

APP-001579

**TWYFELFONTEIN COUNRTY LODGE, UIBASEN
CONSERVANCY, KUNENE REGION**

ENVIRONMENTAL MANAGEMENT PLAN



Prepared by:




Prepared for:



**Twyfelfontein Lodge
Management (Pty) Ltd**

December 2023

Project:	TWYFELFONTEIN COUNTRY LODGE, UIBASEN CONSERVANCY, KUNENE REGION: ENVIRONMENTAL MANAGEMENT PLAN	
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Report Approval	 André Faul Environmental Assessment Practitioner	

I Riaan Brand acting as the representative of Twyfelfontein Lodge Management (Pty) Ltd, hereby confirm that we approve the Environmental Management Plan as presented in this document. All material information in the possession of the Proponent that reasonably has or may have the potential of influencing the Environmental Management Plan was provided to the consultant.

Signed at Windhoek on the 6th day of December 2023.



Twyfelfontein Lodge Management (Pty) Ltd CY/2001/0254
Company Registration Number

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LIST OF ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
BE	Biological/Ecological
BTF	Bulk to Farmer
DWA	Department of Water Affairs
DEA	Directorate of Environmental Affairs
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EMA	Environmental Management Act No 7 of 2007
EMP	Environmental Management Plan
EMS	Environmental Management System
EO	Economic/Operational
ES	Environmental Classification
FGASA	Field Guides Association of Southern Africa
GPT	Geo Pollution Technologies
HIV	Human Immunodeficiency Virus
IAPs	Interested and Affected Parties
IUCN	International Union for Conservation of Nature
LNAPL	Light Non-Aqueous Phase Liquids
m/s	Meter per second
mbs	Meters below surface
MEFT	Ministry of Environment, Forestry and Tourism
mm/a	Millimetres per annum
MSDS	Material Safety Data Sheet
NATH	Namibian Academy for Tourism and Hospitality
NCAA	Namibia Civil Aviation Authority
PC	Physical/Chemical
PPE	Personal Protective Equipment
ppm	Parts per million
SADC	Southern African Development Community
SANS	South African National Standards
SC	Sociological/Cultural
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
WHO	World Health Organization

GLOSSARY OF TERMS

Alternatives - A possible course of action, in place of another, that would meet the same purpose and need but which would avoid or minimize negative impacts or enhance project benefits. These can include alternative locations/sites, routes, layouts, processes, designs, schedules and/or inputs. The “no-go” alternative constitutes the ‘without project’ option and provides a benchmark against which to evaluate changes; development should result in net benefit to society and should avoid undesirable negative impacts.

Assessment - The process of collecting, organising, analysing, interpreting and communicating information relevant to decision making.

Competent Authority - means a body or person empowered under the local authorities act or Environmental Management Act to enforce the rule of law.

Construction - means the building, erection or modification of a facility, structure or infrastructure that is necessary for the undertaking of an activity, including the modification, alteration, upgrading or decommissioning of such facility, structure or infrastructure.

Cumulative Impacts - in relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

Environment - As defined in the Environmental Assessment Policy and Environmental Management Act - “land, water and air; all organic and inorganic matter and living organisms as well as biological diversity; the interacting natural systems that include components referred to in sub-paragraphs, the human environment insofar as it represents archaeological, aesthetic, cultural, historic, economic, palaeontological or social values”.

Environmental Impact Assessment (EIA) - process of assessment of the effects of a development on the environment.

Environmental Management Plan (EMP) - A working document on environmental and socio-economic mitigation measures, which must be implemented by several responsible parties during all the phases of the project.

Environmental Management System (EMS) - An Environment Management System, or EMS, is a comprehensive approach to managing environmental issues, integrating environment-oriented thinking into every aspect of business management. An EMS ensures environmental considerations are a priority, along with other concerns such as costs, product quality, investments, PR productivity and strategic planning. An EMS generally makes a positive impact on a company’s bottom line. It increases efficiency and focuses on customer needs and marketplace conditions, improving both the company’s financial and environmental performance. By using an EMS to convert environmental problems into commercial opportunities, companies usually become more competitive.

Evaluation – means the process of ascertaining the relative importance or significance of information, the light of people’s values, preference and judgements in order to make a decision.

Hazard - Anything that has the potential to cause damage to life, property and/or the environment. The hazard of a particular material or installation is constant; that is, it would present the same hazard wherever it was present.

Interested and Affected Party (IAP) - any person, group of persons or organisation interested in, or affected by an activity; and any organ of state that may have jurisdiction over any aspect of the activity.

Mitigate - The implementation of practical measures to reduce adverse impacts.

Proponent (Applicant) - Any person who has submitted or intends to submit an application for an authorisation, as legislated by the Environmental Management Act no. 7 of 2007, to undertake an

activity or activities identified as a listed activity or listed activities; or in any other notice published by the Minister or Ministry of Environment & Tourism.

Public - Citizens who have diverse cultural, educational, political and socio-economic characteristics. The public is not a homogeneous and unified group of people with a set of agreed common interests and aims. There is no single public. There are a number of publics, some of whom may emerge at any time during the process depending on their particular concerns and the issues involved.

Scoping Process - process of identifying: issues that will be relevant for consideration of the application; the potential environmental impacts of the proposed activity; and alternatives to the proposed activity that are feasible and reasonable.

Significant Effect/Impact - means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

Stakeholder Engagement - The process of engagement between stakeholders (the proponent, authorities and IAPs) during the planning, assessment, implementation and/or management of proposals or activities. The level of stakeholder engagement varies depending on the nature of the proposal or activity as well as the level of commitment by stakeholders to the process. Stakeholder engagement can therefore be described by a spectrum or continuum of increasing levels of engagement in the decision-making process. The term is considered to be more appropriate than the term “public participation”.

Stakeholders - A sub-group of the public whose interests may be positively or negatively affected by a proposal or activity and/or who are concerned with a proposal or activity and its consequences. The term therefore includes the proponent, authorities (both the lead authority and other authorities) and all interested and affected parties (IAPs). The principle that environmental consultants and stakeholder engagement practitioners should be independent and unbiased excludes these groups from being considered stakeholders.

Sustainable Development - “Development that meets the needs of the current generation without compromising the ability of future generations to meet their own needs and aspirations” – the definition of the World Commission on Environment and Development (1987). “Improving the quality of human life while living within the carrying capacity of supporting ecosystems” – the definition given in a publication called “Caring for the Earth: A Strategy for Sustainable Living” by the International Union for Conservation of Nature (IUCN), the United Nations Environment Programme and the World Wide Fund for Nature (1991).

1 INTRODUCTION

Twyfelfontein Lodge Mangement (Pty) Ltd (the Proponent), requested Geo Pollution Technologies (Pty) Ltd to prepare an environmental management plan (EMP) for the existing Twyfelfontein Country Lodge, situated in the Uibasen Conservancy, Kunene Region. The lodge has 69 guest rooms which can accommodate 146 guest, 14 management rooms and 40 junior staff rooms which can accommodate 62 staff members. The lodge also has a landing strip for guests (and other aircrafts) arriving by plane and a fuel retail facility for guests and the general public. Service infrastructure include a restaurant, shop, swimming pool, work shop and related support infrastructure. Operational activities are typical of similar tourism facilities in the region and include day to day lodge operations and maintenance, guided local tours and a number of other tourist activities.

In order to comply with Namibian legislation, and to adhere to all codes and standards applied in their operations, the Proponent wishes to apply for an environmental clearance certificate (ECC) for the lodge operations. In support of the ECC application, an EMP will be submitted to the Ministry of Environment, Forestry and Tourism (MEFT). The EMP provides management options to ensure environmental impacts of the lodge are continually minimised. The environment being defined in the Environmental Assessment Policy and Environmental Management Act as “land, water and air; all organic and inorganic matter and living organisms as well as biological diversity; the interacting natural systems that include components referred to in sub-paragraphs, the human environment insofar as it represents archaeological, aesthetic, cultural, historic, economic, paleontological or social values”.

The Proponent already implements various actions to enhance the positive impacts of the lodge and prevent or mitigate any negative impacts. The EMP, which is a tool used to take pro-active action by addressing potential problems before they occur, is therefore prepared to formalise management measures for the Proponent in so far as it relates to the environment as defined. Where not already implemented, adherence to the various recommendations of the EMP, limits potential future corrective measures that may need to be implemented and allows for application of mitigation measures for unavoidable impacts. This document should be used as an on-site reference document during all phases (planning, construction (upgrades, care and maintenance), operations and decommissioning) of the lodge. All monitoring and records kept should be included in a report to ensure compliance with the EMP. Parties responsible for transgression of the EMP should be held responsible for any rehabilitation that may need to be undertaken. A health, safety, environment and quality (HSEQ) policy as well as Environmental Policy could be used in conjunction with the EMP. Operators and responsible personnel must be taught the contents of these documents. Relevant regulations and guidelines must be adhered to and monitored regularly as outlined in the EMP.

The EMP will be used to apply for renewal of the existing ECC in compliance with Namibia’s Environmental Management Act (Act No 7 of 2007).

2 SCOPE

The scope of the EMP is to:

- ◆ Provide a brief overview of all components and related operations of the lodge.
- ◆ Summarise the legal and regulatory framework within which the lodge operates.
- ◆ Provide a brief overview of the environment, i.e. the physical, biological, social and economic conditions, potentially impacted by the lodge.
- ◆ Identify a range of management actions which could mitigate the potential adverse impacts to acceptable levels.
- ◆ Provide sufficient information to the relevant competent authorities and the MEFT to make an informed decision regarding the granting of the ECC.

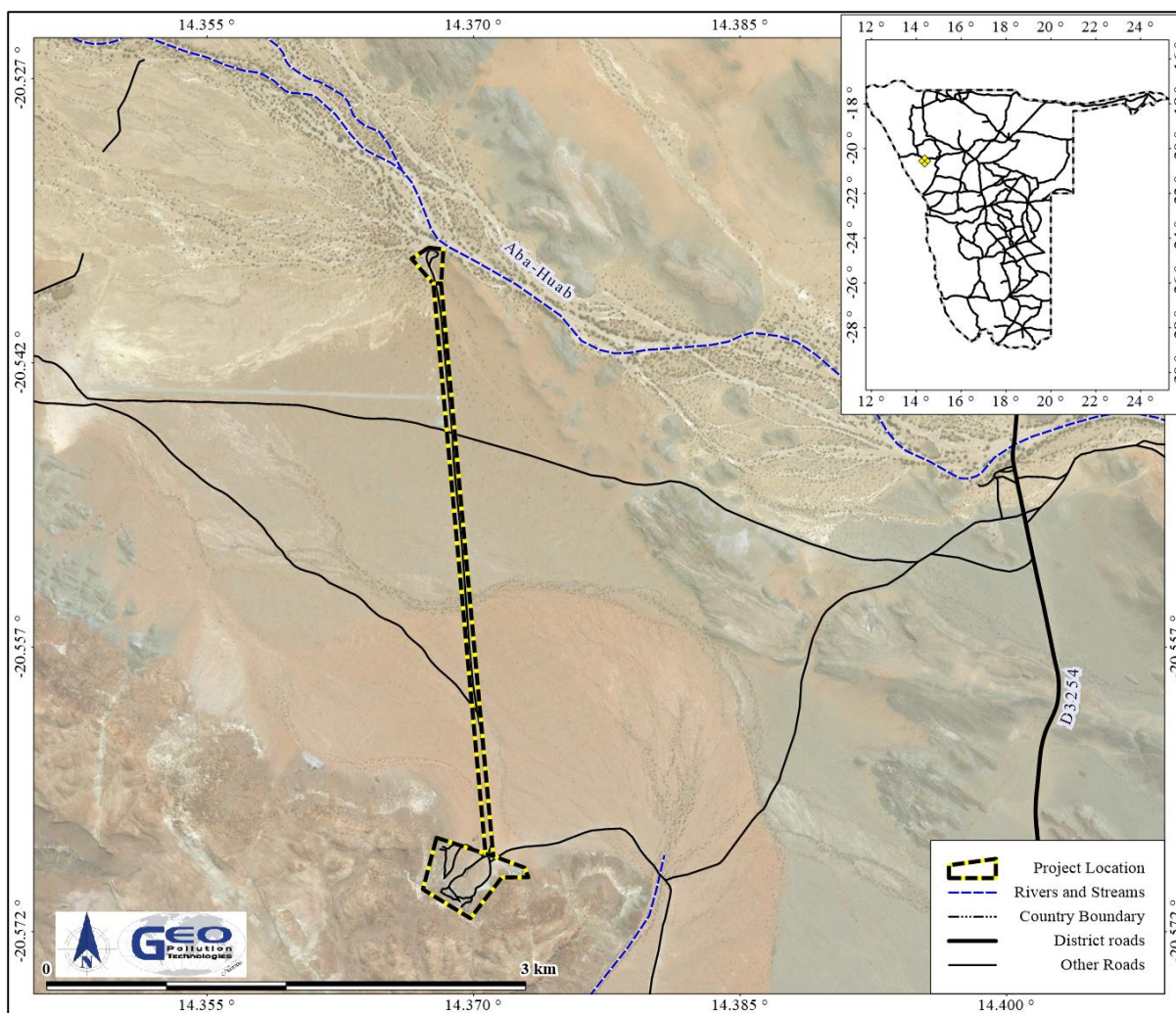


Figure 2-1 Project location

3 LODGE OPERATIONS AND RELATED ACTIVITIES

Twyfelfontein Country Lodge is an existing lodge which has been operational since July 2000. The following section provides a brief description of the infrastructure, services supply and operations of the lodge.

