






iSimangaliso
Wetland Park

Basic Assessment for the Bhangazi Cultural Heritage Lodge, iSimangaliso Wetland Park, South Africa
22 July 2021

DFFE Reference: 2021-06-0024

Draft Basic Assessment Report for 30- Day Public Comment

ERM

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Bhangazi Community Trust

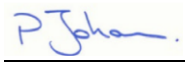
Basic Assessment for the Proposed Bhangazi Cultural Heritage Lodge, iSimangaliso Wetland Park, South Africa
22 July 2021

Draft Basic Assessment Report for 30- Day Public Comment

Prepared by: Stephanie Gopaul
Samantha Moodley
Kamogelo Mokhine

For and on behalf of
Environmental Resources Management

Approved by: Philip Johnson



Position: Partner

Date: July 2021

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ACRONYMS

BA	Basic Assessment
BAR	Basic Assessment Report
BID	Background Information Document
CA	Competent Authority
CRR	Comments and Responses Report
DAFF	Department of Agriculture Forestry and Fisheries
DEA	(National) Department of Environmental Affairs
DEDTEA	KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs
DFFE	Department of Forestry, Fisheries & Environment
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
ERM	Environmental Resources Management Southern Africa (Pty) Ltd
GN	Government Notice
ha	Hectares
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IUCN	International Union for Conservation of Nature
KZN	KwaZulu-Natal
LCA	Landscape Character Areas
M amsl	metres above mean sea level
MSDS	Material Safety Data Sheet
NEMA	National Environmental Management Act
NWA	National Water Act
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework
SDI	Spatial Development Initiatives
SIP	Strategic Integrated Project
STP	Sewage Treatment Plant
ToR	Terms of Reference
UNESCO	United Nations Educational, Scientific and Cultural Organization
WUL	Water Use Licence
WULA	Water Use Licence Application

1 *INTRODUCTION*

1.1 PROJECT BACKGROUND

The Bhangazi Community Trust was granted the right, by the iSimangaliso Wetland Park Authority to develop a tourism facility within the World Heritage Site in Kwa Zulu Natal Province South Africa. In an effort to exercise this right, the Trust proposes to develop a Cultural Heritage Lodge on a 9.94 hectares (ha)piece of land (of which the development site will only occupy 5.06 ha) within the iSimangaliso Wetland Park. The lodge will consist of a 60-bed facility and another 8-bed facility for staff.

This report describes the Basic Assessment (BA) process and identifies and evaluates the positive and negative environmental and socio-economic impacts associated with the proposed construction of the Bhangazi Cultural Heritage Lodge (the Project). This process intends to assess the Project's potential impact on its location on the Eastern Shores of the iSimangaliso Wetland Park, a United Nations Educational, Scientific and Cultural Organization (UNESCO) listed World Heritage Site in KwaZulu-Natal (KZN), South Africa

The site is located along the Main Road to Cape Vidal in the Mtubatuba Local Municipality within the uMkhanyakude District Municipality. It lies along the fringe of a small south-eastern extension of Lake Bhangazi, just west of the St Lucia Road before it crosses the coastal dune belt to Cape Vidal. Please refer to Figure 1-1 for a depiction of the project site.

Figure 1-1 *Locality map of Bhangazi Site*

1.2 PROJECT APPLICANT

The details of the project proponent are as follows:

Mbizeni Development Corporation (Pty) Ltd	
Contact Person:	Mr Thami Kananga
Postal Address:	PO Box 1387 Mtubatuba 3935
Physical Address:	Jacaranda Avenue, Link Building, Office No 4, Mtubatuba
Tel:	082 457 3399
Fax:	035 550 0068
Email:	thami@andisaft.co.za

1.3 ENVIRONMENTAL ASSESSMENT PRACTITIONER

Environmental Resources Management Southern Africa (Pty) Ltd (ERM) has been appointed as the independent Environmental Assessment Practitioner (EAP) to undertake the BA for the proposed Bhangazi Cultural Heritage Lodge.

ERM is a global environmental consulting organisation employing over 4,000 people with 140 offices in 40 countries worldwide. Founded in 1971, ERM has built an organisation based on the supply of a full range of environmental and social policy, scientific, technical, and regulatory expertise. ERM's primary focus is to provide quality work and service to our clients in these areas.

ERM has been involved in multiple projects in Africa over the past 30 years and in 2003, ERM established a permanent presence in Southern Africa to meet the growing needs of our clients. The African ERM offices are based in Cape Town, Johannesburg, Durban, Maputo, Dar es Salaam and Nairobi. ERM Southern Africa has a staff complement of 160 comprising dedicated environmental professionals offering expert skills in the full range of sustainability, environmental and social impact services. More specifically, the team assembled for this Project possesses all the relevant expertise and experience to undertake this BA.

The EAP for the applicant is:

EAP and Contact Person:	Mrs Stephanie Gopaul (Project Manager)
Postal Address:	Postnet Suite 59 Private Bag X21 Westville 3630
Physical Address:	17 The Boulevard, Westway Office Park, Westville,

	Durban
Tel:	+27(0) 31 265 0033
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Email:	Stephanie.Gopaul@erm.com

As part of its supplier development initiative, ERM has appointed Thembeka Environmental Consulting (Pty) Ltd to support the BA process under ERM's supervision. Thembeka Environmental Consulting (Pty) Ltd is 100% black women owned environmental management consultancy, providing a tailored, integrated and complete solution to a variety of clients in both the public and private sectors. The company's extensive experience in the environmental sector has been developed through practical involvement in projects. The company offers personalised attention on every project and aims to deliver a quality and efficient service by using highly skilled and motivated professionals and fostering good relationships with stakeholders.

Samantha Moodley, a registered EAP and Kamogelo Mokhine from TEC have been assigned to the project. Their contact details are as follows:

	Samantha Moodley	Kamogelo Mokhine
Tel:	+27(0) 71 678 1951	+27(0) 73 588 7110
Email:	Samantha@thembeka-env.co.za	Kamogelo@ thembeka-env.co.za

Please find detailed Curricula Vitae of the EAP attached as *Annex A*.

1.4 COMPETENT AUTHORITY

The Competent Authority (CA) in terms of the Environmental Impact Assessment (EIA) Regulations (April 2017) is the National Department of Forestry, Fisheries & Environment (DFFE).

Postal Address:	Department of Forestry, Fisheries & Environment Attention: Director: Integrated Environmental Authorisations Private Bag X447 Pretoria 0001
Physical Address:	Department of Forestry, Fisheries & Environment Attention: Director: Integrated Environmental Authorisations Environment House 473 Steve Biko Road Arcadia Pretoria
Tel:	012 399 9372
Email:	EIAAdmin@environment.gov.za
Project Case Officer	Ms Zamalanga Langa
Tel:	012 399 9389

Email: ZLanga@environment.gov.za

1.5 *OVERVIEW OF THE PREVIOUS ENVIRONMENTAL AUTHORISATION PROCESS FOR THE PROPOSED BHANGAZI CULTURAL HERITAGE LODGE*

In accordance with the National Environmental Management Act, 1998 (No. 107 of 1998, NEMA), as amended, and the Environmental Impact Assessment (EIA) Regulations (Government Notice Regulation (GN R). 326), an EIA was initiated in 2018 and an application for Environmental Authorisation (EA) was submitted to the National Department of Forestry, Fisheries & Environment, (DFFE[1]), as the Competent Authority (CA). The table below**Error! Reference source not found.** gives an overview of the previous BA process which lapsed on 19 November 2020.

Table 1-1: Summary of activities associated with previous BA process

Activity	Date
Stakeholder Engagement and Initial Notification of the Project	November 2016 - December 2016
Initial Basic Assessment Process	April 2019 – September 2019
Decision on EA Application (application rejected)	November 2019
Appeal Process (with extension)	November 2019 – April 2020
BAR Revision based on DFFE appeal decision	April - November 2020
Finalising layout (including sewage layout)	March 2021
BAR finalisation	April 2021
Final BAR submission to DFFE evaluation	May 2021
Notification from DFFE of application lapse	June 2021

Based on an e-mail received from DFEE on 7 June 2021, indicating the previous application has lapsed, the applicant took a decision to initiate a new BA process for the proposed Project, the details of which are contained in Table 1-2.

Table 1-2: Activities undertaken to date for the new environmental authorisation process

Activity	Date
Pre-application consultation meeting with the DFFE	1 July 2021
Public participation Plan submission and approval	9 - 13 July 2021
Draft BAR and EA application submission to the DFFE	23 July 2021

[1] Formerly the Department of Environmental Affairs (DEA)

1.6 PURPOSE OF THIS REPORT

ERM was appointed by Bhangazi Community Trust to conduct a BA process in terms of NEMA. This BAR has been compiled in accordance with the regulatory requirements stipulated in the EIA Government Notice Regulations (GN R326) promulgated in terms of Section 24(5) of NEMA.

The purpose of this BAR is to present:

- A detailed description of the proposed Project and relevant Project alternatives;
- Detailed review of legislation, guidelines and strategies pertinent to the proposed Project and associated BA;
- The outcomes associated with public participation activities carried out to date;
- A detailed baseline review of the physical, biological and socio-economic characteristics of the Project Area;
- An assessment of impacts to the physical, biological and socio-economic environments related with the different phases of the proposed Project, taking into consideration the concerns raised by I&APs in the initial BA process, as well as comments from DFFE and DAFF during the appeal process;
- Mitigation measures that aim to avoid /minimise/manage the severity of identified impacts; and
- An assessment of cumulative impacts associated with other planned, existing or project-related developments in the broader Project Area.

1.7 STRUCTURE OF THIS REPORT

The report has been structured to comply with the format required by the EIA Regulations (April 2017) and is presented as follows:

Chapter	Contents
Chapter 1 – Introduction	Presents a brief background to the Project, the Project motivation, the EIA team, and the purpose and structure of the report
Chapter 2 – Project Description	A description of the scope of the proposed activity including associated structures and infrastructure and the need and desirability of the Project.
Chapter 3 – Alternatives	A full description of alternatives considered including a motivation for the preferred site, activity and technology alternative.

Chapter	Contents
Chapter 4 – Legal and Policy Framework	An identification of all legislation, policies, plans, guidelines etc. that are applicable to this activity and how the proposed activity complies with and responds to the legislation.
Chapter 5 – Biophysical and Socioeconomic Baseline	Provides a detailed baseline assessment of the receiving physical and biological environment in the Study Area
Chapter 6 – BA Process	Outlines steps that have been completed as part of the BA process thus far including details of specialist studies and the public participation process.
Chapter 7– Impact Assessment Methodology	Overview of the methodology that has been used to assess the significance of potential environmental and social impacts.
Chapter 8 - Environmental Impact Assessment	Identification and evaluation of the environmental and social impacts of the Project.
Chapter 9 – Environmental Impact Statement	A summary of the key findings of the EIA including a description of any assumptions, uncertainties and gaps in knowledge.
Chapter 10 –References	List of all references contained in the BA Report.

The Report is supported by the following annexes:

Annexures	Contents
Annex A – Curricula Vitae of the BA team	CVs of the ERM Basic Assessment Project Team.
Annex B – Environmental Management Programme	Details the specific mitigation and/or management measures to be used during the construction and operational phases of the Project and also provides a framework for environmental compliance and monitoring.
Annex C – Stakeholder Engagement Documents	Records of stakeholder engagement conducted during the BA process. 1. Approved Public Participation Plan 2. Public Participation Report, including • I &AP database • I&AP notification material • Meeting minutes • Stakeholder correspondence
Annex D	Comments and Responses Report
Annex E – Specialist Studies and declaration	1. Biodiversity and Wetlands 2. Forest Vegetation Study 3. Visual Impact Assessment 4. Traffic Impact Statement 5. Geotechnical 6. Engineering Services
Annex F	EAP Declaration and Undertaking
Annex G	Maps
Annex H	Exceptional Circumstances Letter
Annex I	Site visit
Annex J	Letter from iSimangaliso Wetland Park Authority

2 *PROJECT DESCRIPTION*

2.1 OVERVIEW OF THE BHANGAZI HERITAGE SITE (ISIMANGALISO WETLAND PARK)

The iSimangaliso Wetland Park is a World Heritage Site located in the coastal and inland areas of north-eastern KwaZulu-Natal. It was established in November 2000 in terms of Regulations published under the World Heritage Convention Act (No 49 of 1999). Between the 1950s and 1970s, people living on the Eastern Shores were forcibly removed. The land claim for this area has been settled through cash compensation, an allocation of community levies, and traditional access rights to graves on higher ground to the north-west of the Bhangazi Lake. Development rights to a portion of land, which comprises the Bhangazi Heritage Site on the south-east of Lake Bhangazi South, have also been granted. The institution formed by the former-claimants is the Bhangazi Community Trust.

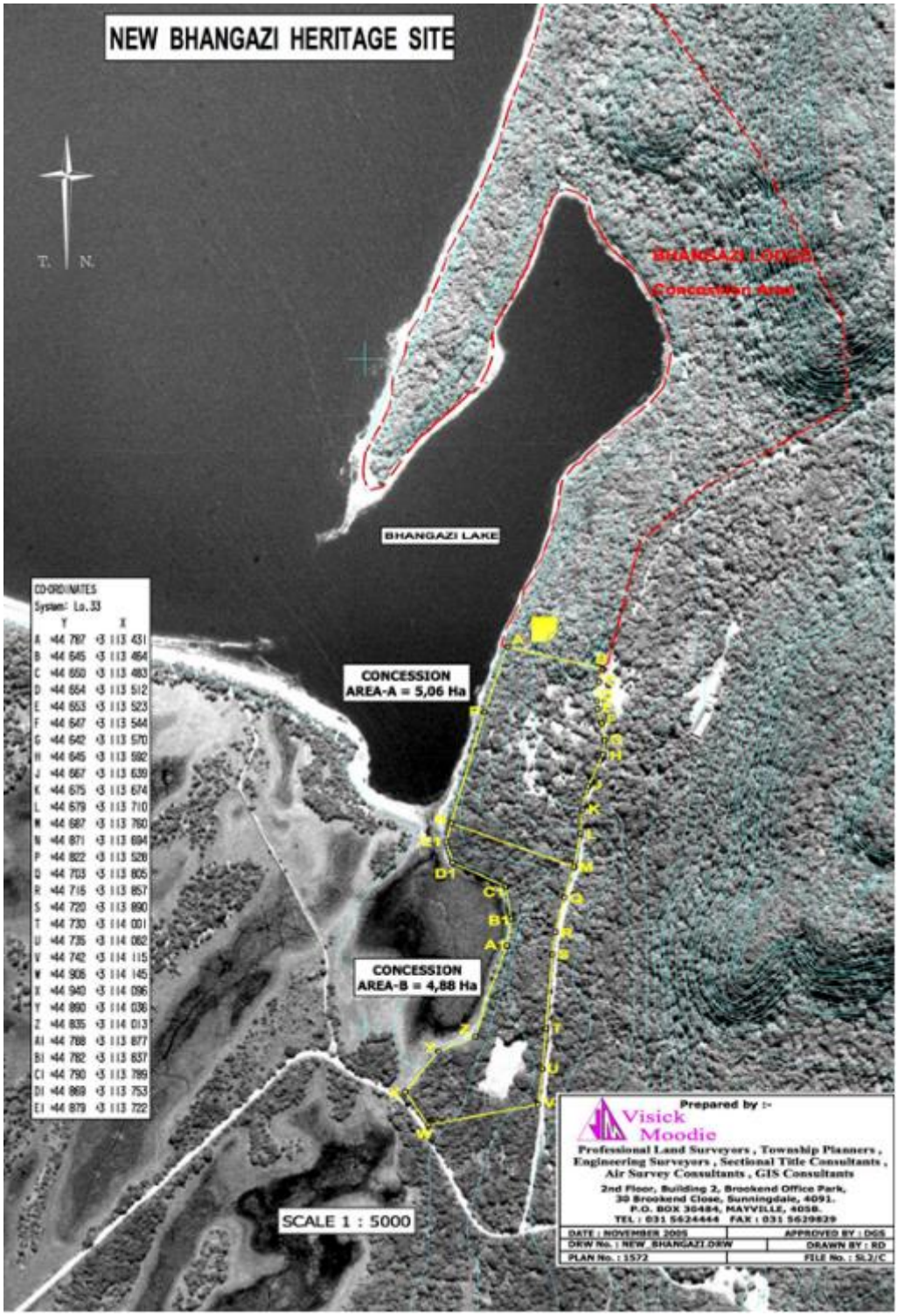
The Bhangazi site falls within the uMkhanyakude District Municipality. The site is about 30 km north of St Lucia and 2 km south-west of the beach at Cape Vidal. The proposed site is 9.94 ha in extent, divided into two areas: a northern portion of 5.06 ha earmarked for development and a southern no-development zone of 4.88 ha. It lies along the fringe of a small south-eastern extension of Lake Bhangazi, just west of the St Lucia Road before it crosses the coastal dune belt to Cape Vidal. The Heritage site also lies adjacent to the Cape Vidal Road, a popular tourist destination. Lake Bhangazi is the only permanent fresh water source in the area. The natural berm separating the Mfabeni Swamp and the Bhangazi Lake is a unique geomorphological feature of high ecological importance. The area provides an extremely important habitat for a number of plant and animal species, including hippopotamuses (*Hippopotamus amphibius*) and crocodiles (*Crocodylus niloticus*). The vegetation in the area consists primarily of coastal forest and secondary grasslands, providing a habitat for many birds and other fauna, including the endangered Red Duiker (*Cephalophus natalensis*) and Samango Monkey (*Cercopithecus mitus*), which breed in this area.

In terms of the agreement between the Bhangazi Community Trust and iSimangaliso, signed in March 2006, "the primary purpose of the Bhangazi Heritage site is for the interpretation of the cultural heritage of the Bhangazi community; where an interpretive centre is the central component of the site concept and design. The proposed development will comprise a tourism facility including overnight chalets, a restaurant and an interpretation/ education centre with all necessary support facilities including parking. The facilities will be located adjacent to Lake Bhangazi, which is within the iSimangaliso Wetland Park.

Figure 2-1 shows the Map of Bhangazi Site (Concession Area A = development zone). The site is 9.94 ha in extent and is divided into two pockets, namely:

- A northern portion of 5.06 ha (Concession Area A) earmarked for development; and
- A southern no-development zone of 4.88 ha (Concession Area B).

Figure 2-1 Map of Bhangazi Site (Concession Area A = development zone)



The site has been affected by anthropogenic activities. It currently contains a number of guest cottages set in forest clearings above the 25-metre contour line. The cottages, accommodating between eight and 20 people each, are currently managed by Ezemvelo KZN Wildlife as part of the Cape Vidal

complex. The cottages have become run down and will be demolished as part of the site's re-development. The cleared area around the current structures has limited aesthetic value. Its sense of place is further diminished by the absence of long views and the proximity of a busy paved road to the east. This is especially so compared to other sites on the Eastern Shores that either have direct beach access or more pleasing views (or a combination of both). However, the forested belt west of the current footprint does have excellent views across Lake Bhangazi's south-eastern basin towards a forested peninsula in the northwest and the main expanse of the lake in the west. The accessibility of the site and its location inside the park (which makes it an ideal base for a range of sea-, lake- and terrestrial activities) further enhances its value as a tourism asset.

2.2 PROPOSED BHANGAZI CULTURAL HERITAGE TOURISM LODGE DEVELOPMENT AT LAKE BHANGAZI

The Bhangazi Community Trust represents approximately 5,500 beneficiaries residing in the Big 5 Hlabisa Local Municipality (established through the amalgamation of The Big 5 False Bay Local Municipality and Hlabisa Local Municipality) and the uMkhanyakude District Municipality on the south-western border of the iSimangaliso Wetland Park. In terms of an agreement between the Bhangazi Community Trust and the iSimangaliso Wetland Park Authority, the Bhangazi Community Trust was granted the right to develop a tourism facility, which would include a heritage display, within the Park. The Bhangazi Community Trust has been assisted by the African Safari Foundation to develop a business plan for a 60-bed facility that will be wholly owned by the Trust through a commercial entity, for the benefit of the Bhangazi Community.

The Bhangazi Community Trust is applying for the proposed development of the Bhangazi Cultural Heritage Lodge. The development project includes 22 tourist accommodation units along the lake shore, five staff quarters away from the lake shore, parking facilities, numerous activities to accommodate day and overnight visitors as well as a restaurant. There are five cottages that have historically been used for tourism accommodation, each accommodating between eight and 20 people. These cottages are currently managed by Ezemvelo KZN Wildlife but will be demolished as part of the site's redevelopment.

Apart from the establishment of the lodge, the Bhangazi Community Trust will also offer activities linked to the lodge, such as boat tours and guided walks (linked to the cultural heritage of the area). All activities are governed by conditions of operation and the Trust is required to comply with these. Apart from the activities that will be operated by the Bhangazi Community Trust, overnight visitors will have the opportunity to take part in various other recreational activities in the area that are offered by the Bhangazi lodge in accordance with the Park zonation and Park rules. The Bhangazi Lodge will offer the following activities:

- A day and night drives on the Eastern Shores;
- Guided short walks on the Eastern Shores and (possibly) in the wilderness area to the north;
- Guaranteed access to Cape Vidal beach for all lodge guests;
- Deep-sea fishing and (if it becomes available) scuba diving via a commercial boat concession to be operated from Cape Vidal;
- Guest activities will emphasize the human stories associated with the Eastern Shores in general and the Bhangazi's in particular; and
- Canoeing on Lake Bhangazi.

2.3 PROJECT NEED AND DESIRABILITY

The Bhangazi Community Trust, in agreement with the iSimangaliso Wetland Park Authority, was given vested authority to develop a tourism facility to display the cultural heritage of the Bhangazi local community as well as benefit the community as a tourism enterprise. The Bhangazi community has also been assisted by the African Safari Foundation to develop a business plan for a 60- bed facility, owned by the Trust as a business venture that would benefit the local Bhangazi community.

The site is part of the Cape Vidal "limited development node" that is consistent with the Authority's policy to cluster development wherever possible in the iSimangaliso Wetland Park, in order to concentrate the impacts, enable the sharing of infrastructure and reduce disturbance of the natural environment.

As part of the business case for the development, the African Safari Foundation investigated the desirability of establishing the lodge. They found that recent surveys have recorded a shift in St Lucia's tourism market. Since the beach-driving ban of 2002, the area has a somewhat reduced reliance on lower-spending domestic markets in favour of higher-spending eco-tourists. These new markets – especially foreigners – are interested in land-, lake- and sea-based activities in the iSimangaliso Wetland Park. They generally also have a greater interest in local culture, which creates an opportunity for new products that present the human history of the area.

Foreign visitors include both fully independent tourists driving themselves in rented vehicles as well as small and large groups on itineraries offered by inbound tour operators.

However, self-drive South Africans on family holidays remain the mainstay of the St Lucia market. The Eastern Shores generally, and Cape Vidal in particular, continue to attract South African visitors interested mainly in fishing and beaches, especially during domestic holidays.

The Trust therefore aims to attract both these markets (international and local) through the development of a well-priced lodge which offers activities with strong links to cultural heritage.

iSimangaliso Wetland Park: Integrated Management Plan

The Bhangazi Heritage Site is within the iSimangaliso Wetland Park World Heritage Site and is therefore zoned for conservation, including tourism activities. The iSimangaliso Wetland Park Authority has an Integrated Management Plan (IMP) (2017 – 2021) which identifies the vision of the Park as: *To create Africa's greatest conservation-based tourism destination driven by community empowerment.*

iSimangaliso Wetland Park's mission is:
To protect, conserve and present the Wetland Park and its World Heritage values for current and future generations in line with the standards laid down by UNESCO and the World Heritage Convention Act, and to deliver benefits to communities living in and adjacent to the Park by facilitating optimal tourism and related development.

The authorisation process for the Bhangazi Cultural Lodge is taking place while the South African tourism industry is heavily strained by the global COVID-19 pandemic. Given the significant disruption in international travel during this time and for the foreseeable future, it is envisaged that local tourism will be bolstered once the pandemic is over (Khan, 2020)[1]. In this regard, the Bhangazi Community would be in a great position to optimize on this downtime in the local industry by developing the new lodge in anticipation of the complete lifting of lockdown restrictions on leisure travel.

There are a number of principles upon which the Bhangazi Development is founded. These principles are aligned with the United Nations Sustainable Development Goals (SDG) and include:

- Facilitating the sharing of sustainable benefits, which leads to poverty alleviation of neighbouring communities and land claimants (in line with SDG 8: SDG 8: Decent Work and Economic Growth; SDG 10: Reduced Inequalities; and SGD 17: Partnerships);

- The sustainable management of forest areas in a manner that involves indigenous communities, not only for human benefit but also for the benefit of animal and plant species (in line with SDG 15: Life on Land);

- Co-management in a manner that enables the participation of land claimants whilst enabling iSimangaliso to conduct its management activities efficiently and effectively, and without compromising financial viability (in line with SDG 10: Reduced Inequalities as well as SDG 15: Life on Land); and

[1] Khan, S. (2020). The era of peak travel is over. Apr 22, 2020. Available at: https://www.vox.com/the-highlight/2020/4/16/21216676/coronavirus-covid-19-travel-vacation-tourism-overtourism

- Implementation of public/private/community partnership, including job creation (in line with SDG 8: Decent Work and Economic Growth, and SGD 17: Partnerships).

Some of the other key environmental principles that are of particular relevance to the Park include:

- Sustainable development;
- Avoidance and minimisation of disturbance to ecosystems (particularly sensitive ones);
- Aim to prevent the loss of biodiversity;
- Protection of cultural heritage and landscapes;
- Avoidance and minimisation of pollution and waste;
- Equitable access and use of environmental resources;
- IUCN Best practice guidelines for protected areas; and
- The application of a risk averse and cautious approach (precautionary principle).

Development Priorities

The development meets national as well as local and community development priorities by way of proving job opportunities and marketing tourism in the area. It is also entirely appropriate in all respects in line with redressing the forced removal of people off their ancestral land. This was remedied in 1999 by cash compensation, a right to gate takings, traditional rights to the heritage sites and graves, and development rights to a portion of land on the south-eastern shore of Lake Bhangazi South. Furthermore, the development will allow communities to derive tangible benefits from conservation and protected areas, which is an important national directive and in line with the objectives of the national People & Parks Programme (born out of the World Parks Congress held in Durban in 2003).

Land Restitution Project

It is part of a Land Restitution Project in terms of the South African Land Reform Programme, whereby the Bhangazi were forcibly removed between the 1950s and 1970s, restitution was provided to the Bhangazi community through cash compensation, an allocation of community levies, and traditional access rights to graves on higher ground to the north-west of the Bhangazi Lake. The Bhangazi Community Trust was formed and is now responsible for maintaining and overseeing the management of the proposed lodge and concession area, expecting tangible benefits, especially from income generation, training and capacity building in the tourism sector.

2.3.1 Project Benefits

The benefit to society in general is the contribution the development will make to maintaining the cultural heritage and identity of the area while promoting

growth of the community through economic development and tourism by offering additional/ alternative facilities and activities for visitors to the area.

2.3.2 *Legislative requirements for motivating for 'Exceptional Circumstances'*

Following discussions between the DFFE and DAFF, the iSimangaliso Wetland Authority, the African Safari Foundation (representing the Bhangazi Trust), and ERM, DAFF requested a written motivation in terms of Section 3(3)(a) of the National Forest Act (No. 84 of 1998, NFA), given the Act's centrality to the development of the proposed lodge. Section 3(3) of the Act states that,

> "*…natural forests must not be destroyed save in exceptional circumstances where, in the opinion of the Minister, a proposed new land use is preferable in terms of its economic, social or environmental benefits*".

In light of the aforementioned, ERM as the appointed environmental practitioner for the Project, was requested to draft a motivation for 'exceptional circumstances' in terms of Section 3(3). This is to be read in conjunction with Section 7 of the Act, which prohibits the removal of indigenous, living trees from a forest unless a licence is obtained. This is due to the transfer of the said state forest from the then Minister of Agriculture, Forestry and Fisheries to the then Minister of Environmental Affairs, as well as the provisions of Section 7 for Protected Areas, which requires that a licence be obtained for such removal, or an exemption be granted to the Applicant.

