

**ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED
TOWNSHIP ESTABLISHMENT OF TWO NEW
EXTENSIONS IN TAMARISKIA, SWAKOPMUND**



SCOPING REPORT
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Project Title: **SWAKOPMUND TOWNSHIP ESTABLISHMENT**

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ABBREVIATIONS

BID	Background Information Document
C°	Degrees Celsius
DEA	Directorate of Environmental Affairs
DWAF	Department of Water Affairs and Forestry
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
EC	Environmental Commissioner
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMA	Environmental Management Act
EMP	Environmental Management Plan
ERC	Erongo Regional Council
ESA	Environmental Scoping Assessment
Etc.	Etcetera
Ha	Hectare
I&APs	Interested and Affected Parties
Km	Kilometre
L	Litre
MAWF	Ministry of Agriculture, Water and Forestry
MET	Ministry of Environment and Tourism
mg	Milligram
mm	Millimetre
NHC	National Heritage Council
No	Number
OEC	Office of the Environmental Commissioner
Ptn	Portion
PPP	Public Participation Process
Re/	Remainder
RoW	Right of Way
SANS	South African National Standards
SELCo	Southern Electricity Company
ToR	Terms of Reference
TDS	Total Dissolved Solids

EXECUTIVE SUMMARY

Tamariskia is a residential neighbourhood within Swakopmund on the Atlantic coast of Namibia. The neighbourhood is situated almost in the centre of town of Swakopmund. Swakopmund is one of the largest coastal towns within Namibia and is situated approximately 30km North of Walvisbay. It is a very popular holiday destination especially over December holidays. The town is constantly expanding and the need for development is always in demand.

The proposed development currently lies on two separate erven and eventually will create 2 new extensions within Swakopmund. Tamariskia Erf 673 is currently 52887m² in extent and comprises of the one extension. Tamariskia Erf RE 540 still needs to be subdivided and the subdivided portion will be used for township development. The subdivided portion will be approximately 44010m² in extent. The proposed development will consist of only residential and public open space erven.

SCOPE OF WORK AND ASSESSMENT APPROACH

In line with the environmental regulatory requirements and project registration, WINPLAN Town and Regional Planning Consultants was appointed by the Eddy Angula Trust to carry out an environmental scoping assessment for the proposed establishment of the two new extensions. The Townships includes certain activities that are listed as 'Listed Activities' according to Government Notice No. 29 of 6 February 2012, which requires that an Environmental Clearance Certificate (ECC) be obtained from the office of the Environmental Commissioner (EC), thus requiring that an Environmental Assessment (EA) be conducted. The following is a summary of 'Listed Activities' that need to be addressed in the Environmental Assessment:

- The construction of facilities for the transmission and supply of electricity
- Temporary storage of waste
- Removal of vegetation
- Establishment of land resettlement scheme
- The construction of water bulk supply pipelines
- The construction of public roads;

The primary objective of the scoping is to identify potential impacts associated with different development phases of the project. The assessment consisted of site visits to the project location and public consultation meetings with the Interested and Affected Parties (I&APs).

NEED AND DESIRABILITY ASSESSMENT

The proposed project aim to offer benefits to the future population of Swakopmund and the entire Erongo Region by offering direct and indirect employment opportunities and capacity building in the receiving communities. The following is a summary of the likely positive impacts that have been assessed for the different phases of the establishment of the two new extensions in Tamariskia:

Impact Description	Construction phase	Operational phase
Employment	High	High
Economic benefit to construction industry	High	-
Rates & taxes	-	High
Land use change (from economic point of view)	-	Very High

The proponent also acknowledges that potential negative impacts especially during the construction phase might be incurred. These impacts can be avoided and mitigated with proper implementation of an Environmental Management Plan (EMP).

SITE SELECTION PROCESS

A site for the establishment of the two new extensions was selected by the project proponent. The proposed site was selected as most suitable in terms of its proximity to the existing settlement as well as various environmental considerations and existing infrastructure. The proposed project sites are currently undeveloped although the effects of human activity are clearly visible. Infrastructure and services for the project amongst others includes roads, bulk water services, and electricity. The project area is currently surrounded by residential development.

SUMMARY OF THE IMPACT ASSESSMENT RESULTS

The following is a summary of the likely negative impacts that have been assessed for the different phases of the proposed development:

Impact Description	Construction Phase		Operational Phase	
	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
Erosion and sedimentation	Moderate	Low	Low	Very Low
Ground and Surface water pollution	Moderate	Low	Moderate	Low
Habitat destruction and loss of biodiversity	Moderate	Low	Moderate	Low
Visual aesthetics and sense of place	Moderate	Moderate	Low	Low
Dust and emissions	Very Low	Very Low	-	-
Traffic safety	Moderate	Low	Moderate	Low
Health, safety & security	Moderate	Low		
Noise & disturbance	-	-	Low	Low
Natural resources	Moderate	Low	-	-

CONCLUSION AND RECOMMENDATION

Based on the environmental assessment of both the identified positive and negative impacts undertaken for the proposed Township Establishment, the positive impacts of this project significantly outweigh the negative ones. Most of the negative impacts could be considered localised especially in terms of biodiversity loss as well as dust and noise pollution. Mitigation measures as detailed in the Environment Management Plan should be adhered to, so as to minimise these effects as much as possible. The land for the project is already legitimately owned by the proponent and had been obtained through following the proper channels.

It is hereby recommended that the establishment of the two new extensions within Tamariskia shall go ahead and that the project should be issued with an Environmental Clearance Certificate. The Environmental Management Plan (EMP) and the proposed mitigation measures must be adhered to and it is the responsibility of the proponent to implement them so as to enhance the positive impacts and reduce the negative effects to a minimal.

1. INTRODUCTION

Eddy Angula had appointed WINPLAN Town and Regional Planning Consultants to undertake the following planning actions in Tamariskia:

- **THE SUBDIVISION OF THE REMAINDER ERF RE 540 INTO PORTION 1 AND REMAINDER.**
- **TOWNSHIP DEVELOPMENT ON PORTION 1 OF THE SUBDIVIDED ERF RE 540 EXTENSION 2 TAMARISKIA.**
- **TOWNSHIP DEVELOPMENT ON ERF 673 EXTENSION 2, TAMARISKIA**

WINPLAN needs to submit an application to the Ministry of Urban and Rural Development (MURD). In order to finalise the above planning actions and as part of the application to the Minister, an Environmental Clearance Certificate needs to be obtained. The Environmental Management Act (No 7 of 2007) stipulates that an Environmental Scoping Assessment is required as the following 'Listed Activities' are involved:

Activity No.	Activity Description
Energy Generation, Transmission and Storage Activities	
Activity 1(b)	<i>The construction of facilities for the transmission and supply of electricity</i>
Waste Management, Treatment, Handling and Disposal Activities	
Activity 2.3	<i>Temporary storage of waste</i>
Forestry Activities	
Activity 4	<i>Removal of vegetation</i>
Land Use and Development Activities	
Activity 5.2	<i>Establishment of Land Resettlement Scheme</i>
Infrastructure	
Activity 10.1(a)	<i>The construction of water bulk supply pipelines</i>
Infrastructure	

Activity 10.1(b)	<i>The construction of public roads</i>
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Table 1: *Applicable listed activities as per Government Notice 29 of 2012*

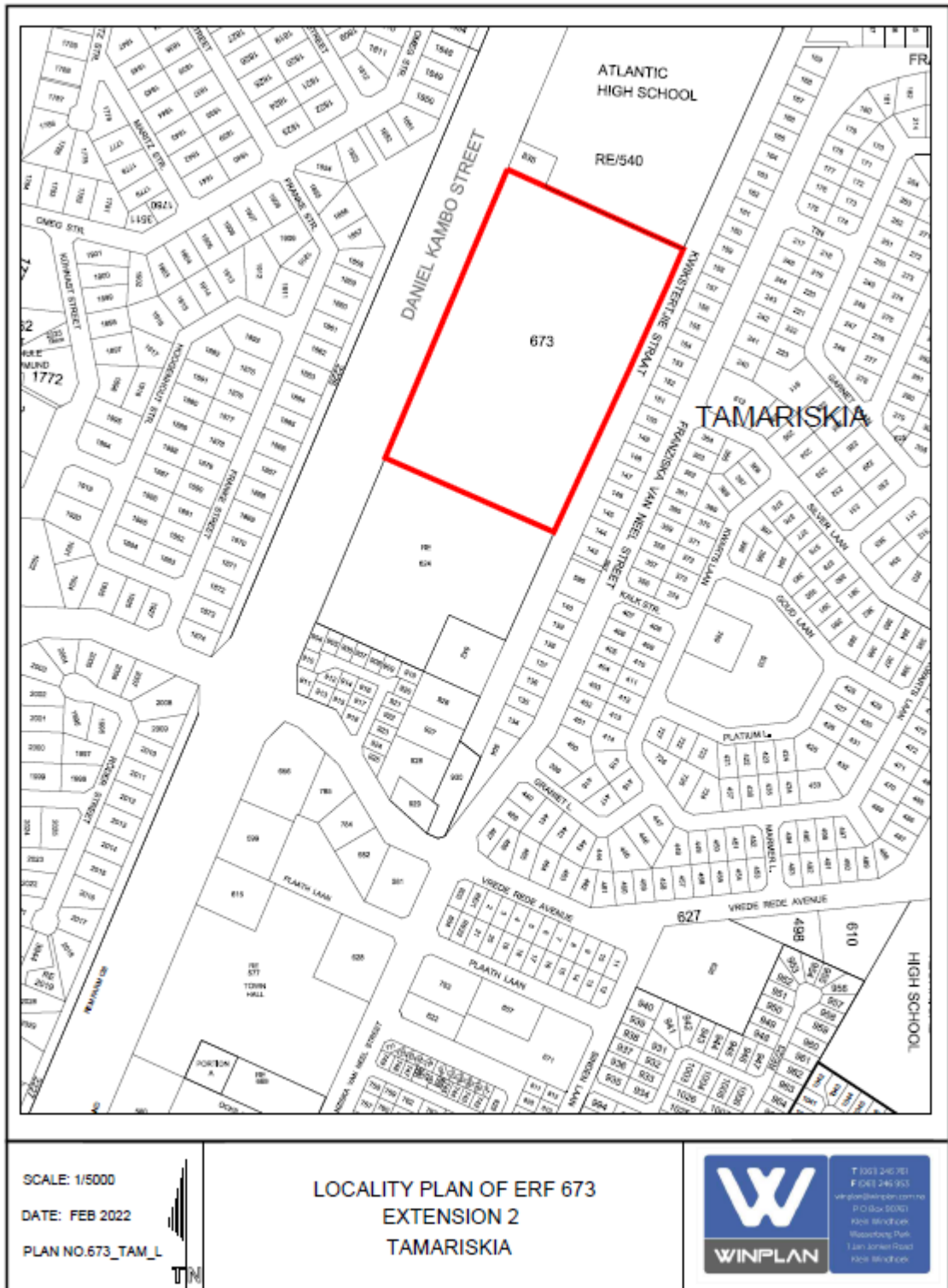
This Environmental Scoping Report contains information on the proposed project and the surrounding areas. It further contains the following:

- Information on the proposed development and related activities,
- Applicable legislation to the study conducted
- Methodology that was followed
- The public consultation that was conducted
- The receiving environment's sensitivity; and
- Any potential ecological, environmental and social impacts.

2. PROJECT LOCATION

The proposed project sites are located within the Townland of Swakopmund, Tamariskia Extension 2. These sites are currently undeveloped although there are anthropological activities clearly visible on the sites. The subject location is within an urban fabric and services will be connected to the existing services infrastructure.

The proposed Township Establishment will include two (2) new extensions on 2 separate even within Swakopmund, Tamariskia. Extension numbers must still be allocated by the office of the surveyor General. The total area of the proposed sites is approximately 44010m² and 52887m² respectively and is located next to each other. The exact locations in relation to the built up area of Tamariskia can be seen in the map below.



Map 1: Locality of the proposed two new Extensions in Tamariskia

3. PROJECT BACKGROUND

The outputs of this project will ultimately, and among others, be to address the housing shortage over the whole spectrum of the property market currently experienced in the entire Erongo region. Swakopmund is rapidly expanding and the demand for new residential erven is highly in need. The results will not only enable property ownership through registration, but also to provide urban services in an orderly manner with the intention of enhancing the use of land while at the same time reducing cost of development.