3.1 LODGE

During the planning and construction phase, the architecture of the lodge was designed to assimilate to the surrounding natural environment incorporating biophysical features. In doing so, limited vegetation clearance was conducted to maximise integration between the lodge and surrounding environment. The guest rooms are twin rooms, double rooms and triple rooms, each with their own bathroom (Photo 3-1), 12 guide rooms (Photo 3-2), and a luxury suite with one large bedroom, a living room and a private swimming pool. Rooms are stand-alone units, separated from the main lodge complex. The lodge operate on a dinner, bed and breakfast principle (Photo 3-3). All food preparations are done at the lodge kitchen and is served at the dining area (Photo 3-4). Majority of the staff are accommodated at the staff quarters. Remainder of employees, who are not living at the staff accommodation, are accommodated at Louw's Inn, an informal settlement approximately 5 km (or 10 km following the proclaimed road) from the lodge. Figure 3-1 and Figure 3-2 provide an overview of the lodge and the supporting infrastructure.

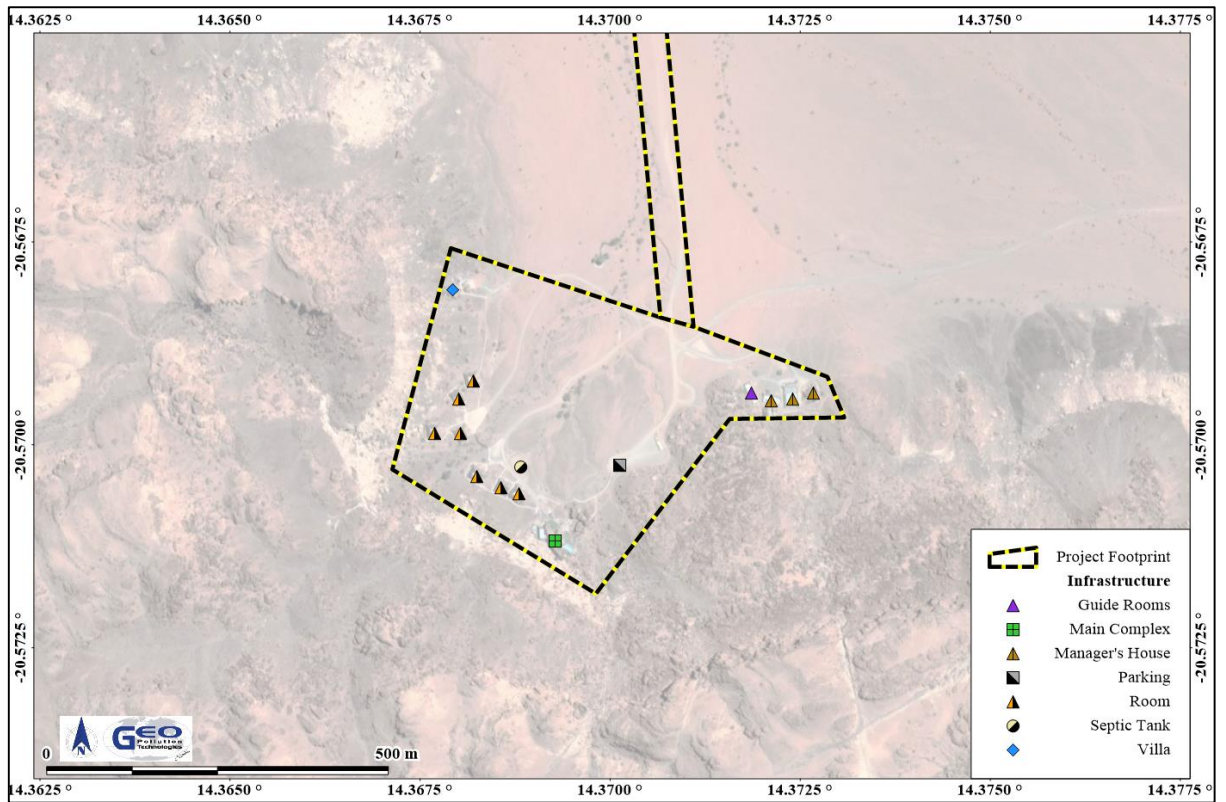


Figure 3-1 Lodge Infrastructure

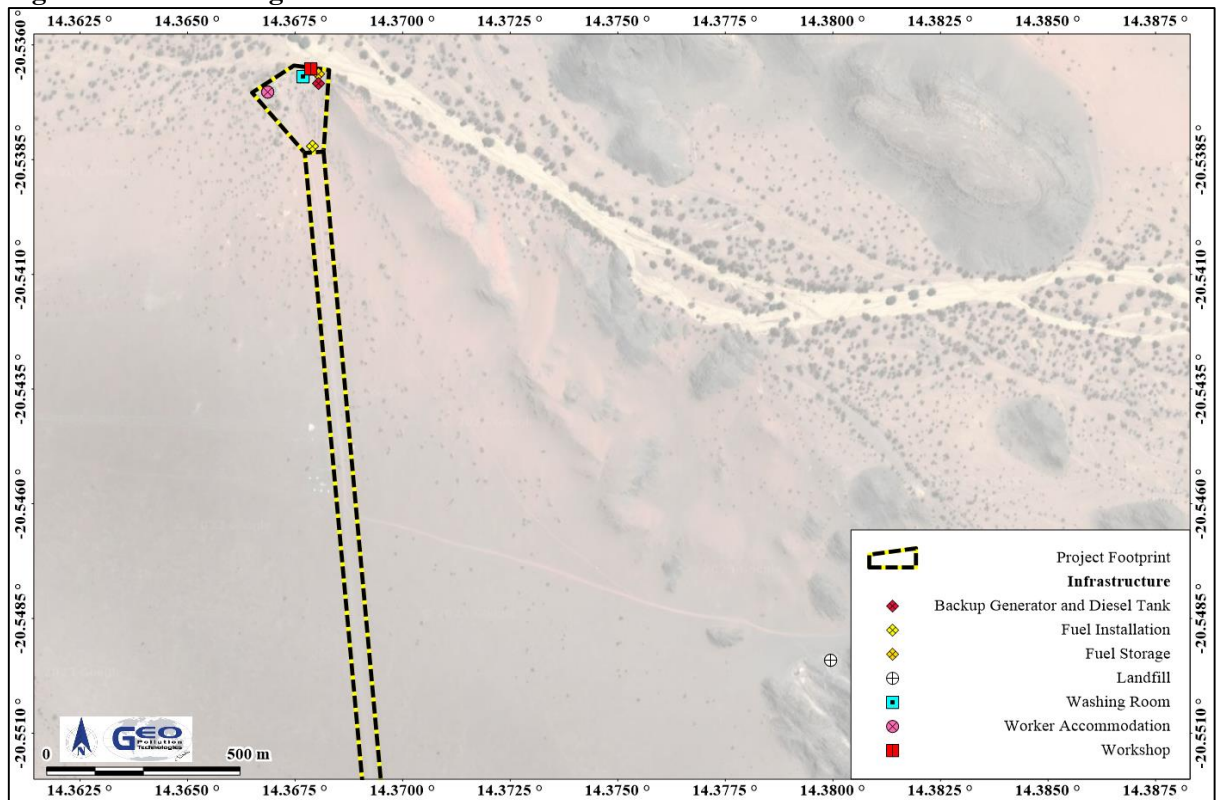


Figure 3-2 Supporting Infrastructure



Photo 3-1 Guest Rooms



Photo 3-2 Guide Rooms



Photo 3-3 Buffet area



Photo 3-4 Dining area

3.2 RESTAURANT, SWIMMING POOL AND SHOP

The main complex area at the lodge hosts a restaurant, bar, reception area, a large swimming pool (Photo 3-5), lounge and a small curio shop. Food are prepared in an onsite kitchen and beverages are prepared at the bar area (Photo 3-6). All food is sourced from third party suppliers. A small tourist shop sells, among others, curios, books and clothing to guests.



Photo 3-5 Swimming Pool



Photo 3-6 Bar

3.3 ADMINISTRATIVE, MAINTENANCE AND SUPPORT INFRASTRUCTURE

Offices for staff and managers are present at the lodge. A number of support buildings include a maintenance workshop (Photo 3-7) and generator room, washing rooms and a fuel retail facility (Photo 3-8). The fuel retail facility supplies diesel and unleaded petrol from two 23 m³ underground tanks. Fuel is supplied to guide vehicles, visitors and the local community.



Photo 3-7 Workshop



Photo 3-8 Fuel retail facility

Twyfelfontein County Lodge employs 65 staff members. Managers and employees not from the area are accommodated in manager rooms (Photo 3-9) near the lodge while other general staff live at the staff quarters (Photo 3-10) and local staff at the nearby settlement. Staff is transported between the settlement and the lodge at the beginning and end of shifts. Staff receive education through an informal education programme implemented by management.



Photo 3-9 Manager rooms



Photo 3-10 Staff quarters

The airstrip utilised for guests to the lodge is approximately 3 km north of the lodge (Photo 3-11). The airstrip is mainly used for guest arriving by plane or other aircrafts and when the river is in flood and access cannot be gained by road. The airstrip is approximately 2 km long and there are no telecommunication towers or other high structures in close proximity to the airstrip. Pilots and air charter operators are required to inform the Proponent of intended use of the airstrip prior to landing. Aircrafts will stop on an interlocked surface (Photo 3-12) for refuelling before departing or taxiing to the parking area if flights commence on a later time (Photo 3-13). A stop and go area for aircrafts was also interlocked to accommodate parking of aircraft for disembarking of guests to the lodge (Photo 3-14).



