

Scoping Report and EMP for Ichingo Chobe River Lodge



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Project Information

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Table of Contents

Figures and tables	ii
Abbreviations	iv
1. Introduction	1
1.1 Project Location	1
1.2 Project Motivation	2
2. Lodge Description	2
2.1 Lodge Facilities	2
2.2 Lodge Utilities	3
2.3 Solid Waste Management	5
2.4 Storage and use of Chemicals	7
2.5 Maintenance Workshop	7
2.6 Laundry Operations	8
2.7 Leisure Activities	8
2.8 Parts storeroom and staff kitchen	9
2.9 Functional areas of the lodge	9
2.10 Employment Status and Social Involvement Projects	9
3. Biophysical Setting Description	11
3.1 Introduction	11
3.2 Hydrology	11
3.3 Geology and Soils	12
3.4 Hydrogeology	12
3.5 Biodiversity	13
3.5.1 Fauna	13
4. The Socio-Economics of Impalila Island	15
5. Stakeholder Consultation	16
6. Impact Assessment and Mitigation	17
6.1 Impacts of Existing lodge Operations, Present Mitigation and Environmental Risk Level 18	
7. Environmental management Plans	23
7.1 Mitigation Measures	24
7.2 Resource Utilization and Biodiversity Management	29
7.3 Healthy and Safety and Heritage Management	30
7.4 Rehabilitation	33

7.5	Roles and Responsibilities.....	33
7.6	Reporting, EMP Implementation and Review	33
7.6.1	Reporting	33
7.6.2	Implementation.....	34
8.	Conclusion and recommendations.....	34
	References	36

Figures and tables

Figure 1 Location of Ichingo Chobe River Lodge on Impalila Island	1
Figure 2 Outlook of the generator room with rechargeable batteries for the solar power system	3
Figure 3 Filtering of the water prior distribution on the lodge	3
Figure 4 The effluent treatment system on the lodge	4
Figure 5 Kitchen greywater discharge point	5
Figure 6 Waste separation practices on the lodge	6
Figure 7 Separated organic waste for composting	6
Figure 8 Separated incombustible waste awaiting collection	6
Figure 9 Incineration area for combustible waste	6
Figure 10 Storerooms for fuels, chemicals and housekeeping detergents	7
Figure 11 Operation at the workshop area	8
Figure 12 Discharging of Laundry water	8
Figure 13 Staff kitchen fused to Parts Storeroom	9
<i>Figure 10 Stakeholder Consultation meeting at Impalila Sub-khuta</i>	<i>16</i>

Abbreviations

DEA Department of Environmental Affairs

MET Ministry of Environment and Tourism

EMA Environmental Management Act (No. 7 of 2007)

I&APs Interested and Affected Parties

MSDS Materials Safety Data Sheet

1. Introduction

1.1 Project Location

Ichingo Chobe River Lodge is a tented lodge located on the southern margins of the Impalila Island across which is the Botswana town of Kasane. The Lodge is built in a riverine forest canopy of the Chobe River on an approximately 5 hectares area of land. The mostly utilized route for travelers to the Impalila Island and consequently to Ichingo Chobe River Lodge is through the B8 route passing the Ngoma border post to Kasane border control (Botswana) and crossing the Chobe River by boat back to the island on the Namibian side. Alternatively, during the drier period of the year, a network of less defined undeveloped private roads could be utilized through the extensive floodplains of the east Zambezi region before eventually crossing the Kasaya channel to the island. Figure 1 below provides clearer appreciation of the area and location of the Ichingo Chobe River Lodge.

