# **ENVIRONMENTAL MANAGEMENT PLAN (EMP)**

EXISTING AND OPERATIONAL AGAMA LODGE AGAMA LODGE, LOCATED IN NAMIB NAUKLUFT PARK OF ||KARAS REGION





Proponent: Weihong Bao & Lin Bo Agama Lodge cc P.O Box 40594 Windhoek Namibia

October 2024

Title	Environmental Management Plan (EMP) for the existing and operational Agama Lodge (Measuring 4.2 Hectares)
EAP	Nyepez Consultancy cc
Reviewer	Erongo Consulting cc
Client	Weihong Bao & Lin Bo (Agama Lodge)
Status	Final Updated Environmental Management Plan (AEMP)
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# 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 Agama Lodge, a Lodge that operates within the Namib Naukluft Park, close to Sossusvlei, Deadvlei & Sesriem Canyon in the IIkharas Region. The size of the land parcel for the lodge is 4.2 hectares.

Weihong Bao & Lin Bo are the developers and operators that manages and operates the Agama lodge cc within the Namib Naukluft Park area. Namib-Naukluft National Park is located on the western side of Namibia just south of the midway point. The park lies between the shoreline of the Atlantic Ocean through to the beginning of the Great Escarpment which extends into South Africa. It borders the neighboring Dorob National Park to the north. The park covers an area of 19,216 square miles (49,768 sq km) creating the largest national park in Africa and the fourth largest in the world. It is a renowned park featuring the splendor of the Namib Desert. It is therefore vital to state that 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 Weihong Bao & Lin Bo of Agama 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

The Proponent (Agama Lodge) had partnered and/or signed a lease agreement with Ministry of Environment, Forest & Tourism, the Naukluft park management and the local communities to develop a medium luxurious exclusive lodge, adhering to strict "eco" principles, in the Namib Desert within the National Park. The lodge is serving as a specialty provider of excellent "wild" accommodation and wildlife-related tourism services for upper-market clients.

The lodge's components consist of of 40 rooms comprising of 20 standard rooms and 20 deluxe rooms. Each room has air conditioning, a separate bathroom and a pattio. Other facilities include an infinity pool, restaurant, a deck with spectacular sunset views and public rest area with views of the Naukluft Mountain Range. Every unit has a starry sky bed on the roof should clients want to sleep under the stars. A fitted kitchenette is also sometimes included, such as that at Desert Quiver Camp (situated amongst granite outcrops in the Sossusvlei area approximately 4 km from the main gate), along with laundry service. There is a Lodge manager's "accommodation room" as well as a few accommodation rooms for other casual staffs. Staff are often drawn from nearby villages and commute by transport (vehicle) provided by the lodge.

In addition, there is a communal viewing platform that provides a commanding view over the Naukluft National Park. The national park and Namibian wetlands and associated wildlife are the main attractions of the lodge. Activities for guests at Agama Lodge include boat cruises, game drives, mountain biking and walks.

#### 3. DEVELOPMENT RATIONAL

Rational for this development in the National Park is because of the varsity tourism potential of the open wild desert assets that 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. Through Ministry of Environment, forestry & Tourism, the Naukluft National Park already has a hunting concession 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 employment for surrounding communities and revenue potential, this development has the further potential to contribute to the overall marketing of the region that will have spin-offs for the sector. The presence of a tourism venture has enhanced biodiversity protection efforts as the enterprise and associated activities are a further deterrent to poaching. With elephant under increasing threat every additional deterrent is important.

### 4. PROJECT OUTLINE

Proponent (Agama Lodge cc) appointed by Nyepez Consultant cc to apply for a valid Environmental Clearance Certificate (ECC) as the lodge was established and is operational but without a valid ECC. Hence this application to acquire a ECC for the lodge's operation compliance. The Environmental Impact Assessment (EIA) was conducted under the requisites of the Environmental Management Act (EMA) (Act 7 of 2007) and its Regulations (2012).



#### 5. PURPOSE OF EMP

This Environmental Managements Plan (EMP) describes a list of management actions needed to ensure that avoidable negative impacts during the development and operation of the project are prevented or minimised and that the positive impacts are enhanced. The EMP addresses all the impacts outlined in the Scoping Report for this project and is aligned with the recommended actions laid out in this report.