Photo 3-11 Airstrip



Photo 3-12 Interlocked slab



Photo 3-13 Apron for planes



Photo 3-14 Stop and go

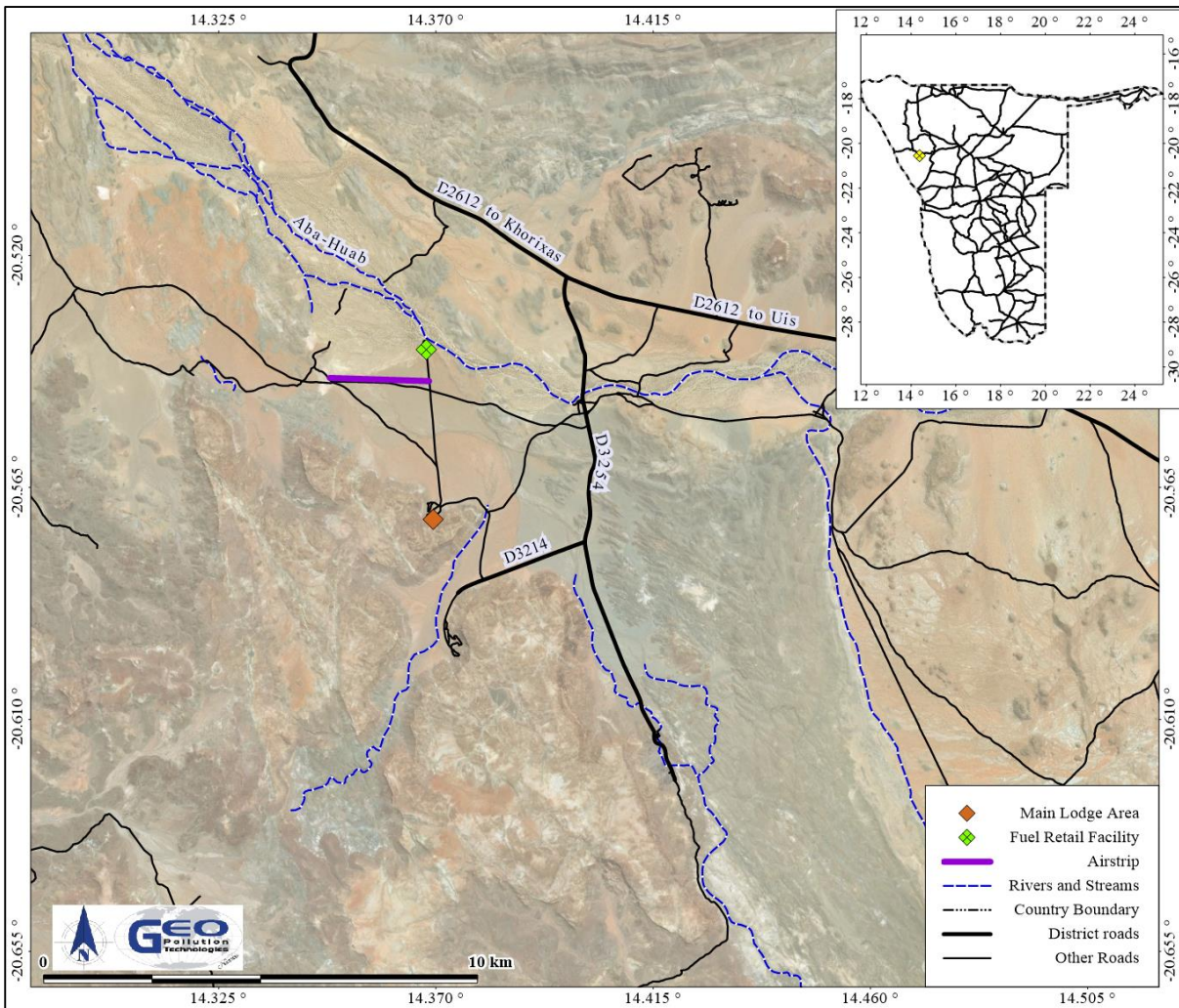


Figure 3-3 Lodge airstrip

3.4 PROPOSED INFRASTRUCTURE

The Proponent plans the construction of a bulk storage facility for aviation fuels. (Photo 3-11) The facility will store avgas and jet A-1 in two 23 m³ above ground tanks. Fuel will be dispensed via pumps to aircrafts en route to various destination in Namibia and to aircrafts arriving with guests that needs to refuel for return flights.

An additional luxury suite is planned and will be constructed in the near future. It will be similar to the existing luxury suite. Construction will entail some earth and concrete works, underground reticulation for services, painting and fitting of plumbing, electrical and carpentry items.

3.5 SERVICES SUPPLY

Electricity supply for operations is supplied by CENORED. If a power outage occur, a backup generator is used to supply electricity to the lodge and guest rooms (Photo 3-15). Water is supplied from two nearby borehole situated on the banks of the Aba-Huab River (Photo 3-16).

All waste produced is collected and temporarily stored in a designated waste storage area. Non-toxic, combustible waste such as paper, cardboard and food is burnt on site at a designated waste storage area (Photo 3-17), while other waste such as plastic, tins, glass, old tyres, petroleum waste, etc., are transported to the Khorixas waste disposal facility.

All wastewater and sewerage of the lodge drains into a three chamber septic tank (Photo 3-18). The first to chambers allows for anaerobic digestion of solids, wastewater then drains into the third chamber which is then pumped out by a sewerage truck and disposed of at a designated disposal site, situated approximately 2.5 km northeast of the main lodge area.

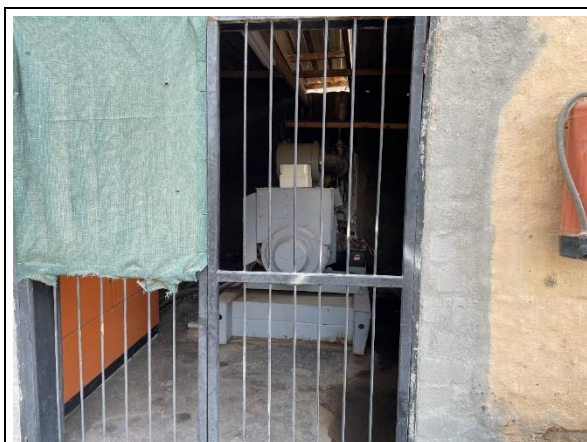


Photo 3-15 Backup generator



Photo 3-16 Borehole



Photo 3-17 Waste storage area



Photo 3-18 Septic tank

3.6 SUSTAINABILITY INITIATIVES

Twyfelfontein Country Lodge implements various initiatives to ensure the lodge is managed in a sustainable manner. These include waste reduction measures and recycling initiatives, employment and training of local people. Recycling initiatives are implemented such as the community recycling project (Photo 3-19). Yearly a percentage of revenue generated is donated to the local conservancy. Furthermore the lodge created a water point for community members that do not have access to potable water (Photo 3-20).

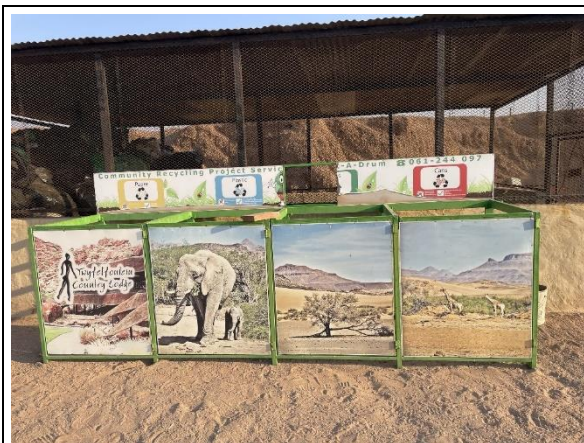


Photo 3-19 Recycling project



Photo 3-20 Community water point

4 ADMINISTRATIVE, LEGAL AND POLICY REQUIREMENTS

To protect the environment and achieve sustainable development, all projects, plans, programmes and policies deemed to have adverse impacts on the environment require an ECC, as per the Namibian legislation. The legislation and standards provided in Table 4-1 to Table 4-3 govern the environmental assessment process in Namibia and/or are relevant to the lodge.

Table 4-1 Namibian law applicable to the lodge

Law	Key Aspects
The Namibian Constitution	<ul style="list-style-type: none"> ◆ Promote the welfare of people. ◆ Incorporates a high level of environmental protection. ◆ Incorporates international agreements as part of Namibian law.
Environmental Management Act Act No. 7 of 2007, Government Notice No. 232 of 2007	<ul style="list-style-type: none"> ◆ Defines the environment. ◆ Promote sustainable management of the environment and the use of natural resources. ◆ Provide a process of assessment and control of activities with possible significant effects on the environment.
Environmental Management Act Regulations Government Notice No. 28-30 of 2012	<ul style="list-style-type: none"> ◆ Commencement of the Environmental Management Act. ◆ List activities that requires an environmental clearance certificate. ◆ Provide Environmental Impact Assessment Regulations.

Law	Key Aspects
<p>Namibia Tourism Board Act Act no. 21 of 2000, Government Notice 261 of 200, 2000</p>	<ul style="list-style-type: none"> ◆ Provide for the registration and grading of accommodation establishments. ◆ Provide for the declaration of any sector of the tourism industry as a regulated sector and for the registration of businesses falling within a regulated sector. ◆ Provides regulations and minimum requirements pertaining to: <ul style="list-style-type: none"> ○ Levies payable. ○ Registrations of regulated businesses. ○ Registrations of accommodation establishments.
<p>Accommodation Establishments and Tourism Ordinance 20 of 1973</p>	<ul style="list-style-type: none"> ◆ Consolidate and amend the laws relating to accommodation establishments and tourism and to provide for the establishment of tourist recreation areas and incidental matters. ◆ Provides for regulations of tourism establishments. ◆ Numerous amendments and repeals.
<p>Petroleum Products and Energy Act Act No. 13 of 1990, Government Notice No. 45 of 1990</p>	<ul style="list-style-type: none"> ◆ Regulates petroleum industry. ◆ Makes provision for impact assessment. ◆ Petroleum Products Regulations (Government Notice No. 155 of 2000). <ul style="list-style-type: none"> ○ Prescribes South African National Standards (SANS) or equivalents for construction, operation and decommissioning of petroleum facilities (refer to Government Notice No. 21 of 2002).
<p>The Water Act Act No. 54 of 1956</p>	<ul style="list-style-type: none"> ◆ Remains in force until the new Water Resources Management Act comes into force. ◆ Defines the interests of the state in protecting water resources. ◆ Controls the disposal of effluent. ◆ Numerous amendments.
<p>Water Resources Management Act Act No. 11 of 2013</p>	<ul style="list-style-type: none"> ◆ Provide for management, protection, development, use and conservation of water resources. ◆ Prevention of water pollution and assignment of liability. ◆ Not in force yet.
<p>Forest Act (Act 12 of 2001, Government Notice No. 248 of 2001)</p>	<ul style="list-style-type: none"> ◆ Makes provision for the protection of the environment and the control and management of forest fires. ◆ Provides the licencing and permit conditions for the removal of woody and other vegetation as well as the disturbance and removal of soil from forested areas.
<p>Forest Regulations: Forest Act, 2001 Government Notice No. 170 of 2015</p>	<ul style="list-style-type: none"> ◆ Declares protected trees or plants. ◆ Issuing of permits to remove protected tree and plant species.

Law	Key Aspects
Civil Aviation Act Act No. 6 of 2016, Government Notice 137 of 2016	<ul style="list-style-type: none"> ◆ Consolidate the laws relating to civil aviation and civil aviation offences. ◆ Provide for a civil aviation regulatory and control framework for maintaining, enhancing and promoting the safety and security of civil aviation for ensuring the implementation of international aviation agreements. ◆ Provides for Namibia Civil Aviation Regulations And Technical Standards.
Aerodrome Ordinance Ordinance 12 of 1963	<ul style="list-style-type: none"> ◆ Provide for the establishment, management and maintenance of aerodromes.
Local Authorities Act Act No. 23 of 1992, Government Notice No. 116 of 1992	<ul style="list-style-type: none"> ◆ Define the powers, duties and functions of local authority councils. ◆ Regulates discharges into sewers.
Public and Environmental Health Act Act No. 1 of 2015, Government Notice No. 86 of 2015	<ul style="list-style-type: none"> ◆ Provides a framework for a structured more uniform public and environmental health system, and for incidental matters. ◆ Deals with Integrated Waste Management including waste collection disposal and recycling; waste generation and storage; and sanitation.
Labour Act Act No 11 of 2007, Government Notice No. 236 of 2007	<ul style="list-style-type: none"> ◆ Provides for Labour Law and the protection and safety of employees. ◆ Labour Act, 1992: Regulations relating to the health and safety of employees at work (Government Notice No. 156 of 1997).
Atmospheric Pollution Prevention Ordinance Ordinance No. 11 of 1976	<ul style="list-style-type: none"> ◆ Governs the control of noxious or offensive gases ◆ Prohibits scheduled process without a registration certificate in a controlled area. ◆ Requires best practical means for preventing or reducing the escape into the atmosphere of noxious or offensive gases produced by the scheduled process.
Hazardous Substances Ordinance Ordinance No. 14 of 1974	<ul style="list-style-type: none"> ◆ Applies to the manufacture, sale, use, disposal and dumping of hazardous substances as well as their import and export. ◆ Aims to prevent hazardous substances from causing injury, ill-health or the death of human beings.
Pollution Control and Waste Management Bill (draft document)	<ul style="list-style-type: none"> ◆ Not in force yet. ◆ Provides for prevention and control of pollution and waste. ◆ Provides for procedures to be followed for licence applications.