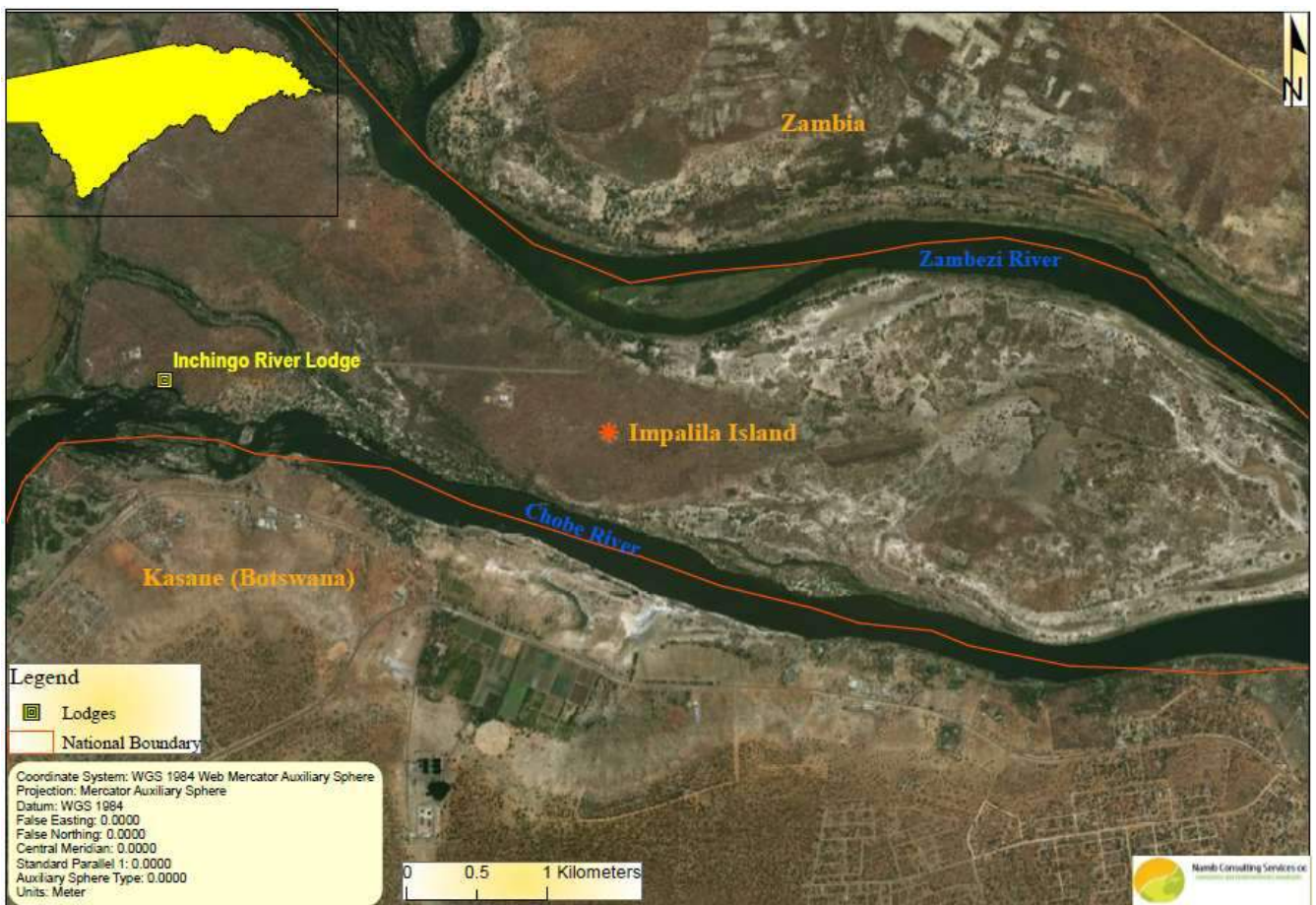


Figure 1 Location of Ichingo Chobe River Lodge on Impalila Island

1.2 Project Motivation

The Environmental Management Act (No. 7 of 2007) and its regulations requires an environmental clearance be obtained prior to undertaking all listed activities. Subsequent to gazetting of the regulations of the Environmental Management Act (EIA Regulations (GN. No. 30 of 2012)), the Department of Environmental Affairs (DEA) of the MET has undertaken efforts to ensure compliance to this act and its regulations for any new developments. Moreover, their efforts extends to ensure that already existing activities mitigate the impacts of their operations to acceptable levels.

Therefore, this project responds to the efforts of DEA to ensure that operations of Ichingo Chobe River Lodge comply with provision of the EMA and its regulations. Moreover, beyond compliance to legislation, this endeavor aims to ensure best practices in managing environmental and social impacts of the operations of Ichingo River Lodge as such builds a formidable reputation that attracts foreign tourists to the country thus continue to the local communities and the Namibian economy.

2. Lodge Description

2.1 Lodge Facilities

The lodge comprises the following onsite facilities;

- Reception office fused with liquor store and cold room storage
- Main kitchen building
- Dining room with bar and satellite kitchen
- Nine (9) tented guestrooms
- Parts store with staff kitchen
- Generator room fused with laundry room
- Workshop area
- Five (5) staff housing
- Fuel store fused with housekeeping store and laundry store

2.2 Lodge Utilities

2.2.1 Power supply

Power supply to Ichingo Lodge is from two diesel generators (90kw capacity each) operating on at all times. This power supply is supported by backup of a solar voltaic system with its rechargeable batteries with capacity of 15kw to offset the pressure on the generators at times (Fig 2).



Figure 2 Outlook of the generator room with rechargeable batteries for the solar power system

2.2.2 Water supply

Water supply to the lodge is self-abstracted and treated through filters before distribution to all facilities and used in showers, sinks, kitchen and laundry. Water for drinking purposes is mainly procured bottled water.



Figure 3 Filtering of the water prior distribution on the lodge

2.2.3 Sewer systems

The sewer system on the Lodge mainly uses septic tanks. Blackwater however inclusive of sinks and showers is handed together while greywater mainly form the kitchen is handled separately.

⇒ **Blackwater:** all the wastewater from guestrooms, staff accommodation and public toilets inclusive of showers and sinks drains into a septic tank of each building. Comprising of two compartment, ecotabs are applied to the first compartment of the septic tank for biodegradation of the raw sewage, resultantly settling of solids in this tank. Overflow effluent from the first tank flows to the second tank where the liquid is stored and eventually discharges by a French drain. The soak-ways are built +/-200m. away from the river



Figure 4 the effluent treatment system on the lodge

Greywater: Water used in kitchens is removed of larger diameter solids as it drains from the sinks into an underground pipe. This greywater although still oily eventually discharged directly into the Chobe River (Fig 5).



Figure 5 Kitchen greywater discharge point

2.3 Solid Waste Management

Handling of solid waste on the lodge involves separation of this waste into combustible, organic waste and recyclables applied across all operations on the lodge. This waste is handled as follows;

- Organic food waste is separated and allowed to drain of leachate before placed in a steel cage for composting (Fig 6, Fig 7). The waste is compost is used for farming of worms and also some provided to communities as manure.
- Combustible waste comprising mainly card boxes and paper is incinerated at a demarcated site on the island within premises of the lodge (Fig 9).
- The recyclables and other plastics, packaging and crushed tins are collected by food supplier Sea-Pride Foods where recyclables are handled further non-recyclables disposed at Katima Mulilo Landfill site (Fig 8).





Figure 6 Waste separation practices on the lodge



Figure 7 Separated organic waste for composting



Figure 8 Separated incombustible waste awaiting collection



Figure 9 Incineration area for combustible waste

2.4 Storage and use of Chemicals

Storages of fuels, detergents and other hazardous substances on the lodge is separated in different storerooms fused together as one building each with own separate access. The chemical shelves are well labeled for identification on entering the stores (MSDS equivalent) (Fig 10).

