourists. To the north there is a village about 1,5 kilometres distant.

▪ *Impacts Description*

The proposed development will have a **low** impact on the landscape. The en-suite units shall have exterior materials of appropriately neutral colour and shall be positioned to nestle within the existing vegetation. These units have a “classic safari” appearance.

▪ *Mitigation*

The developer has committed to mitigating the visual impacts and the maintenance of the “sense of place” by designing the infrastructure to blend in with surrounding landscape forms through the use of appropriate material colour, positioning of infrastructure and aesthetic design. Where possible, installations (gas bottles; refuse storage at kitchen etc.) should be hidden by natural vegetation and/or pole screens.

10.9 Infrastructure and Services

10.9.1 Baseline Description

At present there are no services in this remote site.

▪ *Impacts Description*

The development will have a **moderately negative** impact. This will peak during the construction phase but will then be low once the lodge becomes operational. However, even during the operational phase the waste will not be excessive as conventional building materials (cement, bricks etc.) will not be used in any great amounts. Furthermore, the nature of the building will not

require a large construction force. During the construction phase there will be an increase in general waste from the building operation as well as household waste generated by the building team. The site is remote and far from a refuse dump hence additional care is required to reduce operations waste as far as possible with the principles of reduce, re-cycle and re-use guiding the management plan.

- *Mitigation*

An integrated waste management plan was developed which takes cognisance of the principles of reducing, re-cycling and re-using waste. The operator is committed to aligning waste management with best practices and all solid waste shall be removed from site in industrial strength plastic bags. Mitigation measures during the building phase should include:

- a. Ensuring that all building waste is removed from the site and deposited in an appropriate site in Katima Mulilo.
 - b. Waste concrete slurry (although minimal quantities shall be used,) must be stored in a leak-proof container, allowed to dry out and the residue is disposed of as with solid concrete – i.e. used as filler.
 - c. Left over chemical liquids must be stored in leak-proof containers and transported to approved site.
 - d. Plastics, ceramics, textiles (including woven bags) to be sorted and stored and transported to approved site – NOT TO BE BURNT.
 - e. Paper, cardboard boxes, timber off-cuts, cement bags (plastic lining must be removed) may be burnt in a controlled manner and ash must be buried.
 - f. Metal off-cuts – must be removed from site.
 - g. Building staff are thoroughly informed of environmental standards and expectations and monitored during the building phase.
 - h. All waste is carefully contained especially to guard against dispersal by wind and scavengers such as honey badgers, hyena etc.
- Mitigation measures during operations:
 - a. Waste should, as far as possible be reduced along the principles of reduce, re-use and re-cycle:
 - i. Potable filtered water from the site should be offered to clients thereby decreasing large volumes of plastic bottles.
 - ii. Consideration should be given to beer, and other beverages, in cans rather than bottles, as they are easier to store and dispose of.
 - iii. Bulking buying of foodstuffs where possible in an attempt to reduce packaging waste.
 - iv. If possible, develop a common waste management plan with Conservancy with support of the Village Development Committee.

- b. All staff must be aware of the waste management policy and are involved with implementation & monitoring of the management plan. A focal person, however, needs to be appointed to ensure that there is compliance.
- c. The plan should allow for secure storage of waste and where possible materials should be made available for recycling. The principle of removal of waste from the site shall be followed.
- d. Waste, other than organic, must be removed from site.
- e. Vehicles will be serviced off-site thus it is not expected to have to deal with waste oil, filters and other vehicle parts.
- f. Service-providers providing services to outboard motors shall be instructed to remove all used oils from the site.

10.10 Socio Economic Impacts

10.10.1 Baseline Description

The operational Lodge development falls within a remote area of the Zambezi Region where poverty and lack of access to employment opportunities and training are barriers to socio-economic development. Many people migrate out of the area to seek employment elsewhere and this further inhibits local development while also having a negative impact on the social fabric of the inhabitants. While most of the inhabitants of the conservancy and surrounding area have livestock and crops and to a lesser extent small kitchen gardens for vegetable production, as their primary livelihood strategies the conservancy assets of landscapes and wildlife offer untapped potential to improve their socio-economic well-being. The seasonal flooding of parts of Kabulabula Conservancy further limits the livelihood options of members and a tourism development will diversify income to members through employment and the conservancy through rent and dividends and thereby contribute significantly to financial sustainability.

