

**ENVIRONMENTAL SCOPING ASSESSMENT (ESA) FOR
THE PROPOSED SUBDIVISION AND DEVELOPMENT
OF PORTION 139 OF RUNDU TOWNLANDS NO. 1329,
RUNDU TOWN, KAVANGO EAST REGION-NAMIBIA**



Prepared By:

Prepared For:



ACEMAC Construction cc

APP-001424

MAY 2020

PROJECT TITLE:	Environmental Scoping Assessment (ESA) For the Proposed Subdivision and Development of Portion 139 Of Rundu Townlands No. 1329, Rundu Town, Kavango East Region-Namibia
PREPARED FOR:	ACEMAC Construction cc
PREPARED BY:	EnviroPlan Consulting cc P.O.BOX 70822 Khomasdal, Windhoek
LEAD EAP	TENDAI E. KASINGANETI Cell: +264813634904 Email: ekasinganetie@gmail.com
COPYRIGHT	APP-001424: ENVIROPLAN CONSULTING

Contents

1.	CHAPTER ONE: BACKGROUND	2
1.1.	INTRODUCTION	2
1.2.	PROJECT LOCATION	2
1.3.	PROJECT DESCRIPTION	4
1.4.	NEED AND DESIRABILITY	5
1.5.	OBJECTIVE OF THIS STUDY.....	6
1.6.	TERMS OF REFERENCE	6
2.	CHAPTER TWO: POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK.....	7
2.1.	INTRODUCTION	7
3.	CHAPTER THREE: RECEIVING ENVIRONMENT	16
3.1.	OVERVIEW	16
3.2.	SOCIO-ECONOMIC STATUS	16
3.3.	CLIMATE	17
3.4.	FAUNA	17
3.4.1.	REPTILES, AMPHIBIANS AND INVERTEBRATES	17
3.4.2.	MAMMALS.....	17
3.4.3.	BIRDS	18
3.5.	FLORA	19
3.5.1.	TREES / SHRUBS AND GRASSES	19
3.5.2.	MAHANGU FIELDS.....	20
3.6.	GEOLOGY AND SOILS	20
3.7.	HYDROLOGY	20
4.	CHAPTER FOUR: PUBLIC CONSULTATION	22
4.1.	PUBLIC CONSULTATION ACTIVITIES	22
4.1.1.	LOCAL AND SITE NOTICES.....	23
4.1.2.	PUBLIC MEETING.....	24
5.	CHAPTER FIVE: ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS.....	25
5.1.	OVERVIEW	25
5.2.	IMPACT ASSESSMENT METHODOLOGY	25
5.3.	IMPACT ASSESSMENT.....	28
5.4.	RISK ANALYSIS	38

List of Figures

Figure 1: Portion 139 Rundu	3
Figure 2: Mahangu fields covering the project area	19
Figure 3: Vegetation on portion 139.	19

List of Tables

Table 1: Proposed Site Coordinates	2
Table 2: Applying Policies, legal and Administrative regulations	8
Table 3: List of mammals occurring in and endemic to the region	17
Table 4: Bird Species common in the area	18
Table 5: Details on public notifications of the EIA study	23
Table 6: Impact Screening Criteria	25
Table 7: Impact Rating Criteria	26
Table 8: Environmental impact Assessment Matrix	28

Definitions

TERMS	DEFINITION
BID	Background Information Document
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
EMP	Environmental Management Plan
GHG	Greenhouse Gasses
ISO	International Organization for Standardization
I&APs	Interested and Affected Parties
MET: DEA	Ministry of Environment and Tourism's Directorate of Environmental Affairs
NHC	National Heritage Council
NEMA	Namibia Environmental Management Act
PRP	Pit Rehabilitation Plan
ToR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change

EXECUTIVE SUMMARY

EnviroPlan Consulting cc has been engaged by ACEMAC Construction cc to conduct the Environmental Impact Assessment (EIA) and develop an Environmental Management Plan (EMP) for the proposed Subdivision and Development of Portion 139 Of Rundu Townlands No. 1329, Rundu Town, Kavango East Region-Namibia and to apply for an Environmental Clearance Certificate for the proposed project.

The township development project has triggered the application for an environmental clearance certificate as the following listed activity will be triggered by:

LAND USE AND DEVELOPMENT ACTIVITIES

- 5.1d the rezoning of land from; zoned open space to any other land use

INFRASTRUCTURE

- 10.2 The route determination of roads and design of associated physical infrastructure where -
(a) it is (along/near) a public road;

Environmental Impacts

- Low potential environmental impact.
- Relative or moderate social impact (positive)

Social Impacts

The project is set to improve the socio-economic environment of Rundu Town through a major boost in business through integrations, employment and tourism on the long term.

1. CHAPTER ONE: BACKGROUND

1.1. INTRODUCTION

ACEMAC Construction cc, is the prospective owner of the portion 139 of the Rundu townlands No. 1329, measuring 15 hectares. As per the requirements of the Township and Division of Land Ordinance 1963 and the Environmental Management Act No. 7 of 2007, ACEMAC cc appointed EnviroPlan Consultants to undertake an Environmental Scoping Assessment (ESA), formulate an Environmental Management Plan (EMP) and apply for an Environmental Clearance Certificate (ECC) to the Ministry of Environment and Tourism (MET): Directorate of Environmental Affairs (DEA).

In this respect, this document form part of the application to be made to the DEA's office for an Environmental Clearance certificate for the proposed township establishment on portion 139 of Rundu Townlands that shall allow the development of affordable 170 residential stands, 1 business stand, 5 Public Open Spaces, 1 institutional stand and opening of streets, according the guidelines on the statutes of the Environmental Management Act No.7 of 2007 and the environmental impacts regulations (GN 30 in GG 4878 of 6 February 2012).).