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 be 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 40 accommodation units that are built of local materials and rustic chalets. 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 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 ( by vehicle) provided by the lodge.

#### 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

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Legislation considered	Aspect of Project		
Regional Councils Act,	The Regional Councils Act legislates the establishment of Regional		
1992 (Act No. 22 of 1992)	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. Ilkaras 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	This Act provides a framework for managing water resources based		
(Act No.	on the principles of integrated water resources management. It		
11 of 2013	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	This Bill serves to regulate and prevent the discharge of pollutants		
Management Bill (in preparation)	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	This Ordinance serves to control air pollution from point sources,		
Ordinance (Act No.11 of	but it does not consider ambient air quality. Any person carrying out		
	a 'scheduled process' which are processes resulting in noxious or		

1976)	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	The Act serves to protect the public from nuisance and states that		
1919)	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 Lodge development is situated in the Namib-Naukluft National Park on the western side of Namibia just south of the midway point. It is situated adjacent to the Naukluft Mountain Zebra Park. The park lies between the shoreline of the Atlantic Ocean through to the beginning of the Great Escarpment which extends into South Africa. It borders the neighboring Dorob National Park to the north. The coordinates of the site are *Lat -24.146503, Lon 15.961532* and the size of land is 4.2 hectares.





### 8.2 Lodge activities & facilities

The development shall consist of:

a) 40 rooms comprising of 20 standard rooms b) Central hospitality area incorporating bar, dining area, lounge and outdoor area (including a small plunge pool) c) 20 deluxe rooms. d) Swimming Pool, e) Bar, f) Restaurant, g) BBQ Facilities

The lodge's spacious, air-conditioned chalets feature warm décor and local touches. They also include a desk, wardrobe or closet, and a private shower room. Each chalet has a deck with chairs with views of the Namib Naukluft Mountains. The set-up of a sky bed on the roof terrace is offered at an additional cost which includes a bottle of bubbly and a platter of canapés to complete the perfect 'sundowner' setting. this is inclusive of Morning Drives, Sundowner Drives, Sossusvlei Excursion, Stargazing, Scorpio Walk, Bush Dinner. **The lodge utilities are also provided**:

- 360 deg Sky terrace
- Freestanding unit
- Air-conditioning
- Twin or double bed (s2A)
- Private Parking adjacent to your chalet
- En-suite shower room
- Tea & Coffee making facilities
- Outstanding views



Lodge amenities & infrastructures





### 8.3 Lodge's staffing component

During the operation phase the lodge, the lodge is employing both permanent and casual staffs forming the lodge's labor force. The Lodge have +-60 Permanent staff inclusive of cookers, chefs, cleaners, receptionists etc. and 10 Casuals workers. The staffs are housed in tented rooms and meals are provided from a communal kitchen.

### 8.4 Associated Infrastructure

### 8.4.1 Water

Agama lodge utilises the use of water from the borehole, where a water pump and four 10 litres water tanks are installed to provide water for consumption and domestic use. Further the lodge also have alternative water provision through use of "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

### 8.4.2 Electrical Services

The site is relatively close to the Namib Naukluft-national Park power grid and solar energy is being installed to serve as a backup and alternate power system (especially during power outage). The project electricity is used to power all electronics within the lodge which include heating water and

provide power for lighting and power refrigerators etc. Although solar panels are still in construction phase, this sustainable and ecofriendly method is vital in minimize environmental impact and most tourists view solar power as an attraction that lowers the carbon footprint of the operation.



#### 8.4.3 Sewerage Disposal

The developer utilizes a sewerage approach called Fusion<sup>®</sup> sewerage system, which conforms to the required Namibian discharge standards. The Fusion utilizes a combination of anaerobic (without oxygen) and aerobic (with oxygen) biological processes to treat wastewater. As wastewater enters the Fusion, it is broken down and becomes food for biological organisms operating within the unit

#### 8.4.4 Waste Removal

solida wastes are often collected and stored in black plastic bgas before there are disposed in the dustbins. The building rubbles are usually collected in the skip container provided on the lodge premises. All waste attractive to either predators or scavengers are usually bestored in such a manner that these animals do not have access to the site. All solid waste are often disposed of at the appropriate and nearest designated dumping site in rehoboth.