▪ *Impacts Description*

In an area that is characterised by lack of opportunity the lodge development has a **significantly positive** impact on both individuals and the long-term financial viability of the conservancy.

These impacts include the following:

- a. Employment
- b. Training
- c. Income for the Conservancy

The present agreement with the conservancy allows for direct income to the conservancy. The details of this arrangement follow good practice in this type of joint venture operation and

the conservancy have signed an agreement that outlines the revenue that they shall receive. This will have a significant impact on the financial sustainability of the conservancy. MET shall approve the operator's contract which binds the operator to payments and these shall be monitored by a Joint Management Committee (JMC). MET shall be represented on this committee.

- *Mitigation*

Mitigation measures are not required BUT careful monitoring of the agreement through the JMC shall track and ensure compliance.

10.11 Safety & Health

10.11.1 Baseline Description

There are no issues at present but during construction and operation safety and health issues may arise.

While the appointed contractor shall cover the normal issues surrounding occupational safety, the circumstances of operating in a protected area shall pose other potential safety issues associated with wildlife. There is the potential for encounters between guests and wildlife in the vicinity of the lodge and management is required to minimise these.

- *Impacts Description*

Hippo, elephant, snakes and other wildlife are occasional visitors to the site and the potential for conflict, **although small**, does exist.

- *Mitigation*

The operator needs to limit these threats by:

- a. Ensuring that guests and staff are aware of the possibility of wildlife in the immediate vicinity.
- b. Guests are equipped with torches (or informed by the need to have torches) for moving between the viewing deck area and tents at night.
- c. Where appropriate, paths may be illuminated using solar lights – these should face downwards to minimise impact of light pollution.
- d. Staff needs to receive training in dealing with encounters with these species.

- e. A staff member needs to receive training in dealing with potentially harmful snakes while an appropriate snake-catching stick should be available at the site to remove potentially venomous specimens from the immediate site should they pose a threat to staff or guests.

The findings from the site visit are summarized in Table 2 below.

Environmental Issue	Expected environmental impact			
	Strongly negative	Moderately negative	Not significant	Positive
Geology, Soils & Drainage (includes tracks)		√		
Water Resources		√		
Biodiversity - Plants			√	
Biodiversity - Animals				√
Landscape & Visual Impacts			√	
Services – solid waste			√	
Services - sewage		√		
Socio-economic				√
Health & safety			√	

11. MANAGEMENT ACTIONS

Planning Phase

Objective	Management Measure	Monitoring Action & Method	Responsibility
Environmental Clearance	Apply for environmental clearance	File clearance	Operator
Adhering to EMP requirements	EMP should be shared and discussed prior to layout of building.	Site plan to ensure that layout of buildings reduces visual impact as per the Scoping Report	Operator
	Organise an awareness meeting with all building staff to ensure awareness and the need for compliance with EMP	Complete EMP awareness training	Contractor

Socio-economic benefits	Develop contract monitoring tool to manage & monitor JV contract	Hold inception meeting with conservancy	JV support staff.
Conserve existing vegetation	Layout & design should incorporate the existing trees & shrubs	Layout & design complies with proposed mitigation. The large specimen tree (<i>Faidherbia albida</i>) must not be removed while every effort must be made to minimise impact on existing shrubs.	Contractor
Minimise land degradation & erosion	The access road from Nakabolewa changes according to flooding and lodge vehicles should use the most accessible track and not make unnecessary new tracks.	Monitor accessibility	Contractor
To preserve scenic quality & maintain “sense of place”	Site chalets as far as possible to “nestle” in existing vegetation	Compliance with plans	Contractor
	Place service areas out of sight of guest areas and position installations/services using the existing vegetation	Compliance with site plan	Contractor
	Materials colour should blend in with the site	Discussions between operator and suppliers	Contractor
	Lighting for paths to face downwards to minimise visual impact; avoid harsh external lighting	Agreed between operator and contractor	Operator & contractor
Minimise impact on energy resources	Design energy systems which use, as far as possible, renewable energy	Cost benefit analysis of most appropriate systems BUT which excludes the use of wood	Operator Contractor