1.2. PROJECT LOCATION

The portion 139 is situated approximately 6km from Rundu Town along the Rundu-Nkurenkuru road opposite Sauyemwa Township. The exact coordinates of the location are:

The proposed development is approximately 15 ha. in extent and is vacant areas that is mostly dominated by grass, bushes, shrubs the farm is currently zoned "Undetermined". Several Informal roads and footpaths visible in the area. Notable in the surrounding are disused buildings, the map below (Fig 1) gives an Arial view of the project site and exact project location coordinates are as follows:

Table 1: Proposed Site Coordinates

A	Lat 17° 55' 35.56"	Long 19° 43' 17.34"
B	Lat 17° 56' 1.25"	Long 19° 43' 5.51"
C	Lat 17° 56' 3.57"	Long 19° 43' 15.82"
D	Lat 17° 55' 47.17"	Long 19° 43' 29.09"

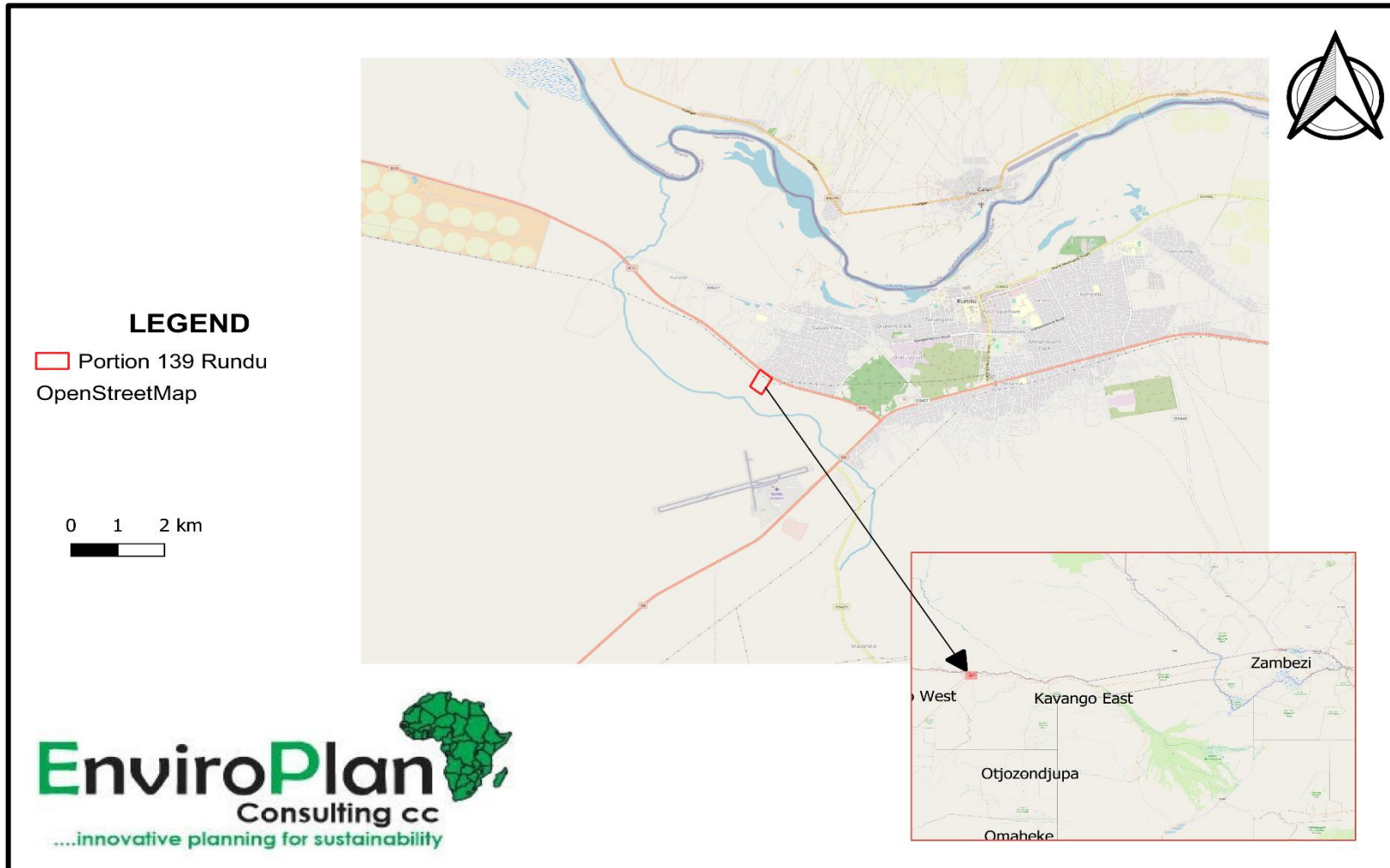


Figure 1: Portion 139 Rundu

1.3. PROJECT DESCRIPTION

Development Proposal & Layout

The proposed project site is at portion 139, a portion located in Rundu Town and Townlands No. 1329. The land is zoned “undetermined”. It is argued that the portion is better developed for township as it is easily accessible to the existing, adjacent Sauyemwa suburb and can be easily connected to the existing service infrastructure (water, electricity, sewer and roads).

The township development on the site can be regarded as a special one due to the fact that the town of Rundu is in dire need of both residential and business purposes. This is critical for the growth of the town and the growing population. Going forward with that and considering that this portion is not being utilized, the developmental would optimize the use of land, which is currently unused, and facilitate the provision of affordable land for residential and business development.

The intention is to use the land primarily for township development on the emphasis of low-cost residential development. The portion 139 has a potential to accommodate approximately 178 single residential erven, 1 business stand (small to medium mall), 1 municipal stand, 1 institutional stand and 5 open ervens for public open space and opening of streets. Local streets should represent not more than an area of 15% of the total site.

Infrastructure and Services

The proponent at the developers’ costs shall liaise with the municipality of Rundu for the provision of municipal services such as electricity, water reticulation, sewerage reticulation and domestic waste management. The services can easily be easily connected to the proposed project site. Since the site is adjacent to the existing Sauyemwa suburbs, water, sewer and electricity services are near and can be connected directly from Sauyemwa.

Roads and Storm Water

Access to the respective portion is through the Rundu-Nkurenkuru highway road. Since the access road is existing, only the inside access roads need to be constructed, which will have a minimum environmental impact. Internal roads of a minimum width of 12m to 15m shall be constructed. The roads would be constructed in line with municipal engineering standards and specifications and all traffic signs and road markings provided.

Storm water would be taken off from surface run-off and drain towards the bottom of the site/township. Adequate and proper drainage should be constructed that avoid instances of waterlogging and flooding of the township. It would be attempted to maintain the natural flow of storm water flow with minimum disruptions.

Water Reticulation

The internal water reticulation network should be connected through the existing municipal network in Sauyemwa suburb. The design of the network should be done in consultation with the municipal engineering department.

Sanitation

The area shall be connected to a Public Sewerage System Network (PSSN) of the Rundu town.

Electricity Distribution Network

There is an existing electricity line passing through the project site therefore electricity connection is not a problem. The property developer is in process to investigate the connection options to that existing NORED grid. However, the capacity is sufficient to serve the proposed development.

Waste collection

Small household bins of 120l shall be provided at every house, others will be strategically positioned across the township such that people will not move 200m without accessing a public bin. The bins have to be collected twice a week. The client should negotiate with Rundu Municipality for a contract on waste collection.