NOTE: In ensuring that we effect Duty of Care, the African Safari Foundation (on behalf of the Bhangazi Community Trust) we will be advised on the steps to be taken in engaging with the Directorate: Woodlands and Indigenous Forests (KZN) and the process to be followed in obtaining any required NFA the licence/s- should it be required. Engagement with the Directorate has been added as a recommendation in the BAR (Section 9.3.), and it is the EAPs opinion that this be made a licence condition with which the African Safari Foundation would need to comply.

In light of the above, the section below provides motivation for the Bhangazi Lodge development as an 'exceptional circumstance'.

2.3.3 *Exceptional Circumstances Motivation*

The iSimangaliso Wetland Park is a World Heritage Site located in the coastal and inland areas of north-eastern KwaZulu-Natal. The Park occupies an area of approximately 358,534 ha comprising fifteen ecosystems and a number of notable and diverse landscapes. Between the 1950s and 1970s, people living on the Eastern Shores were forcibly removed. The land claim for this area has been settled through cash compensation, an allocation of community levies, and traditional access rights to graves on higher ground to the north-west of the Bhangazi Lake. Development rights to a portion of land, which comprises the Bhangazi Heritage Site on the south-east of Lake Bhangazi South, have

also been granted. The institution formed by the former-claimants is the Bhangazi Community Trust.

The Bhangazi Community Trust, in agreement with the iSimangaliso Wetland Park Authority, was given vested authority to develop a 60-bed tourism facility to display the cultural heritage of the Bhangazi local community. This development is proposed to be located on a 5,06-ha site on the shores of Lake Bhangazi, which form part of the Eastern Shores of the iSimangaliso Wetland Park.

It is known however, that the proposed development will comprise of 22 tourist accommodation units along the lake shore, eight staff quarters (with a footprint of approximately no more than 50 m^2 each and a single storey in height, as per the current layout) away from the lake shore, parking facilities, numerous activities to accommodate day and overnight visitors as well as a restaurant that will now be constructed in an already disturbed area. There are five cottages that have historically been used for tourism accommodation, each accommodating between eight and 20 people. These cottages are currently managed by Ezemvelo KZN Wildlife but will be demolished as part of the site's redevelopment.

Section 18 of the National Forests Act, (Act No. 84 of 1998) states that 'natural forests must not be destroyed, except in exceptional circumstances. In terms of the Bhangazi Lodge, the positioning of the chalets within the natural forest area can be considered an 'exceptional circumstance', as per discussions with the Department of Forestry, Fisheries & Environment (DFFE) and the DFFE: Forestry Directorate (formerly the Department of Agriculture, Forestry and Fisheries (DAFF)) during the lodge layout review process (in a site visit and meeting held at the Bhangazi Fishing Camp Site, on 12 March 2020). The Bhangazi lodge development is aimed at promoting eco-tourism and offering lodgers an authentic forest experience while being conscious of the receiving environment.

In terms of Section 18, albeit this development will result in vegetation clearing, the forest itself will certainly not be destroyed. Apart from some understory clearing, the affected vegetation is expected to recover fully within a few years. In addition, the units are to be placed, as far as possible, in areas where the understory had been cleared before and is still relatively open.

Taking into consideration the sensitivity of the area, the facilities will consist of a light-footprint lodge that uses standard safari tents on raised timber decks that blend into the natural environment thus minimizing visual disturbance. Two large Marula trees are found on site and they are the only national protected tree species (DAFF, 2017) identified by the vegetation specialist (see Vegetation Study in Annex E). Of these two trees, only one will be affected as it is in the identified chalet development zone, however, there will be no trees of concern cut down to make way for the development.

The site layout is depicted in Figure 2-2, where:

- The restaurant and pool complex, previously located within the forest, have been repositioned to a disturbed area outside the forest. This specific site is currently totally devoid of indigenous vegetation and is largely covered by an old derelict building, a remnant of the Bhangazi Fishing Camp.

- The layout shows the relocated restaurant and pool complex from the forest zone to the disturbed fishing camp zone. This relocation means that there will no longer be a need to clear an extent of 350 m^2 (forest area) as initially proposed.

- The staff housing has been repositioned on two separate disturbed areas within the old Bhangazi fishing camp (brownfields sites).

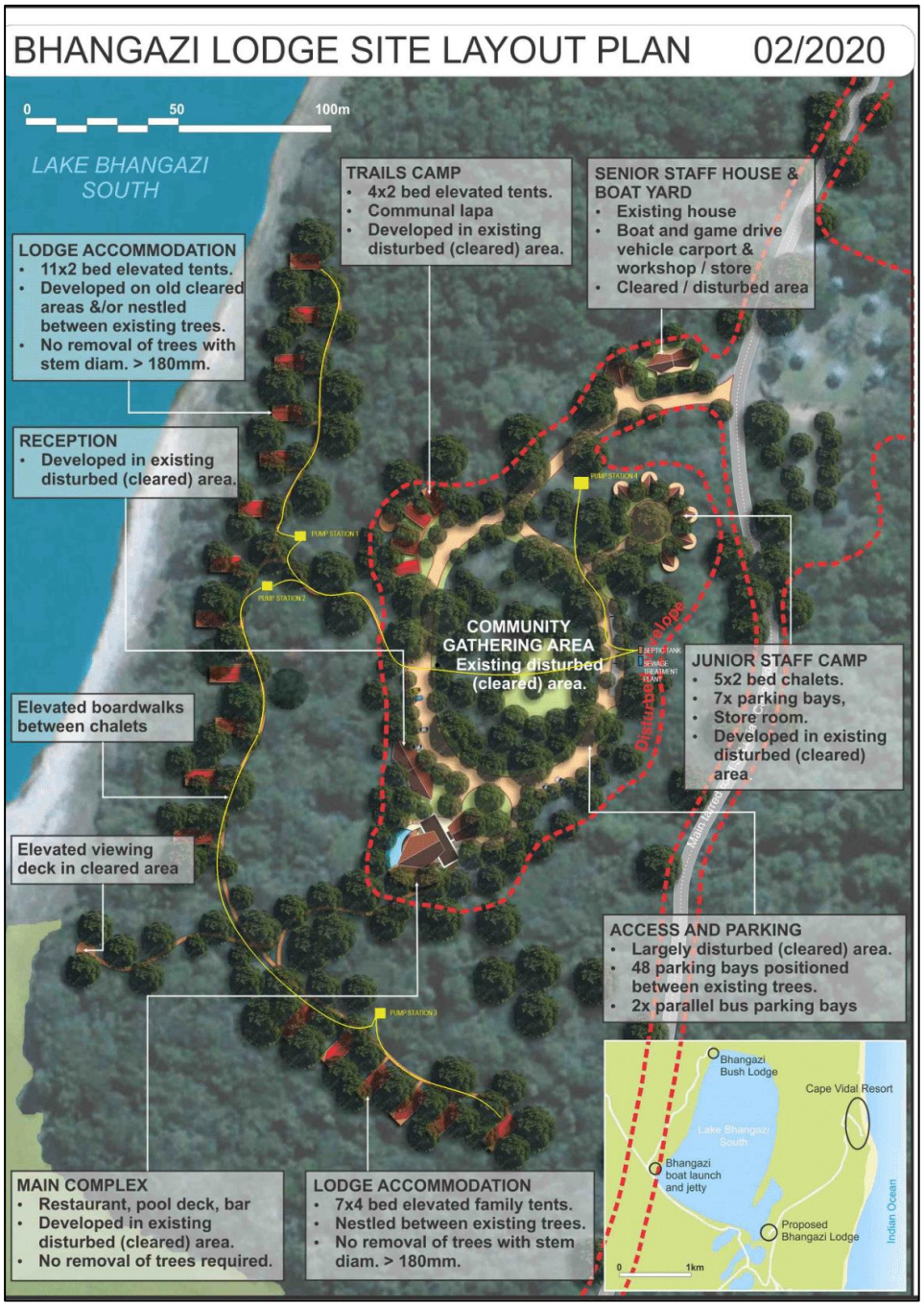
- Development within the forest will be limited to guest chalets and pedestrian boardwalks only and will make use of pre-identified cleared or semi-cleared areas (old camping spots).

- All the chalets within the forest will be developed on elevated decks. Circulation between chalets will be via elevated timber boardwalks (no infrastructure will be built on the ground).

- The previously proposed dual access roads (off the Cape Vidal Road) have been consolidated and restricted to only one access road in and out of the facility.

- Considering the footprint impact of each unit within the forest area, the current layout proposes a reduction in the size of the accommodation units as well as alternate designs of the units to facilitate placement in the forest with minimal impact on existing large trees.

Figure 2-2 Bhangazi Lodge site layout plan



In light of this, the motivation for 'exceptional circumstances' includes the following:

- The proposed development should be placed in broader context of the 358,534 ha iSimangaliso Wetland Park. The Bhangazi Lodge site, which is 5.06 ha in size, will be developed in accordance with best practice environmental, social and governance guidelines. In addition, the proposed development is compliant to the iSimangaliso Development and Environmental Guidelines (2013), which provides strict site-specific parameters for previously identified development nodes within the Park.

- The Bhangazi Community, which was forcibly removed from their land between the 1950s and 1970s, acquired their land rights through the South African Land Restitution process. As such, the Bhangazi Community trust was granted the right by the iSimangaliso Wetland Park Authority, as per an agreement signed by both parties on March 2006 to develop this tourism facility within the World Heritage Site. According to this agreement, "…the primary purpose of the Bhangazi Heritage site is for the interpretation of the cultural heritage of the Bhangazi community…" This leaves no other development alternative for the Bhangazi Community Trust.

- In addition to the above point, According to Section 2(1) of the Restitution of Land Rights Act 22 of 1994, "A person shall be entitled to restitution of a right in land if- (d) it is a community or part of a community dispossessed of a right in land after 19 June 1913 as a result of past racially discriminatory laws or practices...". As such, the continuation of this project would ensure that the Bhangazi Community Trust's rights according to the Restitution of Land Rights Act 22 of 1994 are met.

- The development in question meets national imperatives as well as local and community development priorities. In so doing, the key objectives supporting the proposed development is in line with the key outcomes of the Biodiversity Economy Lab and Rhino Lab, which form part of Operation Phakisa. It is also estimated that the development of Bhangazi will create 90 jobs during the construction phase (of which 67 of those will be new jobs) and 61 jobs during the operational phase.

- In the layout, only the development of the guest chalets will be constructed in the forest area, while the restaurant and pool complex have now been relocated to an already disturbed area. The positioning of the chalets within the natural forest area is considered an 'exceptional circumstance', as the lodge is aimed at promoting eco-tourism and an authentic forest experience.

- Finally, the South African government has also identified tourism as a priority sector that is fundamental to wider transformation of the South African economy. The proposed development will showcase a community public private model where previously disadvantaged communities implement tourism-based enterprise development opportunities in partnership with conservation authorities and the private sector. This model not only provides for tangible community benefits linked to entire tourism value chain, diversify the local economy in areas adjacent to conservation areas, and strengthen local communities' governance structures within rural nodes. This will ensure that local communities realise the tangible benefits from protected areas in South Africa through tourism, and negate the need for them to pursue illicit activities as those provided by wildlife crime.

2.4 PROJECT LOCALITY

The Bhangazi Heritage Site, approximately 9.94 ha in size, is located on the eastern side of Lake Bhangazi South, inland of the Cape Vidal dunes on the Eastern Shores of Lake St Lucia within the iSimangaliso Wetland Park. The total area that will be affected by the development is 5.06 ha.

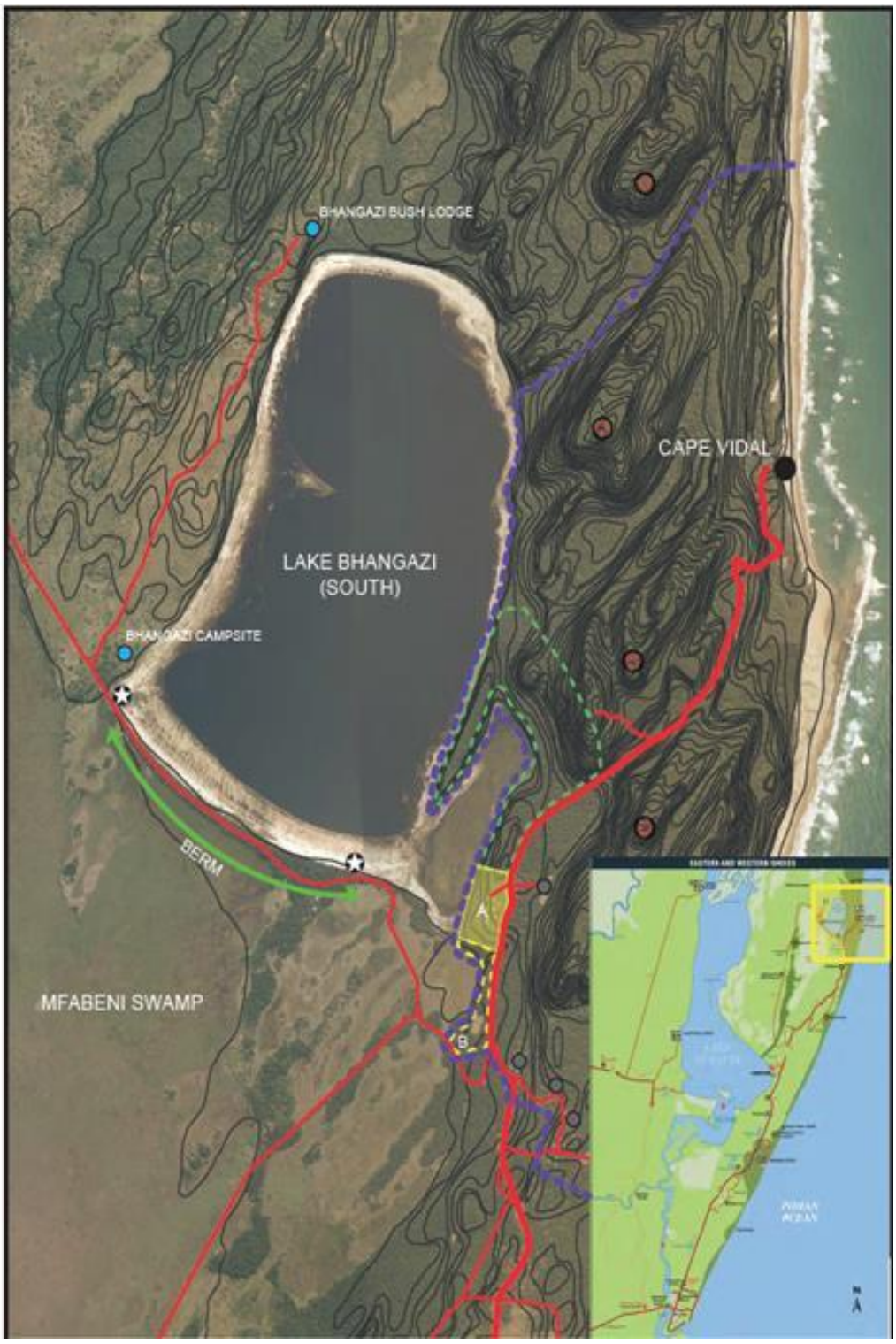
Table 2-1 Property description

Province	KwaZulu-Natal
District Municipality	uMkhanyakude
Local Municipality	Mtubatuba Local Municipality
Ward Number(s)	n/a
Farm Name and Number	n/a
Portion Number	n/a
SG Code	TOLU 00000000000000000

Current Zoning	• Terrestrial Component:
	  o Wilderness.
	  o Restricted.
	  o Controlled.
	• Marine Component:
	  o Wilderness.
	  o Sanctuary.
	  o Restricted.
	  o Controlled.

Centre coordinates	28°06'48.2"S 32°32'11.0

Figure 2-3 Site Location within the iSimangaliso Wetland Park



2.5 PROJECT COMPONENTS

The proposed development is within the environmental and development parameters set by the iSimangaliso Wetland Authority in both the 2003 and 2013 Development and Environmental Guidelines. Considering the preferred/ target market, the characteristics of the site, the sensitivity of the area and the need to keep capital costs low, the facilities will consist of a light-footprint

lodge that uses standard safari tents on raised timber decks that blend into the natural environment thus minimizing visual disturbance.

The proposed lodge will include:

- Ten x 2-bed units with the option of catered and self-catering;
- Eight x 4-bed family units with the option of catered and self-catering;
- Trail camp - four x 2-bed units with a communal braai area;
- The restaurant and pool complex, previously located within the forest, has been repositioned to a disturbed area outside the forest. The specific site is currently totally devoid of indigenous vegetation and is largely covered by an old derelict building, a remnant of the Bhangazi Fishing Camp.
- Five staff quarters each with a footprint area of up to 50 m^2 and single storey in height.
- A jetty with a footprint size of 20 m^2 at the in south-western corner of Lake Bhangazi South.
- The parking arrangements for the project include:
  - Visitors' parking (18)
  - Chalet parking (13)
  - Bus parking (2)
  - Staff parking (3)
  - Lodge vehicles (2)
  - Game drive (1)
- The reception is located within the day visitors /gathering area.

Given the need to optimize views, the accommodation units will be sited between the 25- and 15-metre contour lines below the current development footprint with views to the west and northwest across Lake Bhangazi. This will require innovative placing and stilting along the slope to ensure minimal disturbance to the forest.

The self-catering units will be configured with en-suite bathrooms, kitchenettes and dining areas while the trail camp units will be linked to a communal kitchen and braai area. A variety of self-catering units will be established which provide for families and couples.

The construction of a jetty has been proposed at the current Bhangazi Camp site for the operation of boat tours to be offered from the lodge. The proposed jetty will be located in the south-western corner of Lake Bhangazi South, with the approximate coordinates being: 28˚07'44,81" S, 32˚31'56,03" E. The Bhangazi Camp Site will also serve as a storage area for canoes and associated equipment that will be used for canoeing on the lake.

Service infrastructure will also need to be developed and will include parking, on-site housing for sufficient employees to ensure efficient operation; back-of-house storage, administration facilities; workshops, etc.

A restaurant (with a footprint of 300 m^2) consisting of a lounge, all day bar and dining area, sundowners deck as well as a recreational pool deck area are proposed in the south-western corner of the site. It will be located and orientated in such a way as to maximize views whilst limiting visibility from the adjoining Wilderness zone. Ultimately, the tree canopy will not be altered as a result of the restaurant development. This facility will cater to both overnight guests as well as day visitors.

The aim is also to optimize the use of green technologies to optimise and be efficient in the use of energy, conserve water, treat sewerage and dispose of waste. The proposed method of sewage treatment is through the construction of an above ground Sewage Treatment Plant (placed near the community gathering area), as detailed in Section 3.3.1.

The Trust also has the mandate to develop activities aligned with the operational conditions developed by iSimangaliso. Based on their agreement, these activities should have a cultural heritage focus and could include, for example, guided walks leading to culturally significant sites. All activities developed by the Trust will need to abide by the Park Rules developed by iSimangaliso.

There are currently five cottages as well as a main guest house on the site that have historically been used for tourism accommodation, each accommodating between eight and 20 people. The cottages and the house are in a state of disrepair and will be demolished.

2.5.1 Associated Infrastructure

Access Roads

- The development will be accessed via the Eastern Shores Bhangazi Gate and Cape Vidal tar road, where the lodge will have its own access off the existing road. Cape Vidal is approximately 26 km from the Bhangazi Gate. This will be gravel road with a width of 3.5 m.

2.6 PROJECT SCHEDULE AND PHASING

The Project will require the development of accommodation units located along the western edges of the site. A restaurant area will also form part of the proposed development. To accommodate the phasing in of this development an interim reception/office area as well as a pool has been incorporated into the restaurant building. Interpretive displays can be accommodated along the walls of the restaurant. The service area and staff quarters will also form part of this development.

Further to this, the development will include the interpretation centre, visitors' area with its associated activities such as braai and picnic area. It will also include the introduction of a much larger second pool area for the visitors

to enjoy. The larger family chalets located along the southern boundary of the site will also be developed which will comprise 4 x four bed units.

Construction is anticipated to span 5 years in total (although certain components are likely to be completed in a shorter timeframe). The envisaged commencement of construction is late 2021.

It must be noted that the proposed activity includes operational aspects that will be in effect for a number of years. As such, the envisioned period for which the authorisation is required is in excess of 30 years and an exact date for the conclusion of the lodge operations cannot be given at this stage.

2.7 *RESOURCE USE AND PROCESS DETAILS*

2.7.1 *Water Use*

The site receives its water supply from the Mtubatuba abstraction works, via St Lucia. Typically, the site needs 30 000 litres of water to be functional. In the current drought, there have been severe restrictions and long periods of no water (including St Lucia). Cape Vidal and Bhangazi are at the end of the line and, therefore, the first to have limited or no water.

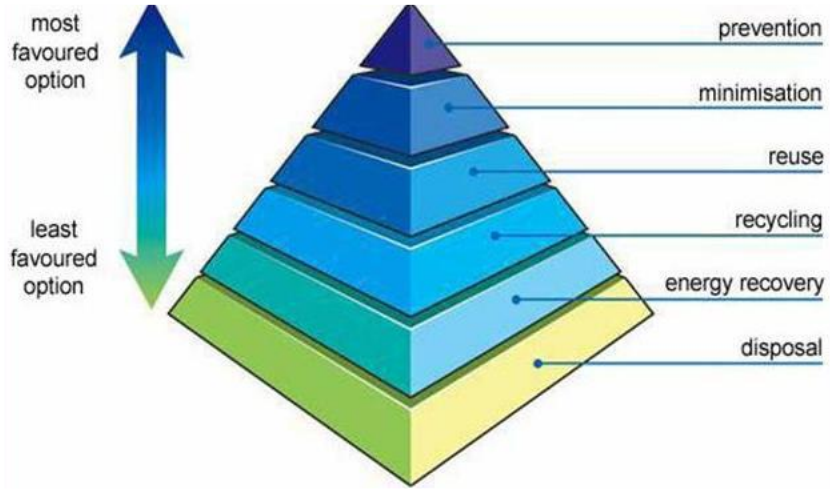
Alternative options for potential water supply have been provided in the Bulk Services Engineering Report (Annex E) which included options of making use of the existing borehole or sinking a new borehole. It should be noted however, that these are will only apply should the mainstream supply not be adequate. The water restrictions alluded to in Section 2.7.1 were most prominent during drought periods, and they would only last a maximum of a few hours in a day. Therefore, it is not expected that the mainstream water supply will be unable to accommodate the proposed development.

Applications for the authorisation of boreholes or any other water sourcing alternatives will be run in a separate process to this BA, should the need arise.

2.7.2 *Solid waste management*

Appropriate procedures for waste management (e.g., reuse and recycling) will be applied to achieve the efficient use of natural resources during construction and operation of the lodge. Waste will be disposed of in accordance with the waste management hierarchy illustrated in Figure 2-4. The waste management hierarchy is a globally accepted guide for prioritising waste management practices with the objective of achieving the optimal environmental outcome. It sets out the preferred order of waste management practices from the most preferred to least preferred. In the hierarchy approach, the ideal actions are waste prevention and minimisation as depicted in Figure 2-4.

Figure 2-4 Waste management hierarchy



During the construction phase, approximately 40 m³ of solid construction waste will be produced per month. It will be transported weekly by the building contractor to the licensed landfill site, possibly in Empangeni. It will include building rubble but not hazardous waste. A temporary storage facility for solid waste has been provided for within the Main Complex area as illustrated in the Figure 2-4.

It is anticipated that approximately 60 m³ of general waste will be produced per month, during the operational phase. It will be stored on site in an animal proof, secure, sealed, bunded area and transported weekly to Empangeni landfill site for safe disposal.

2.7.3 Waste water

As there is a lack of properly managed municipal services, an onsite system for sewage treatment will need to be established. Due to the low nutrient status of the local environment and the contiguous nature of the hydrology of the area (Lake Bhangazi South / Mfabeni Swamp / Lake St Lucia, marine), there is significant potential for contamination (including nutrient loading) of surface and ground water. Thus, treatment and disposal or discharge of sewage will be carefully designed within a contained system to avoid such contamination and allow for adequate sampling and monitoring.

The site falls within a listed water resource due to its Ramsar status. Thus, the treatment and disposal of any effluent on-site requires approval from the Department of Water and Sanitation (DWS), by way of a licence under Section 21 of the National Water Act and needs to comply with Special Limit Values, and other provisions and conditions set by DWS. Please note that the water use authorisation will be run as a separate process by an appointed specialist.

An above ground Sewage Treatment Plant (STP) is proposed to be established on site to remove contaminants from the waste water and sewage generated at the lodge. This system, if designed and maintained correctly, will prevent contamination of the area as it will enable the discharge of water which meets the Discharge Water Quality Standards specified in the iSimangaliso Wetland

Wastewater Treatment and Disposal – Guideline and Protocol. The STP uses a combination of anaerobic and aerobic processes, followed by sterilization through Chlorine. An aeration pump will form part of this system running 24 hours per day.

The appropriate detergents (those which are not ammonia or chlorine based) are proposed to be used at the camps to limit negative impacts on the septic system. Fat traps will be installed at each kitchen point and cleaned daily. Digestive enzymes are to be added in on a weekly basis.

Refer to *Section 3.1.1* for further details on this system and an illustration of a typical system.

In addition, rainwater capturing off main buildings will be implemented.

2.7.4 Power

Power will be supplied via the Eskom grid. However, due to the inconsistent supply (as a result of faults and load shedding), solar power will be the first go-to option in the effort of making the lodge sustainable. Back-up diesel generators will also be put in place to address power shortages. The diesel will be stored at the workshop area in 2 tanks, with the capacity to hold 5 000 litres each. The applicable health and safety procedures will be put in place to ensure the safe and proper handling and storage of the diesel.

2.7.5 Noise

There may be some low-level noise during the construction phase e.g. demolition of current structures and construction of foundations, decking, walkway and road construction.

During the operational phase, the backup diesel generator may be required. This will, however, be soundproofed to limit noise transmission. Vehicular noise is considered to be low level.

2.7.6 Energy Efficiency

LED lighting is proposed to be used on site since it is more energy efficient as compared to traditional lighting such as fluorescent and incandescent lights. Furthermore, cross ventilation and ceiling fans are also used as an energy saving alternative as opposed to air-conditioners. Water will be heated on demand to promote energy efficiency.

Greener technologies will be incorporated into the design of the buildings to enable the efficient use of energy. Best practice standards will be applied.

Building materials to be used generally have low embodied energy.

2.7.7 Placement of service cables

In implementing the Forestry Directorate's recommendations, the Developer will (as far as practicable) place service lines (i.e. like power cables, water supply lines) under the boardwalk, or fix the lines to the boardwalk access paths. This will be done prior to the commencement of construction, with the guidance of the Forest Vegetation Specialist.

2.8 EMPLOYMENT

The proposed Project is likely to generate approximately 90 jobs during the construction phase (of which 67 of those will be new jobs) and 61 during the operational phase after a period of 5 years, when the lodge is anticipated to be financially stable.

3 *ALTERNATIVES*

The EIA Regulations (April 2017) state that due consideration must be given to project alternatives during the BA process. "Alternatives" are defined in the Regulations as:

"*In relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to the-*
a) property on which or location where the activity is proposed to be undertaken;
b) type of activity to be undertaken;
c) design or layout of the activity;
d) technology to be used in the activity; or
e) operational aspects of the activity;
and includes the option of not implementing the activity".

The following *Chapter* provides a full description of alternatives considered including the option of not implementing the proposed activity (i.e. the no-go alternative) and a motivation for the preferred site, activity and technology alternative. It should be noted that the nature and requirements of the proposed Project allows for a limited number of feasible and reasonable alternatives to be considered.

3.1 SITE ALTERNATIVES

No feasible site alternatives have been considered as part of this process as the site is within the Trust's designated concession area. The cultural heritage of the Bhangazi people will provide a show case for Bhangazi heritage and help to differentiate the lodge from its competitors.

The site is part of the larger Cape Vidal node, which includes a large beach site, currently operated by Ezemvelo KZN Wildlife but earmarked for redevelopment by the iSimangaliso. The accessibility of the site and its location inside the park (which makes it an ideal base for a range of sea-, lake- and terrestrial activities) further enhance its value as a tourism asset.

3.2 DESIGN/LAYOUT ALTERNATIVES

Two layouts were considered for the tourism facility.

3.2.1 Alternative 1

The original Master Plan (December 2014) indicated development of 16 tourist accommodation units located along the lake shore but within existing mature trees. This layout clustered the units higher on the dune, above the tree line and closer to the existing units. It was not considered feasible or considered further because it would have a greater impact on the receiving environment.