Table 4-2 Standards or codes of practise

Standard or Code	Key Aspects
South African National Standards (SANS)	<ul style="list-style-type: none"> ◆ The Petroleum Products and Energy Act prescribes SANS standards for the construction, operations and demolition of petroleum facilities. ◆ SANS 10131 is specifically aimed at storage and distribution of petroleum products in aboveground storage tanks. <ul style="list-style-type: none"> ○ Provide requirements for spill control infrastructure.

Table 4-3 Relevant multilateral environmental agreements for Namibia and the lodge

Agreement	Key Aspects
Charter of the Regional Tourism Organisation of Southern Africa (RETOSA), 1997	<ul style="list-style-type: none"> ◆ Development of tourism through effective marketing of the Region in collaboration with the public and private sector. ◆ To facilitate, encourage and assist in the development of legal and ethical tourism throughout the Southern African Region taking due consideration of the overall development of the people, the Region and the Region's natural and cultural resources.
Stockholm Declaration on the Human Environment, Stockholm 1972.	<ul style="list-style-type: none"> ◆ Recognizes the need for a common outlook and common principles to inspire and guide the people of the world in the preservation and enhancement of the human environment.
Protocol on the Development of Tourism in SADC, 1998	<ul style="list-style-type: none"> ◆ The Protocol sets out SADC's objective to build upon the region's potential as a tourist destination.
Statutes of the World Tourism Organization, 1970	<ul style="list-style-type: none"> ◆ Promotion and development of tourism with a view to contributing to economic development, international understanding, peace, prosperity, and universal respect for, and observance of, human rights and fundamental freedoms for all without distinction as to race, sex, language or religion.
United Nations Framework Convention on Climate Change (UNFCCC)	<ul style="list-style-type: none"> ◆ The Convention recognises that developing countries should be accorded appropriate assistance to enable them to fulfil the terms of the Convention.
Convention on Biological Diversity, Rio de Janeiro, 1992	<ul style="list-style-type: none"> ◆ Under article 14 of The Convention, EIAs must be conducted for projects that may negatively affect biological diversity.

Listed activities which require an ECC application (Government Regulation No 29 of 2012) related to this project include the following:

Section 2 of Government Notice No. 29 of 2012: Waste Management, Treatment, Handling and Disposal Activities

- ◆ 2.1 The construction of facilities for waste sites, treatment of waste and disposal of waste. The Proponent temporarily stores waste for disposal at an external landfill, the proponent further burns general, non-toxic combustible waste such as paper, cardboard and food at the site.

Section 6 of Government Notice No. 29 of 2012: Tourism Development Activities

- ◆ 6. The construction of resorts, lodges, hotels or other tourism and hospitality facilities. The lodge and related tourism facility was constructed and currently in operation and maintained accordingly.

Section 8 of Government Notice No. 29 of 2012: Water Resource Developments

- ◆ 8.1. The abstraction of ground or surface water for industrial or commercial purposes: Water is abstracted from borehole for current commercial (tourism) operations.
- ◆ 8.6 Construction of industrial and domestic wastewater treatment plants and related pipeline systems: The Proponent has installed wastewater treatment facilities (three septic tanks with individual chambers) within the operational area to manage mainly black and grey water.

Section 9 of Government Notice No. 29 of 2012: Hazardous Substance Treatment, Handling and Storage

- ◆ 9.4 "The storage and handling of a dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic meters at any one location." (Current total storage capacity for fuel is 46 m³ and the proposed new aviation fuel storage is 46 m³).

- ◆ 9.5 Construction of filling stations or any other facility for the underground and aboveground storage of dangerous goods, including petrol, diesel, liquid, petroleum, gas or paraffin. (The facility is a filling station that stores diesel and unleaded petrol below ground and the proposed aviation fuel storage stores avgas and jet A-1 above ground)

Section 10: Infrastructure

- ◆ 10.1 (d) The construction of airports and airfields. An airfield was constructed simultaneous with lodge construction in 2000 and is operated and maintained by the Proponent.

5 ENVIRONMENTAL CHARACTERISTICS

This section lists pertinent environmental characteristics of the study area and provides a statement on the potential environmental impacts on each.

5.1 LOCALITY AND SURROUNDING LAND USE

The lodge is located within the Uibasen Conservancy, in the Kunene Region (20.571107°S, 14.369408°E) (Figure 2-1). Access to the site is gained from the D3214 district road or by aircraft. The nearest residential development to the site is the Louw's Inn informal settlement, situated approximately 5 km northeast of the lodge. The airstrip is located 2.9 km north of the lodge (20.544353°S, 14.367899°E) Figure 3-3.

Implications and Impacts

The lodge facilitates tourism to the Uibasen Conservancy, located on communal land, by providing hospitality facilities in the remote area. Contribution to the local community is made through direct employment and payment of conservation levies. The lodge has diversified the local and regional land-use, thereby strengthening the local economic resilience. The Proponent regularly conducts environmental infrastructure upgrades and maintenance in the area.

5.2 CLIMATE

The lodge is situated in the arid Damarland, an area classified by the Köppen Climate Classification as hot desert climate (BWh). This means that the area receives precipitation well below potential evapotranspiration and no more than 200 mm of precipitation annually. A hot desert climate generally refers to a climate with an average mean temperature of at least 18°. The general lack of functioning weather stations in Namibia limits the availability of long term, true weather data. The lodge also does not have a weather station. As a best possible workaround to determine precipitation in the area, long term climate data was obtained from the Atlas of Namibia Project (2002) and the CHIRPS-2 database (Funk et al., 2015), see Table 5-1, Table 5-2, Figure 5-1 and Figure 5-2. Atlas of Namibia Project data was compiled from almost 300 rainfall stations across Namibia, the data was contoured in 50 mm intervals prior to 1999 for variable length data sets. Long term precipitation data was obtained from the CHIRPS-2 database (Funk et al., 2015). The CHIRPS-2 dataset (Climate Hazards Group Infra-Red Precipitation with Station data version 2) consist of long term precipitation data (1981 to near-present) obtained from satellite imagery and in-situ station data and therefore represents more recent data. Data is averaged over an area of roughly 5 km by 5 km. This averaging effect should be kept in mind during data analyses as high precipitation from single thunder storm cells would be averaged out, thereby providing a reduced daily maximum precipitation value.

In the project area, days are mostly warm with very hot days during the summer months, while nights are generally cool. The rain season normally starts in October and last until April, peaking in March. Heavier rainfall (single day events) occur between February and March, with a single event of 18 mm in March (last 41 years data) being the highest (Table 5-2).

The average annual rainfall for the last 41 years was calculated as 65 mm/a, with a coefficient of variance of 46% (Table 5-2). This average annual rainfall and coefficient of variance however does not correlate directly with Atlas of Namibia Project data which calculated average rainfall at 100-150 mm/a and variation in rainfall at 70-80 %, see Table 5-1. Daily and seasonal rainfall

data (Funk et al., 2015) is presented in Figure 5-1. Seasonal (July to June) total rainfall, centred on the average line for the last 41 years, is presented, with the daily total rainfall and the seasonal cumulative rainfall.

From the figure it is clear that the area has received mostly below average rainfall since the 2012-2013 season to the 2022 season. The driest year (last 41 years data) being 2019 with about 11 mm recorded (Figure 5-2).

Table 5-1 Summary of climate data for the project area (Atlas of Namibia Project, 2002)

Average annual rainfall (mm/a)	100-150
Variation in annual rainfall (%)	70-80
Average annual evaporation (mm/a)	3200-3400
Water deficit (mm/a)	2100-2300
Average annual temperatures (°C)	20-21
Average solar radiation (kWh/m ² /day)	>5.8

Table 5-2 Rainfall statistics based on CHIRPS-2 data (Funk et al., 2015)

Month	1	2	3	4	5	6	7	8	9	10	11	12
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Minimum (mm/m)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum (mm/m)	40.38	72.17	59.77	7.70	2.62	0.13	0.04	0.06	0.32	11.29	9.31	33.06
Average (mm/m)	14.2	15.7	19.1	1.6	0.1	0.0	0.0	0.0	0.0	3.6	3.5	6.8
Variability (%)	85.0	93.0	72.0	130.0	468.0	624.0	360.0	624.0	624.0	106.0	91.0	125.0
Daily maximum (mm)	16.9	15.9	18.0	7.7	2.6	0.1	0.0	0.0	0.2	8.8	6.5	10.8
Average rain days	4	5	4	1	0	0	0	0	0	1	1	2
Season July - June average: 65 mm						Season coefficient of variation: 46 %						
Data range	1981-Jul-01 to 2022-Jun-30						Lat: 20.5711°S Long: 14.3694°E					

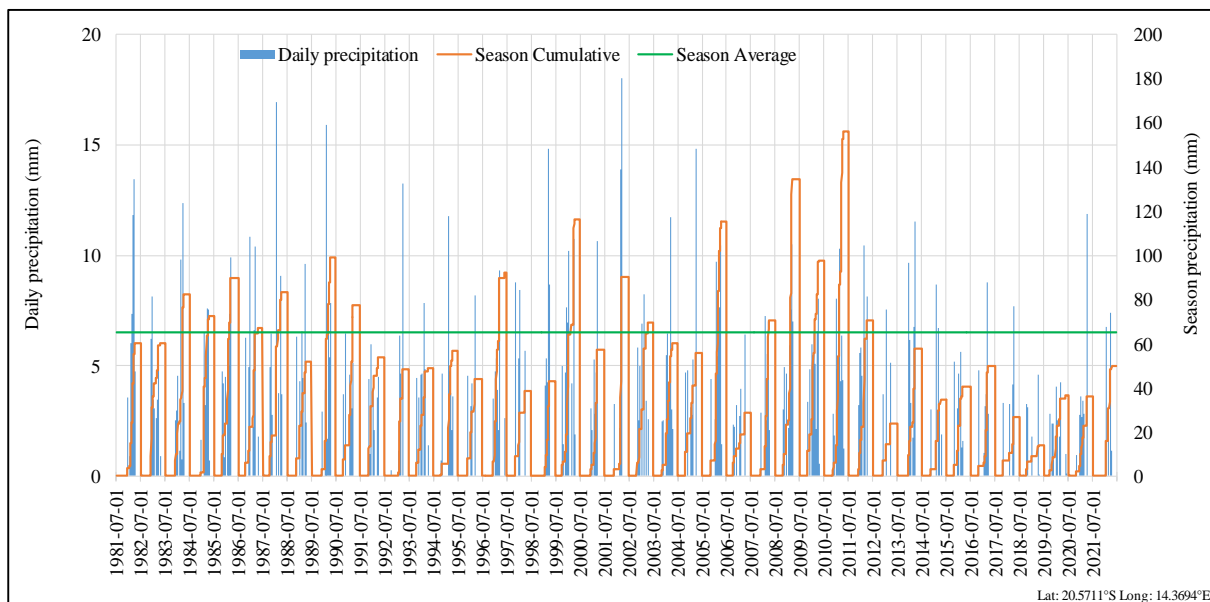


Figure 5-1 Daily and seasonal rainfall from CHIRPS-2 data (Funk et al., 2015)