1.4. NEED AND DESIRABILITY

There is presently a vast shortage for low income residential erven in the major towns of Namibia and Rundu is not an exception. The proposed development is desirable as it is strategically located near existing access road, and other residential locations (Sauyemwa) that makes the township not isolated from the rest of the town. Development of business stands/mall in the township means Sauyemwa people would not need to travel to town for shopping but rather shop in the new township.

In terms of Section 5 of the Township and Division of Land Ordinance (Ordinance 11 of 1963) the owner of land who proposes to establish a township thereon shall make application for permission to do so in writing to the Minister and upon receipt of the application the Minister shall refer it to the Namibia Planning Advisory Board for consideration and a recommendation on the desirability and necessity of establishing the proposed township. The recommendation of the Namibia Planning Advisory Board was submitted to the Minister and the Minister decide the establishment of the proposed township is desirable and necessary. The following procedure was followed on determining the needs and desirability of the proposed developed;

- Subdivision of the Remainder of Rundu Town and Townlands into Portion 139 and Remainder of the Rundu Town and Townlands No. 1329, in order to create the project site.

1.5. OBJECTIVE OF THIS STUDY

This Environmental Impact Assessment is being undertaken in compliance with the Environmental Management Act No.7 of 2007 and the Environmental Impacts Assessments Regulations (GN 30 in GG 4878 of 6 February 2012). It is a prerequisite by the law to have an Environmental Impact Assessment carried out before the implementation of the prescribed projects as elaborated in the Environmental Impacts Regulations (GN 30 in GG 4878 of 6 February 2012). The main objectives of this study are as follows:

- To identify and provide mitigation measures of the expected impacts of the proposed land development project to protect the environment;
- To brief the Project Proponent of the legal and policy framework govern the proposed activity;
- To identify the possible changes in bio-diversity index that might be because of Project implementation in the area;
- To reflect on the various public concerns which will help the National Environmental Action Planners, economist and concerned stakeholders to make decisions;
- To come up with preventive and precautionary measures for the expected physical and biological environmental negative impacts associated with the proposed activities;
- To structure an effective environmental management plan for the sub division and servicing of the land facet to minimise and prevent negative impacts and maximise the positive impacts.

1.6. TERMS OF REFERENCE

The Environmental Impact Assessment conducted by EnviroPlan Consulting cc provides a comprehensive evaluation of the proposed project producing both EIA and EMP report documenting the following:

- A complete description of the existing site proposed for development;
- Significant environmental issues of concern that were based on the baseline data compiled by the EIA Team, which took into consideration social, cultural and heritage information;
- An assessment of the public perception on the proposed development.
- Identification of Policies, Legislation and Regulations relevant to the project;
- Prediction of the likely short, medium and long-term impact of the development on the environment, including direct, indirect and cumulative impacts, and their relative importance to the design of the development's facilities;
- Identification of any mitigation action to be taken to minimize predicted adverse impacts and provide associated costs where applicable and practical;
- Development of an environmental monitoring plan which will ensure that the mitigation measures are adhered to during the implementation phase;
- A conclusion and recommendations remarks for the project proponent on an advisory note.

2. CHAPTER TWO: POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1. INTRODUCTION

An important part of the EIA is identifying and reviewing the administrative, policy and legislative situation concerning the proposed activity, to inform the proponent about the requirements to be fulfilled in undertaking the construction and land servicing activities. This section looks at the legislative framework within which the proposed development will be serviced and operate under.

The focus is on the compliance with the legislation during the planning, construction and operational phases. All relevant legislations, policies and international statutes applying to the project are highlighted in table 2. below as specified in the Environmental Management Act, 2007 (Act No.7 of 2007) and the regulations for Environmental Impact Assessment as set out in the Schedule of Government Notice No. 30 (2012).

Table 2: Applying Policies, legal and Administrative regulations

Legislation/Policy/Guiding document	Provision	Project implication
The Constitution of the Republic of Namibia (1990)	<p>The articles 91(c) and 95(i) commits the state to actively promote and sustain environmental welfare of the nation by formulating and institutionalizing policies to accomplish the sustainable objectives which include:</p> <ul style="list-style-type: none"> - Guarding against overutilization of biological natural resources, - Limiting over-exploitation of non-renewable resources, - Ensuring ecosystem functionality, - Maintain biological diversity. 	<p>Through implementation of the environmental management plan the proposed development will be in conformant to the constitution in terms of environmental management and sustainability.</p>
Vision 2030 and National Development Plans	<p>Namibia’s overall Development ambitions are articulated in the Nations Vision 2030. At the operational level, five-yearly national development plans (NDP’s) are prepared in extensive consultations led by the National Planning Commission in the Office of the President. Currently the Government has so far launched a 5th NDP that pursues three overarching goals for the Namibian nation: high and sustained economic growth; increased income equality; and employment creation.</p>	<p>The proposed project will increase availability of serviced erven in Rundu as well as creating employment in construction, which will be in fulfilment to the NDP and Vision 2030.</p>

<p>Environmental Assessment Policy of Namibia 1994</p>	<p>The Environmental Assessment Policy of Namibia requires that all projects, policies, Programmes, and plans that have detrimental effect on the environment must be accompanied by an EIA. The policy provides a definition to the term “Environment” broadly interpreted to include biophysical, social, economic, cultural, historical and political components and provides reference to the inclusion of alternatives in all projects, policies, programmes and plans.</p>	<p>The development establishment will only commence after being awarded an environmental clearance certificate, thus by abiding to the requirements of the Environmental Assessment Policy of Namibia. The EIA and EMP will cater for the sustainable management of bio-physical environment.</p>
<p>Environmental Management Act No. 07 of 2007</p>	<p>The Act aims at</p> <ul style="list-style-type: none"> ✓ Promoting the sustainable management of the environment and the use of natural resources by establishing principles for decision-making on matters affecting the environment; ✓ To provide for a process of assessment and control of projects which may have significant effects on the environment; ✓ To provide for incidental matters. <p>The Act gives legislative effect to the Environmental Impact Assessment Policy. Moreover, the act also provides procedure for adequate public participation during the environmental assessment process.</p>	<p>This document is compiled in a nature that project implementation is in line with the objectives of the EMA Act. Guiding procedures were also drawn from the act to facilitate for the carrying out of the EIA and drafting the EMP for the proposed development.</p>