3.2.2 *Alternative 2*

The Master Plan of June 2015 increased the number of accommodation units to 22. It is assumed that the units will reflect the local vernacular from which it is assumed that natural materials will be utilised for external finishes. It has been assumed that each unit will have a footprint area in the order of 75m² and will be single storey. A maximum height of 6 m has been assumed which allows 3 m for the accommodation level and 3 m for the roof structure. In light of the concerns raised by the I&APs, this alternative is no longer preferred.

Figure 3-1 Alternative 2: Initial Layout for the Proposed Bhangazi Cultural Heritage Lodge

3.2.3 Alternative 3 (Preferred Layout)

Following extensive consultation with I&APs, Alternative 3 is the preferred layout. This alternative will result in the following net benefits:

- Originally, the physical footprint of the deck structures of approximately 1900 m² of potentially cleared forest area, has now reduced to a potentially 960 m² of cleared forest area.

- The original footprint would've seen the tented chalets, restaurant and staff quarters constructed in the untouched forest area while the current layout will only see tented chalets being constructed in the forest area.

- By removing the restaurant complex from the forest area, an opportunity is created to space the tented chalet units further apart, and therefore more opportunity is created to find a site that can accommodate the units without significant clearance of vegetation.

Figure 3-2 illustrates Alternative 2 compared with Alternative 3.

Figure 3-2 Alternative 2 vs Alternative 3 (preferred)

3.3 TECHNOLOGY ALTERNATIVES

3.3.1 Sewage Treatment

Alternative 1

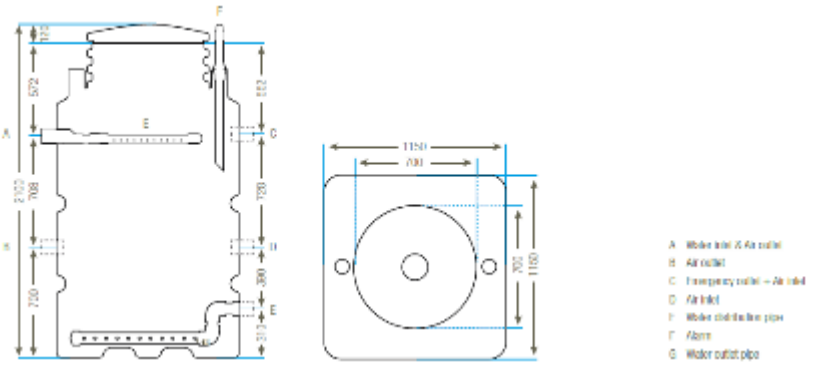
The first alternative related to sewage treatment and disposal proposes to make use of the BIOROCK trickling filter system- a biological process that uses aerobic bacteria in the system to proliferate (flourish) pollutants by means of an innovative draft system, requiring oxygen. It provides a high-quality effluent that meets the highest standards, with low-maintenance and odour-free. The purification process is fully biological and the bacteria grow on and inside the special BIOROCK media. Useful bacteria are responsible for degrading the pollutants and these microorganisms are already present in the wastewater and are stimulated by presence of enzymes.

The temporary storage of the treated sewerage on site will be in underground septic tanks away from the site (to minimise visual and noise disturbances when tanks need to be emptied) with a smaller tank to accommodate minor overflows and avoid spills into the environment. The entire system (including tanks) is therefore designed such that there are no overflows. Tanks will be emptied by waste disposal "Honey Sucker" trucks at appropriate as needed.

This system is to consist of a package plant that makes provision for a sealed underground system that makes use of a natural bio-digestion process to break down the organic matter in the sewer water. A product of this natural bio-digestion process is a grey water discharge. The chemical analysis of this grey water discharge was provided and compared to the *"Wastewater limit values for wastewater discharge in the Wetlands Park"*, as per the iSimangaliso Wetland Wastewater Treatment and Disposal – Guideline and Protocol. These guidelines were exceeded, thus making this alternative not fit for implementing at the site.

An example of a typical system is illustrated in the figure below.

Figure 3-3 Typical BIOROCK System



Design parameters	Value	Unit
Capacity	6	P.E.
Flow per P.E.	150	litres/day
Daily hydraulic load	0.90	m^3/day
Influent BOD_5 per P.E.	60	gr.BOD/PE/day
Daily organic load raw influent	0.3	kg BOD_5/day
Primary Tank		
Recommended volume of the Primary Tank	500	litres/p.e.
Minimum volume Primary Tank	2.5	m^3

Specification	Value	Unit
Volume BIOROCK S tank	1.500	Litres
Overal Length	1.150	mm
Overal Width	1.150	mm
Overal Heigth	2.100	mm
Total Weight (without water)	186	Kg
Pipework Diameter	110	mm

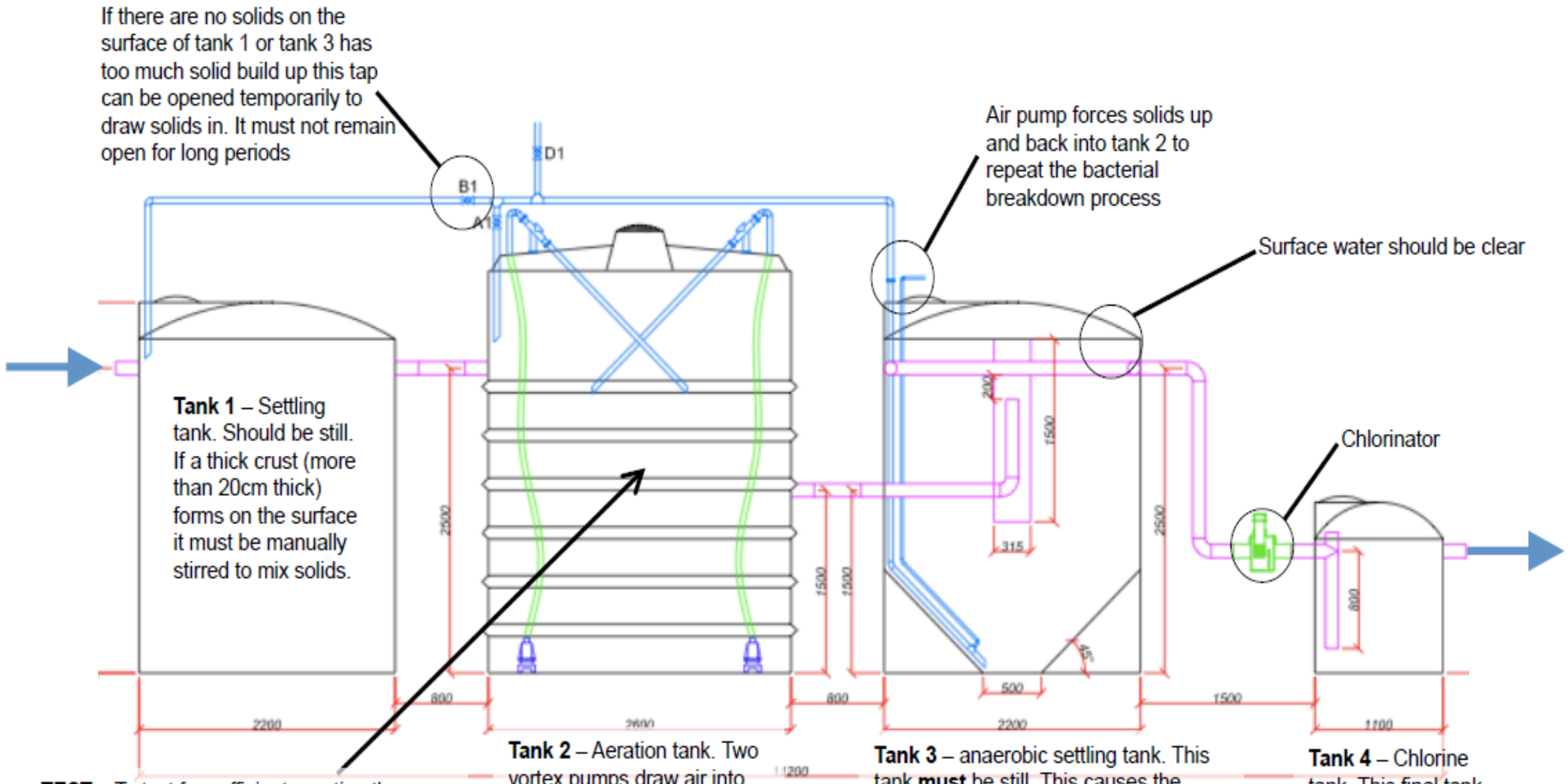
Alternative 2

The alternative to onsite treatment is the installation of conservancy tanks. These will need to be emptied on a regular basis. The system is likely to require a small pump house with a containment facility to pump sewage from the lower sections of the development into the conservancy tank. This facility is likely to be significantly smaller than other proposed structures.

Alternative 3

Another alternative is the establishment of an above ground STP on site. This system, if designed and maintained correctly, will prevent contamination of the area as it will enable the discharge of water which meets the Discharge Water Quality Standards specified in the iSimangaliso Wetland Wastewater Treatment and Disposal – Guideline and Protocol. The system uses a combination of anaerobic and aerobic processes, followed by sterilisation either through Ozone or Chlorine. These systems require an aeration pump to run 24 hours a day (refer to Figure 3-4 for an example of a typical sewage treatment system).

Figure 3-4 Typical Sewage Treatment System



Another vital aspect is ensuring the plant is adequately sized, ensuring maximum retention time. In this regard, 1,500 litre mini-collection tanks are proposed to be installed below ground, at each accommodation unit, where sewage will be stored before being gravity fed into the STP. A dual chambered tank is proposed with a capacity of 1,000ℓ. The proposed STP is to have a throughput capacity of 30, 000ℓ per day (30 m^3), which does not trigger a listed activity.

There will be a main "ring main" pipe of Ø80mm which will be the main feed into the collection tank (see Figure 2-2). This pipe can be either above or below ground and can also be run under the boardwalks, where applicable to remove from sight. Each pump station will pump into this ring main pipe which then feeds into the main concrete collection tank. From this collection tank the black and grey water is then pumped into the sewage treatment plant for processing. The pump stations and plant sizes are approximately to scale indicating the small footprint and limited effect on the existing environment.

In addition, four pump stations will be set up in the forested section, as follows:

- *Pump station 1* will cater for the southern (or top of development) accommodation. Each ablution facility will feed into a common Ø110mm pipe which will then gravity feed into the 1500 litre collection tank. This tank will need to be buried below ground to ensure there is sufficient "fall" to allow gravity feed into this tank.

  The collection tank is then effectively the pumping station which will then pump the black and grey water into the main concrete collection tank. The pumping will be carried out by a submersible sewage pump controlled by a float switch to ensure the collection tank does not overflow.

- *Pump station 2* will cater for the central section of the development including the entertainment and swimming pool areas. Each ablution facility will feed into a common Ø110mm pipe which will then gravity feed into the 1500 litre collection tank. This tank will need to be buried below ground to ensure there is sufficient "fall" to allow gravity feed into this tank.

  The collection tank is then effectively the pumping station which will then pump the black and grey water into the main concrete collection tank. The pumping will be carried out by a submersible sewage pump controlled by a float switch to ensure the collection tank does not overflow.

- *Pump station 3* will cater for the northern (or bottom of development) accommodation. Each ablution facility will feed into a common Ø110mm pipe which will then gravity feed into the 1500 litre collection tank. This tank will need to be buried below ground to ensure there is sufficient "fall" to allow gravity feed into this tank.

The collection tank is then effectively the pumping station which will then pump the black and grey water into the main concrete collection tank. The pumping will be carried out by a submersible sewage pump controlled by a float switch to ensure the collection tank does not overflow.

- *Pump station 4* will cater for the management and staff accommodations. Each ablution facility will feed into a common Ø110mm pipe which will then gravity feed into the 1500 litre collection tank. This tank will need to be buried below ground to ensure there is sufficient "fall" to allow gravity feed into this tank.

  The collection tank is then effectively the pumping station which will then pump the black and grey water into the main concrete collection tank. The pumping will be carried out by a submersible sewage pump controlled by a float switch to ensure the collection tank does not overflow.

Waste is fed to the pump stations, and then to the STP via a gravity-fed pipeline, which will (as far as possible) be placed under the boardwalk.

Discharge water from the STP will be stored in a storage tank with an aerial extent of 880 m^2 before it is used for irrigation and domestic uses at the lodge. The discharge water will be tested by a certified lab bi-annually.

Due to the minimal impact anticipated as a result of Alternative 3, it has been selected as the preferred alternative. The treated effluent is anticipated to be of the standards set by the iSimangaliso Wetland Authority.

There are a few above ground settling tanks currently on the development site, as highlighted in the Bulk Services Engineering Report (Annex E, Part 1). It must be made clear that 1,500 litre mini collection tanks will be installed to collect the grey and black water from each accommodation unit and not per room. The grey and black water will then be pumped up to the main collection tanks, which will be placed strategically around the guest accommodation area. Please refer to the Bio-Sewage schematic diagram (in Annex G), which shows the layout of the sewage tanks.

3.4 NO-GO ALTERNATIVE

The no-go alternative would mean no development of the Bhangazi concession site and therefore the failure of the Trust to accomplish their development rights acquired through the land restitution process. As previously mentioned, the Bhangazi Community Trust signed a settlement and land agreement with the iSimangaliso Wetland Park Authority in March 2006 which gave them the right to develop a cultural heritage lodge through the South African Land Reform and Land Restitution process. The no-go alternative directly is in direct conflict with this Right.

3.5 BASIS FOR SELECTION OF PREFERRED ALTERNATIVE

The only alternative considered in terms of the development and site was the cultural heritage lodge as it is directly in line with the development rights stipulated in the settlement and land agreements between Bhangazi and iSimangaliso. The proposed development is located within the concession area designated for development by the Bhangazi Community Trust.

In terms of the layout/design alternatives, the preferred option is Alternative 3. This is due to the low visual impacts it possesses as opposed to Alternative 1 and 2. The preferred layout is below the tree line and closer to the Bhangazi Lake. The layout has been designed to blend into the environment, thus causing minimal visual impacts as possible and less of an impact on the forest area than the other two alternatives.

The basis for selecting the Technology as the preferred alternative is mainly because it has very minimal anticipated impacts. The proposed STP, if developed and utilised accordingly, is anticipated to treat all wastewater generated on site to the allowable standards set by the iSimangaliso Wetland Park Authority.

4 *LEGAL AND POLICY FRAMEWORK*

This *Chapter* presents an overview of the national and local environmental and social legislation and policies **applicable to the Project**, and how the proposed Project complies with and responds to the legislation.

4.1 NATIONAL LEGISLATION

4.1.1 National Environmental Management Act

The National Environmental Management Act (Act No. 107 of 1998), as amended (NEMA) requires that the potential impact on the environment, socio-economic conditions, and cultural heritage of activities that require authorisation or permission by law must be considered, investigated and assessed prior to implementation, and reported to the relevant authority.

The EIA Regulations (Government Notice R. 327) promulgated in terms of NEMA, identifies a suite of activities, which "*could have a substantial detrimental effect on the environment*". The listed activities identified require an EA from the competent authority, i.e. DEA prior to commencement of the activity. The proposed Project triggers a list of activities, tabulated in *Table 4-1* below.

Table 4-1 Listed NEMA Activities deemed Applicable to the Project

<table>
<tr><th>Activity No.</th><th>Activity Description</th><th>Reasoning</th></tr>
<tr><td>GNR 327 LN 1 Activity 12</td><td>The development of (ii) infrastructure or structures with a physical footprint of 100 square metres or more;

where such development occurs— (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse</td><td>The Bhangazi Site is 9.94 ha in extent and is divided into two pockets: a northern portion of 5.06 ha (Concession Area A) earmarked for development and a southern no-development zone of 4.88 ha (Concession Area B). The total development footprint however, will be under 4 ha.

The proposed lodge will have a combined buildings' footprint (restaurant, tourist tents and staff accommodation) of approximately 7183.7 m² (as per the breakdown below) and is located within 32 m from the edge of Lake Bhangazi:

<table>
<tr><th>Component</th><th>Length (m)</th><th>Width (m)</th><th>Area (m²)</th></tr>
<tr><td>Raised boardwalk</td><td>958</td><td>1.4</td><td>1341.2</td></tr>
<tr><td>Roads</td><td>362</td><td>7</td><td>2534</td></tr>
<tr><td></td><td>137</td><td>5.5</td><td>753.5</td></tr>
<tr><td>Parking</td><td>cars</td><td></td><td>618</td></tr>
<tr><td></td><td>busses</td><td></td><td>100</td></tr>
<tr><td></td><td>staff</td><td></td><td>90</td></tr>
<tr><td>Guest chalets</td><td>2 bed (15)</td><td></td><td>525</td></tr>
<tr><td></td><td>4 bed (7)</td><td></td><td>350</td></tr>
<tr><td>Reception</td><td></td><td></td><td>180</td></tr>
</table></td></tr>
</table>

Activity No.	Activity Description	Reasoning
		Main complex 500 Staff chalets (6) 192 **7183.7**
GNR 327 LN 1 Activity 30	Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).	The proposed lodge is located within the iSimangaliso Wetland Park which is protected under the NEM: Biodiversity Act.
GNR 324 LN 3 Activity 4(d) v	The development of a road wider than 4 metres with a reserve less than 13,5 metres in KwaZulu- Natal within a world heritage site.	The access road to the proposed lodge is wider than 4m to accommodate for a left and right lane with a reserve less than 13.5 metres.
GNR 324 LN 3 Activity 6(d) ix	The development of resorts, lodges, hotels and tourism or hospitality facilities that sleeps 15 people or more in KwaZulu-Natal within a world heritage site.	The proposed lodge is within iSimangaliso and will provide for 60 people including staff.
GNR 324 LN 3 Activity 12(b) ix	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan in KwaZulu- Natal within a world heritage site.	The proposed development is located within iSimangaliso and will require the clearing under 300 m² for the footprints of the units and restaurant.
GNR 324 LN 3 Activity 14 (viii) (x) v	The development of jetties exceeding 10 square meters in size and buildings exceeding 10 square metres in size in KwaZulu-Natal within a world heritage site.	The proposed lodge is within iSimangaliso and will have a combined buildings footprint (restaurant, tourist tents and staff accommodation) of approximately 960 m². The jetty is proposed to be 20 m² in size.

4.1.2 National Water Act

Section 19 of the National Water Act (Act No. 36 of 1998) (NWA) defines responsibilities in terms of the prevention and remedying of the effects of pollution. This includes:

1) *"An owner of land, a person in control of land or a person who occupies or uses the land on which -*
   a) *any activity or process is or was performed or undertaken; or*
   b) *any other situation exists, which causes, has caused or is likely to cause pollution of a water resource, must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring*."

The control of emergency incidents is described under Section 20 of the NWA and states that the person responsible for the incident or the substance involved in an incident is responsible for the remedying of the situation.

Applicability to Project

The proposed Project will have to comply with the NWA and the applicant will be responsible for preventing and remedying the effects of any pollution to water resources.

Since the proposed project is proposed to be undertaken within 500m of a watercourse, the applicant will need to apply for a Water Use Licence (WUL). Further water uses potentially triggered as a result of this project will be investigated in the Water Use Licence Application (WULA) process.

Note: the WULA process is being undertaken in a separate process.

4.1.3 National Forests Act (Act 84 of 1998)

The National Forests Act (NFA) is central to the development of the Bhangazi Cultural Lodge given its location in a forest. The purposes of this Act are to:

- Promote the sustainable management and development of forests for the benefit of all.
- Create the conditions necessary to restructure forestry in State forests.
- Provide special measures for the protection of certain forests and trees.
- Promote the sustainable use of forests for environmental, economic, educational, recreational, cultural, health and spiritual purposes.
- Promote community forestry.
- Promote greater participation in all aspects of forestry and the forest products industry by persons disadvantaged by unfair discrimination.

Although within a natural forest, a large component of the proposed development will be located in a previously disturbed area within such forest. It should also be noted that the proposed accommodation units are anticipated to not be closer than 15 m to each other and they will be placed at least 10 meters away from the forest edge, inside the forest. It must be noted further that as part of the pre-a construction activities, the forest

ecologist (together with the construction team) will do a final site selection within identified pockets of open land on which the accommodation units will be constructed. This is in line with the discussions with the DFFE: Forestry Directorate (13 and 18 February 2020) and the DFFE (12 and 13 March 2020) surrounding the layout.

Applicability to Project

The following stipulations are applicable to the proposed project:

- Section 3, which calls for the preservation of natural forests save in exceptional circumstances (which has been addressed under Section 2.3.2 of this BAR).
- Section 7, which prohibits of indigenous, living trees from a forest unless a licence is obtained for such removal, or an exemption is granted to the Applicant.

It is likely that one of more of the identified licence requirements will need to be fulfilled for the purpose of the Lodge development. In ensuring that ERM effects Duty of Care, the African Safari Foundation we will be advised on the steps to be taken in engaging with the Directorate Woodlands and Indigenous Forests (KZN) and the process to be followed in obtaining any required NFA licences, should they be required.

4.1.4 National Environmental Management: Waste Act

The National Environmental Management: Waste Act (Act No. 59 of 2008) is coupled with, and supports, the legislation included in NEMA. The Act gives legal effect to the White Paper on Integrated Pollution and Waste Management, and provides the basis for the regulation of waste management in South Africa. Furthermore, the Act contains policy elements and provides a mandate for additional waste regulations that are to be promulgated.

Applicability to Project

Following a review of the list of waste management activities that have, or are likely to have, a detrimental effect on the environment, ERM is of the opinion that based on the information provided to date; there is no need for a Waste Management Licence (WML).

4.1.5 National Environmental Management Biodiversity Act (No. 10 of 2004) – NEM: BA

One of the objectives of the National Environmental Management Biodiversity Act (NEMBA) is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and to ensure the sustainable use of indigenous biological resources. Chapter 4, Part 2 of NEMBA provides for listing of species that are threatened or in need of protection to ensure their survival in the wild, while regulating the activities, including trade.

In terms of Section 57(1) of the Act, "*A person may not carry out a restricted activity involving specimen of a listed threatened or protected species without a permit issued in terms of Chapter 7*." "Restricted activity" is defined in the Act insofar as it relates to a specimen of a listed threatened or protected species, as including catching, capturing or killing any living specimen.

Applicability to Project

The proposed lodge is located within the iSimangaliso Wetland Park which is protected under the NEMBA. This triggers the need for authorisation under NEMA GNR 327 LN 1, Activity 30.

4.1.6 Other Applicable National Legislation

Other National Legislation which are applicable to this project include the following:

- World Heritage Convention Act (Act 49 of 1999)
- National Heritage Resources Act (No. 25 of 1999)
  - KwaZulu-Natal Heritage Act (No. 4 of 2008)
- National Environmental Management: Protected Areas Act (Act 57 of 2003)
  - Regulations for the Proper Administration of Special Nature Reserves, National Parks and World Heritage Sites

4.2 NATIONAL, PROVINCIAL AND LOCAL PLANS, POLICIES AND FRAMEWORKS

4.2.1 National Development Plan

The National Development Plan identifies the need to attract economic and industrial growth projects that will create job opportunities and improve livelihoods through community development priorities for generating an income; including education and training (through employment and funds allocated into the development trust). Tourism is also highlighted as a mechanism for promoting rural development.

4.2.2 Lubombo Spatial Development Initiative

In 1996, national Government created a number of Spatial Development Initiatives (SDIs) to stimulate growth in regions with high but neglected potential for development. The Lubombo SDI was established in northern KwaZulu-Natal, southern Mozambique and eastern Swaziland as a trilateral development process between the Governments of South Africa, Mozambique and Swaziland. Its principal aim was to stimulate development in this previously-neglected region by focusing principally on tourism and agriculture. The iSimangaliso Wetland Park was identified as the South African anchor tourism project of the Lubombo SDI, capable of establishing a tourism core, thereby stimulating regional growth and creating a significant number of jobs. The Lubombo SDI is, therefore, a broader process, in terms of

geographic and sectoral reach, within which the establishment of iSimangaliso has occurred.

Part of the vision of the SDI is "the implementation of local economic development programmes, such as the craft and cultural performance programmes, which target women and youth". Within the context of the Lubombo SDI vision, the development of the Bhangazi Cultural Heritage Lodge will aim to grow the cultural heritage tourism market while benefitting the local community.

4.2.3 Lubombo Transfrontier Conservation and Resource Area

Lubombo Transfrontier Conservation and Resource Area includes four transfrontier conservation areas between Mozambique, South Africa and Swaziland, covering a total area of 10 029 km^2. These include:

- Lubombo Conservancy-Goba-Usuthu-Tembe-Futi TFCA (Mozambique/ South Africa/Swaziland).
- Ponta do Ouro-Kosi Bay TFCA (Mozambique/South Africa).
- Nsubane-Pongola TFCA (South Africa/Swaziland).
- Songimvelo-Malolotja TFCA (South Africa/Swaziland).

Lubombo boasts the first marine transfrontier conservation area (TFCA) in Africa, the Ponta do Ouro-Kosi Bay TFCA. In March 2016, the cross-border cooperative efforts between the Ponta do Ouro Partial Marine Reserve in Mozambique and the iSimangaliso Wetland Park in South Africa, saw a gill net measuring 20 x 3 metres removed from the ocean, where it had been trapping marine life.

A number of projects are taking place to develop Maputo Special Reserve and the Ponta do Ouro Partial Marine Reserve, whilst benefiting local communities in South Africa and in Mozambique.

4.2.4 Provincial Spatial Development Framework (PSDF)

The Provincial SDF demarcates the iSimangaliso Wetland Park as an area in need of intervention in terms of which the activity is suitable (PSDF, 2011).

4.2.5 Urban Edge/Edge of Built Environment for the Area

The site falls within an area zoned for development and tourism (outside of the urban edge). Cape Vidal Bhangazi is located on the eastern side of Lake Bhangazi South, inland of the Cape Vidal dunes, on the Eastern Shores of Lake St Lucia, in the iSimangaliso Wetland Park. The Concession Area of approximately 9 ha, comprises indigenous forest and grassland fringing a small bay within Lake Bhangazi South and within a low-density zone.

4.2.6 Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality

iSimangaliso falls within the boundaries of uMkhanyakude District Municipality (DC27). The site is zoned Low Density and lies adjacent to a Wilderness area. The Bhangazi Heritage Site is part of the Eastern Shores land claim settlement. Development rights to a portion of land, which comprises the Bhangazi Heritage Site south-east of Bhangazi Lake have also been granted. The institution formed by the claimants is the Bhangazi Community Trust.

The iSimangaliso Wetland Park: Integrated Management Plan (2017 – 2021) is purposed to create Africa's greatest conservation-based tourism destination driven by community empowerment.

There are no conflicts between the IDP and SDF of the uMkhanyakude District Municipality for the proposed activity. The objectives of the IDP include:

- Protecting the cultural heritage, environmental and rural assets, namely agricultural practices of the area;
- It will promote socio-economic investment and opportunities to the local community;
- The upgrading of areas that needs to be developed and restructured;
- Identifying areas of growth for future projects;
- Development of access roads, corridors and nodes; and
- Identifying areas with existing infrastructure capacity to support integration, densification, as a way of ensuring sustainable development.

4.2.7 Strategic Integrated Projects (SIPS)

Whilst not officially a SIP project, the development contributes to SIP 11, which includes the development of rural tourism infrastructure.

4.2.8 Principles and Guidelines for Control of Development Affecting Natural Forests

The stipulations of the Guidelines have been incorporated in the iSimangaliso Wetland Park Authority has an Integrated Management Plan (IMP) (2017 – 2021). In terms of the proposed development, Section 4.3 (e) of the Guidelines states that

> *"As with environmental impact assessment procedures, no development authorisation should be given to land uses that will significantly transform forests, save in proven exceptional cases of national or provincial strategic importance where no alternatives are available. Where low-impact eco-tourist facilities …and activities are authorized, these must be placed in the least sensitive parts of the forest, and care must be taken to limit the impacts. Development footprints must be limited, building or structure design and colour must blend with the forest, forest canopies must be kept intact, structures should be placed on*

stilts, and heavily used walkways should be placed on boardwalks to prevent soil compaction…"

Measures have been taken with regards to optimise the layout (Figure 2-2 of this BAR) to strategically use the already disturbed areas in the project site so as to minimise the impact. This is in line with the an iSimangaliso Integrated Management Plan as well as the comments received from DAFF received in 2019/2020. In addition, a
vegetation survey was also conducted to identify the potential trees to be affected and recommendations were made to reduce the size of the accommodation units and their footprint as far as practicable (see Annex E). The vegetation study also states that although this development will result in some loss of forest trees, the forest will certainly not be destroyed. Apart from some understory clearing, the understory is expected recover fully within a few years, (provided the structures are on elevated platforms, made of wood, and all paths in the forest consist of elevated boardwalks).