Winplan Town and Regional Planning Consultants is fully confident that the layout plans as proposed for Tamariskia will not only be instrumental in creating a better future for all who will benefit from this proposal through the provision of serviced land, but will also be hugely beneficial in terms of land delivery from a national point of view.

The layout proposal strive to promote a caring, diverse and well-functioning community of all ages and stages of life that celebrates life. With this approach, supporting the needs of the community is thus coupled with fulfilling social, environmental and commercial needs. The ultimate aim of the development concept aspires to provide access to better quality of housing and commercial opportunities within the context of greater future of Swakopmund.

The concept places focus on enhancing the quality of life of a neighbourhood and its social, environmental and economic sustainability. It is about balancing the needs of the present without compromising the ability of future generations to meet their own needs.

The layout of the proposed two Extensions will make provision for only Residential and public open space. Currently there exist no permanent infrastructure that needed to be considered in the layout. The following tables give more insight into the proposed township development.

Table 2 indicates the proposed number of erven that is planned on the respective portions as well as the size of the portion on which the township will be established.

LAND DESCRIPTION	APPROXIMATE SIZE (m ²)	PRELIMINARY NUMBER OF ERVEN	PROPOSED EXTENSION NAME
Portion A of the RE Erf 540 Tamariskia Extension 2 Swakopmund	44010	79	Extension Number to be allocated by the office of the Surveyor General
Erf 673 Tamariskia, Extension 2 Swakopmund	52347	91	Extension number to be allocated by the office of the Surveyor General

Table 2: Proposed number of erven on the respective portions

LAND USE	NO OF ERVEN	%	TOTAL AREA (m ²)
Residential	73	65%	28510
Public Open Space	95	10%	4213
Street Portion	1	1%	12
Remainder (Street)		26%	11275
Total		100%	44010

Table 3: Land use description for Portion 1 of RE Erf 540 Tamariskia Extension 2

LAND USE	NO OF ERVEN	%	TOTAL AREA (m ²)
Residential	87	59%	31641
Public Open Space	4	10%	5078
Remainder (Street)		30%	15628
Total		100%	52347

Table 4: Land use description for Erf 673 Tamariskia Extension 2



Figure 1: Proposed layout Tamariskia Erf RE 540 and Erf 673

4. TERMS OF REFERENCE

The proponent (Eddy Angula Trust) intends to subdivide the Remainder Erf 540 into Portion 1 and Remainder and intends township development on the subdivided Portion 1. The proponent also intends township development on Erf 673. Figure 3 below depict the subdivisions in question.



Figure 3: Subdivision of the Remainder Erf 540 into 1 portion and remainder and Erf 673

5. THE EIA PROCESS

The diagram on the next page illustrates the stages of the typical EIA process to its completion with the submission of the final Environmental Scoping Report to the Directorate of Environmental Affairs (DEA).

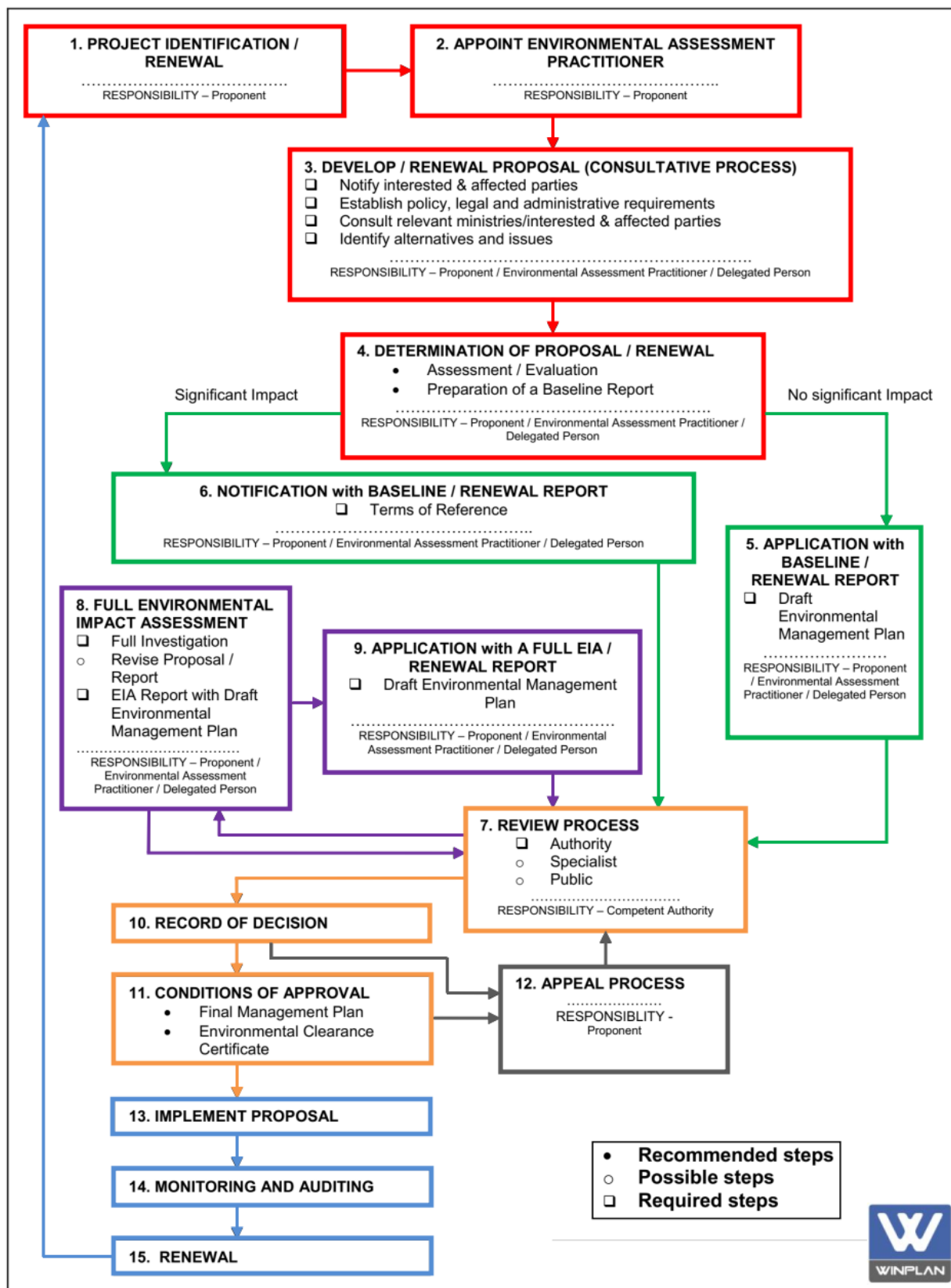


Figure 4: Diagrammatic representation of Namibia's Environmental Assessment process

6. THE PROPOSED DEVELOPMENT

This section will provide an in depth description of the proposed activities as per the terms of reference provided above.

6.1 EMPLOYMENT CREATION

The proposed development has good potential to create employment in the Erongo Region, particularly in Swakopmund, during the planning, construction and operation phases. During the planning phase limited personnel will be employed to render assistance with surveying work and pegging, while a substantial number of people will be employed during the construction phase. Although construction work will be a short-term employment opportunity, the employed people will gain valuable skills and experience that they will utilise post construction phase. Full time employment opportunities will be created for people working in the retail and administrative sectors as well as other informal employment such as domestic work. The ultimate aim of the development aspires to provide access to better quality housing and commercial opportunities within the context of greater future Swakopmund.

6.2 BULK SERVICES AND INFRASTRUCTURE

Tamariskia is situated within an existing urban Fabric within Swakopmund. There are already bulk services available, and no new bulk have to be provided. The proposed 2 new extensions will merely have to be connected to the existing bulk services. Once a detailed design has been completed, services for the newly created Extensions will be provided for the proposed 2 new extensions and where it will link up to the existing bulk services.

6.2.1 Access

Tamariskia is located in the centre of Swakopmund within an existing urban fabric. each extension have one access point towards kwikstreetjie. Access on the other side towards the main road's access is pending. Roads authority still needs to approve that access.

Sewer will be connected to the existing sewer system of Swakopmund. No French drains will be allowed.

6.2.2 Water Supply

The Swakopmund Town Council (STC) will supply water to the proposed new extension through the existing Municipal Water Reticulation System. Swakopmund Council is currently being supplied with bulk water by municipal water.

6.2.3 Storm Water

The design of the internal street network will include provision for storm water and to accommodate the storm water generated by the townships. Underground storm water structures with catch pits complying with accepted engineering standards will be constructed.

6.2.4 Electricity Supply

Electricity will be sourced from the existing grid and distributed to the new extension by the ErongoRed.

6.2.5 Sewage Disposal

The proposed new development will be provided with underground sewer systems consisting of pipes and pump stations which will be connected to the existing municipal sewer system.

6.2.6 Solid Waste Disposal

All type of solid waste that will be generated by the various residents and business in the proposed areas will be collected by the municipality through the existing municipal waste management system and disposed of at an approved waste disposal landfill.

7. CONSTRUCTION AND OPERATIONAL ACTIVITIES

The township development is generally associated with the following activities during both the construction- and the operational phase.

7.1 CONSTRUCTION ACTIVITIES

Activities associated with the construction phase, both during bulk infrastructure and construction of buildings, but not necessarily limited to, are:

- Setting-up of a temporary –
 - construction yard;
 - site office and parking area;
 - workshop and stores;
 - batching area;
 - ablution facilities;
 - solid waste disposal facility;
 - stockpile area; and
 - danger zones area for handling hazardous substances, wash bays, bulk storage and dispensing of fuel.
- Demolition of existing structures (if applicable).
- Clean up of existing dumpsites and smaller points of pollution currently on-site.
- Clearance of vegetation, stockpiling and removal from site.
- Removal of topsoil.
- Dumping of large quantities of unsuitable material.
- Access roads.
- Daily commuting of labour force to and from the site.
- Digging of trenches and construction of infrastructure (i.e. roads, electricity, water and wastewater).
- Generation of construction waste, temporary storage and removal from site.
- Usage of water for daily construction activities and generation of wastewater.

The impacts expected to occur during the construction phase are to a certain extent similar to that of the operational phase, although some impacts are exclusive to the construction phase and is short-lived.

The impacts likely impact to occur during the construction phase, and mitigations measures are detailed in the Environmental Management Plan (EMP) (See Appendix B).

7.2 OPERATIONAL ACTIVITIES

Activities associated with the operational phase, but not necessarily limited to, are:

- Traffic movement.
- Generation of dry and wet waste, the temporary storage thereof and removal.
- Street lighting.
- Noises associated with residential and business activities.
- Resource consumption (i.e. electricity; water).
- Use of pesticides and herbicides; paint, petrol & diesel spillages.
- Routine maintenance on bulk and internal services and servitude maintenance.

An Environmental Clearance Certificate (ECC) will only be obtained once the Environmental Scoping Assessment Report has been submitted, reviewed and approved by the Office of the Environmental Commissioner (OEC).

8. APPROACH TO THE STUDY

The Environmental Scoping Assessment Report (ESAR) incorporates the following activities: desktop studies, site assessment, public participation and scoping. In accordance with the Environmental Management Act (No 7 of 2007, an Environmental Scoping Assessment is an imperative component of this process to necessitate issuance of the ECC for the proposed township establishment and all the associated infrastructures.

The aim of this report is to present the relevant information on the socio-economic and bio-physical conditions in which these activities might occur, sensitise the residents and any interested and affected party affected by the envisaged development and to establish the significance of the associated impacts the planned activities will pose on the ecological and socio-economic environment of Swakopmund.

The aim of the Environmental Scoping Assessment is:

- To ascertain existing environmental conditions in the proposed area in order to determine its environmental sensitivity;
- To inform Interested and Affected Parties (I&APs) and relevant authorities of the likely impacts associated with the proposed development and permit opportunity to raise issues and concerns;
- To assess the significance of issues and concerns raised;
- To compile a report detailing all identified issues and possible impacts, stipulating the way forward and identify specialist area that require further investigations.