<p>Townships and Division of Land Amendment Act, 1992 (Act 28 of 1992)</p>	<p>“(l) Whenever any area of land constitutes, by reason of its situation, a portion of an approved township, or adjoins an approved township, the Executive Committee may, by proclamation notice in the Gazette and after consultation with the Board, extend the boundaries of that township to include such area”. (Minister of Regional and Local Government) A new township needs to be created for approval by the Namibian Planning Advisory Board and the Township Board.</p>	<p>Through conducting this EIA and preparation of The townships board already approved this project, however the construction and operation will need to be regulated accordingly.</p>
<p>Public Health Act (No. 36 of 1919)</p>	<p>Under this act, in section 119: “No person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.”</p>	<p>The project proponent will ensure that all legal requirements of the project in relation to protection of the health of their employees and surrounding residents is protected. -Personal protective equipment shall be provided for employees in construction. -The development shall follow requirements and specification in relation to water supply and sewerage handling so as not to threaten public health of future residents on this piece of land.</p>
<p>Soil Conservation Act 76 of 1969</p>	<p>The objectives of this Act are to: ✓ Make provisions for the combating and prevention of soil erosion,</p>	<p>The project will have a rather localized impact on soils and on the soil through construction and access roads construction hence soil protection</p>

	<p>✓ Promote the conservation, protection and improvement of the soil, vegetation, sources and resources of the Republic.</p>	<p>measures will be employed and preservation of trees as much as possible.</p>
<p>Nature Conservation Ordinance 1996</p>	<p>To consolidate and amend the laws relating to the conservation of nature; the establishment of game Parks and nature reserves; the control of problem animals; and to provide for matters incidental thereto.</p>	<p>The proposed project implementation is not located in any known or demarcated conservation area, national park or unique environments. The project site was selected with this ordinance in mind to ensure that Namibian nature is conserved.</p>
<p>Protected Areas and Wildlife Management Bill</p>	<p>This bill, when it comes into force, will replace the Nature Conservation Ordinance 4 of 1975. The bill recognizes that biological diversity must be maintained, and where necessary, rehabilitated and that essential ecological processes and life support systems be maintained. It protects all indigenous species and control the exploitation of all plants and wildlife.</p>	<p>The project has ensured that their activities do not fall within the boundaries of any protected area and that the project will not affect heavily endangered vegetation and animals on its site.</p>
<p>Forest Act, 2001 (Act No. 12 of 2001)</p>	<p>The Act gives provision for the protection of various plant species through the Ministry of Agriculture, Water and Forestry (MAWF), Directorate of Forestry).</p>	<p>-During the clearing of land for the establishment the cutting down or harvesting of plant species will be done upon approval from the Directorate of Forestry. The proponent will also have to ensure that there is no indiscriminate cutting down of trees.</p>

		-The proposed site is sparsely vegetated with white thorn tree species, which are not threatened or protected.
National Biodiversity Strategy and Action Plan (NBSAP2)	The action plan was operationalised in a bid to make aware the critical importance of biodiversity conservation in Namibia putting together management of matters to do with ecosystems protection, biosafety, biosystematics protection on both terrestrial and aquatic systems.	ACEMAC construction has been advised by the EIA Team and recognises the need for ecosystems protection to manage the changing climatic environment. Through this project, there will be reforestation and fostering of green development, which will be promoting the protection and conservation of the biophysical environment, and with this EIA, it will be ensure that almost 40% of grown tree species on site will not be removed but rather will be part of the development, to promote Greed development.
National Policy on Climate Change for Namibia, 2010	In harmony with the findings of the IPCC over time and the Earth Summits being held annually the policy seeks to outline a coherent, transparent and inclusive framework on climate risk management in accordance with Namibia’s national development agenda, legal framework, and in recognition of environmental constraints and vulnerability. Furthermore, the policy pursues the strengthening of national capacities to reduce climate change risk and build resilience for any climate change shocks.	The proposed project will ensure that there will be limited release of greenhouse gasses such as methane, carbon dioxide, nitrous oxides. Methods such as wet surface operations to reduce dust emissions will be utilised to remove aerosols emitted into the near-surface atmosphere.

<p>Wetland Policy, 2004</p>	<p>The policy provides a platform for the conservation and wise use of wetlands, thus promoting inter-generational equity regarding wetland resource utilization. Furthermore, it facilitates the Nation’s efforts to meet its commitments as a signatory to the International Convention on Wetlands (Ramsar) and other Multinational Environmental Agreements (MEA’s).</p>	<p>In compliance to this policy the development will ensure a standard environmental planning such that it does not affect any wetlands within its locale through recognition of wetlands to promote the conservation and wise utilization of wetlands resources.</p>
<p>Water Resources Management Act, 2013 (Act No. 11 of 2013)</p>	<p>This Act provides for the management, protection, development, use and conservation of water resources and the regulation and monitoring of water services and to provide for incidental matters. (Department of Water Affairs).</p>	<p>Water usage during construction will be supplied by Rundu Town Council.</p>
<p>National Heritage Act 27 of 2004</p>	<p>Heritage resources to be conserved in development. (National Heritage)</p>	<p>During the project implementation as soon as objects of cultural and heritage interests are observed such as graves, artefacts and any other object believed to be older than 50 years, all measures will be taken to protect these objects until the National Heritage Council of Namibia have been informed, and approval to proceed with the operations granted accordingly by the Council.</p>
<p>National Monuments Act of Namibia (No. 28 of 1969) as amended until 1979</p>	<p>“No person shall destroy, damage, excavate, alter, remove from its original site or export from Namibia: (a) any meteorite or fossil; or</p>	<p>The proposed site of development is not within any known monument site both movable or immovable as specified in the Act, however in</p>

	<p>(b) any drawing or painting on stone or a petroglyph known or commonly believed to have been executed by any people who inhabited or visited Namibia before the year 1900 AD; or</p> <p>(c) any implement, ornament or structure known or commonly believed to have been used as a mace, used or erected by people referred to in paragraph (b); or</p> <p>(d) the anthropological or archaeological contents of graves, caves, rock shelters, middens, shell mounds or other sites used by such people; or</p> <p>(e) any other archaeological or palaeontological finds, material or object; except under the authority of and in accordance with a permit issued under this section.</p>	<p>such an instance that any material or sites or archeologic importance are identified, it will be the responsibility of the developer to take the required route and notify the relevant commission.</p>
<p>Pollution Control and Waste Management Bill</p>	<p>This bill has not come into force. Amongst other the bill aims to “prevent and regulate the discharge of pollutants to the air, water and land” Of particular reference to the Project is: Section 21 “(1) Subject to sub-section (4) and section 22, no person shall cause or permit the discharge of pollutants or waste into any water or watercourse.”</p> <p>Section 55 “(1) No person may produce, collect, transport, sort, recover, treat, store, dispose of or otherwise manage waste in a manner that results in or</p>	<p>To control air, water and land pollution as agitated by the Act the project proponent will ensure that erven will have approved drainage on site and that sanitation facilities do not threaten public health, adding on an integrated pollution management strategy following the EMP and will be operationalised on site.</p>

	creates a significant risk of harm to human health or the environment.”	
Convention on Biological Diversity (CBD)	Namibia is a signatory of the Convention on Biological Diversity and thus is obliged to conserve its biodiversity.	The project will preserve tree species on as part of their plans for greed and sustainable development.
United Nations Convention to combat Desertification	Namibia is bound to prevent excessive land degradation that may threaten livelihoods.	It will be the responsibility of the developer and future land owners at to conserve vegetation on and around the area, to avoid encroachment of the desert environs in the area.