It is envisaged that the construction process will be in line with international best practise guiding development within areas such as Bhangazi. One such example is the erection of support structures for boardwalks and the placement of service lines. Guides such as the South African Wood Preservers Association (SAWPA)'s Timber Decking Substructure Regulations and Preservative Treatment guidance note (July 2018), and the United States Department of Agriculture (USDA)'s Forest Service's Wetland Trail Design and Construction (2007) will be followed when erecting such structures. In addition, the final positioning will be determined prior to construction, on the advice of the Forest Vegetation Specialist. This is also to ensure that the concerns raised by I&APs, around construction within the forest, are addressed during project implementation.

Furthermore, having taken into account the stipulations of the DAFF Policy Principles and Guidelines for Control of Development Affecting Natural Forests (2010), as well as the findings of the vegetation survey, the following considerations have been put forward:

- Small pockets of open land in the forest have been identified to develop accommodation units, under the forest canopy, nestled within existing trees.

- It has been proposed that the accommodation be developed on safari tents on raised timber decks.

- Raised boardwalks will be established as walkways all in an effort to minimise the impacts.

5 *BIOPHYSICAL AND SOCIO-ECONOMIC BASELINE*

This *Chapter* provides a description of the existing biophysical and socio-economic environment within which the proposed Project will be located.

The baseline conditions are in many instances described at a regional or national level since they are largely based on secondary data. This is largely derived from published sources, secondary data sourced from publicly available EIA reports as well as published journal articles and online sources.

5.1 BIOPHYSICAL BASELINE

5.1.1 Climate and Meteorology

iSimangaliso falls within the subtropical climatic zone of Africa. The warming influence of the Agulhas current plays a significant role in moderating temperatures between summer and winter, as well as between daily minimum and maximum temperatures. This climate zone is characterised by hot summers (e.g. a maximum recorded temperature of 45 °C at the uMkhuze weather station) and mild winters, with intermittent cold spells (e.g. a minimum recorded temperature of 5.5 °C at the uMkhuze weather station) caused by the passage of cold fronts from the Antarctic region.

The region has high relative humidity, exceeding 90% for most of the year (iSimangaliso Wetland Park Authority, 2017 – 2021). This, coupled with the hot summer temperatures, results in a relatively high discomfort index during the summer months, especially from January to March. However, being a coastal area, this is often offset by prevailing north-easterly winds that blow parallel to the coast for much of the year, peaking in August and dipping in May (iSimangaliso Wetland Park Authority, 2011).

About 60% of the rainfall in the area occurs during the spring and summer months (September to March). Rainfall is highest from January to March and lowest from May to September. As it is common and expected in subtropical regions, rainfall is highly relative in this area both temporarily and spatially. Tropical cyclones moving down the Mozambique Channel result in occasional floods. A steep declining gradient can be noted from the east to the west of the Park, with a mean annual rainfall of 1,200 mm at Cape Vidal on the coast, 650 mm at uMkhuze in the far west, and rising to 800 mm in the Lubombo Mountains (iSimangaliso Wetland Park Authority, 2011 and 2017 – 2021).

Evaporation rates are high, especially during the drier winter and early spring periods. The annual average evaporation in the coastal zone is approximately 1,300 mm, ranging from 160 mm in January to 60 mm in June. In the drier interior, the annual average is 1,660 mm, ranging from 190 mm in January to about 80 mm in June (iSimangaliso Wetland Park Authority, 2011).

5.1.2 Elevation and Topography

The site is at an elevation of 40 metres above mean sea level (m amsl) while the dune crest is at 155 m amsl or 130 m amsl on Google Earth.

The topography of the development site consists of a gentle slope, rising up from the shore of Lake Bhangazi South and its associated wetlands, to the foot of the high dune cordon which runs parallel to the beach.

5.1.3 Geology and Soils

According to the 1:250 000 Geological Map 27½32 St Lucia, the area is underlain by Quaternary and recent unconsolidated sedimentary deposits comprising redistributed aeolian sand, dune cordon sand and alluvial/ lacustrine deposits. At depth these are likely to be underlain by Cretaceous sedimentary rocks of the Zululand Group.

The peripheral deposits around the Lake Bhangazi South are likely to comprise dark coloured, organic sand and silt, abruptly transforming with increasing elevation just below the site boundary to beige/ buff to greyish brown, fine to medium grained sand. Continuing eastwards with increasing elevation the geology changes to red-brown, clayey silty sand of the Berea Formation, which forms the dune cordon running parallel to the coastline. The proposed development is expected to straddle both redistributed aeolian sand on the lower western side and the Berea Formation on the higher eastern side of the site.

The redistributed aeolian sand prevails as a consistent, non-cohesive, inert, fine to medium grained sand with a very loose consistency, high porosity and a natural angle of repose of about 27^0 to 30^0. It requires densification in foundations and subgrades to pre-induce collapse settlement and to increase its bearing strength. It requires stabilisation and retention in slopes and acts as a running sand if not retained in slopes steeper than its angle of repose. In retrospect following treatment it is capable of sustaining relatively high bearing pressures and is non-active.

5.1.4 Hydrology

Lake Bhangazi South is a freshwater lake located in an area of low relief in a large depression in close vicinity to, and on the landward side of the coastal dune barrier. The lake receives some of its water from a relatively small catchment, where replenishment is largely from ground water seepage. The lake is nutrient-poor because of the predominantly sandy, leached nature of the substrate. Bhangazi South is approximately 250 ha in extent and has a mean depth of 4 to 5 m (iSimangaliso Wetland Park Authority, 2011). The Lake is situated at the northern extremity of the Mfabeni Depression, which is on average about 8 m amsl, and drains southwards into Lake St Lucia via the Mfabeni Depression and the Nkazana stream.

5.1.5 Hydrogeology

There are two primary porosity aquifers present on the Maputaland coastal plain (iSimangaliso Wetland Park Authority, 2011). These are:

- The shallow, unconfined aquifer or perched water table that exists in the portions of the Park that have a rainfall higher than 800 mm.

- The deeper confined aquifer of the Uloa and Mkwelane Formations.

The shallower aquifer is present due to the high infiltration and permeability of the KwaMbonambi sand cover of the coastal plain, which overlies the less permeable Port Durnford Formation. Rainfall percolates through the more permeable KwaMbonambi Formation until it reaches the less permeable Port Durnford Formation. It moves laterally to exit the aquifer in interdune depression pans, ponds and streams. The water table usually occurs at a depth of 1 – 6 m below ground level and is fairly extensively exploited for domestic and stock-watering purposes by means of shallow unlined and lined wells.

The deep aquifer contains a considerable amount of groundwater, but how it is recharged is unknown. Due to its depth of occurrence and the relatively high cost of installing the screen well systems necessary to exploit it, it has, to date, not been utilised to any great extent.

5.1.6 Biodiversity

Overview

Lake Bhangazi South is the only permanent fresh water resource in the area. The area provides an extremely important habitat for a number of plant and animal species, including hippos and crocodiles. The vegetation in the area consists primarily of coastal forest and secondary grasslands, providing habitat for many birds and other fauna, including the endangered Red Duiker and Samango Monkey, which breed in this area. To the south of the Bhangazi Heritage Site, separating the lake from the Mfabeni swamp is a berm, a unique geomorphological feature of high ecological importance, which is also unique in the KwaZulu-Natal coastal section of Maputaland.

The vegetation along this berm has a range of Sand Forest elements that do not usually occur in the coastal Lowland Forest and Dune Forests to the east of the whole area. Furthermore, it shows a unique combination of dune, coast and sand forest elements (dry and wet), a few species of which do not extend any further southwards. Amongst the plants that have become established on this berm are several large trees, some of which are estimated to be several hundred years old, such as the group of large *Cleistanthus schlecteri* (Umzithi, False Tamboti) trees that are more common in sand forests further north, extending into Mozambique. There are several other unexpected floral

components, some of which reach their natural limit of known distribution. Epiphytic orchids are also present on some of the tree species.

Flora

The natural vegetation in which the proposed lodge is to be situated consists primarily of Northern Coastal Forest (Foz 7) according to Mucina and Rutherford (2006). The general distribution of this vegetation type is primarily within KwaZulu-Natal (with a very small extent in the Eastern Cape) along the Indian Ocean coastline.

The vegetation and landscape features of the vegetation type are characterised by species-rich, tall to medium-high subtropical coastal forests occurring on the rolling coastal plains and stabilised coastal dunes. The forests on the coastal plains are dominated by *Drypetes natalensis*, *Englerophytum natalense*, *Albizia adianthifolia*, *Diospyros inhacaensis*, etc. The low-tree and shrubby understoreys are species-rich and contain many taxa of (sub) tropical origin. The forests on the stabilised dunes contain well established tree, shrub and herb layers. Herbaceous vines and woody climbers are important structural determinants in these forests.

Scott-Shaw (2011) recognises eight sub-types of this forest type and all are classified as being either "Endangered" or "Critically Endangered". Two of these forest types are present on the dunes in the vicinity of the study site. These are Maputaland Moist Coastal Lowlands Forest and Maputaland Dune Forest. The actual proposed development site is in the former.

The iSimangaliso Wetland Park lies within the Maputaland Centre of Endemism (van Wyk and Smith, 2001) which, in turn is a part of the Maputaland-Pondoland-Albany Biodiversity Hotspot. The iSimangaliso Wetland Park Integrated Management Plan (2000), states that 2185 plant species have been recorded in the Park. These represent 9% of the flora of South Africa and 31% of the flora of KwaZulu-Natal. A total of 44 species are endemic to the region and three species are known to occur only within the Park. It is not known if these species occur within the study site (Eco-Logic Consultants, 2018).

Within the development site itself, four species which are protected in terms of the National Forests Act (Act No. 84 of 1998) were identified, namely, White-milkwood (*Sideroxylon inerme*), Coast Red-milkwood (*Mimusops caffra*), Marula (*Sclerocarya birrea*) and Swamp Fig (*Ficus trichopoda*). Alien tree species were only present in very low numbers. There are the remains of an old garden with Coconut Palms (*Cocos nucifera*), mango trees (*Mangifera indica*), and Bouganvillea (*Bougainvillea* spp.) present. Small stands of Chromolaena (*Chromolaena odorata*) are scattered throughout the area but at generally low densities.

There are also a number of protected trees which may occur within the greater project area. These have been detailed in the table below.

Table 5-1 Protected Trees that may Potentially Occur within the Greater Project Area, with Conservation Status (Eco-Logic Consulting, 2018)

Scientific Name	Common Name	Conservation Status
Warburgia salutaris	Pepper-bark tree	Endangered
Prunus africana	Red stinkwood	Vulnerable
Pittosporum viridiflorum	Cheese wood	Least Concern
Podocarpus falcatus	Yellow wood	Least Concern
Cleistanthus schlectheri	False tamboti	Least Concern

Although none of the plants listed in Table 5-2 were positively identified to occur within the project site, based on their occurrence within similar vegetation types, or plant distribution modelling (SANBI, 2017), there is a small possibility that some may occur in, or near the project site.

Table 5-2 Rare Plants occurring within the Broader Lake Bhangazi Area, Based on Forest Type[1]

Forest Type	Species	Endemic	Status	Trend
KwaZulu-Natal Coastal	*Elaeodendron croceum*	No	LC	Declining
KwaZulu-Natal Dune	*Adenia gummifera*	No	NT	Declining
KwaZulu-Natal Dune	*Vanilla roscheri*	No	NT	Declining
KwaZulu-Natal Dune	*Elaeodendron croceum*	No	LC	Declining
Licuati Sand	*Newtonia hildebrandtii*	No	LC	Declining
Licuati Sand	*Combretum mkuzense*	No	NT	
Swamp	*Raphia australis*	No	VU	
KwaZulu-Natal Dune	*Aloe thraskii*	SA	NT	
KwaZulu-Natal Dune	*Bonatea lamprophylla*	SA	VU	
KwaZulu-Natal Dune	*Didymoplexis verrucosa*	SA	VU	

Table 5-3 Rare Plants potentially occurring within the Quarter Degree Square of Lake Bhangazi Area[2]

Scientific Name	Conservation Status
Brachystelma vahrmeijeri	Endangered
Didimoplexus verrucosa	?
Knipofia leucocephala	Critically Endangered
Searsia kwazuluana	Vulnerable
Warburgia salutaris	Endangered

[1] from Berliner, D.D. (2009). *Systematic conservation planning for South Africa's forest biome: An assessment of the conservation status of South Africa's forests and recommendations for their conservation*. Doctoral thesis, University of Cape Town.

[2] Using rare plant distribution modelling done by SANBI

Fauna

As indicated in Section 5.1.6, Lake Bhangazi South provides an extremely important habitat for a number of animal species (including hippo and crocodiles), while the coastal forest and secondary grasslands provide habitat for many birds and other fauna, including the endangered Red Duiker and Samango Monkey, which breed in this area.

A large number of birds have been recorded in the iSimangaliso Wetland Park, with numerous Red Data bird species present, but this must be viewed in the context of the development area. The core area of the proposed development is coastal forest, with only three of the Red Data listed species depending upon it, namely the Spotted Ground-Thrush, African Broadbill and Woodwards' Batis. The latter two are resident; the thrush is a non-breeding winter visitor, and then only in transit.

The buffer area around the development site is primarily a mosaic of seasonal marsh and grassland. This is used by all the other Red Data listed species to varying degrees. The specialist wet grassland species are the African Grass-Owl, Swamp Nightjar, African Marsh-Harrier, Lesser Jacana, Woolly-necked Stork and Rosy-throated Longclaw. The remaining Red Data listed species do not rely on the mosaic, but can, and usually do, use open water (the Saddle-billed Stork, Caspian Tern, Yellow-billed Stork), dry grassland (the Denham's Bustard, Black-bellied Bustard), or are flexible depending upon current local conditions (the Southern Banded Snake-Eagle, Martial Eagle, African Crowned Eagle).

Other species, like the Pel's Fishing-Owl, are only transient at best, being reliant upon tall trees overlooking permanent water.

The Eastern Shores (Mfabeni) area of Lake St Lucia is known to be particularly rich in butterfly diversity as a consequence of the wide variety of habitat types. While only five butterfly species (all common) were recorded during the biodiversity study field work, it is anticipated that more species occur in the development area.

Wetlands

Wetlands were found to occur only in the lowest lying areas of the site. Any surface (rain) water in this area percolates into the soil and down to the groundwater body which, although dynamic and variable with climatic conditions (R. Taylor, pers. Comm.), is always too deep to allow wetland vegetation to establish.

It was found that the vegetation in the wetlands was significantly altered from what would be anticipated under more normal conditions. In some places, trees had been able grow to a height of approximately two metres. Species

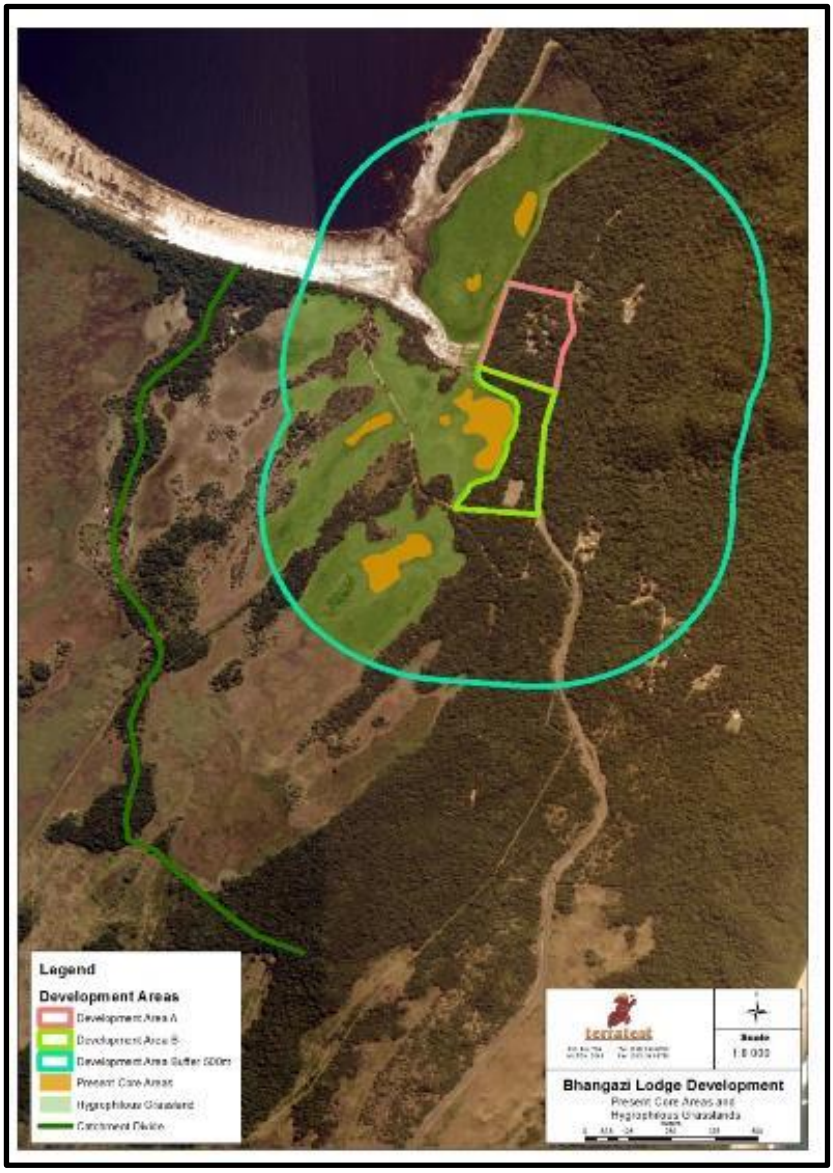
observed to have done this included *Acacia kosiensis* and *Brachylaena discolor*. Their presence is indicative of the long dry period that has been experienced.

While no trace of aquatic macrophytes was found, in some of the wetlands are areas of dead or dormant emergent species such as *Phragmites australis*, *A. mauritianus*, *Persicaria senegalensis*, *Cyperus fastigiatus* and *Scleria poiformis*. Elsewhere, *Eleocharis limosa*, *Pycreus* spp., *Kyllinga* spp., *Juncus kraussii*, and *Cyperus* spp. Were scattered throughout a grass sward which was often grazed to a flat lawn-like condition by a variety of large herbivores including hippopotamus, buffalo, waterbuck, and reedbuck. Grasses noted included *Cynodon dactylon* and *Stenotaphrum secundatum*.

It was noted that the line of transition between the forests, which dominate the eastern side of the study area, and the wetland areas, is remarkably sharp in most places. Elsewhere, where soil slopes are more gradual, the ecotone is wider and less obvious. However, it is clear that the tall trees do not tolerate the conditions in the wetland basins and so a zone of wetland influence is indicated. Since the soils in this area are pale coloured, it is apparent that it is seldom, if ever, wet for long enough for organic material to accumulate and thus a hygrophilous grassland is indicated. This blends downwards to what, in normal climatic conditions, would be true wetland dominated by wetland obligate species.

The biodiversity and wetland study identified small areas of wetland within and surrounding the development site. Six small patches, with a total area of 4.18 ha were found and two of these, with a total area of 0.58 ha were within the backwater basin of the lake (Figure 5-1). All the area around these patches, but within the study area, was designated as hygrophilous grassland.

Figure 5-1 Observed Present Core Wetland Patches and Hygrophilous Wetlands within the Study Area



Source: Terratest, 2016

5.1.7 Vegetation

The Park is located at the southern end of the Maputaland Centre of Plant Endemism, part of the Maputaland-Pondoland-Albany biodiversity hotspot. There is enormous diversity of habitat and vegetation types within the iSimangaliso Wetland Park. Mucina and Rutherford (2006) classify the main forest types around Lake Bhangazi as Northern Coastal Forest (Foz 7) and Northern Dune forests (Azd4).

Figure 5-2 the natural vegetation in which the proposed Lodge is to be developed, which consists primarily of Northern Coastal Forest (Foz 7), according to Mucina and Rutherford (2006).

Figure 5-2 ***The Natural Vegetation in which the proposed Lodge is to be developed (Mucina and Rutherford, 2006)***

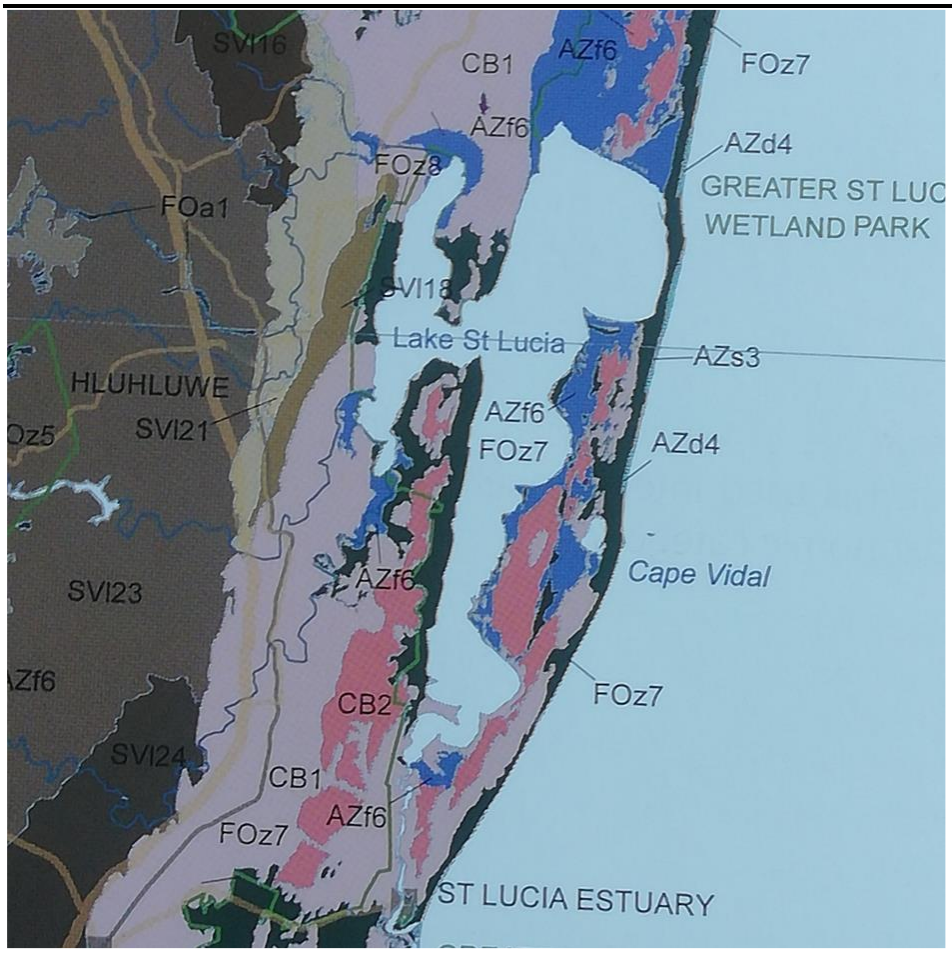


Figure 5-3 shows the habitat and vegetation types within the Lake Bhangazi study area, as follows: Maputaland Dune Forest (Back Ground) Low Land Coastal Forest (middle right, where lodge accommodation is planned); Hydrophilic Grassland- Scrub, (Foreground) and Subtropical Freshwater Lake

Figure 5-3 Habitat and Vegetation Types Within the Lake Bhangazi Study Area:

Source: Eco-Logic Consultants, 2018

Tall and short hydrophilic grasslands

These habitats may be dynamic and change according to fluctuating water levels, fire and herbivory, they include grasses, sedges, reeds, and shrubs (Eco-Logic Consulting, 2018).

Transition zones and ecotones

The line of transition between the forests, and the wetland areas, are remarkably sharp. With dominant forest edge species such as Brachylaena discolor, Vepris lanceolate, and Albizia adianthifolia the forest margin is clearly healthy and intact. Occasional inundation of the grasslands adjacent to the forest, as well as occasional fires, prevents establishment of trees in this zone. Since the soils are pale and sandy, it is apparent that it is seldom, if ever, wet for long enough for organic material to accumulate and thus this ecotone between the forest and the lake consists of hygrophilous grasslands, rather than a wetland. These grasslands form a transition zone between the forests and the true wetlands around the lake edges (Eco-Logic Consulting, 2018).

Dune forests

Von Maltitz et. Al. (2003) classifies this forest type as KwaZulu-Natal dune forests and are described as shrubby thicket to tall forest occurring along the KwaZulu-Natal coastline on the primary dune cordon inland from salt spray zone. These forests show a distinct gradient of change from the beach to the landward side of the dunes. The forest types are characterised by sandy substrata, rolling dune field topography, strong winds and adjacent to ocean beaches. Multi-stemming common and herb layer dominated by Isoglossa woodii. These are species rich forests with many tropical and subtropical

species reaching their southern distribution limits along north-south gradient (Eco-Logic Consulting, 2018).

Two main gradients are found in the dune area, a gradient from the coast inwards and a gradient from mature to secondary stands. High forest communities of mature stands are dominated by Sideroxylon inerme and are about 16 m in height. By contrast coastal thicket is dominated by Euclea schimperi and Eugenia capensis and is only a few meters tall. Multistemmed trees are the norm in the project area (Eco-Logic Consulting, 2018).

Natural disturbances include dramatic storms during summer, as well as fire, wind, and slumping of unstable dune sand substrate. The high degree of salt spray and strong winds help to shape the structure and species composition of the dune forest. Potential recruitment bottlenecks and arrested succession are caused by dominant herb layer (esp. Isoglossa woodii). Slash and burn agriculture has played an important role in the current community structures, and more recently dune mining is a major man induced disturbance to this vegetation type (Eco-Logic Consulting, 2018).

Northern Coastal Forest

Von Maltitz et. Al (2003) classifies the forest type where the lodge accommodation is planned as 'KwaZulu-Natal Coastal Forests', while Scots-Shaw (2011) refers to them as 'Maputaland Moist Coastal Lowlands Forest' and has listed them as being "Endangered". They are described by Von Maltitz *et. Al*, (2003) as "medium to tall, species rich forest closely associated with the flat to rolling topography of the coastal lowlands of KwaZulu-Natal in form of small-sized patches – remnants of formerly dominating vegetation type of the region. These forests occur in the immediate hinterland of coastal dunes or on free-draining deep sands of the Maputaland coastal plain. Many tropical species reach their southern distribution along the affected range.

Typically dominating canopy and sub-canopy layers are found in trees such as *Albizia adianthifolia, Dyospyros inhacaensis, Drypetes arguta, Dyospyros natalensis, Englerophytum natalense, Protorhus longifolia, Teclea gerradii Manilkara concolor*. Shrub layer and synusiae of climbers are well developed, dense and rich in subtropical elements (Eco-Logic Consulting, 2018).

Iron-age farmers cleared much of the forest for agriculture. At present, they are highly susceptible to alien plant invasion, of concern in many areas is *Chromolaena odorata*. Other disturbance events include fire, large animals, cyclones and tornadoes (Eco-Logic Consulting, 2018).

The Integrity of the Vegetation Communities

The disturbed areas on the ridge consist of open areas and buildings situated amongst large mature trees, this is the site where the old Bhangazi fisherman's camp was located.

The forest below is in good condition, showing very little signs of recent human disturbance, however, from a closer look under the canopy, it is apparent that human disturbance occurred some time back. This can be seen in the form of clearings made in the undergrowth, probably for camp sites. There are also several strange concrete and brick structures, including slabs, and a circular structure that may have been used for water storage, situated close to the big forest fig, where the main complex is planned.
Alien plant infestation is very low, although a few individuals of two species of invasive alien plants were seen within the forest, these include, *Chromeleana oderata*, and *Caesalpinia pulcherrima*.

The forest margins along the north-eastern fringe of the forest, facing the lake, are intact and in good condition (see Figure 5-4).