The tasks that were undertaken as part of the Environmental Scoping Assessment process included the evaluation of the following:

- Climate
- Water (Hydrology)
- Vegetation
- Soils
- Social Component
- Cultural Heritage
- Groundwater
- Biodiversity
- Sense of Place
- Socio-economic Environment
- Health, and
- Safety and Traffic

A number of site visits to the proposed sites were carried out to collect information on the ecological and socio-economic of the receiving environment. Consultation with the relevant stakeholders including the Eddy Angula Trust provides imperative information pertaining the need and desirability of the proposed development.

A public participation meeting was held on 12 November 2018 to augment the information pertaining to the socio-economic environment. To ensure that the general public and any interested and affected party are informed on the proposed project public notices were

placed in local newspaper to provide the public with an opportunity to comment and give inputs towards the planned project.

The identified impacts were rated to a degree of significance. The consequences of the impacts were determined in four categories: expected duration of impact, geographical extent of the event, probability of occurring and the expected intensity.

All other permits, licenses or certificates that are further required for the establishment of the proposed development should be applied for by the proponent.

9. ASSUMPTIONS AND LIMITATIONS

It is reputed that the information provided by the proponent (Eddy Angula Trust) is accurate and relevant to the date of compiling this report. The sites were visited several times and any activities on the project site after those visits are not included in this report. It is however assumed that there will be no significant alteration to the proposed sites and the environment will not be adversely affected between the compilation of the assessment and the implementation of the proposed activities. It is further assumed that all other secondary data (books, other specialist studies etc.) researched and collected data are factual and accurate.

10. ADMINISTRATIVE, LEGAL AND POLICY REQUIREMENTS

The administrative, legal and policy requirements are related to the methodology that needs to be followed when conducting an Environmental Scoping Assessment. When compiling and setting up an Environmental Scoping Assessment, a couple of steps need to be followed in order for it to comply with the legal requirements. In the first step, all notice about the endeavours on the sites needs to be placed in two different local Newspapers for two consecutive weeks. Letters stating the development on the project sites and the relevant line Ministries should be informed about the envisaged development, including the residents and all Interested and Affected Parties (I&AP's). Thereafter, a Background Information Document (BID) should be compiled and send to any person on request.

The Environmental Impact Assessment **Regulations (GN 30 in GG 4878, 6 February 2012)** of the **Environmental Management Act (No. 7 of 2007)** that came into effect in 2012 requires/recommends that an Environmental Impact/Scoping Assessment be conducted.

The **Constitution of the Republic of Namibia (1990)** states that the State shall promote and maintain "ecosystems, essential ecological processes and biological diversity of Namibia and to utilise natural resources on a sustainable basis for the benefit of all Namibians both present and future".

The **Water Resources Management Act (No. 24 of 2004)** stipulates conditions that ensure effluent that is produced to be of a certain standard. There should also be controls on the disposal of sewage, the purification of effluent, measures should be taken to ensure the prevention of surface and groundwater pollution and water resources should be used in a sustainable manner.

The **Nature Conservation Ordinance (No 4 of 1975)** covers game parks and nature reserves, the

hunting and protection of wild animals, problem animals, fish and indigenous plant species. The Ministry of Environment and Tourism (MET) administer it and also provides for the establishment of the Nature Conservation Board.

The **Forestry Act (No 12 of 2001)** specifies that there be a general protection of the receiving and surrounding environment. The protection of natural vegetation is of great importance, the Forestry Act especially stipulates that no living tree, bush, shrub or indigenous plants within 100m from any river, stream or watercourse, may be removed without the necessary license.

The **Soil Conservation Act (No 76 of 1969)** stipulates that the combating and preventing of soil erosion should take place; the soil should be conserved, protected and improved, vegetation and water sources and resources should also be preserved and maintained. When proper mitigation measures are followed along the construction and implementation phase of the project, the natural characteristics of the property is expected to have a moderate to low impact on the environment.

The **Labour Act (No 11 of 2007)** states regulations to ensure the health, safety and welfare of employees and to protect employees from unfair labour practices. The Act also states that the employees should be provided with a working environment which is without risk to their health.

11. AFFECTED RECEIVING ENVIRONMENT

11.1 BIODIVERSITY AND VEGETATION

The proposed project sites are currently in a transformed state. It is already showing signs of human inference. In particular, informal tracks exist as well as vegetation that was cleared in order to accommodate other uses. All large trees that exist on the project site would be incorporated in the development to enhance the aesthetic value of the area. No protected trees may be removed without a permit. Any removal of vegetation that arises naturally should be done within a properly managed, planned and responsible manner in order to avoid destruction of unnecessary ground cover. No animals were observed on the sites during the site visits. It is however strongly recommended that any animal if found on the sites whether large or small be safeguarded from the construction and operation activities that may be harmful.



Figures 7 & 8: The already disturbed nature of the study area

Swakopmund falls within the Nama Karoo Biome of Namibia which is recorded to have a grass cover of between 2 and 10 % (Mendelsohn et al. 2009). However, the area borders the Succulent Karoo Biome which has less than 0.1% grass cover is a more accurate description of the sites and the surroundings which does not have any grass cover. This corresponds with the Average Green Vegetation Biomass Production Atlas for Namibia which classifies the area as a category 2: bare ground. Although the habitat is further classified as being suitable for quiver trees the area surrounding Tamariskia has been transformed by residential development and no trees have been observed in the area proposed for these developments. The table below provide a general summary of the fauna and flora of the region.

Vegetation type	Erongo dwarf shrubland
Vegetation structure type	Sparse shrubland
Diversity of higher plants	Low medium plus (Diversity rank = 5 [1 to 7 representing highest to lowest diversity])
Number of plant species	100 -150
Percentage tree cover	0.1-1
Percentage dwarf shrub cover	3.6
Dwarf shrub height (m)	0.5
Grass height (m)	0.5
Dominant plant species 1	Extremely diverse:
Dominant plant species 2	<i>Rhigozum trichotomum-s2</i>

Table 5: General Flora Data (Atlas of Namibia, 2002)

Mammal Diversity	61 - 75 Species
Rodent Diversity	20 - 23 Species
Bird Diversity	51 - 110 Species
Reptile Diversity	61 - 70 Species
Snake Diversity	20 - 24 Species
Lizard Diversity	> 35 Species
Scorpion Diversity	16 - 17 Species

Table 6: General Fauna Data (Atlas of Namibia, 2002)

It should be noted that none of the larger trees/shrubs, especially the protected and endemic species, are exclusively associated with the proposed project area. Furthermore, no animals or reptiles were recorded during the site visits. Various bird species do however exist in the general area.

11.2 VERTEBRATE FAUNA

The general project area is regarded as “low” in overall (all terrestrial species) diversity (Mendelsohn et al. 2009) while the overall terrestrial endemism in the area is viewed as “average” (Mendelsohn et al. 2009). The overall diversity and abundance of large herbivorous mammals (such as game) is viewed as “low-medium” with 1-4 species while the overall diversity of large carnivorous mammals (large predators) is determined at 4 species with brown hyena being a notable conservation-worthy species with “medium” densities expected in the area (Mendelsohn et al. 2009).

11.3 AVIAN DIVERSITY

Although Namibia's avifauna is comparatively sparse compared to the high rainfall equatorial areas elsewhere in Africa, approximately 658 species have already been recorded with a diverse and unique group of arid endemics (Brown, et al., 1998, Maclean, 1985). Fourteen species of birds are endemic or near endemic to Namibia with the majority of Namibian endemics occurring in the savannas (30%) of which ten species occur in a north-south belt of dry savannah in central Namibia (Brown, et al., 1998).

Bird diversity is viewed as “low” in the project area with 51-110 species estimated with 1-3 species being endemic to the general area (Mendelsohn et al. 2009) with Simmons (1998a) confirming the 1-3 endemics expected in the area.

The most important (owing to conservation status) bird species potentially occurring in the project area are viewed as those classified as endangered (Ludwig's bustard, black harrier, booted eagle, martial eagle), vulnerable (lappet-faced vulture, secretary bird) and near threatened (kori bustard, Verreaux's eagle) under Namibian legislation (Simmons et al. 2015) and those classified as endangered (Ludwig's bustard, lappet-faced vulture), vulnerable (martial eagle, secretarybird) and near-threatened (kori bustard) by the IUCN (2019). However most of these species – e.g. Ludwig's and kori bustards, etc. – are not expected to occur in the area throughout the year, but rather frequent in the area after localised rainfall events. The only species with some conservation status expected to occur in the project area throughout the year would be the endemic Barlow's and Gray's larks.

It should be noted that none of the birds, especially the species with some conservation status,

are exclusively associated with the project area

12. TOPOGRAPHY, GEOLOGY AND SOILS

The topography of the majority of the project site consists of flat plains interspersed with rocky outcrops. The average elevation of the site area is approximately 50m above mean sea level. The area is typically characterised by dry riverbeds/drainage lines that runs-off for short periods during the rainy season.

The project sites incorporate geology from the Main Karoo Basin, forming part of the Karoo Supergroup (Mendelsohn, et al, 2009). The main rocks associated with the Main Karoo Basin are Sandstones and Shales.

The soil in the project area is Eutric Leptosols, being thin or shallow medium or fine-textured soils (Mendelsohn et al. 2009). These soils are characterised by their limited depth caused by the presence of continuous hard-rock, highly calcareous or cemented layer within 30cm of the surface. This soil type is further prone to water erosion during heavy rains (Mendelsohn et al. 2009).

13. CLIMATE

The proposed area is situated in the south-eastern part of Namibia in the Erongo Region, which has been classified as a hyper-arid desert. Mostly summer rain is experienced in this area but due to its proximity to the Succulent Karoo Biome often experiences winter rainfall as well.

The average annual rainfall for Swakopmund and surroundings is 50 – 100 mm, while the average evaporation rate is in the region of 2,100 – 2,240 mm a year (Mendelsohn, et al, 2009). It is obvious that evaporation exceeds rainfall by far, resulting in a water deficit, both on a month-to-month and annual basis.

During winter months the average minimum temperature is 8 – 10 °C, while the average maximum day temperature during summer is 22 – 24 °C (Mendelsohn, et al, 2009). Southerly to south-westerly winds dominate throughout the year causing wind erosion where soil cover is low. Average wind speeds are rarely higher than 6m/s.

Given the nature of the development, it is not expected that the climate will have any significant effect and vice versa. Winds may contribute to dust and noise nuisance, having a potential negative implication on the surrounding residential areas.

14. HYDROGEOLOGY

Limited volumes of groundwater are available in the basement rocks of the southern Erongo Region, since there are no productive aquifers. Lack of recharge and poor groundwater quality in most areas further aggravates the situation. However, groundwater is one of the most important resources, especially in the arid climate of Namibia and the protection thereof should be regarded as a high priority.

Although most of the surface water evaporates, runoff can be expected due to the impermeability of the soils (Grunert, 2003). Storage of any material or substance that may cause pollution to water sources should be safely handled and stored in accordance with appropriate legislation.

15. SOCIO-ECONOMIC COMPONENT

Due to the fact that the proposed new townships will be constructed within the townlands area, the social impact would be minimal, since the surrounding area is already inhabited by people. The majority of land use around the area consists out of open land as well as commercial and residential activities. The proposed new development would therefore not have a negative impact on the neighbours or the surrounding areas and could in actual fact be described as an extension of the existing town.

The construction and development of the proposed townships will have little disturbance to the environment and towards the individuals that are located in the area/town. Those people that would be affected by the development will be compensated and relocated as per the directives of the Ministry of Land Reform (MLR). In addition, it could be argued that residents living in the area will benefit from employment opportunity created during planning, construction and operation of the development.

16. CULTURAL HERITAGE

The proposed project area for the township establishment is not known to have any artefact or historical significance prior to or after independence in 1990. The area does not have any National Monuments and the proposed site has no record of any cultural or historical significance or on-site resemblance of any nature. No graveyard or related article was found on the proposed project sites. If any archaeological artefacts are to be found on the sites during the construction phase, it should be reported to the National Heritage Council (NHC) in Windhoek. Any human or other remains that are discovered should be reported to the Namibian Police for further investigation.

17. PUBLIC CONSULTATION PROCESS

Numerous environmental issues to be considered in the EIA has been given specific context and focus through consultation with authorities and IA&Ps. Included below is a summary of the parties consulted, the process that was followed, and the issues that have been identified.

The following Competent Authorities were identified:

- Ministry of Urban and Rural Development (MURD)
- Ministry of Environment and Tourism (MET)

The following I&AP's were identified:

- Residents of Swakopmund
- Swakopmund Town Council

The proposed project was advertised in the Republikein and The Namibian newspapers on Wednesday the 9th of February 2022.