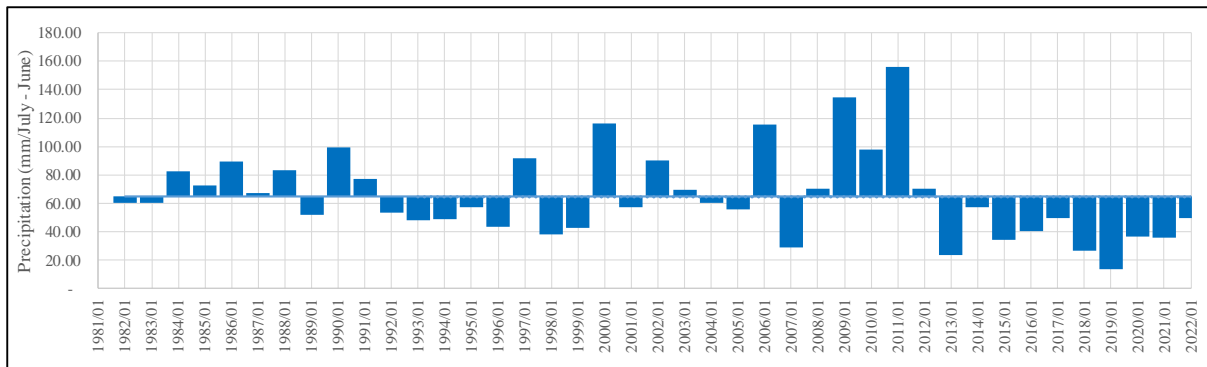


Figure 5-2 Average annual rainfall from CHIRPS-2 data (Funk et al., 2015)

Implications and Impacts

Water is a scarce and valuable resource in Namibia and the extreme variability in seasonal rainfall makes water an extremely vulnerable resource. Rainfall events are typically thunderstorms with heavy rainfall that can occur in short periods of time (cloud bursts). Raw sewerage that enter the groundwater may pollute the valuable resource. Failing fuel storage structure on site may result in hydrocarbon spills which may enter the environment and potentially render the groundwater unusable. However, adherence to SANS standards for the fuel installations will successfully mitigate this risk.

5.3 TOPOGRAPHY AND DRAINAGE

The lodge falls within the Etendeka Tablelands, an arid landscape consisting of flat topped hills underlain by flat lying basalt plates of the Etendeka Group and occasionally Karoo sediments. Ground surface elevation falls between 500-600 m above sea level and the area falls within the Huab River catchment, an ephemeral river. Surface drainage from the area is generally towards the Aba - Huab River, in a north and north-western direction along the slopes where drainage then collects and flow is directed into a western direction. A map showing surface drainage directions is depicted in Figure 5-3.

Implications and Impacts

Topographical features around the site, visually aids the integration of the lodge to the surrounding environment while informing the location of the airstrip and placement of the backup generation. Flash floods may present a risk to the lodge, however, the probability thereof is low. Any pollutants that are not contained and are transported via surface water flow will be transported away from the project location and potentially pollute surrounding areas and ultimately the Huab River. Therefore, the storage and use of fuel must be strictly controlled according to SANS requirements.

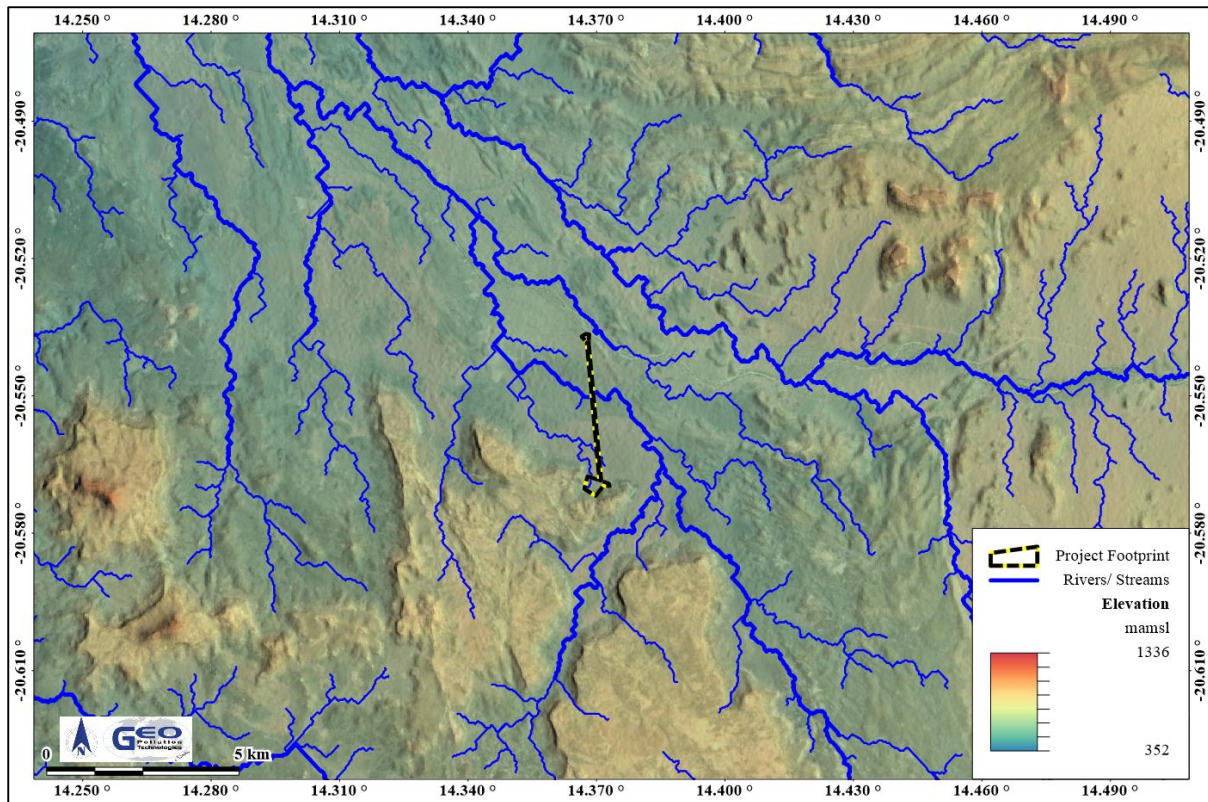


Figure 5-3 Surface drainage

5.4 GEOLOGY AND HYDROGEOLOGY

The geology of the project area mainly consist of rocks and deposits from the Permian Age and Namibian Age. The Permian Age geology of the area comprise of the Prince Albert Formation of the Ecca Group of the Karoo Sequence. Lithology include shale and mudstone. The Namibian Age geology consist of rocks of the Kuiseb Formation, Damara Sequence. The Kuiseb Formation generally consist of metaphoric rocks such mica schist, minor quartzite, graphitic schist and marble. Figure 5-4 provides an overview of the surrounding geology.

The project location is situated in the Kunene South Groundwater Basin. Localised groundwater flow may take place along preferred flow paths in different directions, but the general flow is expected to be in a western direction, with the Huab River aquifer serving as a local recharge zone. The average expected depth of the groundwater is 11 m below surface. The project location falls outside a water control area and therefore a permit from the Ministry of Agriculture, Water and Land Reform is not required for drilling or abstraction of water. All groundwater remains the property of the Government of Namibia.

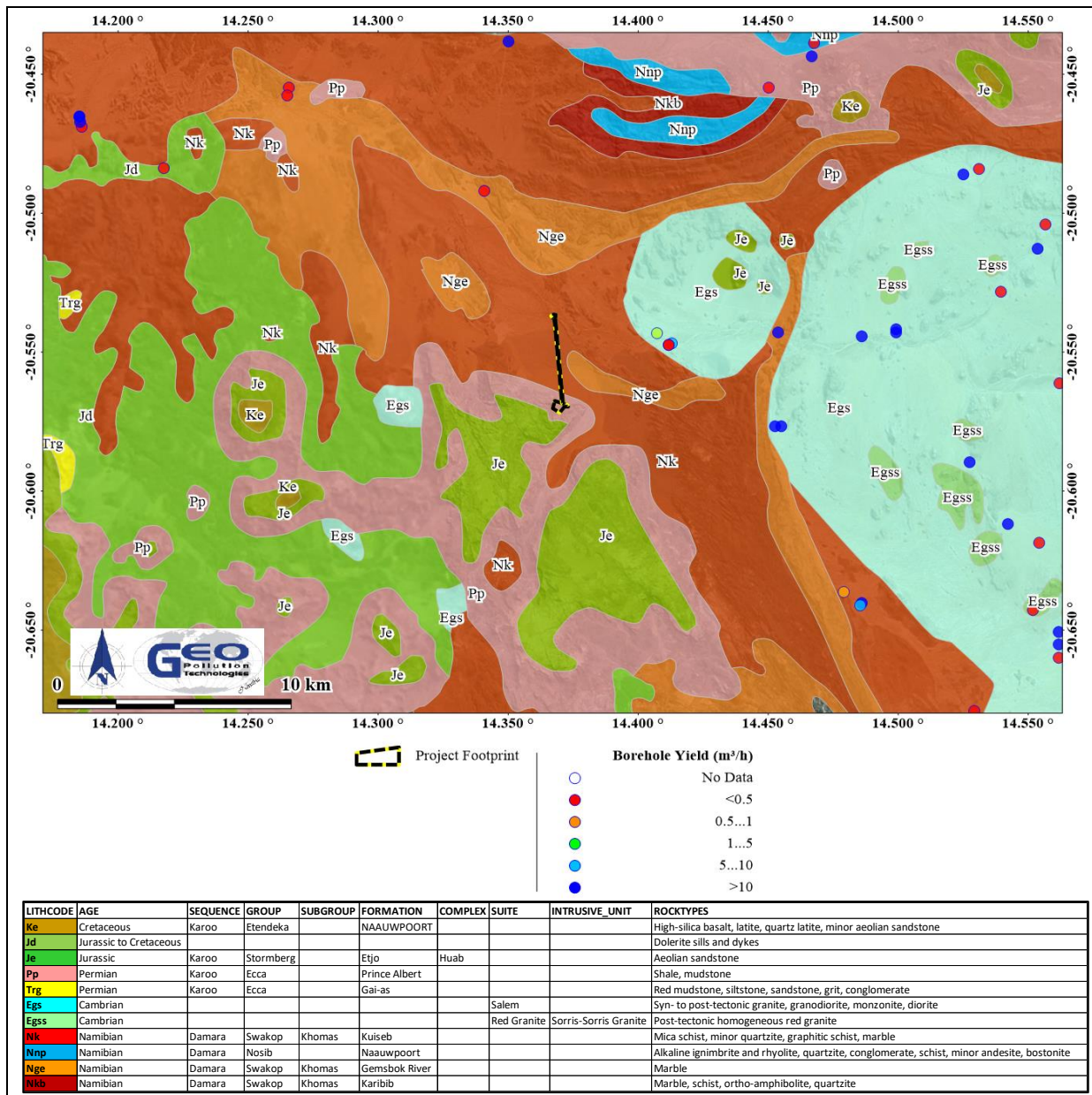


Figure 5-4 Geology of the project area

Implications and Impacts

A risk to groundwater pollution exists due to the geological sensitivity of the area. This is mainly due to the nature of the surficial deposits (river bed) which is sensitive to contamination, as well as the shallow groundwater. Groundwater remains an important resource and would be at risk if sewage / fuel spills are not contained, cleaned and disposed of properly.

5.5 WATER SUPPLY

Groundwater is the only bulk water supply to the area. Water is supplied to the lodge through two boreholes situated on the banks of the Aba - Huab River. Public water supply is sourced from boreholes within the area.

Implications and Impacts

Groundwater in the area is an extremely valuable resource which, however unlikely, may be at risk if over abstraction occurs. Chemical or raw sewage spills may potentially contaminate groundwater if not contained, cleaned and disposed of properly. Water usage of the lodge is not expected to impact on the availability of groundwater. The Proponent supplies water to road building contractors when upgrades or maintenance on the proclaimed roads are conducted.