Figure 5-4 Intact and Healthy Forest Margins

Source: Eco-Logic Consultants, 2018

The forest canopy, beneath where the lodge accommodation is planned, is 85-95 % intact. There are a few gaps, indicating possibly some historical disturbance associated with the camp site. There are numerous paths in the undergrowth made by, and still used by, hippos. There is also evidence of past human presence in the forest, as old litter such as old glass bottles, plastic and other non-degradable rubbish occur in a few places, supporting the idea that the forest may have been used as a camp site in the past.

Of interest, is the age of these coastal forests. The presence of well-established woodland species within the forest, such as *Sclerocarya birre, Ziziphus 56ucronate,* and *Acacia kosiensis*, more typical of woodlands and savannahs,

than coastal forest, and the absence of many very large trees, seem to imply that these forests are of relatively recent origin, and that this area may have been a woodland prior to a forest (Eco-Logic Consultants). It is known that the extent of coastal and dune forest of the North coast have undergone significant changes during iron age hunter gatherer times, as well as more recently during the colonial period of forest exploitation and removal of local populations. For example, Weisser & Marques, (1979), have shown, using air-photos, that the coastal strip between Richards Bay and the Mfolozi River, was mature Acacia karroo Woodlands in 1937, but was replaced by Secondary Dune Forest by 1974.

The causes of these changes probably lie in changes in human impacts brought about by the assumption of control of the area by the Department of Forestry from about 1949. Under this and later the apartheid regime local populations were forced out of the area, resulting in a decline in livestock, a decline in fires and a halt to clearing for cultivation, thus allowing forest succession (Eco-Logic Consultants, 2018).

5.2 SOCIO-ECONOMIC BASELINE

The region surrounding iSimangaliso was previously divided into pockets of the former KwaZulu homeland interspersed with the former province of Natal, and different legislation, policies and development parameters applied to each (iSimangaliso Wetland Park Authority, 2011). This contributed to the development of distinct socio-economic and demographic patterns.

Important features are as follows:

- Land in the former Natal districts is generally held in terms of freehold tenure and is well developed in terms of physical and economic infrastructure.

- The former KwaZulu districts are, in contrast, generally poorly developed and fall under a traditional, communal land tenure system.

iSimangaliso falls almost entirely within the uMkhanyakude District Municipality (DC 27). The main socio-economic characteristics within the District Municipality are (iSimangaliso Wetland Park Authority IMP, 2017):

- The area is the second poorest and most deprived municipality in the country.

- The surrounding districts have a population of 676,810.

- Over 80% of households live below the poverty line and an estimated 13% of the economically active population is formally employed.

- 25.4% of citizens who are 20 years and older have matric and 4.9% have higher education.

- The unemployment rate is 42.8%.

- HIV/AIDS prevalence is between 13 and 15%.

- Much of Umkhanyakude is characterised by remote but densely settled and poorly serviced communities.

- The following development inputs are urgently needed:

    - poverty alleviation;
    - job creation and local economic development;
    - water and sanitation;
    - electricity;
    - health services;
    - roads and public transport;
    - infrastructure; and
    - social services.

- The social impacts of migrancy remain strong as many households are female-headed, or headed by orphaned children.

- The area has a history of poverty, neglect and dispossession, stemming as far back as the creation of 'native reserves' during the colonial period, and later, the establishment of ethnic Bantustans, or homelands by the apartheid government. These periods were attended by widespread and very significant loss of land, and the start of the migrant labour system, through which the absence of men, and their inability to contribute to economic development at home, forced poverty and stagnation upon rural areas.

5.2.1 Archaeological and Cultural Heritage

A cultural heritage survey of the proposed lodge site located no sites of heritage significance within the footprint. However, it is important to note that the footprint is situated in a greater landscape that is of cultural, political and religious significance to the Bhangazi community that was removed from the area during the 1950s and 1970s. Although mostly masked by natural vegetation, these ancestral lands contain numerous graves, and old homestead locations as well as natural features that are memorialised in the oral traditions and collective memory of community members. Many of these sites have "living heritage" status and form part of a greater cultural landscape that most probably covers the whole Eastern Shores area.

5.2.2 Access and Traffic

There is one existing access point to the Cape Vidal area. It is anticipated that this access point will continue to serve the development site. The existing

access road to the Bhangazi Heritage Site is along the access road towards Cape Vidal (refer to the Figure 5-5 for an illustration of the existing road network).

Figure 5-5 Existing Road Network

The site is accessible via the Bhangazi Gate of the iSimangaliso Wetland Park, along the main tarred road leading to Cape Vidal. The main entrance and exit point as indicated in Figure 5-5 will exclusively serve the guests to the development site. Service/delivery vehicles will exclusively use the entrance/exit marked "A" as well. The access gate to Cape Vidal is via an unnamed road which is 2.6 km from the town of St Lucia. This unnamed road has one lane in each direction and in some sections, it has a narrow shoulder and in others, a gravel shoulder.

Traffic in the area is limited by the Park Rules which govern the maximum number of vehicles permitted entry into the Park on a daily basis. The lodge will therefore not increase the current traffic levels but will draw from the traffic already permitted to enter the Park.

Refer to Annex E for Traffic Impact Statement which outlines the following key conclusions from this specialist study:

- It is anticipated that the proposed development will not generate a substantial number of trips.

- The intersection analysed operates satisfactorily with no approach worse than Level of Service (LOS) B before and after the development generated traffic has been added.

- The adjacent road network will be able to accommodate the trips generated by the proposed development.
- Two access points will serve the development site, one for the guests and one for the service/delivery vehicles.

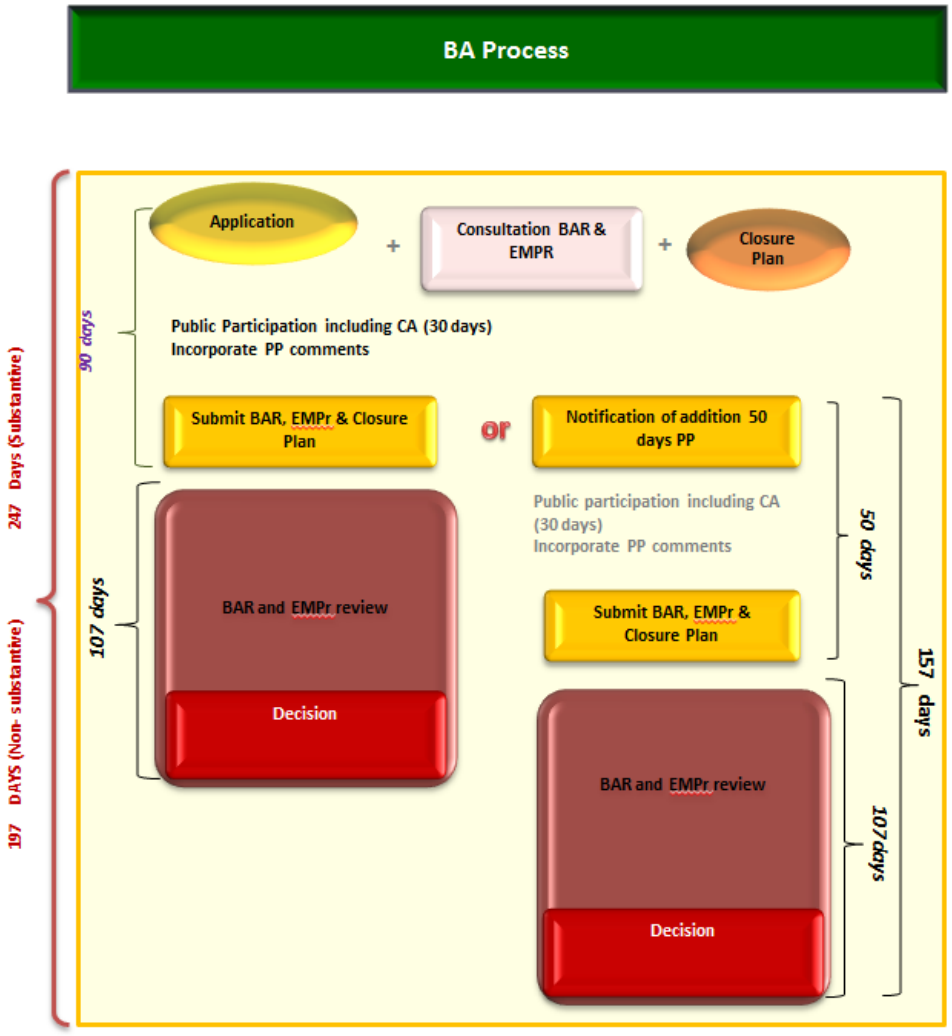
- In total at least, 30 and 10 parking bays should be provided on site to meet the parking demand for the rooms and restaurant, respectively.

6 *BASIC ASSESSMENT PROCESS*

A BA is a systematic process that identifies and evaluates the potential impacts a proposed Project may have on the physical, biological, chemical, and social environment, and develops mitigation measures that will be incorporated in order to eliminate, minimise or reduce these impacts.

As described in *Chapter 4*, the process is prescribed by the EIA Regulations of NEMA. The process and schedule for conducting a BA under these regulations is shown schematically in Figure 6-1.

Figure 6-1 Overview of the Basic Assessment Process



This *Chapter* outlines steps that have been completed as part of the BA process thus far and activities that are proposed for the next phases of the BA process.

6.1 OBJECTIVES OF THE BASIC ASSESSMENT PROCESS

The objective of the basic assessment process is to, through a consultative process—

a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;

b) identify the alternatives considered, including the activity, location, and technology alternatives;

c) describe the need and desirability of the proposed alternatives;

d) undertake an impact and risk assessment process inclusive of cumulative impacts. Additionally, the process should be focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations. It should also investigate the risk of impact of the proposed activity and technology alternatives on these aspects to determine:

   i. the nature, significance, consequence, extent, duration, and probability of the impacts occurring; and
   ii. the degree to which these impacts—
      - can be reversed;
      - may cause irreplaceable loss of resources; and
      - can be managed, avoided or mitigated;

e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
   i. Identify and motivate a preferred site, activity and technology alternative;
   ii. Identify suitable measures to manage, avoid or mitigate identified impacts; and
   iii. Identify residual risks that need to be managed and monitored.

6.2 SITE VISIT

Per communication with the DFFE at a pre-application meeting held on 1 July 2021, the need for a site visit will be confirmed upon the DFFE's review of the draft BAR.

6.3 PPP UNDER COVID-19 LOCKDOWN REGULATIONS

On 5 June 2020, the Minister of DFFE issued Directions[1] regarding measures to address, prevent and combat the spread of COVID-19 relating to National Environmental Management Permits and Licences. The purpose of these Directions is to limit the threat posed by the COVID-19 Pandemic, as well as to alleviate, contain and minimise the effects of the National State of Disaster. This is particularly relevant to environmental licencing and associated public participation processes.

In accordance with Annexure 3 of the Directions, a Public Participation Plan is required prior to the submission of an EA. The purpose of PPP document is to present the Public Participation Plan for the Project to the competent authority, i.e. DFFE. The Public Participation Plan must be agreed to, and approved by, the CA prior to the application being submitted. The EAP received approval for the Plan on 13 July 2021

NOTE: The BAR and supporting documents has only been made available on soft copy- via the project website and upon request from I&APs. This is to ensure that the necessary safety precautions are in place in light of the latest lockdown adjusted level 4 restrictions (as announced by the South African Presidency on 27 June 2021).

Please refer to Annex C for the approved Public Participation Plan.

6.4 SPECIALIST STUDIES

6.4.1 Scope of work and objectives for each specialist study

Detailed in the table below are the individual terms of reference (ToR) required for each specialist study that was commissioned in support of the BA. Apart from complying with Annex 6 of the NEMA EIA Regulations, all specialist studies were required to comply with the terms of the iSimangaliso Wetland Park Authority's internal rules.

Table 6-1 Specialist Study ToR

Specialist Field	Objectives and Scope of work
Cultural and heritage	**Objectives:** • Assist in defining possible cultural and heritage related constraints and benefits associated with the proposed lodge development. • Determine the potential cultural and heritage indirect, direct and cumulative risks/impacts to receptors for the project. • Advise on mitigation measures for identified significant risks/impacts and measures to enhance positive opportunities/impacts of the project.

[1] Disaster Management Act (57/2002): Directions Regarding Measures to Address, Prevent and Combat the Spread of COVID-19 Relating to National Environmental Management Permits and Licences (5 June 2020).

Specialist Field	Objectives and Scope of work
	Scope of work: • Desktop review of the available information and review of available mapping. • Physical survey of lodge development site to identify the presence of cultural heritage sites and their importance. Prepare a baseline environment description for the specialist report. • Identify cultural and heritage impacts associated with the proposed development. • Provide input into the comments and responses report to be prepared as part of the stakeholder engagement activities during the Basic Assessment process, if required. • Undertake an impact assessment according to ERM's standard impact assessment methodology • Document results of the impact assessment including proposed mitigation and/ or enhancement measures. • Input into the environmental management programme as per the format to be prescribed by ERM.
Biodiversity & Wetlands	**Objectives:** • Assist in defining possible biodiversity related constraints and benefits associated with the proposed development of the lodge. • Determine the potential biodiversity indirect, direct and cumulative risks/impacts to receptors for the project site. • Advise on mitigation measures for identified significant risks/impacts and measures to enhance positive opportunities/impacts of the project. **Scope of work:** • Collection of available baseline biodiversity data to establish the biodiversity value of the site location and immediate surroundings, particularly hotspots where biodiversity is concentrated and / or where populations of threatened species, Red Data Species, conservation worthy species, medicinal plants and critical habitats are confirmed to occur. If any of these occur on the proposed site, they will be mapped; • Identify and delineate all wetlands within a 500m radius of the development site (these will be mapped). • Determine the impacts (extent, significance, duration of impact) that the proposed development will have on these wetlands; • Physical survey of the lodge development site to identify sensitive biodiversity habitats or species; • Prepare a baseline environment description of the site including a description of fauna, flora and wetlands (including mapping); • Identify ecological impacts associated with the proposed lodge development. • Provide input into the comments and responses report to be prepared as part of the stakeholder engagement activities during the Basic Assessment process, if required; • Undertake an impact assessment according to ERM's standard impact assessment methodology; • Document results of the impact assessment including proposed mitigation; • Input into the environmental management programme as per the format to be prescribed by ERM.
Geotechnical	**Objectives** • Determine the suitability of the geological founding conditions of the site in terms of developing the lodge and associated sewage treatment plant. **Scope of work** • The desktop geotechnical assessment will consider the suitability of the geological founding conditions of the site for the construction of the lodge and proposed sewage treatment package plant (details provided in separate documentation). • At a desktop level, provide high level recommendations for inclusion in possible foundation designs. • Prepare a desktop specialist report. • Provide input into the comments and responses report to be prepared as part of the stakeholder engagement activities during the Basic Assessment process, if

Specialist Field	Objectives and Scope of work
	required.
Engineering: Bulk Services	**Objectives:** • Determine the capacity of existing bulk services to the proposed lodge site, including water and electricity (self-contained sewage treatment package plant proposed) in terms of the requirements of the proposed lodge development. **Scope of work:** • Collection of available baseline data from relevant authorities to determine status of existing services (water and electricity) to the site; • Determine water and electricity requirements for the operation of the lodge; • Prepare a report outlining the status of the bulk services and whether any upgrades will be required for the operation of the lodge. • Provide input into the comments and responses report to be prepared as part of the stakeholder engagement activities during the Basic Assessment process, if required.

Traffic Impact Statement	**Objectives:**
	• Assist in defining possible traffic-related constraints associated with the proposed lodge development.
	• Advise on measures to address the traffic-related requirements and impacts of the project.
	
	Scope of Work:
	• Based on the National Department of Transport Manual for Traffic Impact Studies – Research Report RR 93/635 and given the expected number of trips to be generated, a Traffic Impact Statement (TISt) will be required.
	• The following aspects must form part of the TISt and are based on the standards and requirements of the National Department of Transport (NdoT):
	  • Site visit;
	  • Traffic counts at the affected intersection(s);
	  • Provide an overview of current traffic flow conditions in the vicinity of the proposed development;
	  • Assessment of the traffic impact on the current road network;
	  • Undertake a performance analysis of the affected intersection(s);
	  • Determine sight distance requirements;
	  • Determine site access requirements
	  • Propose road upgrades and mitigating measures, if required; and
	  • Prepare a draft Traffic Impact Statement report with findings and recommendations for comments and/or approval.
	• Provide input into the comments and responses report to be prepared as part of the stakeholder engagement activities during the Basic Assessment process, if required.

Visual Impact Assessment	**Objectives:** • Assist in defining possible visual constraints associated with the proposed lodge development. • Determine the potential environmental indirect, direct and cumulative risks/impacts to receptors (in this case the visual) for the project. • Advise on mitigation measures for identified significant risks/impacts and measures to enhance positive opportunities/impacts of the project. **Scope of Work:** • Review the information available from the ERM project team including drawings, GIS data sets, scoping documents and programmes. • Undertake a desktop Zones of Theoretical Visibility analysis (ZTV) (amended, as required, by on-site observations) highlighting the possible extent and intensity of visual impacts. • In addition to the ZTV analysis, possible visual receivers will be identified which will include; routes, individual view points and important areas from which views may be possible. These visual receivers will be attributed with relative importance subject to their nature. • From the above information, prepare a desk top scoping report that will highlight key areas of concern and recommend detailed methodology to be utilized at the assessment stage. • The following tasks will be completed during the assessment stage:

Specialist Field	Objectives and Scope of work
	• Confirm the areas of impact or ZTVs from additional ground truthing. • Define sensitivities to landscape change and the likely view typical viewpoints. • Explain and illustrate the nature of impacts. • Assess whether these are likely to have negative implications for the area in terms of possible change in landscape character. • Outline necessary mitigation measures. • Ground truthing of the ZTV with particular reference to adjusting mapping to take account of vegetation and / or inaccurate data. This might result in either amendment to mapping or in written qualification. • Preparation of a baseline landscape analysis indicating possible sensitivity to visual impacts. This will be prepared using either annotated aerial photography or background maps. • Taking typical images as an indication of landscape character and possible impacts. • Preparation of an assessment of the impacts of the change in view from the sensitive areas. In undertaking this, a degree of subjectivity is necessary, however, the descriptions will be kept as objective as possible. Ideally this will be backed up with images (Level 4 Assessment) in order that stakeholders and adjudicating officials can make their own judgment as to significance of impact. • Outline mitigation measures and assess likely success. • Provide input into the comments and responses report to be prepared as part of the stakeholder engagement activities during the Basic Assessment process, if required.
Forest Vegetation Study	**Objectives** • To highlight the quantity and species of trees that need to be trimmed or removed to accommodate the development; • To determine the impacts to the forest by the placement of the planned accommodation units within the forest (greenfield section) **Scope of Work** • Identify the number, size class and species of trees which fall within each of the open pockets where the units are proposed to be developed; • Identify trees which fall within the development area; • Describe the vegetation communities which were potentially impacted by the proposed lodge; • Assess the status of plant species of concern confirmed to occur in the study area, and comment on the likelihood of occurrence of other such species; • Assess the integrity of the vegetation communities, including current impacts and whether the vegetation is benefiting from the protection status of the area; • Determine whether the forest adjacent to lakeshore wetlands qualifies as Riparian Vegetation according to DAFF Wetland Delineation Guidelines, and is so, indicate Riparian Vegetation boundary; • Description of proposed project impacts on forests, and suggested mitigation measures; • Description of the number and types of trees that will be impacted by the proposed development (list >60 cm circumference). • Refining final position of the Lodge facilities and activities, in line with the discussions with DAFF around the current site layout. • Providing an education opinion to the forest-related concerns • Updating the impact assessment • Updating the specialist report to inform the Impact Assessment in the BAR, as well as the EMPr.

7 IMPACT ASSESSMENT METHODOLOGY

The purpose of the impact assessment is to identify and evaluate the likely significance of the potential impacts on identified receptors and resources. This will be done according to defined assessment criteria, to develop and describe measures that will be taken to avoid, minimize, reduce or compensate for any potential adverse environmental effects. Furthermore, it will be to report the significance of the residual impacts that remain following mitigation.

The methodology for detailed impact assessment is outlined below.

7.1 IMPACT IDENTIFICATION AND CHARACTERISATION

An 'impact' is any change to a resource or receptor brought about by the presence of a project component or by a project-related activity. In this assessment, the impacts are described in terms of their characteristics, including the impact's type and the impact's spatial and temporal features (namely extent, duration, scale and frequency). While an impact assessment typically focuses on the negative impacts, an impact can also be positive. The definitions of the terms used in this BA are described in *Table 7-1.*

Table 7-1 Impact Characteristics

Characteristic	Definition	Terms
Type	A descriptor indicating the relationship of the impact to the Project (in terms of cause and effect).	Direct – Impacts that result from a direct interaction between the Project and a resource/receptor (e.g., between occupation of a plot of land and the habitats which are affected). Indirect – Impacts that follow on from the direct interactions between the Project and its environment as a result of subsequent interactions within the environment (e.g. viability of a species population resulting from loss of part of a habitat as a result of the Project occupying a plot of land). Induced – Impacts that result from other activities (which are not part of the Project) that happen as a consequence of the Project. Cumulative – Impacts that arise as a result of an impact and effect from the Project interacting with those from another activity to create an additional impact and effect.
Duration	The time period over which a resource / receptor is affected.	Temporary – (period of less than 3 years - negligible/ pre-construction/ other) Short term – (period of less than 5 years i.e. production ramp up period) Long term – (period of more than 5 years and less than 19 years i.e. life of plant) Permanent – (a period that exceeds the life of plant – i.e. irreversible).

Extent	The reach of the impact (i.e. physical distance an impact will extend to)	On-site – impacts that are limited to the Project site. Local – impacts that are limited to the Project site and adjacent properties. Regional – impacts that are experienced at a regional scale, e.g. Gauteng. National – impacts that are experienced at a national scale. Trans-boundary/International – impacts that are experienced outside of South Africa.
Scale	Quantitative measure of the impact (e.g. the size of the area damaged or impacted, the fraction of a resource that is lost or affected, etc.).	Quantitative measures as applicable for the feature or resources affected.
Frequency	Measure of the constancy or periodicity of the impact.	No fixed designations; intended to be a numerical value or a qualitative description.

An additional characteristic that pertains to unplanned events (e.g. incidents, spills) is likelihood (*Table 7-2*). The likelihood of an unplanned event occurring is determined qualitatively, or when data are available, semi-quantitatively. Likelihood is estimated on the basis of experience and/or evidence that such an outcome has previously occurred. It is also important to distinguish that likelihood is a measure of the degree to which the unplanned event is expected to occur, not the degree to which an impact is expected to occur as a result of the unplanned event.

Table 7-2 Definitions for Likelihood

Likelihood	Definition
Unlikely	The event is unlikely but may occur at some time during normal operating conditions.
Possible	The event is likely to occur at some time during normal operating conditions.
Likely	The event will occur during normal operating conditions (i.e. it is essentially inevitable).

7.2 DETERMINING IMPACT MAGNITUDE

Once an impact's characteristics are defined, the next step in the impact assessment phase is to assign each impact a 'magnitude'. Magnitude is typically a function of some combination (depending on the resource/receptor in question) of the following impact characteristics:

- Extent;
- Duration;
- Scale; and
- Frequency.

Magnitude (from small to large) is in practice a continuum, and evaluation along the spectrum requires the exercise of professional judgement and experience. Each impact is evaluated on a case-by-case basis, and the rationale for each determination is noted. The universal magnitude designations, for negative effects, are: negligible, small, medium and large. The magnitude designations themselves are universally consistent, but the definition for the designations varies by issue. In the case of a positive impact, no magnitude designation has been assigned as it is considered sufficient for the purpose of the impact assessment to indicate that the Project is expected to result in a positive impact.

The magnitude of an impact takes into account the various dimensions of a particular impact in order to make a determination as to where the impact falls on the spectrum from negligible to large. Some impacts will result in changes to the environment that may be immeasurable, undetectable or within the range of normal natural variation. Such changes can be regarded as essentially having no impact, and are characterised as having a negligible magnitude.

In the case of impacts resulting from unplanned events, the same resource/ receptor-specific approach to concluding a magnitude designation is utilised. The likelihood factor is also considered, together with the other impact characteristics, when assigning a magnitude designation.

7.2.1 Determining Magnitude for Biophysical Impacts

For biophysical impacts, the semi-quantitative definitions for the spatial and temporal dimension of the magnitude of impacts used in this assessment are provided below:

Large Magnitude Impact affects an entire area, system (physical), aspect, population or species (biological). It affects them at sufficient magnitude to cause a significant measurable numerical increase in measured concentrations or levels (to be compared with legislated or international limits and standards specific to the receptors) (physical) or a decline in abundance and/ or change in distribution beyond which natural recruitment (reproduction, immigration from unaffected areas) would not return that population or species, or any population or species dependent upon it, to its former level within several generations (physical and biological). A high magnitude impact may also adversely affect the integrity of a site, habitat or ecosystem.

Medium Magnitude Impact affects a portion of an area, system, aspect (physical), population or species (biological) and at sufficient magnitude to cause a measurable numerical increase in measured concentrations or levels (to be compared with legislated or international limits and standards specific to the receptors) (physical) and may bring about a change in abundance and/or distribution over one or more plant/animal generations, but does not threaten the integrity of that population or any population dependent on it (physical and biological). A moderate magnitude impact may also affect the

ecological functioning of a site, habitat or ecosystem but without adversely affecting its overall integrity. The area affected may be local or regional.

Small Magnitude Impact affects a specific area, system, aspect (physical), group of localized individuals within a population (biological) and at sufficient magnitude to result in a small increase in measured concentrations or levels (to be compared with legislated or international limits and standards specific to the receptors) (physical) over a short time period (one plant/animal generation or less, but does not affect other trophic levels or the population itself), and localized area.

7.2.2 Determining Magnitude for Socio-Economic Impacts

For socio-economic impacts, the magnitude considers the perspective of those affected by taking into account the likely perceived importance of the impact, the ability of people to manage and adapt to change and the extent to which a human receptor gains or loses access to, or control over socio-economic resources resulting in a positive or negative effect on their well-being. The quantitative elements are included into the assessment through the designation and consideration of scale and extent of the impact.

7.3 DETERMINING RECEPTOR SENSITIVITY

In addition to characterising the magnitude of impact, the other principal step necessary to assign significance for a given impact is to define the sensitivity of the receptor. There are a range of factors to be taken into account when defining the sensitivity of the receptor, which may be physical, biological, cultural or human. Where the receptor is physical (for example, a water body) its current quality, sensitivity to change, and importance (on a local, national and international scale) are considered. Where the receptor is biological or cultural (for example, the marine environment or a coral reef), its importance (for example, its local, regional, national or international importance) and its sensitivity to the specific type of impact are considered. Where the receptor is human, the vulnerability of the individual, community or wider societal group is considered.

As in the case of magnitude, the sensitivity designations themselves are universally consistent, but the definitions for these designations will vary on a resource/receptor basis. The universal sensitivity of a receptor is low, medium and high.

For ecological impacts, sensitivity is assigned as low, medium or high based on the conservation importance of habitats and species. For habitats, these are based on naturalness, extent, rarity, fragility, diversity and importance as a community resource. For the sensitivity of individual species, *Table 7-3* presents the criteria for deciding on the value or sensitivity of individual species.

For socio-economic impacts, the degree of sensitivity of a receptor is defined as the level of resilience (or capacity to cope) with sudden social and economic changes. The sensitivity of a resource is based on its quality and value/importance, for example, by its local, regional, national or international designation, its importance to the local or wider community, or its economic value.

Table 7-3 and *Table 7-4* present the criteria for deciding on the value or sensitivity of bioglogical and socio-economic receptors.

Table 7-3 Biological and Species Value/Sensitivity Criteria

Value / Sensitivity	**Low**	**Medium**	**High**
Criteria	Not protected or listed as common / abundant; or not critical to other ecosystem functions (e.g. key prey species to other species).	Not protected or listed but may be a species common globally but rare in South Africa with little resilience to ecosystem changes, important to ecosystem functions, or one under threat or population decline.	Specifically protected under South African legislation and/or international conventions e.g. CITIES Listed as rare, threatened or endangered e.g. IUCN

Note: The above criteria should be applied with a degree of caution. Seasonal variations and species lifecycle stage should be taken into account when considering species sensitivity. For example, a population might be deemed as more sensitive during the breeding/spawning and nursery periods. This table uses listing of species (e.g. IUCN) or protection as an indication of the level of threat that this species experiences within the broader ecosystem (global, regional, local). This is used to provide a judgement of the importance of affecting this species in the context of project-level changes.