3. CHAPTER THREE: RECEIVING ENVIRONMENT

3.1. OVERVIEW

In this chapter, the findings of the EIA Team on baseline surveys, public consultation and desk reviews undertaken will be discussed in respect to the ecology, society, economy and geo-political set up of the proposed project area. The geological make up and meteorology of the project site will also be discussed in this chapter to give an in-depth understanding of the project area in question.

3.2. SOCIO-ECONOMIC STATUS

The proposed project site, portion 139 of Rundu Townlands located of adjacent Sauyemwa suburbs. The area is under Rundu Urban Electoral Constituency with a population of about 63,431 inhabitants (2011 Census). The entire Kavango regions (including Rundu Town) ranked among the poor regions in the country with a prevailing high unemployment rate despite some agricultural activities happen in the regions.

Rundu is the capital of the Kavango East region and links to the Capital City of Namibia-Windhoek by tarred B series national road network. This infrastructure serves as the main supply line for the region. All the other population centres in the region are linked with Rundu by road. The major economic activities sustaining Rundu is the existence and operation of both communal and commercial farming specialising in cultivation of different crops. Main agriculture activities are small scale crop farming (53%)-growing Mahangu, livestock (23%) –farming goats, donkeys and cattle, and poultry farming (8%) (Enviro Dynamic 2014). These farming systems provide a degree of food self-sufficiency with a few provisions of economic development of the region. Within the project site they are only two mahangu fields in the south side which is the same side that have a nearby river.

However, most of the crop-growing activities in the region generate little income because fields are small, soils have limited fertility, yields are low, surplus harvests are rare and markets are small (Mendelsohn and El Obeid 2003: 92ff Brown 2010: 25).

3.3. CLIMATE

Classification of climate: Rundu is subjected to a humid subtropical climate, with hot summers and mild winters. During the austral winter, the days are warm and nights cool to cold.

Average rainfall: The annual rainfall ranges between 500 and 550mm with June normally reporting the lowest and January the highest (Mendelsohn et al., 2002)

Temperature: Daytime temperatures exceed 30°C throughout the year, except during May, June and July. Average maximum temperatures fluctuate between 32°C and 34°C and average minimum temperatures between 8°C and 10°C.

Humidity: The average level of humidity ranges from 10 to 20% during winter with the highest humidity normally recorded in March (70-80%).

3.4. FAUNA

3.4.1. REPTILES, AMPHIBIANS AND INVERTEBRATES

The region has a high occurrence of reptiles, snakes. This includes cobras, puff adders (inhabit grasslands and bush ecosystems) and the black and green mamba (inhabiting the riverine ecosystems). The region generally is a habitat of a wide number of lizard species and tortoises. However, on the baseline study conducted on site shows that none of the above reptiles and snakes are prevalent on site, the baseline revealed existence of snails, centipedes, spiders and scorpions.

3.4.2. MAMMALS

The following list is of the mammals that are noticeable in the region however the disappearance of these mammals on the project site could be due to the driven by developmental activities happen in existing Sauyemwa suburb and other nearby areas. The list below was obtained from existing literature and some personal experience with the region. The list of mammals in the table below was then recognised as occurring in the area (MET, 2008).

Table 3: List of mammals occurring in and endemic to the region

Species	Conservation Status
African Buffalo	
Hippopotamus	Endangered
Tsessebe	
<i>Blue Wildebeest</i>	
<i>Sitatunga</i>	
<i>Common Reedbuck</i>	
<i>Elephant</i>	Endangered
<i>Giraffe</i>	

<i>Spotted Hyena</i>	Endangered
<i>Kudu</i>	
<i>Sable Antelope</i>	
<i>Roan Antelope</i>	
<i>Red Lechwe</i>	
<i>Chapman`s Zebra</i>	Endangered
<i>African Leopard</i>	Endangered
<i>South African Cheetah</i>	Endangered

3.4.3. BIRDS

Some environs near the Okavango River in western Bwabwata of the region are listed as an internationally recognized bird's area hosting bird species that are threatened at global level and range as avian diversity hotspots. However, the project site is not part of the demarcated areas bird's area hosting bird species since it is right in townlands. The list below is for bird species occurring in the region.

Table 4: Bird Species common in the area

Specie	Common Name	Conservation Status
<i>Rhynchope Flavirostris</i>	African Skimmer	Endangered
<i>Glareola nordmanni</i>	Black-winged Pratincole	Endangered
<i>Egretta vinaceigula</i>	Slaty Egret	Endangered
<i>Bugeranus carunculatus</i>	Wattled Crane	Endangered
<i>Nettapus auritus</i>	African Pygmy Goose	Endangered
<i>Centropus cupreicaudus</i>	Coppery-tailed coucal	Endangered
<i>Gorsachius leuconotus</i>	White Banked Night Heron	Endangered
<i>Ardeola rufiventris</i>	Rufous-bellied Heron	Endangered
<i>Porphyrio alleni</i>	Allen`s Gallinule	Endangered
<i>Falco dickisoni</i>	Dicksino`s Kestrel	Endangered
<i>Turdoides melanops</i>	Black-faced Babbler	Endangered
<i>Laniarius bicolor</i>	Swamp Boubou	Endangered
<i>Cichladusa arquata</i>	Collared Palm Thrush	Endangered
<i>Lamprotornis mevesii</i>	Meves`s Glossy Starling	Endangered
<i>Burcorvus leadbeateri</i>	Southern Ground Hornbill	Endangered
<i>Glaucidium cuculoides</i>	Asian Barred Owlet	Endangered
<i>Campethera bennettii</i>	Bennett`s Woodpecker	Endangered
<i>Phylloscopus sibilatrix</i>	Wood Warbler	Endangered
<i>Phyllocuspus bonelli</i>	Leaf Warbler	Endangered
<i>Cisticolidae juncidis</i>	Cisticola	Endangered

3.5. FLORA

3.5.1. TREES / SHRUBS AND GRASSES

Areas near the Okavango River prevails a high to very high vegetation density of considerable diversity. However, because of Rundu town development in the area it has been reduced considerably. The further inland is more densely vegetated and is prone to bush fires. Plant species in the area form part of the extensive Kalahari sand basin which is characterized by grassland and encompassing plant species such as *Vossia Cuspidata*, *Cynodon Dactylon* and *Setaria Sphacelata* (Burke, 2002). The project site has minimal vegetation cover cover. Composing of of mahangu fields (bare and sandy) as indicated in the images below:



Figure 2: Mahangu fields covering the project area



Figure 3: Vegetation on portion 139.