5.6 FAUNA AND FLORA

The site lies in the Nama-Karoo biome with a central-western escarpment and inselbergs vegetation type. Plant species such as *Acacia montis-ustii*, *Acacia robynsiana*, *Cyphostemma currorii*, *Sterculia Africana*, *Calicorema capitata*, *Orphanthera albida* and a variety of other grass, shrub and tree species are characteristic of this vegetation type. Table 5-3 and Table 5-4 present a summary of the general fauna and flora of the broader area. Endemism for the area is relatively high with around 81 species of birds, reptiles, mammals, frogs, plant and scorpions being endemic.

The lodge is an existing facility and has been designed to incorporate the natural vegetation and fauna. Wild animals such as ostriches, hartebeest, oryx, giraffe and baboons are frequently sighted while elephants and big cats such as leopards and lions are occasionally sighted at the lodge and surrounding areas.

Table 5-3 General flora data (Atlas of Namibia Project, 2002)

Biome	Nama-Karoo
Vegetation type	Central-western escarpment and inselbergs
Vegetation structure type	Sparse shrubland
Diversity of higher plants	Medium (Diversity rank = 4 [1 to 7 representing highest to lowest diversity])
Number of plant species	150 – 300
Percentage tree cover	2 - 10
Tree height (m)	2 – 5
Percentage shrub cover	2 – 10
Shrub height (m)	0.5 – 1
Percentage dwarf shrub cover	2 – 10
Dwarf shrub height (m)	< 0.5
Percentage grass cover	0.1 - 1
Grass height (m)	0.5
Dominant plant species	<i>Acacia montis-ustii</i> , <i>Acacia robynsiana</i> , <i>Cyphostemma currorii</i> , <i>Sterculia Africana</i> , <i>Calicorema capitata</i> , <i>Orphanthera albida</i>

Table 5-4 General fauna data (Atlas of Namibia Project, 2002)

Mammal Diversity	61 - 75 Species
Rodent Diversity	20 - 23 Species
Bird Diversity	111-140 Species
Reptile Diversity	61 - 70 Species
Snake Diversity	20 - 24 Species
Lizard Diversity	> 35 Species
Frog Diversity	4 - 7 Species
Termite Diversity	1 - 6 Genera
Scorpion Diversity	14 - 15 Species

Implications and Impacts

The lodge itself does not present a threat to the regional biodiversity. Possible pollution and changes or creation of habitats (such as close to the soakaway system), may create a suitable environment for animal and/or plant species not traditionally known in the area or not frequenting the area. Temporary storage of food waste may present an opportunity for wildlife scavenging etc. while uncontrolled pollution (such as hydrocarbon spills) may and can cause damage to the local biodiversity.

While certain insects are considered pests (such as ants, mosquito, locusts, etc.), the use of pesticides may not be as effective and have detrimental effects on other insects as well. The presence of scorpions and other venomous species present safety risks to the staff and lodge patrons. Mammals such as baboons and elephant may be destructive to infrastructure. Continued caution related to the operation of the airstrip and lodge should be taken to prevent potentially dangerous wildlife encounters. The lodge has however been operating in the area for 23 years with no real negative impacts on the environment and no life threatening wildlife encounters recorded.

Poaching and illegal collection of plant, geological and animal material may impact on the local environment. Patrons and staff alike should be made aware of the implications of poaching.

Due to the nature of the tourism operations conducted by the Proponent, nature conservation is of key importance to the Proponent. Assistance is therefore provided to the conservancy owners to conduct game counts within the conservancy. Regular litter clean-up campaigns are also conducted in the lodge and surrounding areas.

5.7 DEMOGRAPHIC AND ECONOMIC CHARACTERISTICS

The project is located within the Kunene Region, falls under the Khorixas Constituency and is located within division A. The total population for this region is 86,856 of which 43,603 are male and 43,253 are female. The region also has a density of 0.8 people/km² and a literacy rate of 66.5%, while the constituency has a total population of 12,566 and a density of 0.6 people/km². Table 5-5 provides demographic information for the Khorixas Constituency, the region and nationally.

Table 5-5 Demographic characteristics of Khorixas Constituency, the Kunene Region and Nationally (Namibia Statistics Agency, 2011)

	Khorixas Constituency	Kunene Region	Namibia
Population (Males)	4,9596	43,603	1,021,912
Population (Females)	4,8269	43,253	1,091,165
Population (Total)	12,566	86,856	2,113,077
Unemployment (15+ years)	46%	24%	33.8%
Literacy (15+ years)	72%	64.9%	87.7%

Implications and Impacts

Current operations have increased employment locally and created positive economic spin-offs for mainly the surrounding community. Conservation levy payments towards the conservancy is a direct, continued economic benefit to the area. Employment opportunities and economic diversification, as brought on through the lodge, may influence the demographic profile of the community through mainly in-migration and education. Skills development and training benefit employees while the lodge may have an influence on further stimulating economic growth for the area. However, additional people would also put additional pressure on existing limited infrastructure, services and natural resources in the area. The Proponent however has an agreement with the conservancy that stipulates that people not from the area, and working at the lodge, should leave the area when their employment is terminated.

The Proponent actively implement social upliftment programmes to local communities, provides them with fresh potable water, and provide food waste from the lodge to a community pig farm.

5.8 CULTURAL, ARCHAEOLOGICAL AND HERITAGE CHARACTERISTICS

The project area is located near the Twyfelfontein or /Ui-//aes Unesco World Heritage Site, showcasing one of Africa's largest concentrations of petroglyphs or rock engravings. These engravings are filled with a rich history of cultural and heritage characteristics that forms a high-quality record of ritual practises associated with hunter-gatherer communities of thousands of years ago. Attractions in addition to the heritage site are Burnt Mountain, which is also a National Monument, Organ Pipes and the Damara living museum.

Implications and Impacts

Considering the potential of undiscovered artefacts in the vicinity of the lodge there is a possibility that artefacts of archaeological, heritage or cultural significance can be lost if not handled correctly e.g.(broken, vandalised and stolen). The lodge however complies with the requirements of the National Heritage Council of Namibia as well as United Nations Educational, Scientific and Cultural Organization (UNESCO) requirements. Changes/adaptions were implemented by the Proponent to maintain compliance.

However the large number of rock engravings and attractions in the area plays an important economic role for the lodge and local communities that are depended on tourists and patrons visiting these attractions. The Proponent provides administrative and technical support services to National Heritage Council.

6 ENVIRONMENTAL MANAGEMENT PLAN

The purpose of this section is to list the most pertinent environmental impacts that are expected from the operational, construction (upgrades, maintenance, etc.) and potential decommissioning activities of the lodge.

6.1 OBJECTIVES OF THE EMP

The EMP provides management options to ensure impacts of the lodge are minimised. An EMP is a tool used to take pro-active action by addressing potential problems before they occur. This should limit the corrective measures needed, although additional mitigation measures might be included if necessary. The environmental management measures are provided in the tables and descriptions below. These management measures should be adhered to during the various phases of the operation of the lodge. This section of the report can act as a stand-alone document. All personnel taking part in the operations of the lodge should be made aware of the contents in this section, so as to plan the operations accordingly and in an environmentally sound manner.

The objectives of the EMP are:

- ◆ to include all components of construction activities (upgrades, maintenance, etc.) and operations of the lodge;
- ◆ to prescribe the best practicable control methods to lessen the environmental impacts associated with the lodge;
- ◆ to monitor and audit the performance of operational personnel in applying such controls; and
- ◆ to ensure that appropriate environmental training is provided to responsible operational personnel.

6.2 IMPLEMENTATION OF THE EMP

Section 6.3 outline the management of the environmental elements that may be affected by the different activities. Impacts addressed and mitigation measures proposed are seen as minimum requirements which have to be elaborated on. Delegation of prevention and mitigation measures as well as reporting activities, should be determined by the Proponent and included in the EMP.

The EMP is a living document that must be prepared in detail, and regularly updated, by the Proponent as the project progress and evolve.

The EMP and ECC must be communicated to the lodge managers. A copy of the ECC and EMP should be kept on site. All monitoring results must be reported on as indicated. Reporting is important for any future renewals of the ECC and must be submitted to the MEFT. Renewal of ECC will require six monthly reports based on the monitoring prescribed in this EMP.

Various potential and definite impacts will emanate from the operations and decommissioning phases. The majority of these impacts can be mitigated or prevented. The prevention and mitigation measures are listed below.

6.3 MANAGEMENT OF IMPACTS: OPERATIONS AND CONSTRUCTION

The following section provide management measures for both the operational phase as well as construction activities related to the lodge. It should be noted that, since it is a well-established lodge that has already operated for 23 years, most of the measures proposed to enhance positive impacts, and prevent or mitigate negative impacts, have already been implemented by the Proponent.

6.3.1 Planning

During the phases of planning for operations, construction and decommissioning of the lodge, it is the responsibility of the Proponent to ensure they are and remain compliant with all legal requirements. The Proponent must also ensure that all required management measures are in place prior to and during all phases, to ensure potential impacts and risks are minimised. The following actions are recommended for the planning phase and should continue during various other phases of the project:

- ◆ Ensure that all necessary permits from the various ministries, local authorities and any other bodies that governs the construction activities and operations of the project are in place and remains valid. This includes registration with the Namibian Tourism Board (NTB), petroleum products licence and effluent disposal permit.
- ◆ Ensure all appointed contractors and employees enter into an agreement which includes the EMP. Ensure that the contents of the EMP are understood by the contractors, sub-contractors, employees and all personnel present or who will be present on site.
- ◆ Make provisions to have a Health, Safety and Environmental Coordinator to implement the EMP and oversee occupational health and safety as well as general environmental related compliance at the site.
- ◆ Have the following emergency plans, equipment and personnel on site where reasonable to deal with all potential emergencies:
 - Risk management / mitigation / EMP/ Emergency Response Plan and HSE Manuals,
 - Adequate protection and indemnity insurance cover for incidents;
 - Comply with the provisions of all relevant safety standards;
 - Procedures, equipment and materials required for emergencies.
- ◆ If one has not already been established, establish and maintain a fund for future ecological restoration of the project site should project activities cease and the site is decommissioned and environmental restoration or pollution remediation is required.
- ◆ Ensure all agreements entered into between the Proponent and the Uibasen Conservancy are continually adhered to, and updated in writing if and where required.
- ◆ Establish and / or maintain a reporting system to report on aspects of construction activities, operations and decommissioning as outlined in the EMP.
- ◆ Submit bi-annual reports to the MEFT to allow for environmental clearance certificate renewal after three years. This is a requirement by MEFT.
- ◆ Appoint a specialist environmental consultant to update the EMP and apply for renewal of the environmental clearance certificate prior to expiry.

6.3.2 Skills, Technology and Development

During operations of the lodge, training is provided to a portion of the workforce to be able to conduct certain tasks according to the required standards. Skills are periodically transferred to an unskilled workforce for general tasks. Development of people and technology are key to economic development. During normal operations, employees will enhance their working expertise while some individuals may be identified for promotion and additional skills development and training.

Desired Outcome: To see an increase in skills of local Namibians, as well as development and technology advancements in the tourism industry and local community.

Actions

Enhancement:

- ◆ If the skills exist locally, contractors must first be sourced from the region and then nationally. Deviations from this practice must be justified.
- ◆ Skills development and improvement programs to be made available as identified during performance assessments.
- ◆ Employees to be informed about parameters and requirements for references upon employment.
- ◆ The Proponent must employ local Namibians from the Conservancy where possible. Deviations from this practise should be justified appropriately.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Record should be kept of training provided.
- ◆ Ensure that all training is certified or managerial reference provided (proof provided to the employees) inclusive of training attendance, completion and implementation.
- ◆ Bi-annual summary report based on employee training.