Table 7-4 Socio-Economic Sensitivity Criteria

Sensitivity	**Low**	**Medium**	**High**
Criteria	Those affected are able to adapt with relative ease and maintain pre-impact status.	Able to adapt with some difficulty and maintain pre-impact status but only with a degree of support.	Those affected will not be able to adapt to changes.

7.4 ASSESSING SIGNIFICANCE

Once magnitude of impact and sensitivity of a receptor have been characterised, the significance can be determined for each impact. The impact significance rating is determined, using the matrix provided in Figure 7-1.

Figure 7-1 Impact Significance

		Sensitivity/Vulnerability/Importance of Resource/Receptor		
		Low	Medium	High
Magnitude of Impact	Negligible	Negligible	Negligible	Negligible
	Small	Negligible	Minor	Moderate
	Medium	Minor	Moderate	Major
	Large	Moderate	Major	Major

The matrix applies universally to all resources/receptors, and all impacts to these resources/receptors, as the resource/receptor-specific considerations are factored into the assignment of magnitude and sensitivity/vulnerability/ importance designations that enter into the matrix. Box 7.1 provides a context for what the various impact significance ratings signify.

Box 7.1 Context of Impact Significances

An impact of **negligible** significance is one where a resource/receptor (including people) will essentially not be affected in any way by a particular activity or the predicted effect is deemed to be 'imperceptible' or is indistinguishable from natural background variations.

An impact of **minor** significance is one where a resource/receptor will experience a noticeable effect, but the impact magnitude is sufficiently small and/or the resource/receptor is of low sensitivity/ vulnerability/ importance. In either case, the magnitude should be well within applicable standards.

An impact of **moderate** significance has an impact magnitude that is within applicable standards, but falls somewhere in the range from a threshold below which the impact is minor, up to a level that might be just short of breaching a legal limit. Clearly, to design an activity so that its effects only just avoid breaking a law and/or cause a major impact is not best practice. The emphasis for moderate impacts is therefore on demonstrating that the impact has been reduced to a level that is as low as reasonably practicable (ALARP). This does not necessarily mean that impacts of moderate significance have to be reduced to minor, but that moderate impacts are being managed effectively and efficiently.

An impact of **major** significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors. An aim of IA is to get to a position where the Project does not have any major residual impacts, certainly not ones that would endure into the long-term or extend over a large area. However, for some aspects there may be major residual impacts after all practicable mitigation options have been exhausted (i.e. ALARP has been applied). An example might be the visual impact of a facility. It is then the function of regulators and stakeholders to weigh such negative factors against the positive ones, such as employment, in coming to a decision on the Project.

7.5 MITIGATION POTENTIAL AND RESIDUAL IMPACTS

One of the key objectives of an EIA is to identify and define socially, environmentally and technically acceptable and cost-effective measures to manage and mitigate potential impacts. Mitigation measures are developed to avoid, reduce, remedy or compensate for potential negative impacts, and to enhance potential environmental and social benefits.

In keeping with the mitigation hierarchy, the priority is to first apply mitigation measures to the source of the impact (i.e. to avoid or reduce the magnitude of the impact from the associated Project activity), and then to address the resultant effect to the resource/receptor via abatement or compensatory measures or offsets (i.e. to reduce the significance of the effect once all reasonably practicable mitigations have been applied to reduce the impact magnitude).

Once mitigation measures are declared, the next step in the impact assessment process is to assign residual impact significance. This is essentially a repeat of the impact assessment steps discussed above, considering the assumed implementation of the additional declared mitigation measures. The approach taken to defining mitigation measures is based on a typical hierarchy of decisions and measures, as described in *Table 7-5*.

Table 7-5 Mitigation Hierarchy

Avoid at Source; Reduce at Source	Avoiding or reducing at source through the design of the Project (e.g. avoiding by siting or re-routing activity away from sensitive areas or reducing by restricting the working area or changing the time of the activity).
Abate on Site	Add something to the design to abate the impact (e.g. pollution control equipment).
Abate at Receptor:	If an impact cannot be abated on-site then control measures can be implemented off-site (e.g. traffic measures).
Repair or Remedy:	Some impacts involve unavoidable damage to a resource (e.g. material storage areas) and these impacts require repair, restoration and reinstatement measures.
Compensate in Kind; Compensate through other means	Where other mitigation approaches are not possible or fully effective, then compensation for loss, damage and disturbance might be appropriate (e.g. financial compensation for degrading agricultural land and impacting crop yields).

7.6 CUMULATIVE IMPACTS

A cumulative impact is one that arises from a result of an impact from the Project interacting with an impact from another activity to create an additional impact. How the impacts and effects are assessed is strongly influenced by the status of the other activities (e.g. already in existence, approved or proposed) and how much data are available to characterize the magnitude of their impacts.

The approach to assessing cumulative impacts is to screen potential interactions with other projects on the basis of:

- Projects that are already in existence and are operating;
- Projects that are approved but not as yet built or operating; and
- Projects that are a realistic proposition but are not yet built.

7.7 ASSUMPTIONS AND LIMITATIONS

Impact Assessment is a process that aims to identify and anticipate possible impacts based on past and present baseline information. As the BA deals with the future there is, inevitably, always some uncertainty about what will actually happen in reality. Impact predictions have been made based on field surveys and with the best data, methods and scientific knowledge available at this time. However, some uncertainties could not be entirely resolved. Where significant uncertainty remains in the impact assessment, this is acknowledged and the level of uncertainty is provided.

8 *ENVIRONMENTAL IMPACT ASSESSMENT*

The predicted impacts to the physical, biological and social environment as a result of the proposed Project are described in this Chapter which is organised as follows:

- Construction and Decommissioning impacts;
- Operational impacts;
- Unplanned events; and
- Cumulative impacts.

The impact assessment is laid out as follows:

- Each section begins with the type of impact being assessed e.g. impacts to ambient air quality.

- Background information relating to the impact is then provided. This includes a description of the baseline environment that will be affected, the Project aspect or activities that will cause the impact and a description of the affected receptors.

- The significance of the impact pre-mitigation is then assessed and rated through use of a rating table (Figure 7-1).

- Following the pre-mitigation rating, a section describing the mitigation/management measures is provided.

- Following the consideration of mitigation/management, the significance of the residual impact (post-mitigation) is then assessed and rated.

8.1 PRE-CONSTRUCTION CONSIDERATIONS

As part of the appeals process development protocols were formulated and agreed upon with which was agreed to by key stakeholders (including DAFF). This relates to the full development lifecycle; and the construction to decommissioning considerations are covered under Section 8.2 to 8.4 of this BAR. These actions are to be read in conjunction with the EMPr as submitted with the BAR.

The pre-construction considerations (tying into the construction phase measures) are as follows:

- The following will be done during site establishment by the appointed Botanist and the Bhangazi Trust's Environmental Officer:
    - Identification of suitable development envelopes;
    - Identification boardwalk alignment;

- Marking of protected trees and trees exceeding 180 mm diameter;
- Identification of possible pruning or thinning requirements;
- Identification of possible tree specimens to be transplanted, and mark accordingly;
- Demarcating proposed construction access, lay-down, storage and mixing areas; and
- Identifying suitable placement of service cables and lines (in accordance with the DFFE: Forestry Directorate's recommendations to place the cables below the boardwalks).

- The architect is to:
  - Finalise the modular layout / arrangement of tented chalet units for each site (site specific).
  - Ensure that the design is responsive to green building guidelines and energy efficiency.

- The Contractor is to:
  - Ensure contractor has experience with construction in similar environments;
  - Undertake project specific environmental awareness and training course with all construction staff (facilitated by the Environmental Officer).
  - Ensure the establishment of a site nursery for transplanting and enrichment planting.

8.2 CONSTRUCTION AND DECOMMISSIONING RELATED IMPACTS

This Section relates to the construction phase of the Project and the decommissioning phase at the end of the operational phase. The construction phase activities include the demolition of the existing buildings/ structures and the construction of the lodge which will entail constructing the wooden walkways, platforms for the safari tents, a restaurant, swimming pool, parking facilities, sewage disposal facilities, etc. Due to the construction and decommissioning phase including similar activities these have been described and assessed simultaneously as presented in the subsequent subsections.

Impacts related to the following areas have been identified and assessed:

- Visual;
- Stormwater and erosion;
- Waste management;
- Hazardous material management;
- Traffic disruption; and
- Noise.

Given the embedded controls in terms of the Park's rules and regulations, impacts relating to worker behaviour, prevention of poaching, etc. have not been assessed but measures to control these aspects are included in the site specific EMPr (which has been drafted in line with the Park's over-arching EMPr).

8.2.1 Impact of the Proposed Development on General Landscape Character

Description of the Baseline Environment

The Bhangazi Heritage Site is located adjacent to Lake Bhangazi South. The development will be constructed within the footprint of the existing lodge with additional units established within the treeline adjacent to the lake. The site is dominated by indigenous vegetation with small open areas and scattered alien plant species within the forest.

The developable area is not visible from the main road which leads to the site and to Cape Vidal. While the forest is visible from across the lake, the developable area itself is within and behind the tree line/ forest, with the canopy height of the forest estimated at 10m. The proposed height of the structures will be a maximum of 6 m, which makes it highly unlikely that roof lines will be highly visible above the canopy level, particularly in areas where the canopy is highest.

According to the Visual Impact Assessment Report (June 2017), Lake Bhangazi is enclosed by the tall coastal dune and coastal forest to the east and north east, by a minor ridgeline reinforced with Coastal Forest and Coastal Belt vegetation that runs to the west and north west of the lake and by a natural bund that retains the lake and is also covered by dense coastal vegetation to the south. This combination of landform and vegetation combine to produce an enclosed landscape with the lake as a focal point. Once inside this space, views of other landscape character areas are limited (refer to Annex E). Anything that is developed on the shores of the lake has the potential of being visible to the lake and lake shores opposite the development. This area therefore has a low visual absorption capacity. Subject to height and the extent and nature of vegetation that needs to be cleared, development away from the lake shore is likely to be screened or at least softened by dense forest vegetation.

The Enclosed Wetland Valley falls immediately to the south of Lake Bhangazi. This area is an enclosed landscape from which views of other Landscape Character Areas (LCAs) are difficult if not impossible to see. From within, views are often possible from one side of the LCA to the other across wet grasslands. Any development that occurs within this LCA, even at lower levels is likely to be visible over much of the LCA. Development at lower levels however is unlikely to be visible to other LCAs. For development at lower levels, this LCA might therefore be considered to have medium visual absorption capacity. However, the higher that development occurs either on the minor ridgelines to the west or the major coastal dune to the east, the less the visual absorption capacity that is likely to be afforded by the landscape (Visual Impact Assessment Report June 2017).

The St Lucia Valley is comprised of Lake St Lucia, its surrounding wetlands and low valley slopes. Views of the proposed site however are likely to be at

least partly screened from the LCA by the minor ridgelines and associated vegetation that enclose Lake Bhangazi. Visibility of the proposed development from within the St Lucia Valley LCA is also likely to be influenced by distance. Minor clearance of vegetation and small-scale structures are unlikely to be obvious. However, VAC could be reduced as the scale of development increases. The use of colours that contrast with the natural landscape and lighting could also contribute to a loss of VAC (Visual Impact Assessment Report June 2017).

Description of the Impact

During the planning and construction phase, the location of the units will be finalised. There may be a requirement for some pruning and clearing of vegetation to facilitate the construction process.

Due to the fact that the reported height of structures will be a maximum of 6 m and the existing canopy height is estimated at 10m and because the necessary width of cleared areas is relatively narrow, it is unlikely that roof lines will be highly visible above the canopy level. Subject to the gradient of the affected areas and the exact height and density of surrounding canopy trees, it is possible that sections of roof lines could be visible. Should clearing of vegetation between the proposed units and Bhangazi Lake be undertaken, then the development is likely to be visible from the lake and areas to the west.

Even without mitigation, this landscape change is unlikely to be obvious outside a 1 km limit and unlikely to be visible to the naked eye outside 3 km. However, night time lighting could exacerbate visual impact making the development obvious over a greater distance.

Significance of Impact (Pre-mitigation)

Although the lodge footprint and vegetation clearing will be reduced with the implementation of the current layout, the character of the natural landscape will be permanently changed. The effect will result in some reduction in the natural character of the landscape due to the development of built elements in an almost pristine area.

During day light hours, this effect is only likely to be obvious from a relatively short distance (within 1 km) – depending on the positioning of the infrastructure. During hours of darkness this effect could be more obvious from a wider area subject to the nature of lighting used.

The visual impact during the construction phase is anticipated to be negative and of Moderate significance.

The undermining and thinning of the forest edge vegetation is potentially an irreplaceable loss. Without the correct management – as detailed in the EMPr,

the forest edge and clearings could attract alien weed species that could prove difficult to eradicate.

Table 8-1 Pre-mitigation Rating of Impacts Related to General Landscape Character during the Construction Phase

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The impact is limited to the Project site and immediately adjacent areas.
Duration	Temporary	Impact will persist for the construction phase of 12 – 18 months.
Scale	1 km radius	Site will be visible for a 1 km radius to the west of the footprint.
Frequency	Once-off	The landscape will be temporarily changed during the construction phase.
Likelihood	Possible	Depending on the clearance required to facilitate construction, the impact is possible.
Magnitude		
Small		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium		
Significance Rating Before Mitigation		
Moderate		

Recommendations and Mitigation/Management Measures

Construction:

- Undertake a detailed tree survey within the proposed development area. Confirm location, species, trunk girth, height, crown diameter and condition of trees.

- Locate units and infrastructure to minimise loss of forest edge vegetation, i.e. reduce the need for pruning/ removal of trees to facilitate construction.

- Consider efficient use of existing cleared areas in order to minimise the need for further removal of forest area.

- Ensure that non reflective finishes are used for all external components within the development. Consider the use of non-reflective finishes on all external glass.

- Ensure that all colours used for external finished blend into the surrounding natural environment.

Decommissioning:

- Remove structures and infrastructure not required for the post-decommissioning use of the site.

- Prepare a detailed landscape rehabilitation plan detailing management, planting and weed control measures that are necessary to ensure that areas cleared for development and not required for post-decommissioning uses re-establish with natural forest species.

Residual Impact Significance

With the implementation of the mitigation measures described above, the magnitude of the impact can be reduced to **Negligible**.

Assuming that vegetation clearance is minimised and cleared areas are sufficiently small to ensure that wind blow on internal forest trees is minimised, weed control measures are effective and additional human intervention is prevented, then there should be no irreplaceable loss as, with appropriate management, as stipulated in the EMPr, the forest is likely to regenerate on decommissioning.

Table 8-2 Residual Impact Rating Related to General Landscape Character during the Construction Phase

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	Designation	Summary of Reasoning
Extent	Local	The impact is limited to the Project site and immediately adjacent areas.
Duration	Temporary	Impact will persist for the construction phase of 12 – 18 months.
Scale	Local	Site will be visible for a 1 km radius to the west of the footprint.
Frequency	Once-off	The landscape will be temporarily changed during the construction phase.
Likelihood	Unlikely	Based on careful locating of units, the need to prune/ remove additional trees will be reduced.
Magnitude		
Negligible		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium		
Significance Rating Post-mitigation		
Negligible		

Irreplaceable loss

The undermining and thinning of the forest edge vegetation is potentially an irreplaceable loss. Without the correct management, the forest edge and clearings could attract alien weed species that could prove difficult to eradicate. Over time degradation could increase through the further loss of natural vegetation either through human intervention in pruning, trampling or removing additional vegetation or through the effects of wind blow within cleared areas.

Assuming that clearance is minimised and cleared areas are sufficiently small to ensure that wind blow on internal forest trees is minimised, weed control measures are effective and additional human intervention is prevented, then

there should be no irreplaceable loss as, with appropriate management, the forest is likely to regenerate on decommissioning.

8.2.2 Impact of the Proposed Development on Flora (Loss of Further Forest)

Description of the Baseline Environment

The Bhangazi Heritage Site is located adjacent to Lake Bhangazi South. The site is dominated by indigenous vegetation with small open areas and scattered alien plant species within the forest.

Since the development area is already substantially transformed from the natural state as a result of both the fishing camp and the Ezemvelo KZN Wildlife staff accommodation being present, the fresh impacts arising out of the proposed lodge development are lower than would be the case if the site was considered to be pristine.

Description of the Impact

During the construction phase, the location of the units will be finalised. There may be a requirement for some additional pruning as well as clearing of vegetation to facilitate the construction of the walkways and units, and the platforms supporting these structures. Based on the tree density in the forest it is likely that board walk construction will require significant tree pruning, some root removal. However, it is believed that it could be constructed with minimal tree removal, however a number of smaller trees will probably need to be removed.

Clearing of vegetation will lead to open areas on the site which may be vulnerable to alien invasive infestation. Seeds of alien species may also be brought to site with equipment and materials transported to site. The clearing of vegetation, although limited, could disturb feeding, breeding and/ or nesting sites in the area.

According to the Biodiversity Assessment (refer to Annex E), although there has already been some loss of forest within the lodge development footprint, the extent of the new development implies that further loss of Endangered Maputaland Moist Coastal Lowlands Forest is likely to be incurred. However, given that the restaurant and pool complex, previously located within the forest, has been repositioned to a disturbed area outside the forest (as per the current layout), the potential loss of forest will be minimal. Similarly, the adoption of a specific Method Statement will further ameliorate potential negative impacts within the natural forest "

With the current Lodge layout and reduction in the footprints of the accommodation units (i.e. from 75 m^2 to <50 m^2 for the 2 bed units, and from 75 m^2 to <60 m^2 for the 4-bedroom units), the number of trees that will be removed is almost certainly less than that envisaged with the original layout. In all cases, except for the main complex, it is anticipated that there will be no more than two trees, (larger than 60 cm) that fall within the approximated

development footprint (as alluded to in the Vegetation study, Annex E). Only two of these trees, which are the two large Marula trees, are protected or endangered in terms of the NFA, with the Marula tree being a national protected tree species (DAFF, 2017).

Significance of Impact (Pre-mitigation)

As mentioned above, the clearing of vegetation creates potential for tree root damage (particularly with the construction of the boardwalk and services servitude), as well as the proliferation of alien vegetation, particular during construction.

The impact during the construction and decommissioning phases is anticipated to be negative and of **Moderate** significance pre-mitigation.

Table 8-3 Pre-mitigation Rating of Impacts Related to Flora during the Construction Phase and Decommissioning Phases

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The impact is limited to the Project site and immediately adjacent areas.
Duration	Temporary to permanent	Impact will persist for the construction phase but may extend beyond this phase if rehabilitation measures are not implemented.
Scale	Up to 4 ha	Decrease in biodiversity integrity and increase in alien infestation. Area B will not be developed. However, according to the vegetation study conducted, most of the development is proposed to occur over the already disturbed area where the accommodations units will be built over platforms.
Frequency	Once-off	Clearance will be a limited to the pre-construction phase and to site establishment specifically.
Likelihood	Possible	Depending on the clearance required to facilitate construction and the disturbance to fauna, the impact is possible.
Magnitude		
Medium		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High		
Significance Rating Before Mitigation		
Moderate		

Recommendations and Mitigation/Management Measures

As a minimum, the following mitigation measures are proposed:

- Trucks transporting natural materials to site are to be washed down prior to leaving source to remove any alien invasive seeds.

- Only areas required for construction are to be cleared (in line with the current site layout) and those sites must be rehabilitated and revegetated as soon as possible on completion of construction.

- A landscape plan must be produced for the site. The plan must be aligned with the current site layout as well as the Park requirements.

- Where necessary, flexible structures should be built to fit around larger trees for the construction of platforms for the accommodation units. In addition, and as far as practicable, platforms should be placed in the old camp sites, with open understory.

- Adherence to the root damage mitigation protocol recommended by the Forest Vegetation Specialist (see Annexure E). This includes:

    - Root proximity to trunk and extent of root removal. The closer to the trunk that roots are cut, the more significant and severe the damage will be to your tree. Never remove more than 25% of a tree's roots. The tree will likely die or fall, or both.

    - Drainage: try to ensure disturbed area has adequate drainage to avoid water pooling round tree roots.

    - Re mulching and filling in around root. Keep topsoil after the holes are dug to use as mulch over and around disturbed areas. The mulch helps condition the soil, moderates soil temperatures, maintains moisture, and reduces competition from weeds and grass.

    - Damaged Bark, trunk wounds, and pruning. Where bark has been damaged along the trunk or on major limbs, remove loose bark to avoid areas where water can accumulate beneath bark. Pruning should be neat and cut at clean 45-degree angles, avoid spiting of limbs.

    - Wound Dressings. Wound dressings were once thought to accelerate wound closure, protect against insects and diseases, and reduce decay. However, research has shown that dressings generally do not reduce decay or speed closure and rarely prevent insect or disease infestations. Most experts recommend that wound dressings not be used. If a dressing must be used for cosmetic purposes, use only a thin coating of a nontoxic material.

    - Time of root pruning. Tree roots should preferable be cut during late winter when the tree is metabolically least active (avoid pruning spring/early summer). After cutting, minimise the time that the roots are exposed to prevent drying, and keep the soil moist.

NOTE: The Bhangazi Trust will align their stormwater and drainage line management measures to those already in place at the iSimangaliso Wetland

Park. In addition, should a separate SWMP be required, one will be developed prior to construction and submitted to the relevant authorities prior to the commencement of construction.

- A programme for alien invasive management and removal must be generated and implemented. Progress against set targets must be measures and reported on.

- A rehabilitation plan must be produced for the decommissioning phase to prevent the establishment of alien invasive species and to encourage forest re-growth.

Residual Impact Significance

With the implementation of the mitigation measures described above, the magnitude of the impact can be reduced to **Moderate**.

Assuming that clearance is minimised and cleared areas are sufficiently small to ensure that wind blow on internal forest trees is minimised, alien vegetation and weed control measures are effective, and additional human intervention is kept to a minimum, then there should be no irreplaceable loss as, with appropriate management, the forest is likely to regenerate on decommissioning.

Table 8-4 Residual Impact Rating Related to Flora during the Construction and Decommissioning Phases

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The impact is limited to the Project site and immediately adjacent areas.
Duration	Temporary to permanent	Impact will persist for the construction phase but may extend beyond this phase if rehabilitation measures are not implemented.
Scale	Up to 4 ha	Decrease in biodiversity integrity and increase in alien infestation. However, according to the vegetation study conducted, most of the development is proposed to occur over the already disturbed area where the accommodations units will be built over platforms.
Frequency	Once-off	Clearance will be a limited number of events.
Likelihood	Possible	Depending on the clearance required to facilitate construction and the disturbance to fauna, the impact is possible.
Magnitude		
Small		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High		
Significance Rating Post-mitigation		
Moderate		

8.2.3 Impact of the Proposed Development on Flora (Increase in the Level of Alien Plant Infestation of the Area)

Description of the Baseline Environment

The Eastern Shores (Mfabeni) area has had a long history of invasion by alien plant species. Certain of these plants were "escapees" from the commercial timber plantations which used to be present in the area but which are now gone, and other invasive species such as *Chromlaena odorata, Psidium guajava and Ricinis communis.* The spread of these was to some extent assisted by the plantation operations as newly harvested areas were readily available to pioneer species, but there was also penetration into the areas of untouched natural veld as well.

Description of the Impact

The opening of the area to fresh development will inevitably result in the increase of alien plant growth even if the lodge has an indigenous plant policy. The species most likely to appear are those listed above but others, such as Mexican poppy (Argemone spp.) could also be accidentally introduced as it is present, at low densities, in the area. However, it must be noted that, as the lodge grounds are landscaped and vegetation covered is re-established, the risk and extent of weed invasion are likely to decrease.

Significance of Impact (Pre-mitigation)

The impact could result in considerable disturbance to the ecology of the area. The threat could be avoided but, if it happens could affect a large area. The sensitivity and value of the vegetation communities in the area around the development site are high. In addition, the site is in a World Heritage Site Park.

The impact during the construction and decommissioning phases is anticipated to be negative and of **Major** significance pre-mitigation.

Table 8-5 Pre-mitigation Rating of Impacts Related to Flora (Increase in the Level of Alien Plant Infestation of the Area) during the Construction Phase and Decommissioning Phases

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local but with risk of spreading	If alien weeds do become established at the development site, then it is very probable that propagules will be spread to the surrounding areas.
Duration	Permanent	The risk will remain as long as there are open areas which may be readily colonised by pioneer weed species.
Scale	Local	The affected area could be extensive with invasions of weeds along the road, or in other areas where the soil is disturbed.

Frequency	Once-off	Impacts on flora, as a result of vegetation clearance, will be limited to the site establishment only.
Likelihood	Possibly intermittent	This impact could be repeated over and over depending on the management of the weeds at the lodge site.
Magnitude		
Small to Medium		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High		
Significance Rating Before Mitigation		
Major		

Recommendations and Mitigation/Management Measures

As a minimum, the following mitigation measures are proposed:

- Trucks transporting natural materials to site are to be washed down prior to leaving source to remove any alien invasive seeds.

- Only areas required for construction are to be cleared and those sites must be rehabilitated and revegetated as soon as possible on completion of construction.

- A landscape plan must be produced for the site. The plan must be aligned with Park requirements.

- A programme for alien invasive management and removal must be generated and implemented during and after construction. These must be incorporated into the EMPr. Progress against set targets must be measures and reported on.

- A rehabilitation plan must be produced for the decommissioning phase to prevent the establishment of alien invasive species and to encourage forest re-growth.

- Limit construction to the footprint prescribed in the current site layout, and (as far as practicable) build where prior clearing of understory has occurred as far, which will minimise vegetation clearing.

Residual Impact Significance

With good management the project could proceed without incurring this impact or, at worst, it being small.

With the implementation of the mitigation measures described above, the magnitude of the impact can be reduced to **Minor**.

Table 8-6 Residual Impact Rating Related to Flora (Increase in the Level of Alien Plant Infestation of the Area) during the Construction and Decommissioning Phases

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	If alien weeds do become established at the development site, then it is very probable that propagules will be spread to the surrounding areas.
Duration	Temporary	The risk will remain as long as there are open areas which may be readily colonised by pioneer weed species.
Scale	Site	The affected area could be minimised if correct controls are in place.
Frequency	Once-off	Clearance will be a limited number of events but death/ injury to animals could be frequent.
Likelihood	Possibly intermittent	This impact could be repeated over and over depending on the management of the weeds at the lodge site.
Magnitude		
Small		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium		
Significance Rating Before Mitigation		
Minor		

8.2.4 Impact of the Proposed Development on Flora (Potential Loss of Forest Understory)

Description of Baseline Environment

The iSimangaliso Wetland Park lies within the Maputaland Centre of Endemism (van Wyk and Smith, 2001) which, in turn is a part of the Maputaland-Pondoland-Albany Biodiversity Hotspot. The iSimangaliso Wetland Park Integrated Management Plan (2000), states that 2185 plant species have been recorded in the Park. These represent 9% of the flora of South Africa and 31% of the flora of KwaZulu-Natal. A total of 44 species are endemic to the region and three species are known to occur only within the Park. It is not known if these species occur within the study site.

Four species which are protected in terms of the National Forests Act are present within the study area. The forest canopy, beneath where the lodge accommodation is planned, is 85-95 % intact.

Description of the Impact

The original extent of cleared forest area (tented chalets, restaurant, staff) was approximately 1900 m^2. This has been revised to a potentially cleared forest area (tented chalets) of 960 m^2. The size of the units has since been reduced from 100 m^2 per unit, to less than 60 m^2 (4 bed) and less than 50 m^2 (2 bed). Note, this is the physical footprint of the deck structures and does not imply clearing of forest canopy. By removing the restaurant complex from the forest area, an opportunity is created to space the tented chalet units further apart,

and therefore more opportunity is created to find a site that can accommodate the units without significant clearance of vegetation (please refer to the site layout, Figure 2-2). As a result, the removal of trees which fall within this footprint will be negligible.

In addition to the above, a loss of understory cover and an increased risk of erosion are also anticipated. However, the extent of loss will be limited to the current development footprint as far as practicable.

Significance of the Impact (Pre-mitigation)

In the short term the construction will result in some loss of understory, although it is envisaged that the forest will recover in the medium (minimum 5 years) to long term.