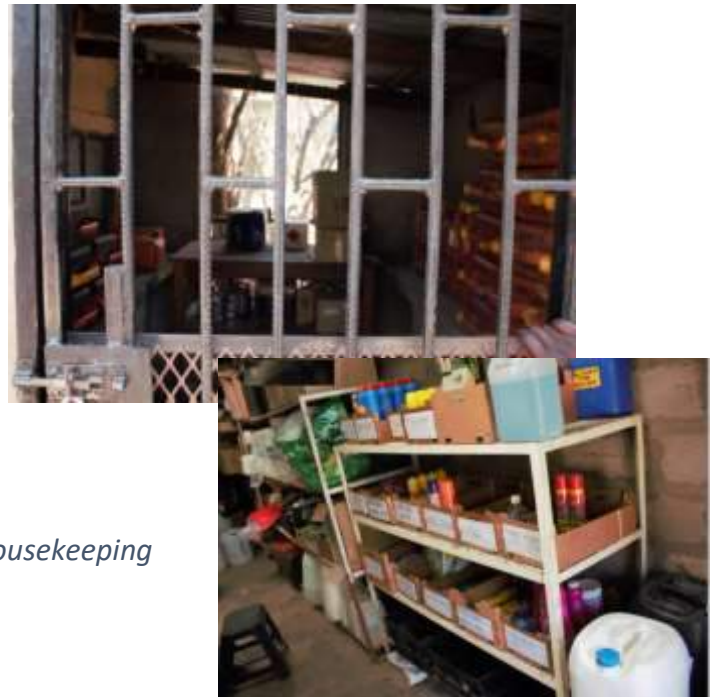


Figure 10 Storerooms for fuels, chemicals and housekeeping detergents

2.5 Maintenance Workshop

The workshop area comprises a concrete area where mechanical repair work for vehicles and boat engines is carried out (Fig 11). All painting, thickening and coating or any maintenance work are prepared on the concrete area prior to actual repair or replacement of facilities on the lodge.

Engine oils is stored in a 200 liter drum beside the concrete area of the workshop (Fig 11). Used oil in the drum is provided to some communities members that request it for coating of wood and reeds used in structure to prevent insect attacks.





Figure 11 Operations at the workshop area

2.6 Laundry Operations

Laundry operations supply housekeeping personnel with clean linen daily thus these operations are critical on the lodge. Laundry water drains into a 500 liters tank upon which when full outflows discharges approximately 300m in the northern direction away from the river although still within the lodge premises. The water discharges on an artificial pile of rocks away with patchy vegetation.



Figure 12 Discharging of Laundry water

2.7 Leisure Activities

The lodge offers some nature based leisure activities comprising;

- River cruises along the banks of the Chobe river for game and bird viewing
- Excursion through the Kasaya Channel connecting the two river systems of Zambezi and Chobe
- Guided walks on Impalila Island visiting the villages and popular historic baobab tree
- Fishing expedition in the Chobe or Zambezi River where requested by guests

2.8 Parts storeroom and staff kitchen

A number of redundant equipment's are kept behind this storeroom while the secure inside is used to store parts still in working condition. Fused with the storeroom is a kitchen used by the staff for preparation of meals and dining area.



Figure 13 Staff kitchen fused to Parts Storeroom

2.9 Functional areas of the lodge

Based on the above, it's evident that the active operational areas of the lodge can be summarized as below;

- Guest and staff accommodation including main building area
- Kitchen operations
- Maintenance workshop and storerooms
- Parts Storeroom and staff kitchen
- Laundry operations
- Leisure activities

2.10 Employment Status and Social Involvement Projects

Ichingo River Lodge employs 52 people (21 females) from the local community of Impalila and surrounding areas, serving in various capacities. Moreover, the management of the lodge carries out community projects involving the support to schools of Kasika, Kabulabula and Impalila Island.

Table 1 Ichingo employment status

Position	Number of staff
Senior Managers	2
Assistant Managers	5

Maintenance	4	
General laborers	6	
Guides lodge	8	
Guides	8	
Chef	5	
Kitchen supervisor	1	
Scullery	4	
Service	4	
Housekeeping	6	
Laundry	2	
Recycling	1	

3. Biophysical Setting Description

3.1 Introduction

The Impalila Island comprises a unique landform that is contrary of the extensive Zambezi-Chobe floodplain that lies to its west. This features make this area of significance both environmentally and socio-economically. The biophysical setting of the area is described below.

3.2 Hydrology

The drainage of the far eastern parts of the Zambezi region is characterized by an extensive floodplain, with approximately 30% of the eastern parts of the region at risk of flooding in any given year (Mendelson and Roberts, 1997). The Zambezi River with mean annual flow of 40 000 m³ per annum measured at Katima Mulilo flows eastward forming the border with Zambia in the north, while the Chobe swamp and River joins the Zambezi on the border with Botswana and Zimbabwe (IWRM Plan for Namibia Report, 2010). The Impalila Island is sandwiched within these two significant drainage systems, further bounded on the western side by its extensive floodplain of backwaters channels linking the Chobe and Zambezi systems. Both the Zambezi and Chobe Rivers are slow flowing with large floodplains and small, vegetated islands, with the only rapids being at Katima Mulilo and Impalila Island (WWF, 2007).

Rivers are critical to the survival of important wetlands providing clean water if unpolluted and support resources such as fish populations. Water quality of the Zambezi and Chobe River is less extensively studied, thus limited published literature exists. However, negligible available literature echoes declining water quality over many years of human settlement along the river. While the Zambezi River may appear less impacted due to its perennial nature, this is less so for the Chobe system which in drier month of the year is fragmented reducing its water quality to a muddy appearance and hugely maintained by a reverse flow reliant on the Zambezi River. However, experiencing different levels of flooding on a year to year basis, the water quality of the extensive Zambezi Chobe River system can be said to be fairly of good quality and many rural communities along the river draw and consume without much treatment. This is echoed in the IWRM Plan for Namibia Report (2010) highlighting that the

northern perennial river of Namibia and associated wetlands have yet been polluted extensively, with their exceptional diversity of fauna, these systems continues to retain their natural cleansing processes and cycles such that water is classed as excellent and flood cycles largely unregulated.

3.3 Geology and Soils

The Impalila Island in eastern Zambezi region belong to the quaternary age Kalahari sand group which is present in the eastern and north eastern parts of Namibia. It is widely believed the Kalahari sand cover originally represent a series of sand dunes oriented mainly in a linear manner. This scenario imply that contrary to present day tropical to sub-tropical conditions, the region was generally dry during the deposition of the wind-blown sand dunes. The base of the Kalahari sand cover is marked by the presence of Karoo basalts, which are exposed at the rapids near Katima Mulilo, and near Ngoma to the east, however, more of these basaltic rocks are extensively exposed within the Island of Impalila (Miller, 2008). The thick Kalahari sand cover has varying thickness across the region, but was established through water borehole southwest of Katima Mulilo to average around 216m (Miller, 2008). Older borehole logs has shown a succession of sand or clayey to sand/loam in various parts of the region, with some of the sand layers unconsolidated. This sand layer is fine to medium grained, getting coarser with increasing depth.