18. ENVIRONMENTAL IMPACT EVALUATION

The potential impacts identified were evaluated in terms of duration, extent, intensity, probability, and status, in combination providing the expected significance. The means of arriving at the different significance ratings is explained in Table 7 below.

These criteria are used to ascertain the significance of the impact, firstly in the case of no mitigation and then with the most effective mitigation measure(s) in place. The significance of an impact is derived by taking into account the temporal and spatial scales and magnitude. Such significance is also informed by the context of the impact, i.e. the character and identity of the receptor of the impact.

CRITERIA	CATEGORY
Impact	This is a description of the expected impact.
Nature Describe the type of effect.	Positive: The activity will have a social/ economical/ environmental benefit. Neutral: The activity will have no effect. Negative: The activity will be socially/ economically/ environmentally harmful.
Extent Describe the scale of the impact.	Site Specific: Expanding only as far as the activity itself (<i>onsite</i>) Small: Restricted to the site's immediate environment within 1 km of the site (<i>limited</i>) Medium: Within 5 km of the site (<i>local</i>) Large: Beyond 5 km of the site (<i>regional</i>)
Duration Predicts the lifetime of the impact.	Temporary: < 1 year Short-term: 1 – 5 years Medium term: 5 – 15 years Long-term: >15 years (Impact will stop after the operational or running life of the activity, either due to natural course or by human interference) Permanent: Impact will be where mitigation or moderation by natural course or by human interference will not occur in a particular means or in a particular time period that the impact can be considered temporary.

<p>Intensity</p> <p>Describe the magnitude (scale/size) of the Impact.</p>	<p>Very low: Affects the environment in such a way that natural and/or social functions/processes are not affected.</p> <p>Low: Natural and/or social functions/processes are slightly altered.</p> <p>Medium: Natural and/or social functions/processes are notably altered in a modified way.</p> <p>High: Natural and/or social functions/processes are severely altered and may temporarily or permanently cease.</p>
<p>Probability of Occurrence</p> <p>Describe the probability of the Impact actually occurring.</p>	<p>Improbable: Not at all likely.</p> <p>Probable: Distinctive possibility.</p> <p>Highly probable: Most likely to happen.</p> <p>Definite: Impact will occur regardless of any prevention measures.</p>
<p>Degree of Confidence in Predictions</p> <p>State the degree of confidence in predictions based on availability of information and specialist knowledge</p>	<p>Low: Little confidence regarding information available (<40%).</p> <p>Med: Moderate confidence regarding information available (40-80%).</p> <p>High: Great confidence regarding information available (>80%).</p>
<p>Significance</p> <p>The impact on each component is determined by a combination of the above criteria.</p>	<p>No change: A potential concern which was found to have no impact when evaluated.</p> <p>Very low: Impacts will be site specific and temporary with no mitigation necessary.</p> <p>Low: The impacts will have a minor influence on the proposed development and/or environment. These impacts require some thought to adjustment of the project design where achievable, or alternative mitigation measures.</p> <p>Moderate: Impacts will be experienced in the local and surrounding areas for the life span of the development and may result in long term changes. The impact can be lessened or improved by an amendment in the project design or implementation of effective mitigation measures.</p> <p>High: Impacts have a high magnitude and will be experienced regionally for at least the life span of the development, or will be irreversible. The impacts could have the no-go proposition on portions of the</p>

	development in spite of any mitigation measures that could be implemented.
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Table 7: Impact Assessment Criteria

19. POTENTIAL IMPACTS IDENTIFIED AND ASSESSED

For the purpose of this assessment, issues and impacts identified are grouped according to the main project phases – i.e. the construction phase and operational phase. Section 19.1 and Section 19.2 give a broad overview of each potential impact expected during the two phases, as well as an assessment outcome. Proposed mitigation measures are discussed in detail in the attached Environmental Management Plan (See Appendix B).

19.1 CONSTRUCTION RELATED IMPACTS

The construction activities, which have been considered, include those activities applicable to both the construction of bulk services (i.e. roads; potable water; sewer; storm water; and electricity) and the construction of buildings (i.e. houses & businesses).

Construction impacts are mostly temporary in nature, but may have a permanent and lasting result if not addressed in time and in an effective manner. Details with regards to the potential impacts expected during the construction phase are briefly discussed below.

Detailed mitigation measures and environmental requirements having direct relevance to the expected construction impacts are presented in the tables below and in the Environmental Management Plan (See Appendix B).

Table 8 below presents the potential impacts expected to occur during the construction phase of the development, while **Table 9** to **Table 18** presents the assessment and outcome of each of the key impacts, with mitigations.

IMPACT	CAUSE
Erosion & Sedimentation	Vegetation clearance
	Trenches & excavated areas
Ground and Surface Water Pollution	Waste disposal
	Hazardous material & liquid disposal
Habitat Destruction and Loss of Biodiversity	Vegetation clearance & removal of trees
	Erosion & sedimentation
	Poaching
Visual Aesthetics and Sense of Place	Vegetation clearance
	Poorly planned construction sites
	Insensitive infrastructure design and scale
Socio-Economic	Income generation and skills transfer (Employment)
	Economic benefit to the construction industry
	Dust and emissions
	Traffic safety
	Health, safety and security
Natural Resources (water & energy)	Unacceptable high levels of consumption
	Wastage

Table 8: Key issues and potential impacts expected during the construction phase

19.1.1 Erosion and Sedimentation

Erosion and sedimentation will take place in the event that soils are exposed to the natural elements (i.e. winds and rains) through clearing of vegetation or steep excavations, which in turn could result in seasonal (rain season) degradation of habitats and visual downgrade. The amount of erosion and sediment transport is directly related to what time of the year the construction activities occur and the duration thereof. If clearing and grading activities take place during the wetter months of the year (November to March), substantially more erosion would result.

Considering the natural conditions (i.e. topography, soil composition and vegetation cover) erosion and sedimentation can be expected if not effectively managed and mitigated. Due to the fact that the project area falls within a very low rainfall area, it is not expected to be vulnerable to erosion and sedimentation.

Given the environment's natural characteristic and township layout, the potential occurrence of erosion and resulting sedimentation is rated as **probable** before mitigations and **low** following proper mitigation measures (see Table 9).

Impact Description	Erosion and sedimentation
Nature	Negative
Extent	Site specific
Duration	Long Term
Intensity	Low
Probability	Probable
Degree of Confidence	Definite
Significance Pre-mitigation	Moderate
Significance Post-mitigation	Low

Table 9: Significance of Erosion and Sedimentation

19.1.2 Ground- and Surface Water Pollution

Construction activities are associated with a variety of potential pollution sources (i.e. cement, oils, diesel, chemicals, paints, etc.), either having a direct and immediate impact or indirect and longer-term impact. As a single incident, in order for ground water to be contaminated, very large quantities of pollutants have to be released into the environment, of which volumes are not associated with this type of development. Although, however small these potential sources of pollution might still requires special attention (i.e. planning, control and management) to avoid any potential pollution of the immediate environment.

The groundwater of the area is not regarded as being of good quality and is not expected to be negatively affected by any pollution, but should be avoided. The proposed area contains no standing permanent water ponds / artificial wetlands, but can potentially be expected during the rainy season. However no flooding of the project area will be expected.

Given the environment's natural characteristics, construction pollution is expected to have a **moderate** impact before mitigation and a **low** impact following proper mitigation measures. It is therefore unlikely that groundwater contamination will occur and the proposed construction phase is not likely to have any detrimental impacts on the groundwater resources of the area.

Impact Description	Groundwater and surface water pollution
Nature	Negative
Extent	Medium (short term) / Large (long term)
Duration	Long Term
Intensity	High
Probability	Probable
Degree of Confidence	Probable / medium
Significance Pre-mitigation	Moderate
Significance Post-mitigation	Low

Table 10: Surface and Groundwater Pollution

19.1.3 Habitat Destruction and loss of Biodiversity

The proposed change in land use will permanently change the present landscape and result in the displacement of existing vegetation and faunal populations, including invertebrates and other living organisms.

Removal of the natural vegetation cover to make way for the roads, buildings and other infrastructure is inevitable. This should however be done within a responsible manner to avoid unnecessary removal of ground cover or any protected species, as per the Forest Act (No. 12 of 2001, as amended).

The proposed townships will be situated in already disturbed areas, which is free of any conservation worthy fauna and flora. Given the environment's natural characteristic and expected scale of habitat disturbance, the impacts are expected to be **moderate** before mitigations and **low** following proper mitigation measures and continuous monitoring.

Impact Description	Habitat destruction and loss of biodiversity
Nature	Negative
Extent	Site specific
Duration	Long Term
Intensity	Low
Probability	Probable
Degree of Confidence	Definite
Significance Pre-mitigation	Moderate
Significance Post-mitigation	Low

Table 11: Habitat destruction and loss of biodiversity significance

19.1.4 Visual Aesthetics and Sense of Place

Although temporary, construction activities are known to have a visual impact due to the nature of the activity. The surrounding land uses to the proposed project sites are typical uses like institutional, business, and residential uses which are normally associated with a town. The activities to be accommodated on the proposed project area are in line with these.

The proposed project sites are by no means untouched, as a result of the human interference. Given the expected size (small) of the larger construction site, the natural vegetation present on-site as well as the already disturbed nature of the two sites, the visual impact is expected to be **moderate**. By applying the proposed mitigations, the impacts during construction can be slightly reduced, but will remain as a permanent feature.

Impact Description	Visual aesthetics and sense of place
Nature	Negative
Extent	Small
Duration	Permanent
Intensity	Medium
Probability	High Probable
Degree of Confidence	Definite
Significance Pre-mitigation	Moderate
Significance Post-mitigation	Low

Table 12: Visual aesthetics and sense of place significance

19.1.5 Socio-Economic Implication

Construction activities are associated with a variety of impacts that has either a direct or indirect implication on the surrounding residents' living conditions and/or socio-economic status. These implications are covered below.

i) Income Generation & Skills Transfer (Employment)

Construction makes use of larger numbers of unskilled labour, as well as skilled labour although to a lesser extent, which does not only contribute to income generation and a security of better livelihoods, but contributes to skills transfer as well.

It is important that local people be employed and that the necessary opportunities exist for unskilled labour to undergo on the job training and skills enhancement.

Impact Description	Income generation and skills transfer
Nature	Positive
Extent	Large
Duration	Temporary
Intensity	High to the unemployed
Probability	Definite
Degree of Confidence	Definite
Significance Pre-mitigation	High to the unemployed
Significance Post-mitigation	High to the unemployed

Table 13: Income generation and skills transfer

ii) Economic Benefit to the Construction Industry

The construction of the bulk and internal services, as well as buildings will have a direct positive implication on the currently struggling construction industry, which is considered to be one of

the most important employers in the country. It is crucial that local contractors be appointed and that as many as possible of the locally available construction material be used throughout the development.

Impact Description	Economic benefit to the construction industry
Nature	Positive
Extent	Large
Duration	Temporary
Intensity	Medium
Probability	Definite
Degree of Confidence	Definite
Significance Pre-mitigation	Moderate
Significance Post-mitigation	Moderate

Table 14: Economic benefit to the construction industry

iii) Dust & Emissions

The air quality in the area is considered good, based on the potential impact that current activities in the area are likely to have on air quality. Dust and emissions are associated with construction activities (i.e. digging; clearing; excavating etc.) of which the severity is directly related to the extent of the development and the nature of the receiving environment. Given the activities within the immediate surroundings, dust is expected to be more of a nuisance than emissions, as a result of construction activities.

Considering the prevailing winds throughout the year and the surrounding receptors, dust nuisance is not expected to be of any significance. However, dust control is considered important and requires effective mitigations.

With regards to the proposed project sites, dust nuisance in general holds a **very low** significance.

Impact Description	Dust and emissions
Nature	Negative
Extent	Small
Duration	Temporary
Intensity	Low
Probability	Highly probable
Degree of Confidence	Definite
Significance Pre-mitigation	Low
Significance Post-mitigation	Very low

Table 15: Dust and emissions

iv) Traffic Safety

Construction activities are associated with an increase in vehicles of different kinds (i.e. workers' busses, delivery vehicles and construction vehicles) to and from the project site, which inevitably increase risk and conflict. It is important that all vehicle drivers be informed of their potential impact on the environment and on the roads, and that the necessary measures are taken to prevent any accidents as a result of increased traffic.