Although most of the development is proposed to occur in an already cleared area and on platforms, some parts of the greenfield section of the forest require pruning, while the clearing of trees is negligible. This will involve some loss of the understory, although this impact is anticipated to be on a short-term basis (i.e. less than 5 years). Given the conservation status of the area, the sensitivity and ultimately the significance of the impact is **Moderate**.

Table 8-7 Pre-mitigation Rating of Impacts Related to Vegetation in the Greenfield during the Construction Phase and Decommissioning Phases

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The loss of habitat will not be restricted to the project site but will extend some distance around it. Species which are territorial may have difficulty in finding living space elsewhere. If they cannot do so, then the consequence will be a reduction in population size either through premature mortality or through reduced breeding success.
Duration	Permanent	The loss will remain at least as long as the project or other development on the site persists. In the short term the construction will result in some loss of understory in the medium term (i.e. 5 years, or more).
Scale	Site	Up to 4 ha of forest could be lost but the additional human presence is likely to make the impacted area greater. However, most of the development will occur on already cleared land and it will be built on platforms as must as practically possible.
Frequency	Once-off	It is assumed that the lodge will not be developed in a stage-by-stage manner.
Likelihood	Possible	Depending on the clearance required to facilitate construction and the disturbance to the forest, the impact is possible.
Magnitude		
Small		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
High		
Significance Rating Before Mitigation		
Moderate		

Recommendations and Mitigation/Management Measures

Diligence in applying avoidance and mitigation measures during construction, can significantly reduce impacts, by minimizing the need to remove the larger trees within the forest. Careful placement of unit platforms within existing understory gaps will be essential. In implementing the recommendations tabled at the meetings with the DFFE and DAFF in early 2020 (see Annex C), a forest ecologist be present when the sites are surveyed and laid out. The mitigation and avoidance measures proposed for this impact include:

- As far as possible, building flexible structure shapes to fit around larger trees.
- Placing of raised platforms and boardwalks in old camp sites, with open understory.
- Enrichment planting of similar trees removed during construction, by planting nursery grown out tree, as close to where they were removed.

Residual Impact Significance

With the implementation of the mitigation measures described above, the magnitude of the impact can be reduced to **Minor**.

Table 8-8 Post-mitigation Rating of Impacts Related to Vegetation in the Greenfield during the Construction Phase and Decommissioning Phases

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The loss of habitat will not be restricted to the project site but will extend some distance around it. Species which are territorial may have difficulty in finding living space elsewhere. If they cannot do so, then the consequence will be a reduction in population size either through premature mortality or through reduced breeding success.
Duration	Permanent	The loss will remain at least as long as the project or other development on the site persists. The forest will recover over the long term.
Scale	Site	Up to 4 ha of forest could be lost but the additional human presence is likely to make the impacted area greater. However, most of the development will occur on already cleared land and it will be built on platforms as must as practically possible.
Frequency	Once-off	It is assumed that the lodge will not be developed in a stage-by-stage manner.
Likelihood	Possible	Depending on the clearance required to facilitate construction and the disturbance to the forest, the impact is possible.
Magnitude		

Small
Sensitivity/Vulnerability/Importance of the Resource/Receptor
Medium
Significance Rating After Mitigation
Minor

8.2.5 Impact of the Proposed Development on Fauna

Description of the Baseline Environment

There are a number of birds, mammals and herpetofauna which use the site for nesting/ refuge/ feeding. The new lodge will affect the fauna of the area in different ways and the extent of the impact will be greater than the extent of the development.

Description of the Impact

The impacts arise out of loss of feeding and/or breeding habitat as well as increased human presence and activity in the area. Within the forest, a number of species, both vertebrate and invertebrate, will be driven away from the site and will be unlikely to return. However, others, including monkeys and some birds will return and at least pass through the area if not actually include the area in their home ranges. Bushbuck and Red Duiker are known to become conditioned to human presence and may even become semi-permanent residents as they have done at the nearby Cape Vidal Camp. Indirect impacts on the fauna would come from higher traffic volumes, which raise the risk of roadkills.

Significance of Impact (Pre-mitigation)

The project will result in considerable disturbance to the fauna in its footprint. Most affected will be the larger mammals, which may totally desert the site, but some birds, reptiles, amphibians, and invertebrates will also lose habitat.

The impact during the construction and decommissioning phases is anticipated to be negative and of **Moderate** significance. The rating is derived from the high magnitude value and the high receptor sensitivity but is reduced as the area affected directly is small. In addition, there is a large amount of similar habitat in the immediate vicinity.

Table 8-9 Pre-mitigation Rating of Impacts Related to Fauna and Flora during the Construction Phase and Decommissioning Phases

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**

Extent	Local	The loss of habitat will not be restricted to the project site but will extend some distance around it. Species which are territorial may have difficulty in finding living space elsewhere. If they cannot do so, then the consequence will be a reduction in population size either through premature mortality or through reduced breeding success.
Duration	Permanent	The loss will remain at least as long as the project or other development on the site persists.
Scale	Site	It is envisaged that less than 1 hectare of forest area is to be cleared and affected by the development, as well as additional human presence once the Lodge is operational. However, according to the vegetation study conducted, most of the development is proposed to occur over pockets that are already disturbed.
Frequency	Once-off	It is assumed that the lodge will not be developed in a stage-by-stage manner.
Likelihood	Possible	Depending on the clearance required to facilitate construction and the disturbance to fauna, the impact is possible.
Magnitude		
Medium		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium		
Significance Rating Before Mitigation		
Moderate		

Recommendations and Mitigation/Management Measures

As a minimum, the following mitigation measures are proposed:

- Awareness raising of staff to prevent killing/ injury of animals and prevent collection of plant material. No poaching will be tolerated, staff caught poaching will be removed from site and face disciplinary action. Staff must also be made aware of how to act if they encounter an animal on site so that injury to both parties can be prevented.

- Only areas required for construction are to be cleared and those sites must be rehabilitated and revegetated as soon as possible on completion of construction.

- Survey for possible nesting sites. Monitor rare and endangered fauna in area.

Residual Impact Significance

With the implementation of the mitigation measures described above, the magnitude of the impact can be reduced to **Minor**.

Assuming that clearance is minimised and cleared areas are sufficiently small to ensure that wind blow on internal forest trees is minimised, weed control measures are effective and additional human intervention is prevented, then there should be no irreplaceable loss as, with appropriate management, the forest is likely to regenerate on decommissioning. Additionally, all contractor

and permanent staff should be trained on how to handle animal life should these be encountered during construction.

Table 8-10 Residual Impact Rating Related to Fauna during the Construction and Decommissioning Phases

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The impact is limited to the Project site and immediately adjacent areas.
Duration	Temporary to permanent	Impact will persist for the construction phase but may extend beyond this phase if rehabilitation measures are not implemented.
Scale	Site	Decrease in biodiversity integrity and increase in alien infestation. However, according to the vegetation study conducted, most of the development is proposed to occur over the already disturbed area where the accommodations units will be built over platforms.
Frequency	Once- Off	Clearance will be a limited number of events but death/ injury to animals could be ad-hoc.
Likelihood	Possible	Depending on the clearance required to facilitate construction and the disturbance to fauna, the impact is possible.
Magnitude		
Small		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium		
Significance Rating Post-mitigation		
Minor		

8.2.6 *Impact of the installation of the installation of the sewage system*

Description of the Baseline Environment

Please refer to sections 8.2.2 to 8.2.5.

Description of the Impact

A prefabricated sewer system will be installed by Bio-Sewage. Impacts from the installation are mainly due to excavations that will be made in the undisturbed forest area, to make way for the installation of the 3 mini-collection tanks (whose excavations will be 0.5 x 2,2 x 1.4), as well as the gravity fed piping. The installation will potentially disturb forest flora and most likely need to cut through tree roots, and some overhead canopy pruning. There's also potential disturbance of natural water drainage around construction sites resulting in water pooling around tree roots with a risk of rotting.

Significance of Impact (Pre-mitigation)

The impact during the construction and decommissioning phases is anticipated to be negative and of Moderate significance. The rating is derived

from the impact of excavating undistributed forest and the risk to the vegetational integrity and health- especially with the potential impact on water drainage.

Table 8-11 Pre-mitigation Rating of Impacts Related to the Installation of the Installation of sewage system

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	Designation	Summary of Reasoning
Extent	Local	The impact on the undisturbed forest will be restricted to the accommodation un its and the boardwalk footprint.
Duration	Short-term	The disturbance is anticipated for the construction period and for a short period thereafter. Will remain at least as long as the project or other development on the site persists.
Scale	Site	The excavations will be limited to the tanks and pipeline servitude required for the sewer system. In this regard, it is not envisaged that the impact will go beyond the development footprint.
Frequency	Once-off	It is assumed that the lodge will not be developed in a stage-by-stage manner.
Likelihood	Likely	There will be excavations for the sewage system in the undisturbed forest area.
Magnitude		
Medium		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium		
Significance Rating Before Mitigation		
Moderate		

Recommendations and Mitigation/Management Measures

As a minimum, the following mitigation measures are proposed:

- Disturbed areas are to be covered with thick layer of forest mulch and revegetated as soon as possible with indigenous, shade tolerant ground cover (e.g., *plectranthus, Clivia spp*.).

- As far as possible, the areas where the boardwalks are to be constructed are to be used as paths for movement into the forest and construction activities.

- As far as possible, excavations in the undisturbed forest are to be done manually.

- Minimise exposure at any one time by clearing and filling as soon possible.

- Activities like cement mixing are to be restricted to the disturbed areas outside of the forest.

- Forest ecologist present during layout and surveying of paths and all structures.
- Stormwater management is to be bult into the construction plans.
- Reinforcement barriers are to be installed around the below ground mini-collection tanks.
- Allow for adequate drainage of water around collection tanks.

Residual Impact Significance

The residual impact during the construction and decommissioning phases is anticipated to be negative and of Minor significance. The associated risks include excessive activity around construction sites which can lead to trampling and compaction of forest floor; root pruning which may render some tree structurally unstable- which may only manifest over time; and root pruning potentially causing some trees to lose viability and die- this may also only manifest over a period of time.

Table 8-12 Residual Impact Rating Related to the Installation of the Installation of sewage System

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	Designation	Summary of Reasoning
Extent	Local	The impact is limited to the Project site.
Duration	Short-term	Impact will persist for the construction phase, although it may take a few years for the disturbed forest floor/ understory to recover.
Scale	Site	The excavations will be limited to the tanks and pipeline servitude required for the sewer system.
Frequency		
Likelihood	Likely	It will take some time for the area disturbed by the excavations to regrow.
Magnitude		
Small		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium		
Significance Rating Before Mitigation		
Minor		

8.2.7 Impact of the Proposed Development on the Aquatic Environment

Description of the Baseline Environment

The Bhangazi Heritage Site is located adjacent to Lake Bhangazi South. The Trust has proposed the development of a jetty in the lake so that they can operate boat tours on the lake.

Description of the Impact

Construction of the jetty will be on the lake shore and into the lake which will directly disturb fauna and flora in the area. Accidental release of pollutants will impact on the water quality and therefore on aquatic fauna and flora.

Significance of Impact (Pre-mitigation)

There will be negative impacts on the aquatic environment, including both direct and indirect impacts related to the project activities.

The sensitivity of the environment and magnitude of the impact are considered to be medium resulting in a predicted impact that is negative and of **Moderate** significance.

Table 8-13 Pre-mitigation Rating of Impacts Related to the Aquatic Environment during the Construction and Decommissioning Phases

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The impact is limited to Lake Bhangazi South and the immediate surroundings.
Duration	Temporary to permanent	Impact will persist for the construction phase but may extend beyond this phase if rehabilitation measures are not implemented.
Scale		Decrease in water quality and loss of aquatic fauna and flora.
Frequency		Daily disturbance for the duration of construction or demolition.
Likelihood	Possible	Construction/ demolition is taking place within a sensitive environment and therefore an unplanned event is possible.
Magnitude		
Medium		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium		
Significance Rating Before Mitigation		
Moderate		

Recommendations and Mitigation/Management Measures

As a minimum, the following mitigation measures are proposed:

- Awareness raising of staff to prevent killing/ injury of animals/ fish and prevent collection of plant material adjacent to the lake.
- Awareness raising to include protocol for dealing with wild animals encountered on site. The training of staff on working in areas where there are dangerous animals should be investigated.
- Staff accessing the lake must be limited to the team required for construction of the jetty.

- No breaks are permitted to be taken at the lake. A designated eating area must be provided on the main site.

- All wood must be treated off-site prior to construction. Any substances used for treating materials must not leach into the water over time (although this is not a planned activity).

- One path from the main site down to the water's edge must be established.

- No hazardous materials are to be stored near the lake (all materials to be stored at the main site in a bunded area).

- The pathway and area around the jetty must be rehabilitated during decommissioning.

- A rehabilitation plan must be produced for the decommissioning phase.

Residual Impact Significance

With the implementation of the mitigation measures described above, the magnitude of the impact can be reduced to **Minor**.

Table 8-14 Residual Impact Rating Related to the Aquatic Environment during the Construction and Decommissioning Phases

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The impact is limited to Lake Bhangazi South and the immediate surroundings.
Duration	Temporary to permanent	Impact will persist for the construction phase but may extend beyond this phase if rehabilitation measures are not implemented.
Scale		Decrease in water quality and loss of aquatic fauna and flora.
Frequency		Daily disturbance for the duration of construction or demolition.
Likelihood	Possible	Construction/ demolition is taking place within a sensitive environment and therefore an unplanned event is possible.
Magnitude		
Small		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium		
Significance Rating Post-mitigation		
Minor		

8.2.8 *Stormwater/ Erosion Control during Construction and Decommissioning Activities*

Description of the Impact

Although limited, there will be a need for clearing of some vegetation during the construction phase in order to construct the walkways and the platforms for the units. Clearing will result in bare soil which is likely to be eroded and washed off the site into the grassland below the site during rainfall events, especially on the slopes where the lower row of units is to be constructed. This will lead to erosion gullies forming on the site and will impact the flow of water into the hygrophilous grasslands below the site. Furthermore, there will be a possible compaction of soils as a result of footpaths in the forest and increased human traffic. This could further increase the stormwater and erosion control issues.

NOTE: The Bhangazi Trust will align their stormwater management measures to those already in place at the iSimangaliso Wetland Park. In addition, should a separate SWMP be required, one will be developed prior to construction and submitted to the relevant authorities prior to the commencement of construction.

Significance of Impact (Pre-mitigation)

Construction and decommissioning are of a temporary nature, thus the impact of construction vehicles will have a **Moderate** negative impact (Table 8.10).

Table 8-15 Pre-mitigation Impact Rating Related to Stormwater Management and Erosion during Construction and Decommissioning Activities

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The site would be affected (erosion gullies, loss of soil) and the grassland below the site (soil accumulation).
Duration	Long-term	Without intervention, erosion gullies would persist and soils eroded from site would remain in the grassland.
Scale		The scale of the impact is restricted to the site and grassland below the site.
Frequency	Intermittent	Impact linked to rainfall events.
Likelihood	Possible	Site clearance leading to bare soil increases the possibility of occurrence.
Magnitude		
Medium		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium		
Significance Rating Before Mitigation		
Moderate		

Recommendations and Mitigation/Management Measures

An EMPr will be in place for the construction and decommissioning periods and includes the need for measures relating to stormwater management and erosion control such as:

- A storm-water management plan must be designed for the site and adhered accordingly.
- Stormwater/ run-off attenuation systems must be established during the construction phase to control stormwater movement across the site.
- Areas must not be cleared too far in advance of construction.
- Cleared areas must be rehabilitated and revegetated as soon as practical after completion of works (continuous process as construction proceeds). The over-arching EMPr must be adhered to in terms of restrictions on plant material.
- Should erosion gullies form, these must be rehabilitated and additional erosion protection measures implemented.
- Use elevated boardwalks

Residual Impact Rating

The implementation of the mitigation measures should minimise the risk related to uncontrolled stormwater run-off and erosion during construction and decommissioning activities. The impact significance rating is reduced to **Minor**.

Table 8-16 Residual Impact Rating Related to Stormwater Management and Erosion during Construction and Decommissioning Activities

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The site would be affected (erosion gullies, loss of soil) and the grassland below the site (soil accumulation).
Duration	Temporary	Affected areas rehabilitated.
Scale		The scale of the impact is restricted to the site and grassland below the site.
Frequency	Intermittent	Impact linked to rainfall events.
Likelihood	Possible	Site clearance leading to bare soil increases the possibility of occurrence.
Magnitude		
Small		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium		
Significance Rating Post-mitigation		
Minor		

8.2.9 General and Hazardous Waste Management during Construction and Decommissioning Activities

Description of the Impact

The construction and decommissioning phase will result in the generation of general and hazardous waste (Table 8-17). The most typical hazardous waste likely to be generated during construction will include hydrocarbon contaminated waste (e.g. used oil containers; oil-contaminated soils and rags), as well as chemical toilet sewage waste. Non-hazardous waste will include domestic litter and food waste; and wood and plastic packaging material.

Table 8-17 Waste Types Potentially Generated during Construction

Waste Type
Hazardous Waste
Used greases
Used batteries and power supplies
Soiled pails and drums
Soiled parts
Soiled rags
Used absorbents
Oil filters
Used Oil
Solvents (including those used in labs to test asphalt mixes)
Acids
Alkalines
Paint
Fluorescents tubes and other mercury containing waste (bulbs)
Hydrocarbon contaminated soils
Sewage waste (from temporary toilets in active work area)
Medical wastes (from incidents on site)
Bituminous mixture containing coal tar
Creosote waste
Asbestos-based construction materials (from demolition of existing structures)
Non-hazardous Waste
Scrap copper, brass, bronze and aluminium (from demolition of existing structures)
Scrap iron and steel including punctured and crushed cans (including spray cans)
Clean drums, pails, boxes
Clean mechanical parts
Hardware (e.g., old tools, fasteners, etc.)
Unsoiled cloth
Ceramics
Wood
Paper and cardboard
Concrete
Gypsum-based construction materials
Glass
Dried paint containers
Plastics
Tyres
Biodegradable food waste
Other biodegradable (green) waste

Waste Type
Discarded PPE
Scrapped line hardware waste

Despite the embedded controls related to waste management protocols for the Park, a lack of adherence to the requirements could result in impacts on the natural environment, e.g. pollution of ground and surface water, risk to animals; and visual impacts. There may also be health implications if waste is not handled, stored and disposed correctly, e.g. sewage spills, accumulation of food waste leading to pest influx.

Waste will need to be transported off the site and disposed of at a DWS-licensed landfill site.

Significance of Impact (Pre-mitigation)

The construction and decommissioning phases are temporary. However, the inappropriate management of waste could result in short-term impacts on the environment. Inappropriate waste management could result in pollution both on site and along the transport route to the final disposal site(s). The impact will have a **Moderate** negative impact (Table 8.10).

Table 8-18 Pre-mitigation Impact Rating Related to General and Hazardous Waste Management during Construction and Decommissioning Activities

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The site and transportation routes could be affected.
Duration	Temporary to short-term	Failure to comply with Park rules and regulations could result in a temporary impact (litter) or short-term impact (pollution of waste resources)
Scale		The scale of the impact would be limited to the site and surroundings, Lake Bhangazi South, and the transportation route.
Frequency	Intermittent to ongoing	Linked to pollution events, poor waste storage and/ or disposal methods.
Likelihood	Possible	If inadequate measures are implemented, pollution events are possible.
Magnitude		
Medium		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium		
Significance Rating Before Mitigation		
Moderate		

Recommendations and Mitigation/Management Measures

An EMPr must be in place for the construction and decommissioning periods and includes the need for measures relating to waste management such as:

- Chemical toilets must be made available throughout construction for all on-site staff.

- The chemical toilets must be serviced regularly and must not overflow, display blockages or be allowed to spill.

- Waste containers will be appropriately designed in terms of volume, composition, and shape. Containers that may react with the waste to produce a harmful substance must not be used.

- To promote the "4Rs" (Reduce, Reuse, Recycle and Reclaim) waste management concept, all waste must be sorted and managed as appropriate, either for reuse, recycling or disposal. The promotion of the 4Rs concept must be included in the Method Statement for waste management.

- Waste must be separated according to their composition, source, and type at source and contained in appropriately labelled and/or colour coded waste containers or waste skips. These bins must be located in a central location for ease of access.

- Solid and liquid wastes must not be mixed.

- All waste must be handled in accordance with its class (hazardous or non-hazardous) and all personnel collecting, handling, transporting or disposing of waste must be trained in the proper procedures for dealing with the said waste class.

- Transport vehicles must cater for the type, class and quantity of waste being transported in terms of its composition, load capacity, covering, etc.

- Method Statements for loading and unloading, and transport of wastes must be developed.

- Vehicles carrying hazardous wastes must be labelled appropriately.

- No burning of waste at work sites will be permitted.

- A workforce eating area must be designated and clearly demarcated, and provided with sufficient bins that must be regularly emptied and cleaned.

- Any cooking on site must be done in a designated area with well-maintained cookers with fire extinguishers present. No open fires will be permitted.

- Waste must be stored in an enclosed, bunded area that is inaccessible to animals and protected from rain.

- Staff must be trained on waste management measures to be implemented, including how to respond to a pollution incident.

Residual Impact Rating

The implementation of the mitigation measures should minimise the risk related to waste management during construction and decommissioning activities. The impact significance rating is reduced to **Minor**.

Table 8-19 Residual Impact Rating Related to Waste Management during Construction and Decommissioning Activities

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The site and transportation routes could be affected.
Duration	Temporary	Pollution events would be unlikely and if an unplanned event occurred, staff would be trained to deal with the incident.
Scale		The scale of the impact would be limited to the site and immediate surroundings, Lake Bhangazi South, and the transportation route.
Frequency	Intermittent	Unplanned event.
Likelihood	Unlikely	The controls in place should reduce the likelihood of an incident.
Magnitude		
Small		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium		
Significance Rating Post-mitigation		
Minor		

8.2.10 Hazardous Materials Management during Construction and Decommissioning Activities

Description of the Impact

Hazardous materials (solvents, bitumen, oil, fuel, paint) will be required during the construction and decommissioning phases. Inappropriate handling, storage and transportation of these materials may result in an accidental spill leading to soil, ground- or surface water contamination or injury/ death of people or animals.

Significance of Impact (Pre-mitigation)

The sensitivity of people, animals and the environment are considered to be medium, while the magnitude of the impact, pre-mitigation, is considered moderate. The impact will have a **Moderate** negative impact (Table 8-20).

Table 8-20 Pre-mitigation Impact Rating Related to General and Hazardous Waste Management during Construction and Decommissioning Activities

Type of Impact

Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The site and immediate surroundings.
Duration	Temporary to permanent	Failure to implement hazardous materials management measures may result in a pollution incident and/ or injury/ death of people/animals.
Scale		The scale of the impact would be limited to the workforce, site and surroundings, Lake Bhangazi South, and the transportation route.
Frequency	Intermittent to ongoing	Linked to pollution events, poor materials handling, storage and/ or transportation methods.
Likelihood	Possible	If inadequate measures are implemented, pollution events are possible.
Magnitude		
Medium		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium		
Significance Rating Before Mitigation		
Moderate		

Recommendations and Mitigation/Management Measures

The EMPr in place for the construction and decommissioning periods includes the need for measures relating to hazardous materials management such as:

- Training regarding proper methods for transporting, transferring and handling hazardous substances that have the potential to impact surface- and groundwater resources.

- No smoking allowed in the vicinity of fuel, lubricants / oils, chemicals, hazardous waste and hazardous material stores and handling areas. Symbolic safety signs depicting "No Smoking", "No Naked Lights" and "Danger" are to be provided. The volume capacity of storage tanks or containers must be displayed. The product contained within the tank must be clearly identified using the emergency information system. Any electrical or petrol-driven pump must be equipped and positioned, so as not to cause any danger of ignition of the product.

- Hazchem signage is to be used where hazardous goods are being stored, hazardous materials to be clearly labelled and fencing and controlled access to limit unauthorised access.

- Prevent the integrity and capacity of the bunded areas being compromised by rainwater and stormwater ingress.

- Provide collection systems (i.e. drip trays or impervious linings) under machinery or equipment that may dispense or leak hydrocarbons / hazardous substances (i.e. generators and pumps).

- Hazardous and dangerous material storage areas will be equipped with emergency spill response equipment.

- Concrete mixing must only take place at agreed specific areas on site and runoff from the area must not be allowed to flow off site into the surrounding forest, grassland or wetlands.

- A preventative maintenance program must be instituted that includes inspection schedules to confirm and maintain the mechanical integrity and operability of storage vessels, and associated containment areas and process equipment for fuel, lubricants / oils, chemicals, hazardous waste and hazardous materials.

- Fuel, lubricants / oils, chemicals, hazardous waste and hazardous material stores and handling areas must be provided with secondary containment capable of holding 110% of the total capacity of the all tanks / vessels. The containment must be checked daily and debris removed. The storage of such substances must not be within 100 m of any wetland or the lake.

- The loading and unloading of hazardous materials and fuels will be confined to an area that is provided with secondary containment and in line with hazardous material handling procedures.

- Maintain an inventory of all dangerous and hazardous goods onsite, together with all relevant Material Safety Data Sheets (MSDS) for all contaminants on-site. These will include human health effects of chemicals handled and will be included in the required training for all employees handling or otherwise exposed to the contaminants. All appropriate personal protective equipment, handling and response procedures must also be identified in the MSDS or otherwise recommended by the suppliers/manufacturers and followed by all Project staff.

- For all hazardous substances stored on the site, the contractor must provide Method Statements detailing the substances/ materials to be used, together with the storage, handling and disposal procedures of the materials. This will include (but not limited to) methods for refuelling of vehicles, machinery and equipment.

- Transportation vehicles and tanks suitable for the materials being transported must be used. These vehicles and tanks must be maintained in adequate condition to insure proper handling and safety of chemicals.

- All vehicles must be equipped with spill response kits appropriate to the materials being transported. The Contractor will be required to maintain these in good condition and working order.

- Drivers must be trained in spill and emergency response and must have a means of communicating with the site, their administrative offices and emergency personnel for the entire transportation route.

- Up-to-date emergency contact information and monitoring sheets and manifests documenting the volume, phase of matter and characteristics of the chemical being transported must be carried with each shipment.

- In the event of a hazardous spill, whether accidental, deliberate or through negligence, on site or during transportation of these substances to/from the site, the Contractor shall:

    - Immediately implement actions to stop or reduce and contain the spill.

    - Report the spill to the EM and arrange implementation of the necessary clean-up procedures.

    - Collect contaminated soil, water and other materials and dispose of it at a licensed waste disposal site

    - All spills or accidents involving such materials are to be recorded.

    - Spill kits must be provided and maintained at the fuel or chemical storage location.

    - Development, implementation and regular training and testing of a Spill Response Plan.

Residual Impact Rating

The implementation of the mitigation measures should minimise the risk related to hazardous materials management during construction and decommissioning activities. The impact rating is reduced to **Minor**.

Table 8-21 Residual Impact Rating Related to Waste Management during Construction and Decommissioning Activities

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The site and immediate surroundings.
Duration	Temporary to short-term	Pollution events would be unlikely and if an unplanned event occurred, staff would be trained to deal with the incident.
Scale		The scale of the impact would be limited to the workforce, site and surroundings, Lake Bhangazi South, and the transportation route.
Frequency	Ad hoc	Linked to pollution events, poor materials handling, storage and/ or transportation methods.
Likelihood	Unlikely	The controls in place should reduce the likelihood of an incident.
Magnitude		
Small		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium		
Significance Rating Post-mitigation		
Minor		

8.2.11 *Traffic Disruption during Construction and Decommissioning Activities*

Description of the Impact

The current traffic in the area is restricted to tourist vehicles, and light delivery vehicles travelling to Cape Vidal. During the construction and decommissioning phase activities of the Project, it is expected that additional heavy vehicle trips will frequent the route between the main entrance and the site, transporting materials and construction staff to the site.

Given the nature and purpose of the trips generated by the construction vehicles, it may cause a disruption to the normal tourist traffic.

Significance of Impact (Pre-mitigation)

Construction and decommissioning are of a temporary nature, thus the impact of construction vehicles will have a **Minor** negative impact (Table 8-22).