3.5.2. MAHANGU FIELDS

A small proportion of the site has mahangu field that have sand soils that are unproductive to cultivate except to cultivate light feed crops like mahangu and groundnuts. This part of the site is located near the river. Rundu town council compensated the owners of the Mahangu field when the Town boundaries were extended, the fields were there because the land was lying idle before development.

3.6. GEOLOGY AND SOILS

As indicated above on the Figure 2, the area consists of completely weathering reddish sandy soils. The area was thoroughly investigated through transacts walks and no noticed rocks on site. The area is underlain by the Kalahari and Namib sands, which are dominated by cambic arenosols, albic arenosols and calcic xerosols (Mendelsohn & el Obeid, 2003). This indicates the completely weathering of the existed rocks long time back to give that Kalahari sand soils as shown on the images below. According to the Agro-Ecological Zoning Programme (AEZ) of the Ministry of Agriculture, Water and Forestry and the World Reference Base for Soil Resources (FAO, 1998), the arenosols contain sandy soil with poor retained nutrient capacity. The sand further is slightly acidic which also results in nutrient deficiency. Generally, soils are deep and purely sandy with average soil fertility. Images below shows the sandy soils at the site.

3.7. HYDROLOGY

A reconnaissance level field assessment was conducted to confirm the current hydrologic conditions at the proposed area and to identify potential hydrologic risks associated with establishment of the proposed township development. The site is relatively flat however, due to its gradient the site can have minor drainage issues but this will be compensated by adequate and proper drainage systems in the layout designs/plans. The potential hydrologic feature at risk is the perennial river that is nearby the site. A distance of 100m shall be maintained between the project and the river. The river is perennial; therefore, the project development and operation phases must be careful so that activities took place on site will not pollute or interfere with the flows of the river. This means proper installation, sufficient and adequate drainage system in the township to ensure that all the storm water collected is safely discharged into that natural water body. The area shows very low evidence of surface erosion. The surrounding area is relatively flat giving limited chance for surface drainage thence the need of good drainage system to avoid waterlogging problems in the township. The figure below shows the nearby river:



Figure 5: The river close the project site located south of the area

However, the region in general has access to potable surface water from the perennial Okavango River. Okavango is a shared water course by three country; Namibia, Botswana and Angola. The River Basin engulfs an area of rounded 190,000 square kilometers across three states (Mendelsohn and el Obeid, 2003). Its water originates from Angola and ends its flow in the Okavango delta in Botswana. Approximately half of its flow comes down the Cuito, with the remaining 50% originating from Cubango as it enters Kavango at Katwitwi

4. CHAPTER FOUR: PUBLIC CONSULTATION

Public Consultation forms an important component of the Environmental Assessment process. It is agitated for in the EIA Regulations (2012), Section 21 of the Regulations details steps to be taken during a given public consultation process and these have been used in guiding our process.

Formal public involvement has taken place via newspaper adverts, site notice and registering I&APs. The public consultation process has been guided by the requirements of Environmental Management Act (EMA) No. 7 of 2007 and the process has been conducted in terms of regulation 7(1) as well as in terms of the EMA Regulations of GN 30 of 6 February 2012.

4.1. PUBLIC CONSULTATION ACTIVITIES

The following tasks have been undertaken during public consultation process which started January 2020.

Identification of Interested and Affected Parties (I&APs)

After the scoping process, the EIA team identified I&APs and key stakeholders of the proposed project. The public participation activities to be undertaken for this EIA process were incorporated into the overall approach of the EIA background information. Among key stakeholders identified were Rundu Town Council and Kavango East Regional Council. Other I&APs could register to the EIA team and a special database created capturing all their names and correspondence details.

Distribution of BID

A Background Information Document (BID) was distributed on request by I&A Parties and it was distributed to key stakeholders identified during the scoping process. The Background Information Document (BID) provided a description summary of the proposed project, and the project proponent and the whole procedure of the EIA to be followed.

Public Announcement.

An extensive public announcement was done to make sure the public is aware of the township establishment by EnviroPlan Consulting cc. The EIA study was announced publicly through site notices, newspaper adverts and liaising with Town Council Town Planner. Proof of adverts and notices is attached in appendices.

Table 5:Details on public notifications of the EIA study

Method	Area of Distribution	Language	Date Placed
Confidante	Country Wide	English	6 and 13 February 2020
New Era	Country Wide	English	6 and 13 February 2020
Site notices	Rundu Town Council	English	06 January 2020
	Project Site	English	06 January 2020
	Kavango Spar	English	06 January 2020

N.B: No objections were raised by I&AP in relation to the project. Community members and Rundu Town council administration was involved in the public participation process.

4.1.1. LOCAL AND SITE NOTICES

As indicated above, three local public notices were placed around the town to inform the residents that might have missed the public announcements made via newspapers. The three local public notices were attached on; one on-site (portion 139), one at Rundu Town Council notice board and the last on the venue where the public meeting took place.



Fig 6: (Left) Notice at Rundu Town Council public notice board Figure 7: Notice at meeting venue in Sauyemwa

Figure 8: (Right)EIA Notice at the proposed site

4.1.2. PUBLIC MEETING

A public meeting was held on the 15 February 2020 at Methodist Church in Sauyemwa Township, Time: 1000HRS. Participation and commenting window was open Until 29 February 2020. However, the meeting was not attended by locals due to different commitments and as always is the case in Public meetings like these, with the spirit to reach as much public as possible, BID documents were given to surrounding locals to inform them of the coming development.

5. CHAPTER FIVE: ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS

5.1. OVERVIEW

ACEMAC Construction is committed to sustainability and environmental compliance through coming up with a corrective action plan for all the anticipated environmental impacts associated with the project. This is also in line with the Namibian Environmental Management legislation and International best practices on township establishment and associated activities.

The proponent shall implement the hereto attached Environmental Management Plan (EMP) in order to prevent, minimise and mitigate negative impacts. The EMP developed by EnviroPlan to address all the identified expected impacts, the plan will be monitored and updated on a continuous basis, with aim for continuous improvement to addressing impacts.