The potential pre-mitigation impact is regarded as **moderate**, which can be reduced to **low** through applying proper mitigations.

Impact Description	Traffic safety
Nature	Negative
Extent	Small
Duration	Temporary
Intensity	High
Probability	Probable
Degree of Confidence	Probable
Significance Pre-mitigation	Moderate
Significance Post-mitigation	Low

Table 16: Traffic safety

v) Health, Safety & Security

Areas within which construction activities takes place is usually associated with criminal activity, posing a security risk to those residing in the area. It is not to say that these criminal activities are as a result of the construction staff, but is known to happen in the vicinity of construction sites.

These potential impacts hold **moderate** significance and can with appropriate mitigations reduce its impact to **low**.

Impact Description	Health, safety & security
Nature	Negative
Extent	Small
Duration	Temporary
Intensity	Medium
Probability	Probable
Degree of Confidence	Probable
Significance Pre-mitigation	Moderate
Significance Post-mitigation	Low

Table 17: Health, Safety and Security

19.1.6 Natural Resources

The construction phase requires both water and electricity of which water is currently the source under pressure. The construction of roads would require the highest volume of water followed by dust suppression.

Alternative water resources (such as treated wastewater) should be used during the construction phase. A very small part of the construction phase would require potable water. These potential impacts hold moderate significance and can with appropriate mitigations reduce its impact to low.

Impact Description	Natural resources
Nature	Negative
Extent	Large
Duration	Permanent
Intensity	Medium
Probability	High Probable
Degree of Confidence	Definite
Significance Pre-mitigation	Moderate
Significance Post-mitigation	Low

Table 18: Natural resources

19.2 OPERATIONAL-RELATED IMPACTS

These impacts are usually more permanent in nature or at least until decommissioning of the proposed project. Details with regards to the potential impacts expected during the operation phase are briefly discussed below. Detailed mitigation measures and environmental requirements having direct relevance to the expected operational phase impacts are presented in the attached EMP.

Table 19 below presents the potential impacts expected to occur during the operational phase of the proposed development, while **Table 20** to **Table 27** presents the outcome of each.

IMPACT	CAUSE
Erosion & Sedimentation	Vegetation clearance
Ground and Surface Water Pollution	Waste disposal
	Hazardous material and liquids disposal
Habitat Destruction and Loss of Biodiversity	Vegetation clearance
	Erosion & sedimentation
	Poaching

IMPACT	CAUSE
Visual Aesthetics and Sense of Place	Vegetation clearance / altered vegetation
	Architectural design & scale of buildings
	Land use change
Socio-Economic	Income generation and skills transfer (Employment)
	Municipal rates and taxes
	Noise and disturbance
	Traffic & safety
	Land use change
Natural Resources (water & electricity)	Unacceptable high level of consumption
	Wastage
	No sustainable practises

Table 19: Key potential impacts expected during the operational phase

19.2.1 Erosion and Sedimentation

Erosion and sedimentation during the operational phase is highly unlikely, as provision will be made for storm water management, which reduces the occurrence of erosion and sedimentation. It will however take place in the event where open areas are cleared of vegetation, for whatever reason, which would then result in erosion and sedimentation. Open areas should therefore be kept within a natural state and no vegetation removal should be tolerated.

Given that storm water management will be done as part of the engineering designs, the potential occurrence of erosion and resulting sedimentation is rated as **low** before mitigations and **very low** following proper mitigation measures.

Impact Description	Erosion and sedimentation
Nature	Negative
Extent	Site specific
Duration	Long Term
Intensity	Low
Probability	Improbable
Degree of Confidence	Definite
Significance Pre-mitigation	Low
Significance Post-mitigation	Very Low

Table 20: Erosion and sedimentation significance

19.2.2 Ground- and Surface Water Pollution

Ground and surface water pollution can have a negative effect on the receiving environment. Sources of potential pollution include, but are not limited to hazardous liquids (i.e. diesel/petrol/cleaning liquids) stored at homes or businesses; leakages from wastewater network; pesticides; improper storage of domestic waste and dumping of waste within open areas. Increased run-off created as a result of the proposed development (i.e. roofs and other hard surfaces) could enhance pollutant transportation, as well as increase the distance pollutants can be transported from its source.

There are no permanent standing water bodies on the project sites that had been identified during the site visits. As mentioned previously, in order for groundwater to be contaminated, large amounts of pollutants will have to seep through the soil over a period of time. It is therefore our opinion that the significance of potential damage to water resources as a result of the proposed development is low. Care should however still be taken to protect the environment and to prevent any possible pollution created as a result of waste production.

It is important to note that it is not only the quality of the surface water that can be negatively affected, but also the aesthetic component of the natural environment. With the correct attitude and with precautionary measures in place, groundwater contamination and waste pollution in general, can easily be prevented.

Possible pollution by way of the wastewater network (and others) is initially considered to be low, but has proven to increase in risk over the years as the infrastructure and equipment degrade. Should proper management practices not be in place and monitoring be from the side of the Local Authority, the risk factor can be regarded as high, but can be avoided and reduced to **low** following proper mitigation measures and constant monitoring.

Impact Description	Groundwater and Surface Water
Nature	Negative
Extent	Medium (short term) / Large (long term)
Duration	Long Term
Intensity	High
Probability	High probable
Degree of Confidence	Probable / medium
Significance Pre-mitigation	Moderate
Significance Post-mitigation	Low

Table 21: Surface and ground water pollution significance

19.2.3 Habitat Destruction and Loss of Biodiversity

The most destructive disturbance to the local habitat takes place during the construction phase, when the land is prepared for the intended infrastructure. The risk of further habitat destruction during the operational phase depends on the mind-set and environmental awareness of the residing community.

The introduction of human activities on a daily basis can place an increased strain on the fauna and flora species if not managed sensitively. Impacts during the operational phase are predominantly associated with the daily operations of humans and poor management practices and irresponsible behaviour (e.g. uncontrolled access to sensitive areas; collecting of plants or animals; killing of snakes, use of general poison, etc.). Given the environment's natural characteristic and expected scale of habitat disturbance, the impacts are expected to be **moderate** before mitigations and **low** following proper mitigation measures and constant monitoring.

Impact Description	Habitat destruction and loss of biodiversity
Nature	Negative
Extent	Site specific
Duration	Long Term
Intensity	Low
Probability	Probable
Degree of Confidence	Definite
Significance Pre-mitigation	Moderate
Significance Post-mitigation	Low

Table 22: *Habitat destruction and loss of biodiversity significance*

19.2.4 Visual Aesthetics and Sense of Place

The operational phase consisting of various buildings and infrastructure will have an urban sense of place. The lasting visual aesthetics is determined by the architecture and scale of buildings, emphasised by the receiving environment's topography and vegetation cover. As mentioned previously, as a result of human interference, the study area is by no means untouched. Given the scale and nature of the proposed development, the lack of natural vegetation present on-site as well as the topography, visual impact and change in sense of place is expected to be **low**. Very little mitigation exists to decrease the impact apart from applying sensible and sensitive architecture (i.e. design, scale, etc.).

Impact Description	Visual aesthetics and sense of place
Nature	Negative
Extent	Small
Duration	Permanent
Intensity	Very low
Probability	Probable
Degree of Confidence	Definite
Significance Pre-mitigation	Low
Significance Post-mitigation	Low

Table 23: *Visual aesthetics and sense of place significance*

19.2.5 Socio-Economic Implication

The operational phase of any type of development is associated with a variety of impacts that has either a direct or indirect implication to the residents and surrounding residents. These impacts and the implications thereof are discussed in more detail below.

i) Income Generation & Skills Transfer (Employment)

Employment in the form of domestic workers, cleaners and gardeners are the ones most common during the operational phase. Considering the current socio-economic standing of the Region, a serious need for employment opportunities and improved living conditions is desperately needed. It is important that local people be employed and that the necessary opportunities exist for unskilled labour to undergo on the job training and skills enhancement.

Impact Description	Income generation and skills transfer
Nature	Positive
Extent	Large
Duration	Permanent
Intensity	High to the unemployed
Probability	Definite
Degree of Confidence	Definite
Significance Pre-mitigation	High to the unemployed
Significance Post-mitigation	High to the unemployed

Table 24: Income generation and skills transfer

ii) Municipal Rates & Taxes

The development, falls within the jurisdictional area of the Swakopmund Town Council and will bring additional revenue to the local authority coffers, which is pretty much needed for service delivery throughout the Local Authority Area.

Impact Description	Municipal Rates and Taxes
Nature	Positive
Extent	Large
Duration	Permanent
Intensity	Low to Medium
Probability	Definite
Degree of Confidence	Definite
Significance Pre-mitigation	Moderate
Significance Post-mitigation	Moderate

Table 25: Municipal rates and taxes

iii) Noise & Disturbance

Apart from vehicle movement, no other noise of significance are associated with the operational activities. Noise nuisance from the B3 main road running through the town is to be expected.

Urban developments of this scale and nature are not associated with activities generating unhealthy noise levels, such as industrial activities or agricultural activities. The increase in vehicle movement to and from the proposed developments will have a slight increase in traffic noise compared to the current status, but is expected to be of low significance.

The predicted noise levels from the operations of the proposed development and that of the nearby traffic onto the development is considered **low**.

Impact Description	Noise
Nature	Negative
Extent	Small
Duration	Permanent
Intensity	Low
Probability	Definite
Degree of Confidence	Definite
Significance Pre-mitigation	Low
Significance Post-mitigation	Very low

Table 26: Noise

iv) Traffic & Safety

Operational activities in this respect are associated with vehicle movement of residents' and visitors' to and from the proposed developments. The potential pre-mitigation impact is regarded as **moderate**, which can be reduced to **low** through applying proper mitigations.

Impact Description	Traffic & safety
Nature	Negative
Extent	Small
Duration	Permanent
Intensity	Low
Probability	High Probable
Degree of Confidence	Definite
Significance Pre-mitigation	Moderate
Significance Post-mitigation	Low

Table 27: Traffic & safety

v) Land Use Change

The increase in residential density and addition of a few business activities will result in a land use alteration, which is considered to have both a negative and positive implication. Therefore the proposed development would result in a substantial increase in the value of land and more importantly a supply in much needed serviced urban land contributing in addressing the housing shortage experienced in Swakopmund.

From a negative perspective, the change in land results in large open areas being transformed into developed areas, which results in a direct loss of natural vegetation and loss of openness. However, due to the lack of natural vegetation in the project area, and the visible sign of human activity, this would not be of big significance. The change in land use is therefore expected to have a **low negative** impact from an environmental perspective, while from an economic point of view a **high positive** impact.

19.2.6 Natural Resources (Demand vs. Supply)

i) Water Demand

Water is supplied to Tamariskia, Swakopmund by the Swakopmund Municipality. The 2 new extensions will be linked to the existing water system. The expected upgrades will be made to accommodate the proposed new extensions.

To alleviate pressure on the water resources, it is recommended that sustainable practises and principles be applied during the construction and operational phases. These methods and principles include the following:

- The recycling and reuse of treated wastewater for purpose of flushing of toilets and gardening, which can bring a saving of 35% of the daily potable water consumption;
- Harvesting of rainwater for the purpose of household consumption;
- Restricting gardens to indigenous plants and limited in size; and
- Water wise technologies within the household.

ii) Electricity Demand

Electricity is being supplied by ErongoRed and the proposed new development will be connected to the existing electricity network. However alternative source of energy such as solar power supply is suggested considering the abundance and intensity of sunshine in the area.

20. CONCLUSION

In order to adhere to the Environmental Management Act (No. 7 of 2007), it was necessary to conduct an Environmental Scoping Assessment for the proposed township establishments and the layout approvals on the different portions as indicated. These may not be undertaken without an Environmental Clearance Certificate and hence this application. It is the intent to use the proposed sites for the construction of the proposed townships. We are of the opinion that the two different sites as indicated have the full potential to be used for the intended activities. In the aftermath of this assessment it is our opinion that the proposed activities will not have a significant negative impact on the environment. In addition, no objections were received during the public participation process. It is further believed that this project can largely be of economic benefit to the town of Swakopmund and its residents and in addressing the shortage of housing in the town.