#### 8.3.5 Roads

There is an existing gravel road to the site and this is usually used to acess the lodge. The gravel road adjoins the National C19



road between Solitaire and Sesriem. There are also a number of existing tracks connecting villages. Different type of vehicles (such as sedans, 4x4 and vans) carrying tourists usually use this road to reach the lodge project area.

### 8.4 Employment and Skills Development

The Proponent (Weihong Bao & Lin Bo) of Agama Lodge hires and have hired local residents (Namibians) from around Sossusvlei, Deadvlei and Sesriem communal areas and 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 area calculated as follows;

A=A1 x A2 B=B1 +B2+B3 Environmental Classification (ES) =A x B

Table 5: Environmental Classification of Impacts according the Rapid Impact Assessment Method ofPastakia 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 Agama Lodge development project operations are minimized. The EMP acts as a stand-alone document, which can be used drying 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 Namib Naukluft Park, 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 ongoing 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 park management 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 park management. 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 park management context. This should underpin the lodge "branding" while there is a need to acknowledge the park management for their role in identifying wildlife and tourism as a valid form of land-use.

The proponent Weihong Bao & Lin Bo of Agama 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 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

Rainfall is quite rare in the Namib Desert. The three months of January, February, and March get the most rainfall, with mean monthly totals of about 62 mm, 66 mm, and 55 mm, respectively. Namib-Naukluft National Park has a hot and extremely dry climate with very little rainfall. Temperatures can peak well above 38°C/100°F during summer (November to April), but nights can drop below freezing point in winter (May to October). The altitude in the park varies widely.

### 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**. Agama Lodge transport vehicles are serviced on site by an external service-provider. The service agreement 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 was unlikely to exceed 6,000 litres per day, as very little concrete was used.

- Mitigation
  - 1. Management of Sewerage

a. Sewerage treatment plants such as the one erected by the developer should be used: <u>http://www.clarusenvironmental.com/en-na/product/397-fusion-series-treatment-systems#technical-data</u>

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

The Namib-Naukluft Park is Namibia's most versatile conservation area and one of the country's major tourist destinations. The vast wilderness of almost 50 000 square kilometres contains key features such as Sossusvlei, Sesriem, the Welwitschia Trail, Sandwich Harbour, the Naukluft Mountains and the Kuiseb Canyon.

### 10.7 Vegetation at Agama Lodge

Wildlife in National Namib-Naukluft Park area is semi-desert savanna. It is home to some of the rarest and weirdest plant species in the world, including the Welwitschia, large lichen fields, several aloe species, cluster figs, acacia thorn trees and many different Euphorbia species. The Central Namib contains a narrow strip of vegetation that follows the coastline north of the Swakop River, which supports shrubs such as Psilocaulon salicornioides, Zygophyllum clavatum, Salsola aphylla, and S. nollothensis. The pencil plant and dollar bush are prominent in the fog-influenced coastal belt.

Naukluft escarp- ment	Scenic value and important for cliff-nesting birds and cliff-loving plants	
Naukluft incised valleys and wet- lands	Rich and highly unusual ecosystems, often containing pools of water throughout the year and providing this essential resource to plants, birds, mammals and insects.	Source: Nami
Naukluft Plateau	The only part of the Namibia escarpment that is in a State protected area, and therefore requiring high levels of protection.	Naukluft Par Management Pla (2013)



Vegetation plant species in Namib Naukluft Park



The development area is not fenced and elephant, kudu and springboks are occasional visitors to the site. The site is located within the Namib-Naukluft Park area and one of the objectives of this initiative concerns wildlife habitats within the region. In the IIKharas region Namibia, through a network of protected areas and conservancies, has received acknowledgment for pioneering and innovative approaches.

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 MEFT 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 MEFT 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 community 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 national park hence there is a **positive biodiversity** impact for Agama Lodge and surrounding communities.