Being part of the extensive Kalahari basin that formed over 130 to 180 million years, much of the soils of the region characterized by sand shaped into dunes. To a great extent the soil texture determines the classification of the soil, with much of the flood-prone areas characterized by high clayish to sand content, and those westward of the region more sand content (Mendelson and Roberts, 1997).

3.4 Hydrogeology

The local hydrogeology of the area is less extensively examined by existing literature. This is attributed to non-existent utilization of groundwater resources given proximity of the Zambezi – Chobe surface systems. However, regionally characterized in the Kalahari Group formations that extensively overlays the eastern Zambezi Region. The Upper Kalahari Group is composed mainly of Aeolian sands, colluvium, alluvial/deltaic sands, interbedded alluvium,

sand, silt and clay, while the Lower Kalahari Group units include; conglomerates and gravel units which sporadically occur at the base of the Lower Kalahari Group and occasionally fine-grained, homogenous marls/clays; varicolored, sandstones; calcretes, silcretes and other duricrusts (Kawawa, 2015; Thomas & Shaw, 1991b). The Kalahari Sequence is characterized mainly of porous aquifers, however displays variability in properties over short distances (Struckmeier & Chritelis, 2001).

Groundwater table varies within 20 to 40 m below ground level in the far eastern parts of the region (Kawawa, 2015). The quality of groundwater is characterized as highly variable throughout the region, however areas in proximity to rivers generally have good quality due to surface-groundwater interactions.

Despite significant potential of groundwater both qualitatively and quantitatively on the Impalila Island, this resource is less utilized compared to its counterpart, surface water, however the former still valuable for maintaining ecosystem functioning.

3.5 Biodiversity

Locally, the Impalila Island falls within the registered Impalila Conservancy, while regionally under the extensive Kavango Zambezi Transfrontier Conservation (KAZA) area, evidence of the biodiversity value of the area. Closer assessment of the biodiversity of the area is provided below.

3.5.1 Fauna

3.5.1.1 Mammals

The Impalila conservancy lists among large mammals found in their conservation area the following species; elephant, buffalo, hippo, waterbuck, common impala, lechwe, sitatunga, warthogs and bushbuck. Much of these mammals are listed as specially protected or protected species under the Nature Conservation Ordinance (No 4 of 1975), however, of the list of these mammals, the Hippo is listed among vulnerable species on the IUCN Red list.

3.5.1.2 Reptiles

Among the common occurring reptiles in the Zambezi-Chobe system is the Nile crocodile. A wildlife survey of 2007 by Elephants Without Borders (EWB) funded by MET and cooperating partners indicated that crocodiles were widely distributed in the Chobe and Zambezi floodplains away from the main river channel. Moreover the no reptile species from the “four corners area” an area consisting of parts of Botswana, Namibia, Zambia and Zimbabwe sharing the Zambezi river appear on the 2002 IUCN Red List of Threatened Species, but all species in the lizard genus *Cordylus* and the Monitor lizard genus *Varanus*, in addition to *Python natalensis*, are listed on CITES Appendix 2 (AWF, 2004),.

3.5.1.3 Amphibians

Without limitation to the Zambezi –Chobe, but an extensive connected system including the Kwando-Linyanti when flooded is pronounced as having three-quarter of all known frogs found in Namibia. According to AWF (2004), no amphibian species from the “four Corners area” appear on the 2002 IUCN Red List of Threatened Species.

3.5.1.4 Birds

The water channel along confluence of the Zambezi/Chobe River provide habitat for many federally threatened bird species. The area is renowned for its high diversity of wetland birds. More than 44 species belonging to 17 different families has been recorded within the limits of its borders making it a great birding destination for tourism. Avitourism is one of the faster growing subsectors of ecotourism, recognized for its economic value. Birdwatchers are a diverse group, some of whom competitively seek vagrant birds (i.e., birds outside their normal geographic range). Notable birds species around the Zambezi/Chobe area includes the little egret, squacco heron, black heron, cormorants, African darter, Blacksmith lap-winged plover, African skimmer and the Pied king fisher. Birdlife is especially rich where permanent water is present. There are many fish eagles on the river, and their call is one of the most iconic sounds of Africa. Potential species includes skimmers along the sand banks, making a sighting particularly exciting for southern Africa bird watchers. Most wetland birds dwells on small fish, making wetlands ecologically and biologically important. In addition to food source, wetlands of the Zambezi/Chobe Rivers are idyllic breeding sites and pass ways for migratory birds such as the heron, skimmers

and the yellow billed storks. As a result, wetlands within the marginal border of the Zambezi/Chobe River must be viewed as important sites for future conservation of migratory birds.

3.5.1.5 Fishery

The middle Zambezi and Chobe Floodplains provide breeding and feeding grounds for a moderately rich fish fauna including a near-endemic radiation of large riverine cichlids. There are around 89 fish species in the Zambezi/Chobe ecoregions (Hay et al., 2009). Cyprinids, Cichlids, Characins, Mochokidae, Claridae, Mormyridae and Schilbe dominate the fish fauna. The most common species consists mainly of cichlids: *Oreochromis andersonii*, *Oreochromis macrochir*, *Coptodon rendalli*, *Serranochromis spp*, but also *Hydrocynus vittatus* (Recreational species), *Clarias gariepinus* and *C. ngamensis*, smaller species such as *Schilbe intermedius*, *Marcusenius altisambesi*, *Synodontis spp*, *Brycinus lateralis*, small Barbus. *Hydrocynus vittatus*, *Oreochromis andersonii*, catfish, Nembwe and dusk breams are the target recreational species for tourists who practice catch and release.

3.5.1.6 Flora

Vegetation of the Impalila Island is described by Mendelson & Roberts (1997) as Impalila woodlands, identifying this vegetation as not occurring elsewhere in Namibia. The drier areas of island areas are dominated by mopane including papyrus, baobab, water figs, pod mahogany, knobthorn and star chestnut, while margins of the island or riverine areas are dominated by species *Diospyros mesipiliformis*, *Lonchocarous capassa*, *Ficus sycomorus*, *Cassine tranvaalensis*, *Kigelia Africana* and *Syzygium guineense*. These plants species do not appear on the list of protected species of Namibia.