Therefore the subdivision of the Remainder of Erf 540 Tamariskia Extension 2 and Erf 673 on which a township will be established is feasible for the intended project. Most of the potential impacts that were identified during Environmental Scoping Assessment were characterised as having a low or moderate impact on the receiving environment. Hence if the mitigation measures will be followed, the impacts will be of low significance or could in fact be totally avoided.

21. RECOMMENDATION

It is therefore recommended that an Environmental Clearance Certificate should be issued for the proposed township establishment, subject to the following recommendations:

- All required permits, licenses and approvals for the proposed development are obtained before construction commences.
- Pollutants of different sorts should be managed and treated in such a manner not to cause any pollution of the immediate and surrounding receiving environments.
- An Environmental Control Officer (ECO) should be appointed during the construction phase of the development to make sure all the requirements in the Environmental Scoping Report and Environmental Management Plan (Appendix B) are adhered to.
- In the event that road construction material is sourced from nearby quarries it is required that the necessary approval (i.e. environmental clearance certificate) either exists or is obtained by the appointed contractor.
- That various Green Building Designs and Principles be applied to ensure sustainable development over the long term. It is recommended that alternative and renewable sources of energy be explored and introduced to reduce dependency on natural resources.
- That the entire construction site be cleared of any rubbish and removed to the designated landfill in Tamariskia.
- Continued public participation should form part of the construction phase.

- A fire management plan or disaster management plan should be drafted for the construction phase.

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BACKGROUND INFORMATION DOCUMENT

BACKGROUND INFORMATION DOCUMENT (BID)

FEBRUARY 2022

Proposed Township Establishment of Two New Extensions in Tamariskia

1. PURPOSE OF THIS DOCUMENT

The purpose of this Background Information Document (BID) is to inform Interested & Affected Parties (I&AP's) and various Stakeholders about an Environmental Impact Assessment to be undertaken for the proposed Township Establishment of two new extensions in Tamariskia, Swakopmund.

2. INTRODUCTION

The proponent (Eddy Angula Trust) is of the intention to expand the existing town by establishing two (2) new extensions in the town of Swakopmund which will occupy a total size of approximately 9.6357 Ha located to the northern central part of Swakopmund. The layout of the proposed two extensions will make provision for residential and public open space erven. The establishment of the two new extensions will ease the shortage of housing in the town of Swakopmund and make more serviced land available.

WINPLAN Town and Regional Planning Consultants needs to submit an application to the Ministry of Urban and Rural Development (MURD) to affect the required town planning actions for the proposed township establishments. In order to finalise the planning actions and as part of the application, an Environmental Clearance Certificate should be obtained.

3. PROJECT INFORMATION

The proposed project sites are located within the townlands area of Swakopmund Municipality. These sites are currently undeveloped although the effects of human activity are clearly visible on the sites. Infrastructure and services for the project sites among other include roads, water services, and bulk electricity. The approximate locations in relation to the built up area of Swakopmund can be seen in the image below.



The table below indicates the proposed number of erven that is planned on the respective portions as well as the size of the portion on which the township will be established.

LAND DESCRIPTION	APPROXIMATE SIZE (m ²)	PRELIMINARY NUMBER OF ERVEN	PROPOSED EXTENSION NAME
Portion A of the RE Erf 540 Tamariskia Extension 2 Swakopmund	44010	79	Extension Number to be allocated by the office of the Surveyor General
Erf 673 Tamariskia, Extension 2 Swakopmund	52347	91	Extension number to be allocated by the office of the Surveyor General

The layout of the proposed two Extensions will make provision for residential and public open space.

The schematic design below gives more insight into the proposed township development.

The preliminary layout for Erven RE 540, and 673 Tamariskia extensions can be seen below:



4. EIA PROCESS

The Environmental Management Act (No 7 of 2007) stipulates that an Environmental Scoping Assessment is required if the following 'Listed Activities' are involved:

Activity No.	Activity Description
Energy Generation, Transmission and Storage Activities	
Activity 1 (b)	<i>The construction of facilities for the transmission and supply of electricity</i>
Waste Management, Treatment, Handling and Disposal Activities	
Activity 2.3	<i>Temporary storage of waste</i>
Forestry Activities	
Activity 4	<i>Removal of vegetation</i>
Land Use and Development Activities	
Activity 5.2	<i>Establishment of Land Resettlement Scheme</i>
Infrastructure	
Activity 10.1(a)	<i>The construction of water bulk supply pipelines</i>
Activity 10.1(b)	<i>The construction of public roads</i>

The BID forms the first part of this assessment. Based on the comments received and the findings of the scoping study, a Scoping Report will be drafted. The Scoping Report will include an assessment and Environmental Management Plan (EMP). The EMP will detail the measures to be implemented to ensure that all issues and impacts are managed and mitigated. Following this, the report will be finalised and submitted to the MET for review. If the MET is satisfied that a comprehensive impact assessment and public consultation process has been undertaken, then they will issue an ECC. However, if they determine that further studies and assessment are necessary, then they will require for the EIA process to be extended to a full EIA.

5. SCOPE OF WORK OF THE EIA

The EIA will cover all aspects relating to the construction, and operation of the project. A few key issues that will need be investigated:

IMPACT	CAUSE
Erosion & Sedimentation	Vegetation clearance
	Trenches & excavated areas
Ground and Surface	Waste disposal

IMPACT	CAUSE
Water Pollution	Hazardous material & liquid disposal
Habitat Destruction and Loss of Biodiversity	Vegetation clearance & removal of trees
	Erosion & sedimentation
	Poaching
Visual Aesthetics and Sense of Place	Vegetation clearance
	Poorly planned construction sites
	Insensitive infrastructure design and scale
Socio-Economic	Income generation and skills transfer (Employment)
	Economic benefit to the construction industry
	Dust and emissions
	Traffic safety
	Health, safety and security
Natural Resources (water & energy)	Unacceptable high levels of consumption
	Wastage

6. PUBLIC CONSULTATION

Any I&AP on the proposed township establishment, has an opportunity to participate and provide input. To register as an interested and affected party (I&AP), please send requests/responses to:

WINPLAN Town and Regional Planning Consultants
P. O Box 90761
Klein Windhoek

E-mail: Winplan@winplan.com.na

Tel: +264 (61) 246 761

7. REGISTRATION AND COMMENTS



**PROPOSED TOWNSHIP ESTABLISHMENT OF TWO NEW EXTENSIONS IN TAMARISKIA
ENVIRONMENTAL IMPACT ASSESSMENTS (EIA) – BACKGROUND INFORMATION
DOCUMENT**

REGISTRATION AND COMMENT SHEET

WINPLAN Town and Regional Planning Consultants
P. O Box 90761
Klein Windhoek

E-mail: Winplan@winplan.com.na
Tel: +264 (61) 246 761

Title		Organisation	
First Name		Tel No.	
Surname		E-mail	
Postal Address			

Please register me as an I&AP so that I may receive further information during the EIA process.	Yes	No
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COMMENTS: Please comment on your issues of concern or suggestions you may have for the EIA process. Any other comments or queries are welcomed. You may use a separate sheet.

ENVIRONMENTAL MANAGEMENT PLAN (EMP)

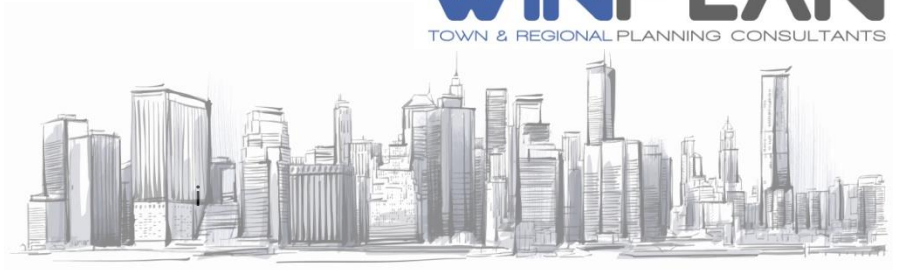
**PROPOSED TOWNSHIP ESTABLISHMENT OF TWO NEW
EXTENSIONS IN TAMARISKIA, SWAKOPMUND**



ENVIRONMENTAL MANAGEMENT PLAN

FEBRUARY 2022

WINPLAN
TOWN & REGIONAL PLANNING CONSULTANTS



Project Title: **TAMARISKIA TOWNSHIP ESTABLISHMENT**

Type of Project: **ENVIRONMENTAL MANAGEMENT PLAN**

Project Location: **TAMARISKIA EXTENSION 2, SWAKOPMUND**

Competent Authority: **MINISTRY OF URBAN AND RURAL DEVELOPMENT**
NAMIBIA PLANNING AND ADVISORY BOARD / TOWNSHIPS BOARD
PRIVATE BAG 13289
WINDHOEK
NAMIBIA

Approving Authority **DIRECTORATE OF ENVIRONMENTAL AFFAIRS**
MINISTRY OF ENVIRONMENT AND TOURISM
PRIVATE BAG 13306
WINDHOEK

Proponent/Client: **EDDY ANGULA TRUST**
081 787 7467
SWAKOPMUND

Consultancy: **WINPLAN**
PO BOX 90761, KLEIN WINDHOEK
TEL.: (061) 246 761
E-MAIL: winplan@winplan.com.na

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APPENDICES


- Appendix A: Locality Maps
- Appendix B: Township Layouts

GLOSSARY

Activity:	The physical work that a proponent proposes to construct, operate, modify, decommission or abandon or an activity that a proponent proposes to undertake.
Alien Species:	It refers to a non-indigenous plant, animal or micro-organism; or an indigenous plant, animal or micro-organism, translocated or intended to be translocated to a place outside its natural range of nature, that does not normally interbreed with individuals of another kind, including any subspecies cultivar, variety, geographic race, strain, hybrid or geographically separate population.
Assessment:	The process of identifying, predicting and evaluating the significant effects of activities on the environment; and the risks and consequences of activities and their alternatives and options for mitigation with a view to minimise the effects of activities on the environment.
Batch Plant:	Machinery used on site for the mixing and production of concrete and associated equipment and materials.
Bund:	An enclosure designed to hold at least 120% of the contents of a liquid storage vessel, tank or drums to contain any spillage.
Construction Activity:	A construction activity is any action taken by the contractor, his subcontractors, suppliers or personnel during the construction process.
Environment	An interconnected system of natural and human-made elements such as land, water, air, all living organisms and matter from nature as well as cultural, historic, economic and social heritage and values.
Environmental Management Plan (EMP):	A plan that describes how activities that may have significant environments effects on the environment are to be mitigated controlled and monitored.
Contaminated Water:	Water contaminated by the activities of the contractor, e.g. concrete water and runoff from plant/personnel wash areas.
Contractor:	The principal person or company, including all subcontractors, undertaking the construction of the development as appointed by the proponent.
Construction Camp:	Refers to all storage stockpiles sites, site offices, container sites, other areas required to undertake construction and rest areas for construction staff or management.

Environmental Control Officer (ECO):	A suitably qualified professional who oversees the construction phase and ensure that all environmental specifications and EMP obligations are met during the phase. The ECO will be responsible for the monitoring, reviewing and verifying of compliance with the EMP by the contractor.
Emergency Situation	<p>An incident, which potentially has the ability to significantly impact on the environment, and which, could cause irreparable damage to sensitive environmental features. Typical situations entail amongst others the:</p> <ul style="list-style-type: none"> • Spill of petroleum products and lubricants into the aquatic system; • Potential damage, erosion and slumping of unstable river embankments or drainage channels; • Potential event of impeding the continuous flow of water to downstream water users dependant on the flow; and • Dangerous situation where livestock and children can be injured by any activity emanating from the construction or rehabilitation of the project implementation.
Environment:	<p>The complex of natural and anthropogenic factors and elements that are mutually interrelated and affect the ecological equilibrium and the quality of life, including :</p> <p>(a) The natural environment that is the land, water and air, all organic and inorganic material and all living organisms; and</p> <p>(b) The human environment that is the landscape and natural, cultural, historical, aesthetic, economic and social heritage and values.</p>
Environmental Impact Assessment (EIA):	The process of examining the environmental effects of a development as prescribed by the Environmental Impact Assessment Regulations (GN. No. 30 of 2012) for activities listed as List of Activities which may not be undertaken without an Environmental Clearance Certificate from the Environmental Commissioner (GN. No. 29 of 2012).
Hazardous Substance:	A substance that, in the reasonable opinion of the engineer and/or ECO, can have a harmful effect on the environment.
Listed Activity:	An activity listed in terms of section 27(2) of the Environmental Management Act and the List of Activities which may not be undertaken without an Environmental Clearance Certificate from the Environmental Commissioner (GN. No. 29 of 2012).