#### Mitigation

The single large trees are 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 shades, planting of trees and trees that grown 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: *Welwitschia, large lichen fields, several aloe species, cluster figs, acacia thorn trees and many different Euphorbia species.* 

The above list is not complete and the developer may not include species that do not occur in the area. Prior to offering tours, tour-guiders 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 IIKaras 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 within Namib-Naukluft Park, which is a national park in western Namibia, situated between the coast of the Atlantic Ocean and the edge of the Great Escarpment. The site was previously used a commonage as a national public game park. Namib Naukluft Habitat or as we call Nam-Nau Habitat is a unique 25 000-hectare private desert which stretches from the Namib desert to the naukluft mountains, bordering to the Namib Naukluft Park on both sides, east and west.

### Impacts Description

The existing development have a **low** impact on the landscape. The en-suite units have exterior materials of appropriately neutral colour and are 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, except for agama lodge site infrastructures.

Impacts Description

The development has a **moderate negative** impact. This will peak during the construction or upgrading phase but will then be low once the lodge becomes operational. However, even during the operational phase the waste are not excessive as conventional building materials (cement, bricks etc.) are not used in any great amounts. Furthermore, the nature of the building does not require a large construction force. During the construction phase there was an increase in general waste from the building operation as well as household waste generated by the building process. 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-sue 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 Rehoboth.
- 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 park management 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 form 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 form the site.

### **10.10 Socio Economic Impacts**

### 10.10.1 Baseline Description

**Regarding plant resources**: The lower reaches of the Kuiseb River in the Namib Naukluft Park (NNP) are the home of Topnaar people, who traditionally use local resources such as !nara plants and local firewood for their livelihood. The Use of these resources should be allowed only through a permit system which has input from the Topnaar Traditional Authority and as long as traditional harvesting methods are used. **Regarding wildlife resources:** Wildlife will be harvested, culled or translocated as long as there is adequate proof from ongoing monitoring that the population can withstand the intended offtake and that there is full justification for one of the following reasons:

- Removal of individuals causing conflict with people;
- Provision of meat for traditional festivals or national events, in keeping with sustainable offtake levels and never for personal gain by individuals. This should be in line with the National Policy on Utilization of Game in Protected Areas and Other State Land;
- For community benefit in collaboration with neighbouring conservancies and in keeping with sustainable offtake levels. '

Natural plant products in NNP (predominantly !naras and firewood) that are part of the traditional and cultural heritage of Topnaar people, are harvested sustainably for the benefit of local rural communities. Over-exploitation of the products is prevented by imposing the condition that harvesting methods must be traditional. These restrictions help to prevent wastage and excessive harvesting by any one individual.

### 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 national park. These impacts include the following:

- a. Employment
- b. Training
- c. Income for the park works and lodge employees

The present agreement with the park allows for direct income to the park and surrounding communities/villages. The details of this arrangement follow good practice in this type of joint venture operation and the park have signed an agreement that outlines the revenue that they shall receive. This will have a significant impact on the financial sustainability of the park, lodge and communities. MEFT shall approve the operator's contract which binds the operator to payments and these shall be monitored by a Joint Management Committee (JMC). MEFT 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 have and/or 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

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.

Table2. Summary of potential impacts from the development of Agama Louge					
	Expected environmental impact				
Environmental Issue	Strongly negative	Moderately negative	Not significant	Positive	
Geology, Soils & Drainage (includes tracks)		$\checkmark$			
Water Resources		$\checkmark$			
Biodiversity - Plants					
Biodiversity - Animals				$\checkmark$	
Landscape & Visual Impacts					
Services – solid waste			$\checkmark$		
Services - sewage		$\checkmark$			
Socio-economic				$\checkmark$	
Health & safety					

### Table 2: Summary of notential impacts from the development of Agama Lodge

### **11. MANAGEMENT ACTIONS**

### **Planning Phase**

Objective	Management Measure	Monitoring Action & Method	Responsibility
Environmental	Apply for environmental	File clearance	Operator
Clearance	clearance		
Adhering to EMP	EMP should be shared and	Site plan to ensure that	Operator
requirements	discussed <b>prior</b> to layout of	layout of buildings reduces	
	building.	visual impact as per the	
		Scoping Report	