4. The Socio-Economics of Impalila Island

The Impalila Island comprises an area of 73 square kilometers and forms part of the Kabbe South Constituency of the Zambezi region. The population of the island is estimated at close to 2000 people, where majority of the people survive through a diversity of subsistence activities including crop production, vegetable gardening, fishing, livestock keeping and selling of thatching grass and reeds (NACSO, 2012). Formal employment on the island is primarily in public service (Ministries of Education, Health, Immigration and Safety and

Security) although described as mostly held by people from outside the island. Alternatively, tourism operations such as lodges, houseboats, along with the operations of the conservancy provides the economic backbone of the island.

5. Stakeholder Consultation

The purpose of stakeholder consultation is deliberate to enable them to voice concerns related to the project and its activities. While consultation is a critical step in the planning stage of a new development, the value of the process can still be harnessed even for projects already in operating stage of the project to ensure that concerns raised by I&APs are addressed. Moreover, the process is valuable as it enables I&APs to support the project and attain approval of the acceptable risk level for the project to continue operating.



A stakeholder consultation was conducted on the 5th of October 2018 to give the community of Impalila and Kasika an opportunity to be involved in providing their concerns. Concerns raised and responses are attached as appendix to this document.



Figure 14 Stakeholder Consultation meeting at Impalila Sub-khuta

6. Impact Assessment and Mitigation

Impacts of the existing operations and infrastructure of Ichingo Chobe River Lodge were identified through a process involving;

- A public consultation meeting
- Site inspections visits
- Academic knowledge and professional experience in the field

Before impact assessment, it would be worthy providing the following definitions that form part of the impact assessment table provided below.

- ⇒ An *activity* is described as a distinct process or risk undertaken by an organization for which a responsibility can be assigned, inclusive of infrastructure or pieces of infrastructure that are possessed by an organization.
- ⇒ *Impacts* are consequences of the aspects on social or natural environment or receptors with particular value or sensitivity.

All Ichingo Chobe River Lodge operations have existed for years and therefore, this sections examines impacts of these activities and adequacy of the present measures to mitigate against them.

A simplified criteria of determining the level of impact was developed as described below. The likelihood was ignored as the report presents the present case scenarios of results of the lodge operations.

Impact severity scale/level;

- **Low impacts** activity has negligible change on the environment, lasting less than 12 month in duration and confined to point of occurrence.
- **Medium Impact** has moderate change on the environment, lasting over 1 to 3 years duration and of scale beyond the point of occurrence to 10km radius (i.e. beyond the local area but not nationally/Internationally).
- **High impacts** has prominent change lasting over 3 year's duration and going beyond national to international scale, beyond 10km radius.

6.1 Impacts of Existing lodge Operations, Present Mitigation and Environmental Risk Level

Activity/Infrastructure	Waste type	Pathways	Receptor	Impact	Current practices	Risk Level with Present mitigation	Compliance Gaps
Accommodation facilities (Guest and Staff inclusive of public toilets)	Blackwater	Discharge in water and on land	Aquatic life, humans and wildlife	<ul style="list-style-type: none"> ○ Degrade the aquatic environment leading to fatality in aquatic life ○ Render river water unusable due to deteriorated quality ○ Pose a health hazard to wildlife and people in the local area and downstream 	<ul style="list-style-type: none"> ○ Use of plastic septic tanks ○ Application of ecotabs tablets for biological treatment ○ Discharge or outflow of the effluent through a French drain to lined ponds ○ Tanks provide for pumping if full 	Medium	<ul style="list-style-type: none"> ○ No permit from Department of Water Affairs for operations, for disposal of effluent ○ No regular inspection of the septic tanks for leakages and possible overflows ○ No response plan for possible overflow for any septic tank
	Solid waste	Disposal in water or on land	Humans, Environment and wildlife	<ul style="list-style-type: none"> ○ Impairing of aesthetic value of the area 	<ul style="list-style-type: none"> ○ Waste is separation ○ combustible waste is incinerated ○ Return of recyclables waste 	Low	<ul style="list-style-type: none"> ○ None recyclable waste returned with food supplier may put pressure on landfill at location of

					and other packaging waste to food supplier		disposal in Katima Mulilo.
Kitchen operations at main and satellite	Greywater	Discharge in water and on land	Aquatic life, humans and wildlife	<ul style="list-style-type: none"> ○ Access oils and fats in standing water may reduce oxygen diffusion in the river system, impacting aquatic life ○ Access oils may impair quality of water for direct consumption 	<ul style="list-style-type: none"> ○ Kitchen water discharges into the Chobe river 	Medium	<ul style="list-style-type: none"> ○ Direct discharge of satellite kitchen water into the river
	Solid waste	Discharge on land and water	Aquatic life, humans and wildlife	<ul style="list-style-type: none"> ○ Impair aesthetic value of the area ○ Environmental hazard to both wildlife and humans ○ Degrading waste generate foul smells 	<ul style="list-style-type: none"> ○ Waste is separation ○ combustible waste is incinerated ○ food waste is composted and supplied to local community for keeping worms and pets ○ Return of recyclables waste and other packaging waste 	Medium	<ul style="list-style-type: none"> ○ None recyclable waste returned to food supplier may put pressure on landfill at location of disposal in Katima Mulilo. ○ Establish a tracing system of the beneficiaries of the compost

					collected by food supplier		
Maintenance workshop for repairs	Hazardous waste (engine oils etc.)	Deposition on soils to groundwater and surface waters	Aquatic life, wildlife and humans	<ul style="list-style-type: none"> Contamination of land and water sources thus poses as a health hazard Deterioration of the value aquatic system to provide ecosystem services 	<ul style="list-style-type: none"> All repair works carried out on the concrete area of the workshop Waste engine oils stored in a drum. Used oils supplied to local community members for own uses 	Medium	<ul style="list-style-type: none"> Waste oil drum placed on bare soils No tracing system of the local community members that collect oil and specific uses No spill handling procedure
Storeroom and use of paints, thickeners, detergents, lubricants and fuels	Hazardous waste	Spills on soils, surface and to groundwater	<ul style="list-style-type: none"> Aquatic life, wildlife and humans 	<ul style="list-style-type: none"> Contamination of the soils and water resources Compromise health of the workers Render aquatic system cease its ecosystem functioning 	<ul style="list-style-type: none"> Controlled storage of oils, lubricants and fuels. Regular inspection of storage for leakage Paints and related are securely stored in the storeroom Detergent storeroom well labeled and secure (MSDS) All painting is done on a concrete area before fittings 	Medium	<ul style="list-style-type: none"> No spillage handling procedure