Mitigation	The implementation of practical measures to reduce adverse impacts of to enhance beneficial impacts.
Monitoring:	Regular inspection and verification of construction activities for degree of compliance to the EMP.
No-Go Areas:	Areas identified as being environmentally sensitive in some manner and demarcated on plan, and on the site with pegs or fencing and which are out of bounds to unauthorised persons. Authorisation must be obtained prior to entry.
Project Engineer:	The person(s) who represents the proponent and are responsible for the technical and contractual implementation of the works to be undertaken by the appointed contractors.
Proponent:	The legal entity duly authorised and appointed representative, with rights to undertake the development.
Rehabilitation	Restoring a disturbed area to more or less its natural state.
Resident Engineer (RE):	A person who represents the project engineer on site and is responsible for the technical and contractual implementation of the works to be undertaken.
Search and Rescue:	The location and removal of specified plant species, without unnecessary damage, and their transfer to a specified location (on-site nursery).
Solid Waste:	All solid waste, including construction debris, chemical waste, excess cement/concrete, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste.
Species of Special Concern:	Those species listed in the Endangered, Threatened, Rare, Indeterminate, or Monitoring categories of the South African Red Data Books, and/or species listed in Globally Near Threatened, Nationally Threatened or Nationally Near Threatened categories (Barnes, 1998).
Specification:	A technical description of the standards of materials and workmanship that the Contractor is to use in the works to be executed, the performance of the works when completed and the manner in which payment is to be made.
Topsoil:	The top 150 mm of soil (topsoil) and root material of cleared vegetation.
Works:	The construction operations and all related and incidental works, such as



search and rescue, fencing and rehabilitation, in connection with the execution and carrying to completion of the project.

1. BACKGROUND INFORMATION

1.1 PROJECT LOCATION

The proposed project sites are located within the Townlands area of Swakopmund (see Appendix H). These sites are currently undeveloped although the effects of human activity are clearly conspicuous on the sites. Infrastructure and services for the project sites among other include roads, water services, and bulk electricity. The areas are mainly surrounded by residential erven and houses already established.

The proposed township establishment would include two (2) new extensions within the Townlands of Swakopmund. These Extension numbers still needs to be allocated by the office of the surveyor General. The total size of the proposed sites is approximately 9.5 Hectares and is located to the northern central area of Swakopmund.

1.2 TOWNSHIP LAYOUTS

The layout of the proposed two Extensions will make provision for residential and public open space erven (See Appendix I). The following tables give more insight into the proposed township development.

The preliminary layout plan for **Erf RE 540 Tamariskia, Extension 2** provides for the following:

LAND USE	NO OF ERVEN	%	TOTAL AREA (m ²)
Residential	73	65%	28510
Public Open Space	95	10%	4213
Street Portion	1	1%	12
Remainder (Street)		26%	11275
Total		100%	44010

The preliminary layout plan for **Erf 673 Tamariskia Extension 2** provides for the following:

LAND USE	NO OF ERVEN	%	TOTAL AREA (m ²)
Residential	87	59%	31641
Public Open Space	4	10%	5078
Remainder (Street)		30%	15628
Total		100%	52347

1.3 BULK SERVICES AND INFRASTRUCTURE

All bulk services such as water, electricity and sewerage are readily available in the town of Swakopmund. Once a detailed design has been completed, services for the newly created Extensions will be linked to the existing services network of Swakopmund.

1.3.1 Access

Tamariskia is located next to the C34 running from Swakopmund along the coast all the way to Skeleton Coast. Access from the C34 is subject to approval from Roads Authority. Access will be obtained from Kwikstretjie on the eastern side of the proposed new extension.

1.3.2 Water Supply

The Swakopmund Town (STC) will supply water to the proposed new extensions through the existing Municipal Water Reticulation System.

1.3.3 Storm Water

The design of the internal street network will include provision for storm water and to accommodate the storm water generated by the townships. Underground storm water structures with catch pits complying with accepted engineering standards will be constructed.

1.3.4 Electricity Supply

Electricity will be supplied from ErongoRed who the current supplier for Swakopmund Town. The proposed new extensions are located within an existing municipal fabric and will merely be connected to the bulk infrastructure.

1.3.5 Sewage Disposal

The proposed new development will be connected to the existing municipal sewer network.

1.3.6 Solid Waste Disposal

Solid waste created by the various land uses will be collected and disposed of through the municipal waste collection and management systems and discard of at an approved waste disposal site.

1.4 INTRODUCTION TO THE ENVIRONMENTAL MANAGEMENT PLAN

1.4.1 Purpose of the EMP

The purpose of the EMP is to provide specifications for "good environmental practice" for application during construction and operation. As such, the EMP provides specifications that the proponent and the appointed contractors must adhere to in order to minimise adverse environmental impacts associated with the construction and operational activities. The

proponent to which authorisation was granted, is ultimately responsible for the overall environmental performance.

The guidelines for the execution of an EMP include the following:

- Responsibilities for the environmental performance of the proposed development are communicated to the construction workers;
- Communications channels to report on environmental performance, problems and priorities are in place;
- A monitoring schedule is established to identify potential negative environmental impacts associated with the construction and operation of the proposed development;
- Method Statements (mitigation measures) are implemented to avoid or minimise the identified negative environmental impacts (rehabilitation of eroded areas; bush clearings; complaints from the public) as well as to enhance the positive impact on the environment (employment; support of conservation efforts); and
- Monitoring programme or schedule is developed to track the plans that have been implemented so as to ensure the effectiveness of the plan.

1.4.2 Scope of the EMP

In order to ensure a holistic approach to the management of environmental impacts during the construction works as well as the operational phase, this EMP sets out the methods by which proper environmental controls are to be implemented by the contractor and all other parties involved, and monitored by the Independent Environmental Control Officer (ECO) and Resident Engineer (RE).

This EMP intends to guide and manage the construction and operational activities on each site and surrounding areas as they relate to the natural environment. It further describes mitigation measures. In addition, this document must be seen as open-ended, requiring regular review and updating via the correct channels in order for it to effectively guide environmental management of this project.

The provisions of this EMP are binding on the proponent until such time that ownership is transferred to the community or any other stakeholder, if it is the case. Any third party appointed by the proponent in terms of the design and construction must comply with the conditions of this EMP.

The EMP is a dynamic document subject to similar influences and changes created by variations to the provisions of the project specification. Any substantial changes shall require the approval from the Environmental Control Officer (ECO).

2. ENVIRONMENTAL MANAGEMENT PLAN

2.1 RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT

The Eddy Angula Trust will be responsible for environmental control on site during both the construction and operational phase. It is imperative that a daily briefing meeting be held at all times during the construction phase to reach an agreement on specific roles of various parties and penalties for non-compliance.

2.2 TRAINING AND INDUCTION

The Eddy Angula Trust is responsible to ensure that environmental awareness and education of all employees and contractors are carried out. The Trust should further ensure that that employees and contractors are made aware of the environmental requirements of the project.

The EMP should form part of the Terms of Reference of all contractors, sub-contractors and suppliers. All of the above is obligated to sign a contract to ensure that they are familiar with this EMP and that they comply. All senior staff (foremen/supervisors) should familiarise themselves with the contents of this EMP and they should render training and assistance to the rest of the employees and staff members on the contents of this EMP.

2.3 ENVIRONMENTAL CONTROL OFFICER (ECO)

The Environmental Control Officer (ECO) for the site is an independent environmental consultant appointed by the Eddie Angula Trust to monitor and review the on-site environmental management and implementation of this EMP.

The duties of the ECO include (but are not limited to) the following:

- To ensure that the conditions of the EMP are adhered to at all times and that the appropriate actions are taken;
- To provide an environmental register at the site to be completed by any person/s reporting an environmental incident, issue or concern;
- To identify potential environmental impacts prior to the onset of decommissioning;
- To ensure that the Environmental Impacts (EI) are kept to a minimum;
- To report to the Eddie Angula Trust and the contractor on a regular basis and to inform them of any major environmental impacts;
- To attend important site meetings;
- To inspect the site and surroundings on a regular basis;
- To request the removal of any person/s or equipment not complying with the specifications set out in this EMP;
- To review the EMP on a continuous basis and to submit a report to the relevant stakeholders and/or authorities;
- The ECO shall submit all written/verbal requests and/or instructions to the KTC via the contractor or project engineer.

2.4 ENVIRONMENTAL REGISTER

An environmental register should be kept on site in which incidents related should be recorded. This will include information related to incidents such as spillages, dust generation as well as complaints from surrounding neighbours. Records should also be kept of any actions taken. The register should be open for any person/s on site. The ECO should be responsible for the environmental registry on site.

2.5 DISPUTES AND DISAGREEMENTS

Any disputes or disagreements between role players on site (with regard to environmental management) will be referred to the Directorate of Environmental Affairs (Ministry of Environment and Tourism). If no resolution on the matter is possible it must be presented to an outside party agreed by all parties involved.

2.6 ENVIRONMENTAL INCIDENT REPORTING

All environmental incidents occurring at the proposed site will be recorded. The incident report will have to include time, date, location, and nature of the incident, extent of the incident, actions taken and personnel involved.

All complaints received should be directed to the CEO of the Eddie Angula Trust and channelled to the appointed ECO. The Eddie Angula Trust management should respond to the complaint within a week or as soon as possible. All complaints should be entered in the environmental register and all responses and actions taken to address these should be taken.

2.7 ENVIRONMENTAL MONITORING

The day-to-day monitoring and verification that the EMP is being adhered to shall be undertaken by the appointed contractor.

The ECO shall visit and inspect the site at least once a month to ensure that correct operational procedures are being implemented and that the contractor is complying with the environmental specifications of the EMP.

Additional site inspections by the ECO may be required during the initial and final stages of the construction phase. The ECO shall address any queries to the project engineer. If the queries cannot be resolved at this level, they shall be referred to the proponent, if necessary.

The ECO will carry the responsibility of monitoring the implementation of the EMP on site, assisted by the project engineer. In this regard, the ECO will submit a monthly monitoring report to the DEA until after all rehabilitation work has been completed.

Regular meetings will be held between the project engineer and the ECO. The purposes of the meetings shall be:

- To establish the suitability of the contractor's methods and machinery in an effort to lower the risk involved for the environment.
- To discuss possible non-conformance to EMP guidelines or environmental legislation.
- To assess the general state of the environment on site and discuss any environmental problems which may have materialised.
- To accommodate the local community in the decision-making process regarding social and environmental issues on site.

Any non-compliance with the agreed procedures of the EMP is a transgression of the various statutes and laws that define the manner by which the environment is managed. Non-conformance identified during monitoring must be recorded. Non-conformance reports will describe, in detail, the cause, nature and effects of any environmental non-conformance by the contractor and could stand as evidence should legal action required.

If possible photographs should also be included as evidence to substantiate the report. This report will also suggest mitigation measures to correct the non-conformance (if necessary) and contemplate revisions to any of the strategies used in the construction phase, whether they pertain to monitoring or to construction methods used on site. The non-conformance shall be documented and reported as part of the Monitoring Report.

2.8 NON-COMPLIANCE

The ECO shall issue the contractor a notice of non-compliance whenever transgressions are observed. The contractor/s shall act immediately when such notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the construction site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken.

The Eddy Angula Trust is responsible for reporting non-compliance with the EMP, to the ECO. The Eddy Angula Trust management together with the ECO must thereafter take the following actions:

- Investigate and identify the cause of non-compliance;
- Report matters of non-compliance to the ECO;
- Implement suitable corrective actions;
- Take actions to prevent reoccurrence of the incident;
- Assign responsibility for corrective and preventative action;
- Any corrective action taken to eliminate the causes of non-compliance shall be fitting to the magnitude of the incident.

2.9 SITE MANAGEMENT

2.9.1 Contractors Camp

The extent and location of the contractor's camp shall be indicated on the site plans to be approved by the engineer and ECO. The planning and design for the construction camp must ensure that there is minimal impact on the environment.