6.3.3 Economic Resilience and Employment

The change in land use, from communal to tourism, lead to changes in the way revenue is generated and paid to the national treasury. Skilled and unskilled labour are required for the operations and maintenance / construction activities associated with the lodge. Furthermore, a percentage of income generated is paid towards the Uibasen Conservancy for development and conservation purposes. A report released by the World Travel and Tourism Council (2018), prior to the Covid19 pandemic, estimated that Namibia will see a growth of 3.6% in travel and tourism's contribution to employment over the next 10 years. The expected growth is higher than estimations for Sub-Sahara Africa (2.3%). As a result of the Covid19 pandemic, Namibia has seen a significant reduction in tourism, however the tourism sector since recovered significantly. Increased travel within Namibia and specifically to this region is therefore expected to increase the demand for accommodation and related services.

Desired Outcome: Contribution to national treasury and continued remuneration of temporary and permanent employees as per the Labour Act. Continued contributions to social security.

Actions

Enhancement:

- ◆ The Proponent must employ local Namibians from the Conservancy where possible.
- ◆ If the skills exist locally, employees must first be sourced from the town, then the region and then nationally.
- ◆ Deviations from this practice must be justified.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ Bi-annual summary report based on employee records and financial contributions to the various institutions such as social security, receiver of revenue etc.

6.3.4 Demographic Profile and Community Health

Greater economic prosperity as linked to the flourishing lodge operations may lead to a change in the demographic profile of the local community. Change will result with an influx of job seekers over time and further densification of the settlement. Community structures may change with an increase in population while the economic profile will be adjusted as the employment structure of the area is changed. Community health may be exposed to factors such as communicable disease like HIV/AIDS and alcoholism/drug abuse. An increase in people in the area may potentially increase the risk of criminal and socially deviant behaviour such as vandalism and poaching. More people in the area will exert additional pressure on governmental services, particularly essential services such as health care. Medical assistance, emergency services and the policing of the community may become strained.

Desired Outcome: To prevent the occurrence of social ills and prevent the spread of diseases such as HIV/AIDS.

Actions:

Prevention:

- ◆ Employ only local people from the conservancy where possible, deviations from this practice should be justified appropriately.
- ◆ Ensure sanitation facilities and all related sanitation requirements are available and maintained at the lodge for all employees.
- ◆ To prevent conflict between families within the settlement, employment should be divided in such a manner that ensures adequate distribution between families as far as possible.
- ◆ Educational programmes for employees on various topics of social behaviour HIV/AIDS and general upliftment of employees' social status.
- ◆ Appointment of reputable contractors.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ Facility inspection sheet for all areas which may present environmental health risks, kept on file.
- ◆ Bi-annual summary report based on educational programmes and training conducted.

6.3.5 Traffic

As the lodge is located in a remote area, traffic impact are expected to be unlikely, and mostly related to degradation of road surfaces and dust generation.

Desired Outcome: Minimum impact on traffic and no transport or traffic related incidents.

Actions

Prevention:

- ◆ Erect clear signage regarding access and exit points at the lodge.
- ◆ Vehicle accessing and leaving the lodge should remain on existing established roads / tracks and maintain low speeds.
- ◆ If any traffic impacts are expected, possibly as a result of delivery of equipment or construction material, traffic management should be performed to prevent these.

Mitigation:

- ◆ Treated grey water may be used for dust suppression purposes on access roads to the lodge.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Any complaints received regarding traffic issues should be recorded together with action taken to prevent impacts from repeating itself.
- ◆ A bi-annual report should be compiled of all incidents reported, complaints received, and action taken.

6.3.6 Health, Safety and Security

Activity associated with operations and maintenance / construction is reliant on human labour and therefore health and safety risks exist. Activities such as the operation of vehicles and machinery as well as handling of hazardous chemicals pose risks to employees. The site is frequently visited by wild animals. Encounters with wild animals, including venomous species like snakes and scorpions may pose risks to staff and uninformed guests. The airstrip may pose safety risk which may lead to injury and even death if not properly designed and operated, and regularly maintained. Security risks will be related to unauthorized entry, theft and sabotage.

Desired Outcome: To prevent injury, health impacts and theft.

Actions

Prevention:

- ◆ Clearly label dangerous and restricted areas as well as dangerous equipment and products. This includes the chemical store and consumer fuel installation.
- ◆ Equipment and goods that will be locked away on site must be placed in a way that does not encourage criminal activities (e.g. theft).
- ◆ Provide all employees with required and adequate personal protective equipment (PPE).
- ◆ Staff should be educated / trained on human wildlife conflict management, and guest should be informed upon arrival not to approach wild animals and to be vigilant for, and not to confront, snakes or other potentially venomous / dangerous animals.
- ◆ Although the frequency of malaria infection in this area is low, personnel and guests should be encouraged to, during times of mosquito activity, take measures to prevent mosquito bites including wearing long sleeved clothing, applying insect repellents and sleeping under mosquito nets.
- ◆ All Health and Safety standards specified in the Labour Act should be complied with.
- ◆ Implementation of maintenance register for all equipment and fuel/hazardous substance storage areas.
- ◆ All industry specific health and safety procedures and regulations applicable to the kitchen and the preparation of food for guests should be in place and adhered to.
- ◆ Consult with the Namibia Civil Aviation Authority (NCAA) on the design, operational procedures and maintenance of the airstrip to ensure all necessary safety parameters are in place.

Mitigation:

- ◆ Selected personnel should be trained in first aid and a first aid kit must be available on site. The contact details of all emergency services must be readily available.
- ◆ Implement and maintain an integrated health and safety management system, to act as a monitoring and mitigating tool, which includes: colour coding of pipes, operational, safe work and medical procedures, permits to work, emergency response plans, housekeeping rules, MSDS's and signage requirements (PPE, flammable etc.).
- ◆ Educate staff on the symptoms of malaria and encourage them to report such symptoms.
- ◆ Security procedures and proper security measures must be in place to protect workers and clients, especially during cash in transit activities.
- ◆ Reduce the amount of cash kept on site to reduce the risk of robberies

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Any incidents must be recorded with action taken to prevent future occurrences.
- ◆ A bi-annual report should be compiled of all incidents reported. The report should contain dates when training were conducted and when safety equipment and structures were inspected and maintained.

6.3.7 Fire

Construction activities, failing electrical infrastructure and fires outside of designated areas may increase the risk of the occurrence of uncontrolled fires which may spread into the nearby vegetation. Similarly machinery can ignite dry vegetation if sufficient heat (e.g. exhaust pipes) or sparks are produced. Chemicals and fuels stored and used for general activities may be flammable. Improper waste burning or discarding of cigarette buds further increases fire risks.

Desired Outcome: To prevent property damage, veld fires, possible injury and impacts caused by uncontrolled fires.

Actions:

Prevention:

- ◆ Prepare a holistic fire protection and prevention plan. This plan must include evacuation plans and signage, an emergency response plan and a firefighting plan.
- ◆ Personnel training (safe operational procedures, firefighting, fire prevention and responsible housekeeping practices).
- ◆ Ensure all flammable chemicals are stored according to material safety data sheet (MSDS) and SANS instructions and all spills or leaks are cleaned up immediately.
- ◆ Maintain regular site, mechanical and electrical inspections and maintenance.
- ◆ Maintain firefighting equipment and promote good housekeeping.
- ◆ Ensure that fires are never left unattended.
- ◆ Fire used for purposes such as cooking (by staff) must only be allowed within designated areas.

Mitigation:

- ◆ Implement the fire protection and firefighting plan in the event of a fire.
- ◆ Quick response time by trained staff will limit the spread and impact of fire.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ A register of all incidents must be maintained on a daily basis. This should include measures taken to ensure that such incidents do not repeat themselves.
- ◆ A bi-annual report should be compiled of all incidents reported. The report should contain dates when fire drills were conducted and when fire equipment was tested and training given.

6.3.8 Noise

Since the lodge is a tourist establishment, noise are typically kept to a minimum not to be a disturbance to guests. However, during construction and maintenance activities some noise generating activities can exist that may lead to hearing loss in workers. Aircraft landing and taking off from the airstrip may cause noise disturbances at nearby receptors. The closest receptor to the airstrip is the lodge itself, approximately 3 km from the airstrip. Furthermore aircraft will visit the airstrip very infrequently and landing and take-off will be during the day unless there are some sort of emergency. The backup generator is located 4 km north of the lodge and its noise is unlikely to be nuisance for guests.

Desired Outcome: To prevent any nuisance and hearing loss due to noise generated.

Actions

Prevention:

- ◆ Follow World Health Organization (WHO) guidelines on maximum noise levels (Guidelines for Community Noise, 1999) to prevent hearing impairment.
- ◆ All machinery and vehicles must be regularly serviced to ensure minimal noise production.

Mitigation:

- ◆ Hearing protectors as standard PPE for workers in situations with elevated noise levels.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ WHO Guidelines.
- ◆ Maintain a complaints register.
- ◆ Bi-annual reporting on complaints and actions taken to address complaints and prevent future occurrences.

6.3.9 Waste production

Various forms of waste are produced during the operational and construction / maintenance phases. Waste may include hazardous waste associated with hydrocarbon products and chemicals and soil and water contaminated with such products. Construction waste may include building rubble and discarded equipment. Domestic waste will be generated by the lodge and related operations. Waste presents a contamination risk and when not removed regularly may become a health and / or fire hazard and attract wild animals and scavengers. Sewage is a form of liquid biological waste that needs disposal.

Desired Outcome: To reduce the amount of waste produced, and prevent pollution and littering.

Actions

Prevention:

- ◆ All regulation and by-laws relating to environmental health should be adhered to.
- ◆ Waste reduction measures should be implemented and all waste that can be re-used / recycled must be kept separate.
- ◆ Ensure adequate temporary waste storage facilities are available.
- ◆ Ensure waste cannot be blown away by wind.
- ◆ Prevent scavenging (human and non-human) of waste.
- ◆ Ensure all ablution facilities are connected to properly constructed and maintained effluent treatment system to prevent groundwater contamination.
- ◆ The septic tank should be designed and operated according to the general guidelines set forth in the *Department of Water Affairs and Forestry, Code of Practice: Volume 1, Septic tank Systems*.
- ◆ Adhere to effluent disposal permit conditions for the disposal of treated water from the septic tank systems.
- ◆ The septic tank should be located >500 m from any drinking water source.
- ◆ No foreign objects, hazardous chemicals, fuels or excessive amounts of cooking grease may enter the sewage system.
- ◆ Use only bio-degradable, septic tank friendly cleaning chemicals.
- ◆ Should any buildings or structures be decommissioned, all waste and infrastructure should be removed from the site and disposed of at a recognised landfill site.
- ◆ Should the septic tanks be decommissioned, all waste should be removed from the tank and disposed of in an appropriate manner. The tanks may then be crushed in place and the holes effectively backfilled.

Mitigation:

- ◆ Waste should be disposed of regularly and at appropriately classified disposal facilities, this includes hazardous material (empty chemical containers, contaminated rugs, paper water and soil).
- ◆ See the material safety data sheets available from suppliers for disposal of contaminated products and empty containers.
- ◆ Liaise with the local authority regarding waste and handling of hazardous waste.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ A register of hazardous waste disposal should be kept. This should include type of waste, volume as well as disposal method/facility.
- ◆ Any complaints received regarding waste should be recorded with notes on action taken.
- ◆ All information and reporting to be included in a bi-annual report.

6.3.10 Ecosystem and Biodiversity Impact

Twyfelfontein Country Lodge is an existing facility and no further impact on vegetation is expected. The lodge further indirectly contributes to biodiversity management by contributing a portion of income generated to the Uibasen Conservancy. Poaching and illegal collection of plant and animal materials may occur. Impacts may also be related to pollution of the environment. Bird or animal collisions with aircraft landing or taking-off from the airstrip are possible. Human / wildlife interactions further present a risk to both the wildlife and the people involved if not properly managed.

Desired Outcome: To avoid pollution of, and impacts on, the ecological environment.

Actions.