		for heating (gas acceptable)	
Minimise impact on water resources	Use water-saving devices in toilets and low-flow shower heads	Specified in details	Contractor
	Specify water meters to monitor water consumption	Specified in details	Contractor
	Place sewerage systems to ensure such that potential for contamination of ground water is minimised – cognisance of the fact that there is a shallow water table needs to be acknowledged when designing system.	Septic tanks to be positioned out of floodplain waterlogged zone and French drains located in well-drained soils.	Contractor
	Grey waste water disposal system to be built	French drains to be positioned in well-drained soil.	Contractor
	Fat traps to be installed at scullery.	Ensure that specified in details	Operator

Building Phase

Objective	Management Measure	Monitoring Action & Method	Responsibility
To ensure that provisions of the EMP are implemented during construction	Contractor to report at every site meeting with operator on implementation of EMP	Included in site meeting notes	Operator
	Contractor to conduct training & awareness for workers	Worker's awareness & training meeting	Operator
	Copy of EMP included as part of contractor's instructions and	EMP available on site	Operator

	available to all staff and sub-contractors		
	A sign-off procedure should there be any change to the EMP or should there be any deviation from the clauses or intention of the EMP	Updates and instructions included in construction instructions	Contractor MET
Minimise damage to environment during construction	Demarcate area which shall be subjected to disturbance	Common understanding on extent of construction area	Contractor
	Detailed instructions to be issued on rehabilitation of disturbed areas	Instructions shared with contractor	Contractor
	Protection of woody plants. Where possible these should be incorporated into the design	Compliance with contractor instructions	Contractor
	Wildlife not to be disturbed, trapped or killed and any offender shall be reported to MET for further action	Incidents to be recorded and reported to MET and conservancy	Contractor
	To minimise soil or water pollution	Spillages of potentially harmful substances must be cleared immediately and disposed of at an appropriate site	Contractor
	To ensure that sound waste waste		Contractor

	management is practiced during the construction phase and should be classified as industrial (oil, metal and chemical based materials); solid waste (normal household waste) and human waste (sewerage)		
Handling of building waste	Wet concrete & concrete slurry to be mixed on protected surface	Management & disposal of waste is undertaken on the principle of removal from the site and disposal at an appropriate dump (paper etc. may be burnt on site)	Contractor
	Waste concrete slurry to be stored to dry out and then disposed of or used for filling; road repair etc.		Contractor
	Plastics (including cement bag liners, wrapping etc.) to be sorted and separated and transported to depot/dump.		
	Metal off-cuts – as above		
	Textiles including woven bags – as above		
	Paper (including cement bags BUT with plastic liner removed) & timber – may be burnt on site in a controlled manner		

Operational Phase

Objective	Management Measure	Monitoring Action & Method	Responsibility
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To ensure that EMP and the Scoping Report understood by management & staff	EMP & Scoping Report incorporated into contract of Lodge Manager	Contract which aligns EMP & Scoping Report	Operator
	Staff receive training and understand the implications and reasons for the EMP	Training held & roles and responsibilities of various staff members clearly spelt out and included in job descriptions	Lodge Manager
To ensure that the agreed socio-economic benefits of the JV contract are achieved	Implement contract monitoring tool	Ensure that reviewed and acted upon at JMC meetings between operator and conservancy	Operator Lodge Manager Conservancy MET
Minimise impacts on vegetation	Existing vegetation in lodge area is not removed except where it is a hindrance to lodge operations	Conduct regular inspections and keep staff informed	Lodge Manager
	Introduced ornamental plants must only be indigenous to the area	Compliance with approved list	Lodge Manager
	Staff do not fell trees or damage vegetation	Inform staff of policy as well as the repercussions should there be non-compliance. Include in code of conduct for staff	Lodge Manager
	Track network at the site is confined	Inform staff	Lodge Manager
Minimise impact on wildlife	Ensure that guests are aware of the potential	Guides to be trained in responding to elephant, hippo and predators;	Operator Lodge Manager