Table 8-22 Pre-mitigation Impact Rating Related to Traffic during Construction and Decommissioning Activities

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The extent of the increase in traffic is considered to be local as the impacts are experienced beyond the Project site and along the construction vehicle routes.
Duration	Temporary	Construction and decommissioning are of a temporary nature.
Scale	Route through the Park to site	The scale of the impact is estimated to be restricted to the access road through the Park to the site.
Frequency	Daily	There will be multiple entries of construction vehicles into the Park on a daily basis.
Likelihood	Possible	Given the increase in traffic and the type of vehicles, this may cause a disruption to tourist activities.
Magnitude		
Medium		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Low		
Significance Rating Before Mitigation		
Minor		

Recommendations and Mitigation/Management Measures

The following recommendations for management and/or mitigation of identified impacts are proposed:

- Develop a transport management plan where the construction and operation period will be scheduled, to prevent traffic at the Bhangazi Gate during peak holiday periods.

- Driver induction to include the Park Rules and driving etiquette (including speed limitations, behaviour, no hooting, no heavy breaking, etc.).

- Two access points to serve this proposed development and be taken directly off the Main Road to Cape Vidal.

- In total at least, 30 and 10 parking bays should be provided on site to meet the parking demand for the rooms and restaurant, respectively.

Residual Impact Rating

The implementation of the mitigation measures should minimise the risk of traffic disruptions during construction and decommissioning activities and reduce the impact rating to **Negligible**.

Table 8-23 Residual Impact Rating Related to Traffic during Construction and Decommissioning Activities

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The extent of the increase in traffic is considered to be local as the impacts are experienced beyond the Project site and along the construction vehicle routes.
Duration	Temporary	Construction and decommissioning are of a temporary nature.
Scale	Route through the Park to site	The scale of the impact is estimated to be restricted to the access road through the Park to the site.
Frequency	Daily	There will be multiple entries of construction vehicles into the Park on a daily basis.
Likelihood	Possible	Given the increase in traffic and the type of vehicles, this may cause a disruption to tourist activities.
Magnitude		
Negligible		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Low		
Significance Rating Post-mitigation		
Negligible		

8.2.12 Noise during Construction and Decommissioning Activities

Description of the Impact

Noise will be generated as a result of construction activities as well as demolition of the existing structures. Noise will be generated from plant, equipment and vehicles which will cause disturbance to fauna and tourists in the area.

Significance of Impact (Pre-mitigation)

Construction and decommissioning are of a temporary nature, thus the impact of construction vehicles will have a **Minor** negative impact (*Table 8-24*).

Table 8-24 Pre-mitigation Impact Rating Related to Noise during Construction and Decommissioning Activities

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Noise generated from construction activities will be audible on site and the immediate surroundings.
Duration	Temporary	Construction and decommissioning are of a temporary nature.
Scale	Within the Park	Noise levels will be increased above current ambient levels.
Frequency	Daily	Construction noise will be generated on a daily basis.
Likelihood	Likely	Activities will result in noise generation.
Magnitude		
Medium		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Low		
Significance Rating Before Mitigation		
Minor		

Recommendations and Mitigation/Management Measures

The following recommendations for management and/or mitigation of identified impacts are proposed:

- Suitable and effective silencing devices for any pneumatic tools used and other plant equipment that would otherwise cause a noise level exceeding 85dB (A) must be used.

- Machinery, equipment and vehicles must be regularly inspected and maintained to ensure they are in good working order. The condition of mufflers must also be periodically checked.

- Awareness raising of staff on behaviour (no hooting, shouting, loud noise).

Residual Impact Rating

The implementation of the mitigation measures should minimise the level of noise during construction and decommissioning activities, and reduce the impact significance rating to **Negligible**.

Table 8-25 Residual Impact Rating Related to Noise during Construction and Decommissioning Activities

Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Noise generated from construction activities will be audible on site and the immediate surroundings.
Duration	Temporary	Construction and decommissioning are of a temporary nature.
Scale		Noise levels will be increased above current ambient levels.
Frequency	Daily	Construction noise will be generated on a daily basis.
Likelihood	Possible	Activities will result in noise generation but where feasible, the volume should be kept within acceptable limits.
Magnitude		
Small		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Low		
Significance Rating Post-mitigation		
Negligible		

8.3 OPERATIONAL IMPACTS

Impacts relating to the following areas have been identified and assessed:

- Visual;
- Sewage treatment and disposal;
- Socio-economic.

8.3.1 Impact of the Proposed Development on General Landscape Character and Sensitive Receptors

Description of the Baseline Environment

The Bhangazi Heritage Site is located adjacent to Lake Bhangazi South. The development will be constructed within the footprint of the existing lodge with additional units established within the treeline adjacent to the lake. The site is dominated by indigenous vegetation with small open areas and scattered alien plant species within the forest.

The developable area is not visible from the main road which leads to the site and to Cape Vidal. While the forest is visible from across the lake, the developable area itself is within and behind the tree line/ forest, with the canopy height of the forest estimated at 10m.

Description of the Impact

General Landscape Character

According to the Visual Impact Assessment Report (June 2017), the reported height of structures will be a maximum of 6 m, while the existing canopy height is estimated at 10 m. It is unlikely that roof lines will be highly visible above the canopy level given that the canopy will remain intact with the implementation of the current layout. Subject to the gradient of the affected

areas and the exact height and density of surrounding canopy trees, it is possible that sections of roof lines could be visible.

With the implementation of the current layout, and retaining the state of the canopy, it is not envisaged that there will be impacts caused by canopy disturbance. Even without mitigation, this landscape change is unlikely to be obvious outside a 1 km radius and unlikely to be visible to the naked eye outside 3 km. However, night time lighting could exacerbate visual impact making the development obvious over a greater distance.

Sensitive Receptors: (a) Potential visual impact on visitors on Lake Bhangazi and its southern and western shores including the impact on visitors at the View Sites to the south of the lake

Any visual impact associated with the development is likely to be visible to the southern and western sections, and shores of the lake and will be screened from the northern (wilderness) and eastern sections of the lake and lake shores.

Subject to the gradient of the area on which development occurs and the extent of low-level clearing to open up views of the lake from the individual units, it is also possible that structures could be visible from southern and south eastern sections of the lake and lake shores.

Night time lighting within the development is also likely to be visible beneath and through the forest edge. This is likely to be particularly obvious from close quarters but subject to the nature of lighting, it is possible that it might be visible from the west side of the lake.

Sensitive Receptors: (b) Potential visual impact on visitors travelling on the main St Lucia to Cape Vidal access road including the impact on visitors using the View Site that is located on the road approximately 2.2 km south of the site

Views of the site from the main Cape Vidal access road are visible from approximately 3 km distance from the site. The road sits on high ground and is surrounded by relatively open grassland between approximately 3 km and 1.5 km from the site. This enables views over Lake Bhangazi and the site. As the road starts to fall towards the lake from approximately 1.5 km from the site, the landscape changes from open grassland to a relatively dense forest landscape which, with the exception of sections of road that are aligned towards the site this has the effect of largely screening views of the site and adjacent lake.

Approaching the site on the Cape Vidal Road from the north the forested valley slopes screen the lake and site from view.

From both directions the forested eastern edge of the site is visible from the road as it runs adjacent to the boundary. The vegetation is dense however and because of this, views of the site are limited to the edge only. In the vicinity of the site, other development becomes noticeable as the road passes an area of

staff accommodation blocks to the north east and park administration offices to the south east of the site. These areas of development are only obvious in as far as signage is visible and glimpses of low buildings are possible as the viewer approaches the area. Otherwise, existing development has minimal impact on the road.

The proposed development has the potential to change existing views in the following way:

- From higher sections of the road to the south, rooflines may become visible in amongst the trees that are retained. Views of the site will be from a distance of 1.5-3.0 km and it is likely that retained trees will provide screening for the majority of proposed structures. During the day, therefore, due to distance and partial screening by trees, it is likely that the development may be visible but unlikely that it will be obvious and it may be missed by the casual observer. During the night, it is possible that lighting could make the development highly conspicuous in an otherwise dark landscape. This includes night-time driving and game drives during the night.

- From the section of the road that runs along the eastern site boundary, it is possible that the proposed development could open up the forest sufficiently to allow greater penetration of views through the trees making development in the area more obvious. Of particular concern is the proposed helipad which is located in close proximity to the road (and it is likely to require removal of a substantial number of forest trees).

Sensitive Receptors: I Potential visual impact on visitors travelling on the road to the Bhangazi Bush Lodge

The only section of this road that is likely to be affected is the approximately 1.7 km length of the road that runs close to the western shore of the lake. The distance between this section of the road and the lake edge varies from approximately 70 m to approximately 320 m. The road also varies in elevation, at its lowest at the southern end it is approximately 4m above the edge of the lake and at its highest towards its northern end it is approximately 17 m above the edge of the lake.

Vegetation close to the road is generally sparse and low being comprised largely of grassland with occasional trees and low scrub with denser woody vegetation occurring closer to the lake edge.

This means that views through and over the sparse tree cover will be possible from the road towards the eastern shore of the lake and the development site. Views will however be intermittent as in areas they will be broken by roadside vegetation.

At its closest towards the southern end the road is approximately 1.9 km from the site and at its furthest towards the northern end is approximately 2.8 km from the site.

Due to the distance involved and subject to the extent of clearance particularly in front of units close to the shore line, it is possible that the development may be visible from sections of the road. However, if reasonable tree cover is maintained in front of the shore side units and given the intermittent nature of views from the road, it is unlikely that the development will be obvious to the casual viewer during day light hours.

During the hours of darkness, it is likely that lighting within the development will be visible to users of this section of the road. However, it is important to note that driving is off-limits after gate closure times and no users are anticipated.

Should photovoltaic panels be used on roof structures they could be highly obvious from this viewpoint due to glint and glare particularly during early morning when the sun is low in the east and light will be refracted at an equally low angle towards the west.

Sensitive Receptors: (d) Potential visual impact on visitors staying at the Bhangazi Bush Lodge

Given the distance (approximately 2.7 km), it is possible that the proposed development could be obvious from Bhangazi Bush Lodge. Even in the worst case a degree of vegetation retention will occur around the development, it is unlikely to be obvious to the casual viewer during day light hours.

During the hours of darkness, it is likely that lighting within the development, particularly the restaurant and western section of the development, will be visible to the Bhangazi Bush Lodge and the wilderness area to the North.

Significance of Impact on General Landscape Character and Sensitive Receptors (Pre-mitigation)

The character of the natural landscape will be changed. The effect will result in a reduction in the natural character due to the development of built elements. During day light hours, this effect is only likely to be obvious from a relatively short distance (within 1 km) to the west of the site but unlikely to be visible to the casual observer from the road leading to Cape Vidal.

During hours of darkness this effect could be more obvious from a wider area subject to the nature of lighting used.

The undermining of the forest and clearing forest edge vegetation is potentially an irreplaceable loss. Without the correct management, this could attract alien weed species that could prove difficult to eradicate. Over time degradation could increase through the further loss of natural vegetation

either through human intervention in pruning, trampling or removing additional vegetation or through the effects of wind blow within cleared areas.

The loss of natural character is likely to be seen as a negative impact of varying significance, depending on the receptor, and the time of day. In terms of impacting the general landscape character and receptors (a) to (c), the significance of the impact differs between daylight and hours of darkness (given the impact of lighting), with the pre-mitigation significance being **Minor** and **Moderate**, respectively.

The impact on receptors (d) during daylight hours is **Negligible** and during hours of darkness is **Minor**.

Table 8-26 Pre-mitigation Impact Rating Related to General Landscape Character and Sensitive Receptors during the Operational Phase

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The impact is limited to the Project site and immediately adjacent areas.
Duration	Long term	Impact will persist for the life of the development.
Scale	1-3 km radius west of the site boundary	During day time, visible up to 1 km radius to the west. Night time, visible up to 3 km, based on lighting. Limited visibility from the road leading to Cape Vidal.
Frequency	Continuous	The landscape will be permanently changed.
Likelihood	Likely	There will be a definite change in the landscape, even if minor.
Magnitude		
Daylight hours: Small		
Hours of darkness: Medium		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
General Landscape and Receptors (a) to (c)		
Medium		
Receptor (d)		
Low		
Significance Rating Before Mitigation		
General Landscape and Receptors (a) to (c)		
Daylight hours: Minor		
Hours of darkness: Moderate		
Receptor (d)		
Daylight hours: Negligible		
Hours of darkness: Minor		

Recommendations and Mitigation/Management Measures

While there are a number of mitigation measures that should be implemented during the operational phase itself, it is important that mitigation measures are taken into account during the planning phase as this has implications for the operational phase.

During the planning phase:

- Locate units and infrastructure to minimise loss of forest edge vegetation.

- Optimise lake views when locating units, with consideration to the forest edge.

- Staggering units as far as possible, rather than setting them out in a continuous line (see Figure 2-2). It is important to note that this has been considered to an extent in the initial layout as well as the revision, together with other design criteria.

- Lighting is carefully planned in order to minimise lighting levels and light pollution of the surrounding natural landscape. The following are recommended.

- The use of motion sensor triggered lighting along paths and within common areas to ensure that only lighting that is absolutely necessary is switched on.

- The use of shielding to prevent light spill outside the areas that are necessary to luminate.

- The use of minimal lighting required both from a power perspective and the number of fittings in order to ensure the safety of visitors and staff.

- A concern relating to the use of tented structures is that light glow tends to shine through some tent fabrics. Ensure that all structures are designed to minimise light spill into surrounding areas.

Operation:

- Strict controls should be enforced to ensure that visitors and staff stick to specific circulation routes. The opening up of additional tracks particularly between visitor units and the lake edge must be prevented.

- Strict controls to be enforced to ensure that vehicles only park/ use allocated parking areas and roads/ tracks within the development area.

- Reinforce the forest edge vegetation as necessary with planting particularly around areas that have been cleared for access and to allow views from units to ensure that it appears as continuous as possible. This might include the planting of low edge species in areas where openings are made for views out of the development.

- Undertake regular, weekly, weed control.

- Do not allow pruning or removal of woody vegetation without authorisation from the Park Authority.

- Ensure that all maintenance of the lighting system including replacement or addition of light fittings is undertaken with the objectives of power conservation and minimal visual disturbance.

- Any proposed changes to the development that would require amendment to the circulation system, relocation or addition of structures should be authorised by the DFFE.

Residual Impact Significance

With the implementation of the mitigation measures described above, the magnitude of the impact will be reduced, especially during the hours of darkness.

The residual impact is reduced to **Minor** for the general landscape character and **Negligible** for sensitive receptors.

Table 8-27 Residual Impact Rating Related to General Landscape Character and Sensitive Receptors (Post-mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	Designation	Summary of Reasoning
Extent	Local	The impact is limited to the Project site and immediately adjacent areas.
Duration	Long term	Impact will persist for the life of the development, although the magnitude of the impact is likely to decrease over time as the developed view blends into the landscape.
Scale	1-3 km radius west of the site boundary	During day time, visible up to 1 km radius. Night time, visible up to 3 km, based on lighting.
Frequency	Continuous	The landscape will be permanently changed.
Likelihood	Unlikely (D) Possible (N)	Daylight hours (D): there is unlikely to be a visual impact. Night time (N): There is still the possibility that lights from the development are seen from across the lake.
Magnitude		
Small		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium (although sensitivity may decrease as the development blends into the landscape over time).		
Significance Rating Post-mitigation		
General Landscape		
Daylight hours: Negligible		
Hours of darkness: Minor		
Receptors (a) – (d)		
Daylight hours and Hours of darkness: Negligible		

8.3.2 *Impact of Nutrient Enrichment of Wetlands in the Area and of Lake Bhangazi South*

Description of the Impact

The preferred technology alternative as stated in Section 3.3.1 is the development of the Sewage Treatment Plant on site. The system works by removing contaminants from the waste water and sewage generated on site using both the anaerobic and aerobic processes. This will ensure that the water discharged from the Plant meets the guidelines set out in the iSimangaliso Wetland Wastewater Treatment and Disposal – Guideline and Protocol.

Detergents to be used at the units are proposed to be ammonia and chlorine free. These substances can cause harm to a freshwater environment. Using detergents which are ammonia and chlorine free, and the use of the Sewage treatment Plant will decrease the potential for nutrient enrichment related impacts in the area.

The wastewater discharge limits as per the Guideline Protocol set by the iSimangaliso Authority are provided in Table 8-28

Table 8-28 Wastewater Discharge Water Limits as per Guideline Protocol

Substance/Parameter	**Wastewater Discharge Limits as per Guideline Protocol**
Chemical Oxygen Demand (mg/l)	30(i)
pH	5.5 – 7.5
Ammonia (ionised and un-ionised) as Nitrogen (mg/l)	2
Nitrate/Nitrite as Nitrogen (mg/l)	1.5
Suspended Solids (mg/l)	10
Ortho-phosphate as phosphorous	1 (median) and 2.5 (maximum)

Should the STP be operated appropriately, it is expected that there would be minimal impacts associated with nutrient enrichment of the wetland or Bhangazi Lake. Extra precautions taken to ensure the use of ammonia and chlorine free detergents should work at limiting this impact as much as possible.

Significance of Impact (Pre-mitigation)

If the grey water is released from the package plant into the environment, it would result in a **Moderate** negative impact on the ecology of the area, including impacts to Lake Bhangazi South.

Table 8-29 Rating of Impacts Related to Nutrient Enrichment (Pre-mitigation)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The contamination will be largely apparent in the lake. If nutrients enter the groundwater and flow through the Mfabeni Swamp, they will almost certainly be taken up in the swamp prior to reaching Lake St Lucia.
Duration	Permanent	The loss will remain at least as long as the environment continues to receive nutrient rich effluent. Should the impact take place, but then be corrected, it is possible that recovery will take years as the nutrient substances will have to be purged from the system by natural processes.
Scale	Lake Bhangazi South	The affected area will be Lake Bhangazi South.
Frequency	Ad hoc	This impact could be repeated over and over depending on the management of the waste water at the lodge site.
Likelihood	Possible	The release of water from the system would impact the lake.

Magnitude
Medium
The threat is easily avoided but, if it happens could open the developer to action in terms of the National Water Act (Act 36 of 1988).
Sensitivity/Vulnerability/Importance of the Resource/Receptor
High
Significance Rating Before Mitigation
Moderate

Recommendations and Mitigation/Management Measures

The following migratory actions are recommended:

- An appropriate specialist must compile all available data relating to the chemistry and biology of Lake Bhangazi South. The compiled information must be available to serve as a benchmark for the system.

- A STP is proposed to be constructed on site where waste water generated on site will be directed to the plant and treated. It is anticipated that the Plant will treat the waste water to the Discharge standards set by the iSimangaliso Authority.

- Treated water should be monitored and recorded bi-annually

Residual Impact Significance

If the treated waste water is contained and not released to the environment, the risk of impact is reduced as the event would only take place under exceptional circumstances and would be infrequent, resulting in a **Minor** impact rating.

Table 8-30 Residual Impact Rating Related to Nutrient Enrichment (<u>Post-mitigation</u>)

Type of Impact		
Direct Negative Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	The contamination will be largely apparent in the lake. If nutrients enter the groundwater and flow through the Mfabeni Swamp, they will almost certainly be taken up in the swamp prior to reaching Lake St Lucia.
Duration	Short-term	The loss will remain at least as long as the environment continues to receive nutrient rich effluent. Should the impact take place, but then be corrected, it is possible that recovery will take years as the nutrient substances will have to be purged from the system by natural processes.
Scale	Lake Bhangazi South	The affected area will be Lake Bhangazi South.
Frequency	Ad hoc	This impact could be repeated over and over depending on the management of the waste water at the lodge site.
Likelihood	Unlikely	If the grey water is contained in a closed system and transferred to the onsite sewage treatment plant, the likelihood of a release would only be linked to unplanned events.
Magnitude		
Small		

The threat is easily avoided but, if it happens could open the developer to action in terms of the National Water Act (Act 36 of 1988).
Sensitivity/Vulnerability/Importance of the Resource/Receptor
High
Significance Rating Post-mitigation
Minor

8.3.3 Socio-economic Impact

Description of the Impact

The Bhangazi community were forcibly removed from the site in the 1950s and 1970s. While they have been granted rights to access and utilise the site, the potential has not been realised. The proposed project will provide the community with a form of income to be managed through the Trust as well as (limited) job opportunities for members of the community during the operational phase of the lodge.

Significance of Impact (Pre-mitigation)

The significance of the impact is expected to be positive and **Minor** as per the Table below.

Table 8-31 Socio-economic Pre-mitigation Impact Rating during the Operational Phase

Type of Impact		
Direct Positive Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Some community members will benefit from job opportunities created by the development. There will be an estimated 90 jobs in the construction phase, of which 67 will be new jobs, and 61 jobs in operational phase after 5 years (when lodge is financially sustainable). The community will also benefit through funds generated by the development and managed by the Trust. These funds will be a minimal rental plus a percentage of the turnover.
Duration	Long-term	The benefits will extend for the lifetime of the project.
Scale	The Bhangazi community	Increased income generated by the Trust as well as individual opportunities.
Frequency	Continuous	The benefits will extend over the project lifetime.
Likelihood	Likely	Although limited, there will be job opportunities created. The lodge should generate income which will benefit the community.
Magnitude		
Small		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium		
Significance Rating Before Mitigation		
Minor		

Recommendations and Enhancement/ Management Measures

- The approach and method of recruitment must be shared with the entire community so that everyone is aware of how, where and when to apply for opportunities and what the minimum requirements for employment are.

- Opportunities for employment must be offered to the community first before filling from other sources.

- The Trust must get assistance in the management of funds generated from the development to ensure that benefits are realised and that they reach the community as a whole.

Residual Impact Significance

The residual socio-economic impact associated with the operational phase of this project will be positive **Moderate** (Table 8-32).

Table 8-32 Socio-economic Residual Impact Rating during the Operational Phase

Type of Impact		
Direct Positive Impact		
Rating of Impacts		
Characteristic	**Designation**	**Summary of Reasoning**
Extent	Local	Some community members will benefit from job opportunities created by the development. The community will also benefit through funds generated by the development and managed by the Trust.
Duration	Long-term	The benefits will extend for the lifetime of the project.
Scale	The Bhangazi community	Increased income generated by the Trust as well as individual opportunities.
Frequency	Continuous	The benefits will extend over the project lifetime.
Likelihood	Likely	Although limited, there will be job opportunities created. The lodge should generate income which will benefit the community.
Magnitude		
Medium		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium		
Significance Rating Post-mitigation		
Moderate		

8.4 POTENTIAL CUMULATIVE IMPACTS

A cumulative impact is one that arises from a result of an impact from the Project interacting with an impact from another activity to create an additional impact.

Although the development will increase the number of tourists staying overnight in the Park, there will not be a resultant increase in traffic through the Park as these numbers will remain limited/ controlled.

The lodge will need to be self-sufficient with respect to bulk services, apart from water supply, and will therefore not result in an increased demand for sewage treatment. It has been confirmed that the current water supply is sufficient for Cape Vidal and the Bhangazi Cultural Heritage Lodge requirements. Eskom is currently supplying power to Cape Vidal and supply to the proposed development will result in an increase on this supply.

The removal of trees/ pruning of branches to create the area required for the development will be offset by the rehabilitation project being managed by the iSimangaliso Wetland Park Authority to increase forest areas in the Park.

The aim of the BA for the proposed Project is to provide information to inform decision-making that will contribute to sustainable development. During the BA process, which included stakeholder and specialist input, ERM has identified and assessed a number of potential impacts relating to the Project. This section provides an overview of the findings and provides key mitigation measures, should the Project be developed.

The Project has been discussed and investigated by the Bhangazi Community Trust in collaboration with the iSimangaliso Wetland Park Authority for over 15 years. The no-go option is therefore not considered as a viable option as it would prohibit the community from realising their development rights.

There may, however, be differences in opinion within the community with respect to the proposed development but it is anticipated that any such issues would be resolved internally with the community and their elected Trust representatives.

The proposed development site is located in a landscape that is historically significant to the local Bhangazi community and their ancestral connection with the area. The development will provide an opportunity for people to learn about the cultural heritage of the area, and specifically, the Bhangazi community. It will provide an opportunity for the intangible history of the area to be captured and preserved.

From an economic view, the development of the lodge will provide income to the community, through the Trust, as well as direct job opportunities to community members.

While the landscape character may be impacted, this is considered to be of a temporary duration, with the development blending into the landscape over time.

In term of the impacts on the forest areas, these will be of moderate to minor significance give the changes to the site layout. The restaurant and pool complex will be constructed in an already disturbed area outside the forest, the staff housing has been repositioned on two separate disturbed areas within the old Bhangazi fishing camp, all development within the forest will make use of pre-identified cleared areas where possible, and the accommodation units will each cover a smaller area than initially planned.

9.1 SUMMARY OF IMPACTS IDENTIFIED AND ASSESSED

9.1.1 Impacts Associated with Activities during the Construction and Decommissioning Phases

It is anticipated that the anticipated impacts can be mitigated with impact significance reduced to minor and negligible levels (see Table 9.1).

Table 9-1 Impact Summary: Construction and Decommissioning Phase Activities

Affected Resource / Receptor	Potential Impact	Pre-Mitigation Significance	Post-Mitigation Significance
General Landscape Character	Change in character of the landscape	Minor	Negligible
Flora	Potential loss of Forest Understory	Moderate	Minor
Flora	Further Loss Forest	Major	Moderate
Flora	Increase in the Level of Alien Plant Infestation of the Area	Moderate	Minor
Fauna	Loss of biodiversity	Moderate	Minor
Flora	Installation of sewage system	Moderate	Minor
Aquatic Environment	Decreased water quality and loss of/ damage to aquatic fauna and flora	Moderate	Minor
Stormwater/ Erosion	Uncontrolled stormwater run-off and increased soil erosion.	Moderate	Minor
Waste	Poor waste management leading to pollution, damage to/ loss of fauna and flora.	Moderate	Minor
Hazardous Materials	Poor management leading to pollution events and/ or injury/ death of people and/ or fauna	Moderate	Minor
Traffic	Increased	Minor	Negligible
Noise	Noise generated as a result of construction activities as well as demolition of the existing structures	Minor	Negligible

9.1.2 Operational Phase Impacts

During the operational phase there are a number of embedded controls that will contribute to the sustainable management of the lodge and associated activities.

Table 9-2 Impact Summary: Operation Phase

Affected Resource / Receptor	Potential Impact	Pre-Mitigation Significance	Post-Mitigation Significance
General Landscape Character and Sensitive Receptors	Change in character of the landscape and impact on sensitive receptors	Daylight: Minor	Daylight: Negligible
		Hours of darkness: Moderate	Hours of darkness: Minor
Wetlands	Nutrient enrichment from sewage treatment.	Moderate	Minor

Affected Resource / Receptor	Potential Impact	Pre-Mitigation Significance	Post-Mitigation Significance
Socio-economic	Income generation for the Trust and individual job opportunities for community members.	Minor +VE	Moderate +VE

9.2 KEY MITIGATION AND MANAGEMENT MEASURES

The following key mitigations must be undertaken to enhance the environmental and socio-economic viability of the Project and minimise environmental and social risks.

9.2.1 *Construction and Decommissioning Phases*

The impacts arising in these phases can be managed through the implementation of an EMPr which should be monitored by the developer's Environmental Officer (EO). Mitigation measures are not included here as they are detailed in the EMPr contained in Annex B.

9.2.2 *Operational Phase*

The key impacts arising from the operational phase relate to the management of sewage, the visual impact and the enhancement of the benefits of the development through job creation and income generation for the community. The negative impacts identified for this phase are also addressed in the EMPr.

9.3 RECOMMENDATIONS

The implementation of the mitigation measures identified above and those detailed in Annex B (EMPr), including monitoring, will provide a basis for ensuring that the potential positive and negative impacts associated with the Project are enhanced and mitigated, respectively, to a level which is deemed adequate for the Project to proceed.

Key recommendations include:

- Full tree survey during the finalisation of the planning phase to confirm the location of the units within the forest;
- Treated sewage generated by the sewage treatment package plant to be stored on site prior to disposal off-site;
- Investigate the use of renewable energy sources to generate power for the site;
- Full and effective implementation of the EMPr;

- Appointment of an ECO during site establishment, construction, post construction, and decommissioning;

- Bhangazi Community Trust to develop a recruitment process for the transparent and equitable employment of staff for the operational phase; and

- Independent annual audit of the lodge and associated activities during operation.

- It is recommended that the African Safari Foundation engaging with the Directorate: Woodlands and Indigenous Forests (KZN) with regards to the NFA forest licencing requirements.