	Organise an awareness meeting	Complete EMP awareness	Contractor
	with all building staff to ensure	training	
	awareness and the need for		
	compliance with EMP		
Socio oconomic		Hold incontion monting with	W support staff
bonofite			JV Support Stan.
Denents	to manage & monitor JV contract		
Conserve existing	Layout & design should	Layout & design complies	Contractor
vegetation	incorporate the existing trees &	with proposed mitigation.	
	shrubs	The large specimen tree	
		(Welwitschia, large lichen	
		<i>fields</i> ) must not be removed	
		while every effort must be	
		made to minimise impact	
		on existing shrubs.	
Minimise land	The access road to the lodge site	Monitor accessibility	Contractor
degradation &	could changes based on rain		
erosion	season flooding and lodge		
	vehicles should use the most		
	accessible track and not make		
	unnecessary new tracks.		
To preserve scenic	Site chalets as far as possible to	Compliance with plans	Contractor
quality & maintain	"nestle" in existing vegetation		
"sense of place"	Place service areas out of sight	Compliance with site plan	Contractor
	of guest areas and position		
	installations/services using the		
	existing vegetation		
	Materials colour should blend in	Discussions between	Contractor
	with the site	operator and suppliers	Contractor
	Lighting for nother to face		Operator &
	downwards to minimica visual	Agreed between operator	
	import quoid base bastarnal		CUITTACIUI
· · · · ·			
Minimise impact on	Design energy systems which	Cost benefit analysis of	Operator
energy resources	use, as far as possible,	most appropriate systems	Contractor
	renewable energy	BUT which excludes the use	

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

# **Building Phase**

Objective	Management Measure	Monitoring Action & Method	Responsibility
To ensure that	Contractor to report at every	Included in site meeting notes	Operator
provisions of the EMP	site meeting with operator on		
are implemented	implementation of EMP		
during construction	Contractor to conduct	Worker's awareness & training	Operator
	training & awareness for	meeting	
	workers		
	Copy of EMP included as part	EMP available on site	Operator
	of contractor's instructions		
	and available to all staff and		
	sub-contractors		
	A sign-off procedure should	Updates and instructions	Contractor
	there be any change to the	included in construction	MEFT
	EMP or should there be any	instructions	

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	deviation from the clauses or		
	Intention of the EMP		
Minimise damage to	Demarcate area which shall	Common understanding on	Contractor
environment during	be subjected to disturbance	extent of construction area	
construction	Detailed instructions to be	Instructions shared with	Contractor
	issued on rehabilitation of	contractor	
	disturbed areas		
	Protection of woody plants.	Compliance with contractor	Contractor
	Where possible these should	instructions	
	be incorporated into the		
	design		
	Wildlife not to be disturbed,	Incidents to be recorded and	Contractor
	trapped or killed and any	reported to MEFT and park	
	offender shall be reported to	management	
	MEFT for further action		
	To minimise soil or water	Spillages of potentially harmful	Contractor
	pollution	substances must be cleared	
		immediately and disposed of at	
		an appropriate site	
	To ensure that sound waste		Contractor
	management is practiced		Contractor
	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	Wet concrete & concrete	Management & disposal of	Contractor
waste	slurry to be mixed on	waste is undertaken on the	
	protected surface	principle of removal from the	
	Waste concrete slurry to be	site and disposal at an	Contractor
	stored to dry out and then	appropriate dump (paper etc.	
	disposed of or used for filling;	may be burnt on site)	
	road repair etc.		

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 &	Responsibility
		Method	
To ensure that EMP and	EMP & Scoping Report	Contract which aligns	Operator
the Scoping Report	incorporated into contract	EMP & Scoping Report	
understood by	of Lodge Manager		
management & staff	Staff receive training and	Training held & roles and	Lodge Manager
	understand the	responsibilities of various	
	implications and reasons	staff members clearly	
	for the EMP	spelt out and included in	
		job descriptions	
To ensure that the	Implement contract	Ensure that reviewed and	Operator
agreed socio-economic	monitoring tool	acted upon at JMC	Lodge Manager
benefits of the JV		meetings between	MEFT
contract are achieved		operator and park	
		management	
Minimise impacts on	Existing vegetation in lodge	Conduct regular	Lodge Manager
vegetation	area is not removed except	inspections and keep	
	where it is a hindrance to	staff informed	
	lodge operations		