5.2. IMPACT ASSESSMENT METHODOLOGY

An impact assessment matrix was used to assess all possible impacts of the project on the environment. In line with Namibia Environmental Management Act No. 7 of 2007 and the Environmental Impacts Regulations (GN 30 in GG 4878 of 6 February 2012) with the direction on impacts analysis the following impact assessment criteria was identified by the team and deemed suitable.

Table 6: Impact Screening Criteria

Aspect	Description
Nature	Focuses on the type of effect that the proposed establishment will have on environmental components. Addresses questions related to “what will be affected and how?”
Extent	Spatial extend of the project and anticipated spatial extend of impacts indicating whether the impact will be within a limited area (on site where construction is to take place); local (limited to within 15km of the area); regional (limited to ~100km radius); national (extending beyond Namibia’s borders).
Duration	This looks at the temporal issues pertaining to time frames e.g. whether the impact will be temporary (during construction only), short term (1-5 years), medium term (5-10 years), long term (longer than 10 years, but will cease after operation) or permanent.

Intensity	Establishes whether the magnitude of the impact is destructive or innocuous and whether it exceeds set standards, and is described as none (no impact); low (where natural/ social environmental functions and processes are negligibly affected); medium (where the environment continues to function but in a noticeably modified manner); or high (where environmental functions and processes are altered such that they temporarily or permanently cease and/or exceed legal standards/requirements).
Probability	Considers the likelihood of the impact occurring and is described as uncertain, improbable (low likelihood), probable (distinct possibility), highly probable (most likely) or definite (impact will occur regardless of prevention measures).
Significance	Significance is given before and after mitigation. Low if the impact will not have an influence on the decision or require to be significantly accommodated in the project design, Medium if the impact could have an influence on the environment which will require modification of the project design or alternative mitigation (the route can be used, but with deviations or mitigation) High where it could have a “no-go” implication regardless of any possible mitigation (an alternative route should be used).

The application of the above criteria will be used to determine the significance of potential impacts using a combination of duration, extent, and intensity/magnitude, augmented by probability, cumulative effects, and confidence. Significance is described as follows:

Table 7: Impact Rating Criteria

Significance Rating	Criteria
Low	Where the impact will have a negligible influence on the environment and no modifications or mitigations are necessary for the given development description. This would be allocated to impacts of any severity/ magnitude, if at a local scale/ extent and of temporary duration/time.
Medium	Where the impact could have an influence on the environment, which will require modification of the development design and/or alternative mitigation. This would be allocated to impacts of moderate severity/magnitude, locally to regionally, and in the short term.

High	Where the impact could have a significant influence on the environment and, in the event of a negative impact the activity(ies) causing it, should not be permitted (i.e. there could be a 'no-go' implication for the development, regardless of any possible mitigation). This would be allocated to impacts of high magnitude, locally for longer than a month, and/or of high magnitude regionally and beyond.
-------------	--

5.3. IMPACT ASSESSMENT

By subjecting each of the potential impacts to the matrix above, the EIA team established the significance of each impact prior to implementing mitigation measures and then after mitigation measures have been implemented. Some of the mitigation measures are mentioned but detailed descriptions of management actions are contained in the accompanying EMP.

Table 8: Environmental impact Assessment Matrix

Impact	Status/nature	Extent	Duration	Intensity	Probability	Significance		
						Before Mitigation	Mitigation applied	Post Mitigation
Servicing and Construction Phase								
-Soil physical disturbance during servicing of the land and construction activities	-Erosion of tracks -Proliferation of tracks -Negative excavation methods such as blasting.	Local	Short	Medium	Definite	High	-Restrict construction activities on defined areas. -Proper management of stockpiles. Excavated material must be covered in stockpiles until reuse. -Restrict movement to defined areas. Use existing roads until access require limited new roads. -Use surface anchored foundations with very limited rock breaking.	Low

							-Service of the land especially for sewer and water reticulation must ensure that the trenches need opened for the shortest practicable time to minimize potential for the generation of silt laden surface water runoff	
Urbanization/ urban growth	Physical expansion of the town	Regional	Long	Medium	Definite	Low	-All built structures should be constructed according to the local Authority bylaws to guarantee strength and longevity of structures built.	Low
Noise from land servicing activities and construction vehicles and equipment	-Nuisance and disturbance. -Noise and vibrations will also have an impact on animals such as birds and reptiles. Birds are known to abandon their nests if subjected	Local	Short	Medium	Definite	High	- All workers on site must be equipped with ear plugs to be used when the noise becomes unbearable. - Switch off machines that are not used. - All locals must be notified about the noise construction activities on time during excavations and ground preparation, servicing of the	Low

	to continuous noise. Noise to the nearby locals and to construction workers.						land and any constructions beyond. - All noisy construction activities must not be carried during night time, early morning and evenings, they must be done during daytime to ensure minimum disturbance of the nearby residents.	
-Physical destruction of vegetation through land servicing, construction activities and the upgrading and opening of new roads	-these activities may result in the removal and destruction of few trees species on site.	Local	Long Term	High	Definite	High	-Limit activity footprint and limit movement to designated areas only. Implement and monitor the Vegetation Management Plan if there is a significant destruction of the on-site and surrounding areas. -Preserve some plants in the yards of erven. Only remove vegetation that are in the path were services will be constructed.	Medium/ Low
Disturbance and killing of reptiles	-reptiles and small animals in	Local	Temporary term	Low	probable	medium	-Remove all (if any) special reptile species encountered	Low

and small animal's activities	the locality are bound and likely to be affected						-Forbid indiscriminate killing of animals and reptiles.	
Disturbance through noise, movement and temporary occupation of an otherwise less disturbed habitat	-negatively affect local animals and birds if any	Regional	Temporary	medium	Highly probable	High	-Minimum disturbance of local environment by ensure operations does not produce extreme noise that negatively affect nearby animals and birds. - Switch off machines that are not used.	Medium
Habitat loss, including foraging, roosting and breeding habitat of the area occupied by the proposed project site	-Negative impact on local habitats and vegetative species	Local	Permanent	high	Definite	High	-Preserve some plants in the yards of erven. -Only remove plants that are in the path were services will be constructed. -A permit must be obtained from the Directorate of Forestry before any protected species is removed	Medium
Upgrading and opening of access roads	-Negative effects of construction operations on site	Local	Permanent	Medium	Definite	Medium	-Ensuring the opening and upgrading of access roads must not affect vegetation and animals not within the road marked area.	Low