					anywhere on the lodge ○ Controlled access to the storerooms		
Laundry operations	Greywater	Discharge in water or on land	Aquatic life, humans and wildlife	<ul style="list-style-type: none"> ○ Stable foam formation in rivers may hinder water-air interactions ○ Hydrophilic detergents may endanger the survival of aquatic life ○ Lowering of surface tension of water thus increasing risk of fish to absorb other toxins into the body 	<ul style="list-style-type: none"> ○ Laundry water drains into a plastic tank to contain it ○ Outflow when filled up discharges onto a nearby artificially rocky vegetated area away from the riverine area 	Low	<ul style="list-style-type: none"> ○ The greywater holding tank location seems to be a temporal as it keeps being shifted around operational areas of the lodge
Parts Storeroom and staff kitchen	Hazardous waste	Land into water resources	Water resources	<ul style="list-style-type: none"> ○ Contamination of underground to surface water sources, impairing quality for use and other ecosystem 	<ul style="list-style-type: none"> ○ All parts and equipment's in working order well stored in the secure storeroom. ○ Redundant equipment's stored behind the storeroom 	Medium	<ul style="list-style-type: none"> ○ Redundant equipment's are kept on bare soils leaking oil to the ground ○ Hygienic conditions of the staff kitchen not in good order

				services provided			<ul style="list-style-type: none"> ○ Solid waste placed behind the staff kitchen not securely, it attracts wild animals to disturb this waste
Boat cruises and fishing trips	Solid waste	Water and Land	Aquatic life, human and wildlife	<ul style="list-style-type: none"> ○ Impair the aesthetic value of the environment ○ Health hazard to wildlife and humans 	<ul style="list-style-type: none"> ○ Stored and delivered to the lodge to be handled along with lodge's solid waste 	Medium	<ul style="list-style-type: none"> ○ None recyclable waste returned to food supplier may put pressure on landfill at location of disposal.
Village walks and guided walks	Solid waste	Land	Impair the aesthetic value of the area Health hazard to humans and wildlife	<ul style="list-style-type: none"> ○ no control over waste disposal from guests ○ 	<ul style="list-style-type: none"> ○ All village walks are guided ○ No tourist is allowed to undertake village walks without a guide. ○ Recyclable containers are used during guided walks 	Medium	<ul style="list-style-type: none"> ○ None recyclable waste returned to food supplier may put pressure on landfill at location of disposal.

7. Environmental management Plans

An EMP is defined as a document outlining measures or management actions on how activities with significant impact on the environment will be mitigated, controlled and monitored during the various phases of the project or throughout the lifespan of an operation, but also ensuring capitalization of the positive benefits of the project or an operation.

Moreover, an EMP outlines the roles and responsibilities and timescales both for implementation of mitigation measures but also the provide basis for measurement of compliance and ensuring general best environmental management practices.

Although an EMP covers the entire project cycle from construction, operation and decommissioning, an existing facility such as Ichingo Chobe river Lodge constructed and operating for over 23 years prior enacting of environmental legislation (EMA), an EMP will only be restricted to the operations and decommission components of the generic project cycle phases. Therefore, this EMP will concentrate on these two components of Ichingo Chobe River Lodge operation

7.1 Mitigation Measures

Activity/Infrastructure	Waste type	Current Mitigating Measures	Identified Gaps/Non-Compliance Issues	Additional or Revised Mitigation Measures	Risk Status after Additional Mitigation	Responsible
Guest and Staff Accommodation inclusive of Main buildings facilities	Blackwater	<ul style="list-style-type: none"> ○ Use of concrete septic tanks with separation chambers. ○ Application of eco-tabs tablets for biological treatment ○ Discharge or outflow of the effluent through a French drain to lined ponds ○ Tanks provide for pumping if full 	<ul style="list-style-type: none"> ○ No permit from Department of Water Affairs for operations for disposal of effluent ○ No regular inspection of the septic tanks for leakages and possible overflows ○ No schedule for application of the eco-tabs ○ No response plan for possible of an overflowing septic tank 	<ul style="list-style-type: none"> i. Application for effluent treatment and disposal permit from Department of Water affairs as a matter urgency. ii. Develop a regular schedule for application of eco-tabs in septic tanks iii. Schedule regular inspections of septic tanks and French drain for signs of blockages and attend to incidents iv. Develop a response plan should any of the septic tanks fill up v. Use of toilets on the lodge instead of the veldt must be strictly adhered to vi. Remove canopy over the final effluent ponds to allow further effluent 	Low	<p>Senior Manager (i)</p> <p>Assistant manager maintenance (ii-vii)</p>

				<p>treatment by solar radiation and evaporation</p> <p>vii. Line the bottom of the ponds with sand and rock material to enable filtration of the final water than plastic lining</p>		
	Solid combustible and non-combustible	<ul style="list-style-type: none"> ○ Waste is separation ○ combustible waste is incinerated ○ Return of recyclables waste and other packaging waste with food supplier 	<ul style="list-style-type: none"> ○ None recyclable waste returned with food supplier may put pressure on landfill at location of disposal in Katima Mulilo. ○ 	<ul style="list-style-type: none"> ○ Lodge collaborates with local community to designate and operate a landfill site on the island 	Low	Senior Manager
Kitchen operations at main and satellite	Greywater	<ul style="list-style-type: none"> ○ Kitchen water discharges into the Chobe river 	<ul style="list-style-type: none"> ○ Direct discharge of satellite kitchen water into the river 	<ul style="list-style-type: none"> ○ Install a fat trap to reduce the oils and fats in water prior discharge into the stream this could include a soak-away to utilize infiltration properties of riverine sand 	Low	Assistant Manager Lodge Operations
	Solid waste	<ul style="list-style-type: none"> ○ Waste separation ○ Incineration of combustible waste ○ Supply of composted organic food waste to local community Return of waste to food supplier 	<ul style="list-style-type: none"> ○ None recyclable waste returned to food supplier may put pressure on landfill at location of disposal in Katima Mulilo. 	<ul style="list-style-type: none"> ○ Establish a more formalized arrangement for provision and collection of composted organic food waste to local community e.g. recipients, actual uses and dates of collection ○ Demarcate and secure area for storage of solid waste 	Low	Assistant Manager Maintenance