	Introduced ernemental	Complianco with	Lodgo Managor
			Louge Manager
	plants must only be	approved list	
	indigenous to the area		
	Staff do not fell trees or	Inform staff of policy as	Lodge Manager
	damage vegetation	well as the repercussions	
		should there be non-	
		compliance. Include in	
		code of conduct for staff	
	Track network at the site is	Inform staff	Lodge Manager
	confined		
Minimise impact on	Ensure that guests are	Guides to be trained in	Operator
wildlife	aware of the potential	responding to elephant,	Lodge Manager
	danger of wild animals	hippo and predators;	
	entering lodge site	relevant information is	
		provided in	
		accommodation units	
	Staff do not have an impact	Staff to be aware of the	Operator
	on wildlife	legal implications and	Lodge Manager
		company policy in	
		catching, trapping or	
		killing wild animals	
Capitalise on presence	Maintain integrity of the	Report any suspicious	Lodge Manager
of lodge for biodiversity	area	behaviour to MEFT	
management	Provide reports on species	Share records with MEFT	Lodge Manager
	of special interest as		Guides
	required		
			Lodge Manager
			Guides
Minimise land	Rainfall run-off at lodge	Regular inspections and if	Lodge Manager
degradation & erosion	site does not cause undue	required remedial	-
-	erosion	contouring or drainage	
	Ensure that tracks used for	Undertake inspections	Lodge Manager
	lodge activities are not	regularly	
	subjected to erosion		

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	Minimise impacts of boat	Training provided to boat	Lodge Manager
	activities on river banks	guides on the impacts of	Guides
	(boat rides are an option	boat wakes on exposed	
	that may be offered at a	river banks and methods	
	later stage)	to reduce impacts	
To preserve scenic	Mitigation measures	Regular inspections of	Lodge Manager
quality & "sense of	implemented during	screens etc. hiding	
place"	construction phase are	services & installations	
	maintained	are functional and if	
		required repair	
Minimise impact on	Staff are aware of the need	Undertake staff training	Lodge Manager
water resources	to use water carefully		
	Water usage &	Monitor water usage on a	Lodge Manager
	consumption is within the	monthly basis	
	"best practice guidelines"		
	There is no leakage from	Undertake regular	Lodge Manager
	water systems	inspections of all water	
		pipes	
Minimise soil & water	Spillages of potentially	Inspection and follow-up	Lodge Manager
pollution	harmful substances must	clean-ups if required	
P	be cleared immediately		
	and disposed of at an		
	annronriate site		
	Functional sentic tanks	l Indertake regular	Lodge Manager
		inspections and if	Louge Finnager
		required de sludge	
	Eurotional fat trans		Lodgo Managor
	Functional lat traps		Louge Manager
		regular basis and store	
		matter in sealed	
		containers	
	Functional soak-aways	Inspect on a regular basis	Lodge Manager
	Functional and leak-free	Inspect on a regular basis	Lodge Manager
	waste water pipes	and repair if required	
	Use of environment-	Ensure that procurement	Lodge Manager
	friendly soaps & detergents	specifies this need	
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	No contamination of soil or	Ensure that all fuels	Lodge Manager
	water by fuels or oil	stored and managed to	
		reduce risk of spillages	
		Lodge vehicle must be	
		serviced off-site	
Ensure management of	All solid waste safely	Include in duty sheet for	Lodge Manager
solid waste according	stored to avoid dispersal	lodge staff	Operator
the principle of reduce,	by wind, predators or other	Operator to undertake	Park Management (MEFT)
re-use and re-cycle	wild animals	weekly checks	
(where feasible)	Waste removed from site		
	in appropriate containers		
	Evaluate all purchases off	Include in duty sheet for	Operator
	foodstuffs & beverages to	Lodge Manager	
	reduce packaging		

# **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	Frequency	Responsibility
	monitored		
JV contract	Socio-economic benefits	Quarterly	Operator
	for park management		Park Management (MEFT)
	delivered by operator		
JV contract	Park management	Quarterly	Operator
	compliance		Park Management (MEFT)
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	Weekly	Lodge Manager
	purification equipment		

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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Nyepez Consultancy CC Environmental and Management Consultant