Archaeological Landscape	-Visual degradation	Local	Long term	Medium	Improbable	Medium	-Demarcate, protect and avoid development near sites. If removal is inevitable, apply at Heritage Council via an archaeologist.	Low
Change in topography/ landscape character	-Use of caterpillars for servicing (roads construction and paving of the site)	Local	Long term	Medium	Probable	High	-Refill all the pits dug to ensure that there are no pits left open on site and creating a new paved landscape (use of cement interlocks)	Low
Environmental contamination by hydrocarbons release into the environment (grease, oils, fuel spills and leakages from machinery and fugitive wastes.)	There will be no storage of oils and fuel on site according to the engaged contractors, however there is risk of spillage of hydrocarbons from vehicles and machinery operations, maintenance	local	Short Term	Medium	Probable	Medium	-Implement a maintenance programme to ensure all vehicles, machinery and equipment are and remain in proper working order -Vehicle maintenance should be Conducted in designated areas only, preferably off-site. If maintenance is to be conducted on site, these areas should be designed to contain spillages i.e. maintenance site must be bundled and paved and the use	-Low

	<p>through leakages and spillages which may result in:</p> <ul style="list-style-type: none"> -Washing away of contaminated soils by rains into nearby rivers -Pollution of soil and affecting small living organisms habituating the soil -Result in possible groundwater pollution. -Possible fire risk on and around the site 						<p>of chemicals must be controlled.</p> <ul style="list-style-type: none"> - Spillages are to be removed from site by a specialist waste removal contractor such a rent a drum. -Waste oil, fuels and other chemicals from drip trays on stationery vehicles and machinery will be disposed of as hazardous waste at a licensed facility by a specialist hazardous waste handler. -Oil residue will be treated with oil absorbent material such as Drizit or bio-remediation and removed to an approved waste disposal site -Spill kits will be easily accessible and workers will be trained in the use thereof. -Staff and contractors will be trained in the handling and storage of oils, fuels, chemicals 	
--	--	--	--	--	--	--	---	--

							and other hazardous substances -No bins containing organic solvents such as paint and thinners shall be cleaned on site, unless containers for liquid waste disposal are provided on site.	
Land Pollution	-Negative effect on the ecosystem when waste emanating from construction activities is not managed properly.	Local	Temporary	Medium	Probable	Medium	- Ensure that all waste (stockpiles) from construction activities must be stored and contained in designated containers and transported to Rundu Waste Disposal Site for proper disposal. - Adequate mobile toilets must be provided at the construction camps for the use of the workers.	Low
Dust from the general servicing of the land and construction activities	-Respiratory sicknesses can result from prolonged exposure to dust	Local	Temporary	High	Probable	Medium	-Equip all the workers exposed to dust with dust masks -Water spray all the areas that are sources of dust to minimize dust.	Low

	<p>-Dust can negative affect the ecosystem in general and the nearby residents</p> <p>-it also causes general pollution of the air</p>						<ul style="list-style-type: none"> - Minimize activities that can generate dust during windy days. - Limit the speed within the whole construction area to a maximum of 40 km/h to avoid excessive generation of dust - Dust will significantly be reduced if excavation and land clearing is carried out after it has rained and the soil is wet or dust suppression can be done 	
<p>Employment opportunities during the servicing and construction phases of the development</p>	<p>-The general servicing and al construction activities create job opportunities both to the locals, regional and national, this will have a positive economic impact on surrounding</p>	Regional	Temporary	Low	Highly probable	high	<p>-The Project Manager should make it mandatory to contractors that all unskilled work should be given to the locals.</p>	high

	Communities and technical companies involved							
The spread of HIV/AIDS and others STDs throughout the construction phase of the project.	-The huge inflow of employees and other people can result in the spread of HIV/AIDS, other STDs	Local	Long term	Medium	Highly probable	Low	-Awareness at workplace and provision of condoms -Massive education of the employees and the general public on the importance of having protective sex	Low
Operational Phase								
Pollution from solid waste and sewerage	-Failure to manage waste properly result in general pollution of the environment and this might have a detrimental impact on the people's well-being and the	Local	Long term	Low	Highly probable	Medium	-All erven must be serviced, connected to Rundu Town Council Sewer reticulation system whose manhole for connection is less than 10mm from the Erven. -Regular collection of solid waste by the municipal -Provisions of domestic solid waste collection bins to the residents	Low

	quality of the environment							
Population influx	-Results in social tensions and an increase infection of sexually transmitted diseases particularly HIV and AIDS, and other STDs.	-Local	-long term	Medium	Definite	High	-Educate employees on social integration and sexual behaviour	Medium
Social integration	Potential for conflict between people of different backgrounds and cultural beliefs.	Local	Short Term	Medium	Probable	Medium	-Public relations should adequately address the integrated societal values and morals	Low
Community development	Employment creation	Regional	Long term	High	Definite	High	-Promote local businesses and employ locals	High

5.4. RISK ANALYSIS

Based on the impacts identified by this study during site visit, process analysis, desk study and stakeholder consultations conducted, an integrated environmental risk analysis was carried out using the DEFRA Guidelines for Environmental Risk Assessment and Management 'Green Leaves III' (latest edition) as well as the international Procedures for best practices. The risk analysis shows that the project will have some negative impacts on the environment (Biophysical, economic, social and political), it has been also noted that the project will deliver some positive impacts on the receiving environment, as well as on social and economic aspects.

However, it is imperative to note that the project is being undertaken within an already disturbed locale. In order to prevent or mitigate negative impacts and to increase positive impacts a coordinated project management strategy according to an Environmental Management Plan, developed specific to this development.

Appendix A: References

Directorate of Environmental Affairs. (2002) Ministry of Environment and Tourism, Atlas of Namibia Project.

Ministry of Environment and Tourism. (1994) National Environmental Assessment Policy.

Ministry of Environment and Tourism. (2002) National Environmental Management Bill.

Ruppel and Ruppel schlichting (eds) (2011). Environmental Law and Policy in Namibia

Simmons, R.E (1998a). Important Bird Areas in Namibia. In: Barnard,P. (ed). Biological Diversity in Namibia: a country study. Windhoek: Namibia Biodiversity Task Force.

Lindback, E. & Murray, J. (1996). Shrimp Farming in the El Oro District. Agricultural Institute, Ecuador.

Middler, S. (1998). Toxicological Effects of Methylmercury. National Academy Press, Washington D.C.

Middler, S. (2001). The chemistry of water. Cambridge United States of America.

UNEP. (2002). Tools and Approaches for policy making in Environmental Management and public Health: Retrieved 9 April 2009 from

<http://www.whoafro.unep.inte/heag2008/docsenNew%20and%20emerging%threats.pdf>.