			<ul style="list-style-type: none"> ○ Lack of a tracing system of the beneficiaries of the compost 	<p>awaiting collection by supplier to avoid disturbance by wild animals</p> <ul style="list-style-type: none"> ○ Establish a system of recording the collectors of compost and uses 		
Maintenance workshop for repairs	Hazardous waste	<ul style="list-style-type: none"> ○ All repair works carried out on the concrete area of the workshop ○ Waste engine oils stored in a drum placed on bare soils. ○ Used oils supplied to local community members for own uses 	<ul style="list-style-type: none"> ○ Waste oil drum placed on bare soils ○ No tracing system of the local community members that collect oil and specific uses ○ No spill handling procedure 	<ul style="list-style-type: none"> ○ Develop a spill handling procedure for the site. Designate an area for bioremediation of this contaminated soil. Procedure to involve scooping of the soils upon which spill occurred. Application of sawdust to the soils to absorb and reduce the total hydrocarbon content. ○ Waste oil drum to be placed on an area bounded with concrete slab and its opening always closed. ○ Develop a recording system of community members that collect oil and uses ○ Oil change on equipment's away from the concrete area to use drip trays 	Low	Assistant manager maintenance

<p>Storage and use of paints, thickeners, detergents and cants and fuels</p>	<p>Hazardous waste</p>	<ul style="list-style-type: none"> ○ Controlled storage of oils, lubricants and fuels. ○ Regular inspection of storage for leakage ○ Paints and related are securely stored in the storeroom ○ Detergent storeroom well labeled and secure (MSDS) ○ All painting is done on a concrete area before fittings anywhere on the lodge ○ Controlled access to the storerooms 	<ul style="list-style-type: none"> ○ No spillage or soil contaminated handling procedure 	<ul style="list-style-type: none"> ○ Establish formal protocols for handling of hazardous substances inclusive of proper protective wears ○ Oil change on equipment's or machinery to use drip trays ○ Fueling of boats tanks to be done on concretized areas/or nozzle pipes to avoid spills onto the ground or use of drip trays ○ Develop a spill handling procedure for the site. Designate an area for of this contaminated soil (incineration area). Procedure to involve scooping of the soils upon which spill occurred. Application of sawdust to the soils to absorb and reduce the total hydrocarbon content. 	<p>Low</p>	<p>Assistant manager maintenance</p>
<p>Parts Storeroom and staff kitchen</p>	<p>Hazardous waste</p>	<ul style="list-style-type: none"> ○ Regular inspection of the storeroom for spillages and leakages ○ All parts and equipment's in working 	<ul style="list-style-type: none"> ○ Redundant equipment's are kept on bare soils ○ Hygienic conditions of the staff kitchen not in good order 	<ul style="list-style-type: none"> ○ Place a plastic lining under all redundant equipment's kept outside the storeroom ○ Develop a decommission strategy for all the redundant equipment's 	<p>Low</p>	<p>Assistant manager maintenance</p>

		<p>order well stored in the secure storeroom.</p> <ul style="list-style-type: none"> ○ Redundant equipment's stored behind the storeroom 	<ul style="list-style-type: none"> ○ Solid waste placed behind the staff not secure attracting wild animals to disturb this waste 	<ul style="list-style-type: none"> ○ Waste behind the staff kitchen to be secured at all time to avoid animal disturbance. ○ Improve hygienic conditions of the staff kitchen area 		
Laundry operations	Greywater	<ul style="list-style-type: none"> ○ Laundry water drains into a plastic tank prior to ○ outflow when full discharges onto a nearby vegetated area away from the riverine area 	<ul style="list-style-type: none"> ○ The holding tank seems to be a temporal measure as it keeps being shifted 	<ul style="list-style-type: none"> ○ Construct levees to control dispersion around the discharge area ○ Designate a permanent placement of the holding tank of laundry water away from active areas of the lodge 	Low	Assistant manager maintenance

7.2 Resource Utilization and Biodiversity Management

Activity	Requirements	Management Actions	
Water resources and wastewater	Water Act of 1956 Water abstraction from a river and treatment and disposal of wastewater must be in possession of a valid permit.	<ul style="list-style-type: none"> ○ Application for water abstraction permit from the Department of water affairs. ○ Regular monitoring and reporting of abstraction volumes. ○ Ensure that all leakages are reported and repaired with urgency ○ Encourage guests to reuse linen, through discouraging daily change of linen to reduce laundry use thus water used per day and greywater discharged 	○ Senior manager
Electricity	Minimize emissions and carbon footprint	<ul style="list-style-type: none"> ○ Keep unused lights off especially during the day ○ Maintain use of gas stoves in kitchen 	Assistant Manager operations
Biodiversity	Nature conservation ordinance of 1975 Protection of Namibia's fauna and flora	<ul style="list-style-type: none"> ○ Movements of staff restricted to the operational sites and work areas only. ○ No hunting, trapping, setting of snares, or any other disturbance of any fauna species allowed without a required permit 	Senior Manager
	Inland Fisheries Act (1 of 2003) as amended prescribes a need for recreational fishing license, fishing seasons and fishing areas, as well as type	<ul style="list-style-type: none"> ○ Acquire a license for undertaking recreational fishing. ○ Familiarization with restricted fishing areas and closed fishing seasons 	Senior Manager

	of fishing equipment's	<ul style="list-style-type: none"> ○ Obtain registration of all boats used in inland water 	
	Forest Act of 2001 Section 21 of the Act prohibits cutting or removal of vegetation within 100m of a river or stream or watercourse except under authorization of a license.	<ul style="list-style-type: none"> ○ No trees occurring in this environment may be damaged or removed for any purpose without the required permit ○ Any construction in new areas need a permit to be obtained prior removing any vegetation 	Senior Manager