	danger of wild animals entering lodge site	relevant information is provided in accommodation units	
	Staff do not have an impact on wildlife	Staff to be aware of the legal implications and company policy in catching, trapping or killing wild animals	Operator Lodge Manager
Capitalise on presence of lodge for biodiversity management	Maintain integrity of the area	Report any suspicious behaviour to MET	Lodge Manager
	Provide reports on species of special interest as required	Share records with MET	Lodge Manager Guides
			Lodge Manager Guides
Minimise land degradation & erosion	Rainfall run-off at lodge site does not cause undue erosion	Regular inspections and if required remedial contouring or drainage	Lodge Manager
	Ensure that tracks used for lodge activities are not subjected to erosion	Undertake inspections regularly	Lodge Manager
	Minimise impacts of boat activities on river banks (boat rides are an option that may be offered at a later stage)	Training provided to boat guides on the impacts of boat wakes on exposed river banks and methods to reduce impacts	Lodge Manager Guides
To preserve scenic quality & “sense of place”	Mitigation measures implemented during construction phase are maintained	Regular inspections of screens etc. hiding services & installations are functional and if required repair	Lodge Manager

Minimise impact on water resources	Staff are aware of the need to use water carefully	Undertake staff training	Lodge Manager
	Water usage & consumption is within the “best practice guidelines”	Monitor water usage on a monthly basis	Lodge Manager
	There is no leakage from water systems	Undertake regular inspections of all water pipes	Lodge Manager
Minimise soil & water pollution	Spillages of potentially harmful substances must be cleared immediately and disposed of at an appropriate site	Inspection and follow-up clean-ups if required	Lodge Manager
	Functional septic tanks	Undertake regular inspections and, if required, de-sludge	Lodge Manager
	Functional fat traps	Inspect & clean on a regular basis and store matter in sealed containers	Lodge Manager
	Functional soak-aways	Inspect on a regular basis	Lodge Manager
	Functional and leak-free waste water pipes	Inspect on a regular basis and repair if required	Lodge Manager
	Use of environment-friendly soaps & detergents	Ensure that procurement specifies this need	Lodge Manager
	No contamination of soil or water by fuels or oil	Ensure that all fuels stored and managed to reduce risk of spillages	Lodge Manager

		Lodge vehicle must be serviced off-site	
Ensure management of solid waste according the principle of reduce, re-use and re-cycle (where feasible)	All solid waste safely stored to avoid dispersal by wind, predators or other wild animals Waste removed from site in appropriate containers	Include in duty sheet for lodge staff Operator to undertake weekly checks	Lodge Manager Operator
	Evaluate all purchases off foodstuffs & beverages to reduce packaging	Include in duty sheet for Lodge Manager	Operator

11.1 Environmental Monitoring (Operational Phase)

The following represents key monitoring activities but lodge management may add as the need arises

Note: Most of the monitoring is the responsibility of the manager BUT he/she may delegate as required but those responsible need to have the task included in job description

To be Monitored	What needs to be monitored	Frequency	Responsibility
JV contract	Socio-economic benefits for conservancy delivered by operator	Quarterly	Operator Conservancy
JV contract	Conservancy compliance	Quarterly	Operator Conservancy
Sewerage system	Septic tanks	Monthly	Lodge Manager
Sewerage pipes	Leaks	Monthly	Lodge Manager
Grey water pipes	Leaks	Monthly	Lodge Manager
Fat traps	Functioning equipment	Weekly	Lodge Manager

Water installations	Functioning of purification equipment	Weekly	Lodge Manager
Solid waste	Secure storage of solid waste	Daily	Lodge Manager
Solid waste	Removal of waste from site and secure storage of waste	As per waste management plan	Operator
Soak-aways	Drainage	Weekly	Lodge Manager
Wildlife	Suspicious or illegal activities	On-going	Lodge Manager
	Species of special interest	On-going	Lodge Manager Guides

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Nyepuz Consultancy CC
Environmental and Management Consultant