Prevention:

- ◆ Educate all contracted and permanent employees on the value of biodiversity.
- ◆ Strict conditions prohibiting harvesting and poaching of fauna and flora should be part of employment contracts. This includes prohibitions or regulations on the collection of firewood.
- ◆ Regular inspection of surrounding areas and river courses for snares, traps or any other illegal activities.
- ◆ Disciplinary actions to be taken against all employees failing to comply with contractual conditions related to poaching and the environment.
- ◆ Where possible, removal of trees, especially protected species and large trees, must be avoided.
- ◆ The necessary permits from the Directorate of Forestry, MEFT must be obtained for removal of all protected species.
- ◆ Ensure that no animals or birds are present on the airstrip prior to aircraft landing or taking off (e.g. fly-overs or driving length of airstrip with vehicle).
- ◆ Guided wildlife tours should be limited to existing established roads.
- ◆ Policy documents should be drafted and implemented on how to deal with wildlife interactions, this should include:
 - Training requirements for guides,
 - Induction requirements for clients,
 - Routes that may be used.

Mitigation:

- ◆ For construction activities, if any, contain construction material to a designated laydown area and prevent unnecessary movement out of areas earmarked for clearing and construction.
- ◆ Report any extraordinary animal sightings, conflict or incidents to the MEFT.
- ◆ Mitigation measures related to waste handling and the prevention of groundwater, surface water and soil contamination should limit ecosystem and biodiversity impacts.
- ◆ Prevent scavenging of waste by fauna.

Responsible Body:

- ◆ Contractor
- ◆ Proponent

Data Sources and Monitoring:

- ◆ All information and reporting to be included in a bi-annual report.

6.3.11 Groundwater, Surface Water and Soil Contamination

Various sources exist that may potentially pollute soil and subsequently groundwater. This include vehicles and machinery that leak oil or hydraulic fluids (e.g. earthmoving equipment and graders). Operations entail the storage and handling of chemicals in small quantities which present contamination risks if not sufficiently contained. Raw sewage not sufficiently treated that enters the environment can reach groundwater.

Desired Outcome: To prevent the contamination of water and soil.

Actions

Prevention:

- ◆ Proper training of operators of machinery and vehicles and employees must be conducted on a regular basis (fuel and chemical handling, spill detection, spill control).
- ◆ All machinery and vehicles should be properly maintained to be in a good working condition during operations.
- ◆ Employ drip trays and spill kits when servicing / repairs of equipment is needed.
- ◆ The septic tanks must be regularly inspected and serviced as required.
- ◆ If water from the swimming pool will enter the environment, biodegradable / environmentally friendly chemicals should be used for water treatment.
- ◆ All chemical should be stored in a sufficiently bunded area.
- ◆ The storage and handling of fuel should be done in accordance with SANS requirements.

Mitigation:

- ◆ Any chemical spillage of more than 200 litre must be reported to the Ministry of Mines and Energy.
- ◆ Spill clean-up means must be readily available on site as per the relevant MSDS.
- ◆ The fuel tanks' bund area must be cleaned if any fuel products are present and this waste must be disposed of at a suitably classified hazardous waste disposal facility.
- ◆ Any spill must be cleaned up immediately.

Responsible Body:

- ◆ Department of Water Affairs, Ministry of Agriculture, Water and Land Reform
- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Effluent disposal permit.
- ◆ A report should be compiled bi-annually of all spills or leakages reported. The report should contain the following information: date and duration of spill, product spilled, volume of spill, remedial action taken.

6.3.12 Visual Impact

This impact is not only associated with the aesthetics of the site, but also the structural integrity. The existing lodge was designed to form part of the landscape character. The lodge is uniquely located and serves as a point of interest to tourists and patrons to the area, it should be kept clean, tidy and maintained to ensure it remains aesthetically pleasing.

Desired Outcome: To minimise aesthetic impacts associated with the lodge.

Actions

Prevention:

- ◆ Regular waste disposal, good housekeeping and routine maintenance on infrastructure will ensure that the longevity of structures are maximised and a low visual impact is maintained.
- ◆ Low brightness lights should be used and directed downwards to ensure a minimal visual impact is maintained.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ A maintenance record should be kept.
- ◆ A report should be compiled of all complaints received and actions taken.

6.3.13 Heritage and Archaeological Impacts

The Twyfelfontein area is rich in archaeological sites with numerous locations of rock engravings. Some previously undiscovered artefacts of archaeological or heritage significance may be discovered around the lodge and its operational areas or during guided walks or drives.

Desired Outcome: To preserve any artefacts of archaeological, heritage or cultural significance.

Actions

Prevention:

- ◆ Educate employees and contractors on what constitutes a possible heritage or archaeologically significant find and inform them to be vigilant for any extraordinary finds and to prevent any damage.

Mitigation:

- ◆ If such a site or any other archaeologically important artefact is found a “chance finds procedure” must be initiated which includes stopping any further work that can cause damage and reporting to superiors and the relevant specialists / authorities.
- ◆ For any human remains, the Namibian Police must be informed as a first action.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Compile a bi-annual report of all chance finds, proof of reporting to authorities and actions taken.

6.3.14 Cumulative Impact

Possible cumulative impacts associated with the operational phase and any maintenance / construction activities are mainly linked to increased traffic. Being isolated, cumulative impacts are however expected to be unlikely.

Desired Outcome: To minimise cumulative all impacts associated with the lodge.

Actions

Mitigation:

- ◆ Adherence to the exclusive use zone of the lodge (20 km radius around the lodge) will reduce possible cumulative impacts. This excludes existing camps.
- ◆ Strategies should be put in place, in conjunction with the Conservancy, to reduce impacts on popular tourist spots “pressure points” within the vicinity.
- ◆ Addressing each of the individual impacts as discussed and recommended in the EMP would reduce the cumulative impact.

◆ **Responsible Body:**

- ◆ Proponent

Data Sources and Monitoring:

- ◆ Reviewing biannual reports for any new or re-occurring impacts or problems would aid in identifying cumulative impacts and help in planning if the existing mitigations are insufficient.

6.4 DECOMMISSIONING AND REHABILITATION

Decommissioning is not foreseen during the validity of the ECC. Construction activities may however include modification and decommissioning. Should decommissioning occur at any stage, rehabilitation of the area may be required. Prior to the complete decommissioning of the lodge, the post closure land use should be assessed. It is recommended that the lodge either be sold, or all infrastructure be offered to the local community in order to continue with the operations. This will mitigate the possible impacts associated with job losses etc. Should the lodge be donated to the local community / sold, all existing contamination at the site should be cleared / remediated prior to the transfer of infrastructure, the existing EIA and EMP should further be transferred to the new owner to ensure continual compliance with EMP requirements.

In the event where the lodge cannot be sold or transferred to the local community, decommissioning will entail the complete removal of all infrastructure including buildings and underground infrastructure, if any, not forming part of post decommissioning land use. Any pollution present on the site must be remediated. The impacts associated with this phase include noise and waste production as structures are dismantled. Noise must be kept within WHO standards and waste should be contained and disposed of at an appropriately classified and approved waste facility and not dumped in the surrounding areas. Should operations be decommissioned with no employment or remuneration plan for the conservancy and employees, a significant social and economic impact will be suffered by the local community. The EMP for the lodge will have to be reviewed and updated prior to decommissioning to cater for changes made to the site and implement guidelines and mitigation measures related to social and environmental aspects.

6.5 ENVIRONMENTAL MANAGEMENT SYSTEM

The Proponent could implement an Environmental Management System (EMS) for their operations. An EMS is an internationally recognized and certified management system that will ensure ongoing incorporation of environmental constraints. At the heart of an EMS is the concept of continual improvement of environmental performance with resulting increases in operational efficiency, financial savings and reduction in environmental, health and safety risks. An effective EMS would need to include the following elements:

- ◆ A stated environmental policy which sets the desired level of environmental performance;
- ◆ An environmental legal register;
- ◆ An institutional structure which sets out the responsibility, authority, lines of communication and resources needed to implement the EMS;
- ◆ Identification of environmental, safety and health training needs;
- ◆ An environmental program(s) stipulating environmental objectives and targets to be met, and work instructions and controls to be applied in order to achieve compliance with the environmental policy; and
- ◆ Periodic (internal and external) audits and reviews of environmental performance and the effectiveness of the EMS.
- ◆ The EMP.

7 CONCLUSION

Operations of Twyfelfontein Country Lodge has a positive impact on the tourism sector operational in the area and Namibia. It provides luxury accommodation and tourism related services in a remote area, increasing ease of accessibility. It provides employment opportunities and skills development to a local workforce. Revenue is generated that contributes to the Uibasen Conservancy as well as the Namibian economy.

Negative impacts associated with the operations and maintenance / construction activities can successfully be mitigated. Implementing a safety, health, environment and quality (SHEQ) policy will contribute to effective management procedures to prevent and mitigate impacts. All regulations relating to tourism and health and safety legislation should be implemented. Groundwater and soil pollution must be prevented at all times. Fire prevention should be key and fire response plans must be in place and regular training provided. All staff must be made aware of the importance of biodiversity and the poaching or illegal harvesting of animal and plant products prohibited. Any waste produced must be removed from site and disposed of at an appropriate facility or re-used or recycled where possible. Hazardous waste must be disposed of at an approved hazardous waste disposal site.

The EMP should be used as an on-site reference document for the operations of the lodge. Parties responsible for transgressing of the EMP should be held responsible for any rehabilitation that may need to be undertaken. The Proponent could use an in-house Environment Management System in conjunction with the environmental management plan. All operational personnel must be taught the contents of these documents.

8 REFERENCES

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Appendix A: Consultant's Curriculum Vitae

ENVIRONMENTAL SCIENTIST**André Faul**

André entered the environmental assessment profession at the beginning of 2013 and since then has worked on more than 190 environmental impact assessments and related environmental reports including assessments for the petroleum industry, harbour expansions, irrigation schemes, township establishment and power generation and transmission. André's post graduate studies focussed on zoological and ecological sciences and he holds a M.Sc. in Conservation Ecology and a Ph.D. in Medical Bioscience. His expertise is in ecotoxicological related studies focussing specifically on endocrine disrupting chemicals. His Ph.D. thesis title was The Assessment of Namibian Water Resources for Endocrine Disruptors. Before joining the environmental assessment profession he worked for 12 years in the Environmental Section of the Department of Biological Sciences at the University of Namibia, first as laboratory technician and then as lecturer in biological and ecological sciences.

CURRICULUM VITAE ANDRÉ FAUL

Name of Firm	:	Geo Pollution Technologies (Pty) Ltd.
Name of Staff	:	ANDRÉ FAUL
Profession	:	Environmental Scientist
Years' Experience	:	22
Nationality	:	Namibian
Position	:	Environmental Scientist
Specialisation	:	Environmental Toxicology
Languages	:	Afrikaans – speaking, reading, writing – excellent English – speaking, reading, writing – excellent

First Aid Class A	OSH-Med 2022
Basic Fire Fighting	OSH-Med 2022

EDUCATION AND PROFESSIONAL STATUS:

B.Sc. Zoology/Biochemistry	:	University of Stellenbosch, 1999
B.Sc. (Hons.) Zoology	:	University of Stellenbosch, 2000
M.Sc. (Conservation Ecology)	:	University of Stellenbosch, 2005
Ph.D. (Medical Bioscience)	:	University of the Western Cape, 2018

PROFESSIONAL SOCIETY AFFILIATION:

Environmental Assessment Professionals of Namibia (Environmental Practitioner)

AREAS OF EXPERTISE:

Knowledge and expertise in:

- ◆ Water Sampling, Extractions and Analysis
- ◆ Biomonitoring and Bioassays
- ◆ Biodiversity Assessment
- ◆ Toxicology
- ◆ Restoration Ecology

EMPLOYMENT:

2013-Date	:	Geo Pollution Technologies – Environmental Scientist
2005-2012	:	Lecturer, University of Namibia
2001-2004	:	Laboratory Technician, University of Namibia

PUBLICATIONS:

Publications:	5
Contract Reports	+190
Research Reports & Manuals:	5
Conference Presentations:	1