7.3 Healthy and Safety and Heritage Management

Activity	Requirements	Management Actions	Responsible
Healthy and safety of workers	Health and safety act Chapter 3 of the acts prescribes conditions for ensuring the welfare of workers at workplaces Chapter 5 of the acts prescribes management of hazardous substances. Chapter 6 of the acts prescribes requirements for managing of physical hazards to the workers as well as provision of protective equipment's	<ul style="list-style-type: none"> ○ Establish formal protocols for handling of hazardous substances inclusive of proper protective wears where required. ○ Maintain policy of no intoxication while at work to eliminate safety and health risks 	Senior Manager
	Hazardous Substances ordinance 14 of 1975 Prescribes restriction on storing and sale of Group I declared hazardous substances	<ul style="list-style-type: none"> ○ Familiarization with regulation for import, storage and sale of group I declared hazardous substances 	Senior Manager

Employment and Employee welfare	<ul style="list-style-type: none"> ○ Labour Act of 	<ul style="list-style-type: none"> ○ Any new employment opportunities should be filled with local employees ○ Adhere to the legal provisions in the Labour Act for the recruitment of labour (target percentages for gender balance, optimal use of local labour and SME's, etc.) in the Contract. ○ 	Senior Manager
Archaeological	<p>The National Heritage Act Through section 46, prohibition is placed on removing or demolish, destroy or despoil, develop or excavate all or part of a protected place. Under subsequent sections of the act, such can be only conducted under provisions of an exemption or under a permit issued by the council. Moreover, should during operations an object of historical significance be uncovered, the operations are to be halted immediately.</p>	<ul style="list-style-type: none"> ○ Should a heritage site or archaeological site (e.g. a grave or stone malrkings) be uncovered or discovered during operations, the following procedure to be taken; <ul style="list-style-type: none"> - employee to stop work being carried out - immediately report this to the supervisor - demarcate the area off with tape - contact the National Heritage Council for further instructions on way forward 	Senior Manager
Environmental training and Awareness	Sensitization of lodge employees of environmental impacts of their operations	<ul style="list-style-type: none"> ○ Design a short induction training for new employees to sensitize them on environmental issues and expectations. ○ The lodge to keep a record of these trainings. ○ Regular weekly briefings of the current staff to include environmental 	Assistant Manager Operations

		<p>issues relating to maintain and improve waste separation, handling and maintaining hygienic practices at all times in various areas of their operations, inclusive of minimization of water wastage, electricity saving as well as matter relating to health and safety of workers.</p> <ul style="list-style-type: none"> ○ Explanation of the specific mitigation measures within this EMP especially unfamiliar provisions ○ Explanation of the importance of complying with the EMP 	
Local Community	Local communities maintain their lifestyles without drastic alteration	<ul style="list-style-type: none"> ○ The Lodge to develop an engagement strategy for the local community to sensitize them to understand of the lodge operations inclusive of how various environmental, health and safety issues are handled ○ Avoid drastic disturbance of social livelihood of local community ○ Engage communities on possible areas of support and maintain record of social responsibility projects (e.g. schools, clinic etc.). 	Senior Manager

7.4 Rehabilitation

The Lodge is planned to continue operations for an indefinite period in the future, therefore rather than plan for closure, the lodge to develop a strategy for decommissioning of redundant operations or facilities of the lodge. The strategy to look at aspects such as decommissioning either facilities or equipment's of the lodge that have become redundant as the lodge continue its activities.

The strategy can include the current decommissioning of the current redundant generator and boat engines to minimize potential risks and loss of economic gain as the equipment ages. Furthermore, redundant materials from maintenance of facilities such as decks, walkaways initially coated prior installation, need proper post use handling measures to minimize risks of contamination as their coating erodes their materials body.

7.5 Roles and Responsibilities

Monitoring requirements	Frequency	Responsible
Inspection of septic tanks and French drain	Weekly	Assistant Manager Maintenance
Inspection of waste separation in all areas and proper storage/disposal as per requirements	Weekly	Assistant Manager lodge operations
Inspection of laundry greywater discharge	Weekly	Assistant Manager lodge operations
Inspection of chemicals Storeroom	Weekly	Assistant Manager Maintenance
Maintenance workshop area Inspection	Weekly	Assistant Manager Maintenance

7.6 Reporting, EMP Implementation and Review

7.6.1 Reporting

To ensure successfully implementation of the EMP, all employees are required to report incidents relating to environment, health and safety on the premises to their supervisors who

shall report to the responsible manager responsible. All environmental, health and safety incidents or observation to be recorded and actions taken to address these incidents and ensure close-outs.

7.6.2 Implementation

Implementation of this EMP rests in the Senior Manager of Ichingo Chobe River Lodge as the overall head of all operations. The manager may delegate responsibilities of specific areas of operations to his staff, however overall accountability is retained. Moreover, the Manager retains the accountability for;

- Reporting as required by competent authority
- Obtaining of all required permits as outlined in this EMP
- Review and update of this EMP document.

8. Conclusion and recommendations

The documents highlights that although the lodge being in operation for a period (1995) longer beyond enacting of the EMA, the lodge has adopted significant measures to ensure that impacts of the operation are minimized to acceptable levels. This document further indicates that with implementation of the prescribed mitigation measures in the EMP section, the residual impacts of the operations of Ichingo Chobe River Lodge will be minimal.

The public consultation meeting revealed a lack of cordial transparent relationship between the Lodge and the community, as such there appears to be intense speculation of the methods of handling waste on the lodge. This can only be addressed through engagement and transparency that can be created through awareness. It is therefore recommended the Lodge make a commitment to establishing this transparent relation through inviting a committee that may include representatives from the following institutions on the island; the traditional authority of the area (i.e. Induna of the Impalila sub-khuta), the Impalila conservancy, the Village Development Committee (VDC), ordinary members of the community and Ministry of Health to an awareness session on the practices of handling, treatment and disposal of waste from the lodge. Intervals of such engagements to be determined by the lodge and such a committee.

Secondly, lack of a designated landfill site on the island seems to be a major cause of inconsistent handling of waste both for lodge operations and local community. As per suggestions of the community to at the consultation meeting to endeavor in seeking a portion of land from the people of the island to designate as landfill site, the lodge to support these efforts as it may potentially be beneficial and minimize environmental costs for own handling of waste.

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