The following should apply:

- The construction camp will be placed within an existing disturbed area as far as possible;
- The camp shall be located in an area of low environmental and social sensitivity;
- The construction camp must preferably be located in such a manner as to minimise visual impact;
- Its final location shall be identified in consultation with the engineer and ECO;
- With the decommissioning of the structures all compacted platforms and slab foundations must be ripped up and be removed.

All vehicles will be allocated a dedicated parking area in the construction camps. The position of which will be agreed by the project engineer and ECO. No storage of vehicles will be allowed outside of the designated areas.

2.9.2 Ablution Facilities

Washing and acts of excretion and urination are strictly prohibited other than at the designated facilities provided. The Contractor shall provide suitable sanitary arrangements within the boundaries of the construction camps or within walking distance ($\pm 200\text{m}$) from where construction activities are taking place.

The exact location of the facilities shall be approved by the ECO and resident engineer prior to establishment. All temporary portable toilets shall be secured to the ground to prevent them toppling due to wind or any other cause.

Toilets supplied by the contractor for the workers shall occur at a maximum ratio of 1 toilet per 15 workers and be within walking distance of the staff. These facilities shall be maintained in a hygienic state and serviced regularly. Toilet paper shall be provided. The contractor shall ensure that toilets are emptied regularly, as well as before the builders' holidays. The contractor shall further ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are removed from site. Discharge of waste from toilets into the environment is prohibited.

2.9.3 Eating Area

Eating areas should be within the boundaries of the construction camp as agreed with by the ECO. Temporary eating areas (i.e. outside the construction camp) would require very strict requirements and control and would only be allowed once approved by the ECO.

The contractor shall provide adequate refuse bins at the eating area (i.e. permanent or temporary eating areas) to the satisfaction of the ECO and shall ensure that all eating areas are cleaned on a daily basis. Collected waste shall be stored in a central waste area at the main construction camp and disposed of at the local solid waste site on a regular basis. Waste receipts in this regards should be kept on site.

Waste bins at the eating areas should have scavenger proof lids and not left overnight, but removed to the main construction camp on a daily basis.

Cooking of food shall be done using gas cookers only and within the main construction camp only. Cooking with wood is strictly prohibited. No fires may be lit except if approved by the engineer or ECO, and in properly prepared facilities approved by the engineer.

2.9.4 Access Routes

During the construction phase all construction related traffic shall only access the sites from existing roads and accesses. No new tracks/roads shall be established and only existing roads may be used. Work sites shall be clearly demarcated and road signs erected where needed. The general public shall not have uncontrolled access to the site during the construction phase. In addition, vehicle access will be limited to one or two entrances to facilitate control.

The movement of plant and workmen shall be restricted to the construction areas and essential access routes. The choice of access routes, which shall need the approval of the ECO and project engineer shall where possible, be existing routes. The contractor/s shall control the movement of all vehicles and plant machinery so that they remain on designated/demarcated routes.

Only if absolutely necessary will new routes (temporary or permanent) be allowed, but should be planned in consultation with the ECO and project engineer, constructed and maintained in such manner not to cause any harm or damage to the natural environment or be of any nuisance to the affected community. Temporary roads should be rehabilitated soon after their purpose has expired and should be done in a manner as approved by the ECO.

Special care should be taken to prevent spillages on the roads. Vehicles should be equipped with drip trays to prevent oil and fuel spillages. In the event of spillages, it should be reported to the ECO and resident engineer immediately and cleaned as soon as possible.

The speed limit for light vehicles is 40 km/h and for heavy vehicles 20 km/h. No vehicles are to leave or reverse off designated access roads unless at areas previously agreed to with the project engineer or ECO. Notices should be placed on visible locations in the vicinity of the construction site to warn the public of construction activities and indicating that heavy vehicles may be using the road. Failure to maintain road signs, warning signs or indicator lights, etc., in a good condition shall constitute ample reason for the project engineer to suspend the work until the road signs, etc., have been remedied to his satisfaction.

During construction of roads the contractor/s shall protect all areas susceptible to erosion by installing all necessary temporary and permanent drainage works as soon as possible.

2.9.5 Staff Management

The contractor must ensure that their employees have suitable personal protective gear and equipment and that they are properly trained in first aid and fire fighting. It is advised that training records be kept for future reference.

2.9.6 Fire and Safety Management

Proper handling, storage, use and disposal of any hazardous waste should be conducted. All electrical installations and wiring at the site must be done and approved by a qualified electrician who would also issue a certificate of compliance.

No fires may be lit except if approved by the project engineer or ECO, and in properly prepared facilities approved by the ECO. Fires shall be kept small and appropriate to their function. Smoking is only permitted in designated smoking areas. Appropriate signage shall be erected in these areas. A container filled with sand and a dedicated fire extinguisher must be available at the smoking area.

The contractor shall take all reasonable measures and active steps to avoid increasing the risk of fire through activities on site and prevent the accidental occurrence and spread of fire. The contractor shall further ensure that there is sufficient fire-fighting equipment on site at all times.

Relevant occupational Health and Safety requirements shall be adhered to. Telephone numbers of emergency services, including the fire safety officer, shall be displayed clearly in the contractor's office near a telephone. No firearms are permitted.

Staff must be made aware of their responsibilities to ensure that impacts such as fire, safety and pollution are taken care of. This must form part of the Environmental Education. The movement of construction workers must be controlled and access to adjacent properties must be prohibited. All excavated areas and/or holes should be clearly demarcated.

2.9.7 Aesthetics

The contractor shall take reasonable measures to ensure that construction activities do not have an unreasonable impact on the aesthetics of the area.

2.9.8 Cement and Concrete Batching

Concrete mixing directly on the ground shall be strictly prohibited and shall only take place in an impermeable surface. All runoff from batching areas shall be strictly controlled and water contaminated by cement shall be collected, stored and disposed of at a suitable wastewater disposal facility.

2.9.9 Hazardous substances

Petroleum, chemicals, harmful and hazardous waste shall be stored in an enclosed and bonded area at the main construction camp. This area shall be subject to the approval of the project engineer and ECO. The waste shall be disposed of at an appropriate disposal site. Any spillage of more than 200 litres must be reported to the Ministry of Mines and Energy as per the regulations of the Petroleum Products Act.

The contractor shall take all preventative measures to ensure that surface or groundwater pollution from hazardous substances does not occur.

2.9.10 Waste Management

During the construction phase, waste will be generated in the form of rubble, cement bags, pipes and electrical wire cuttings. Contaminated soil due to oil leakages, lubricants and grease from the construction equipment and machinery may also be generated during the construction phase.

No burying or dumping of any waste materials, rubble or refuse shall occur on site. The contractor shall set up a solid waste control and removal system at the main construction camp and waste shall be disposed of at the local solid waste site on a regular basis. Waste receipts in this regards should be kept on site.

Waste bins at the eating areas should not be left overnight, but removed to the solid waste control and removal system at the main construction camp on a daily basis. The accumulation of construction waste materials must be avoided as far as possible.

In addition the contractor shall set up a contaminated water management system, which shall include collection facilities to be used to prevent pollution, as well as suitable methods of disposal of contaminated water to fit into the larger wastewater management system. The contractor shall prevent the discharge of water contaminated with any pollutants, such as soaps, detergent, cements, concrete, lime, chemicals, glues, solvents, paints and fuels, into the environment. The contractor shall notify the ECO and resident engineer immediately of any pollution incidents on Site.

Water from kitchens, showers, sinks, etc. shall be discharged into a conservancy tank for removal from site. Runoff from fuel depots/workshops/truck washing areas and concrete swills shall be directed into a conservancy tank and disposed of at an approved municipal hazardous waste site.

Wash areas shall be placed and constructed in such a manner so as to ensure that the surrounding areas are not polluted. This includes, but is not limited to; concrete batching areas, vehicle washing, workshop wash bays, paint wash and cleaning. Wash areas for domestic use at the main construction camp shall ensure that the disposal of contaminated water is sanctioned by the ECO.

2.9.11 Information Board

The contractor will be responsible for putting up information boards on site. The number of and locations of these information boards shall be agreed upon by the ECO. The contents of these information boards shall be provided by the contractor and resident engineer as well as the ECO and will essentially be to advise the public of the construction activities and the prohibition on entering certain areas. The information board shall also provide contact details of the ECO, to ensure that the public have access to additional information and also have a communication channel to lodge complaints and raise other issues.

3. MANAGEMENT OF ENVIRONMENTAL ASPECTS

3.1 CONSTRUCTION PHASE

3.1.1 Erosion and Sedimentation

Impact Description	<p>Erosion and sedimentation will take place in the event that soils are exposed to the natural elements (i.e. winds and rains) through clearing of vegetation or steep excavations, which in turn could result in seasonal (rain season) degradation of habitats and visual downgrade. The amount of erosion and sediment transport is directly related to what time of the year the construction activities occur and the duration thereof. If clearing and grading activities take place during the wetter months of the year (November to March), substantially more erosion would result.</p> <p>Considering the natural conditions (i.e. topography, soil composition and vegetation cover) erosion and sedimentation can be expected if not effectively managed and mitigated. Due to the fact that the project area falls within a very low rainfall area, it is not expected to be that sensitive to erosion and sedimentation.</p>
Mitigation Measures	<p>Apply acceptable engineering standards and design, or Best Management Practices (BMP). BMPs are defined as physical, structural, and/or managerial practices, that when used singly or in combination, prevent or reduce the expected impact/s. Structural BMPs typically include sediment ponds or traps, stabilised construction entrances, filter fences, check dams, and riprap. Managerial BMPs include preserving the natural vegetation, leaving buffer zones, and providing dust control.</p> <p>Plan the timing of construction to avoid clearing and grading during erosive high rainfall months of the year. Avoid unnecessary and excessive vegetation clearance and disturbance of top soil.</p> <p>Contractor should draft a Rehabilitation Plan and re-vegetated exposed areas once construction at the particular area ceased. The Rehabilitation Plan should provide for a phased approach ensuring that no large area is exposed to natural elements (e.g. wind, water).</p>
Responsible Party	Contractor/Proponent

3.1.2 Ground and Surface Water Pollution

<p>Impact Description</p>	<p>Construction activities are associated with a variety of potential pollution sources (i.e. cement, oils, diesel, chemicals, paints, etc.), either having a direct and immediate impact or indirect and longer-term impact. As a single incident, in order for ground water to be contaminated, very large quantities of pollutants will have to be released into the environment, of which volumes are not associated with this type of development. Although, however small these potential sources of pollution might be, it still requires special attention (i.e. planning, control and management) to avoid any potential pollution of the immediate environment.</p> <p>The groundwater of the area is not regarded as being of good quality and is not expected to be negatively affected by any pollution, but should be avoided. The study area contains no standing permanent water ponds / artificial wetlands, but can potentially be expected during the rainy season. No flooding of the study area is expected.</p>
<p>Mitigation Measures</p>	<p>Draft and implement a Construction Waste Management Plan to be maintained for the duration of the construction phase.</p> <p>Waste should be stored in appropriate containers in an appropriately constructed area protected against exposure to high intensity rainfall.</p> <p>Waste should be frequently disposed of at the Swakopmund landfill site.</p> <p>Storage of any material or substance that may cause pollution to water sources should be safely handled and stored in accordance with appropriate legislation.</p> <p>A Storm Water Management Plan should be drafted to be maintained for the duration of the construction time frame.</p> <p>Ensure proper maintenance of all construction vehicles and equipment, and conduct continues maintenance and check-ups.</p> <p>Draft and implement a detailed Preparedness and Emergency Plan for all construction related spillages.</p> <p>Ensure that oil/ fuel spillages from construction vehicles and machinery are minimised and that where these occur, that they are appropriately dealt with. Polluted soil and building rubble must be transported away from the site to an</p>

Responsible Party	<p>approved and appropriately classified waste disposal site. Polluted soil must be remediated where possible.</p> <p>Drip trays must be placed underneath construction vehicles when not in use to contain all oil that might be leaking from these vehicles.</p> <p>All fuel tanks must be bonded to 120% of the capacity of the tank in order to contain any spillages that might take place.</p> <p>Washing of personnel or any equipment should not be allowed on site. Should it be necessary to wash construction equipment these should be done at an area properly suited and prepared to receive and contain polluted waters. These polluted waters should be transported and disposed at the local waste site for hazardous materials.</p> <p>Appointing qualified and reputable contractors is essential. Proper training of construction personnel would reduce the possibility of the impact occurring.</p> <p>'Best' practice measures should be applied to minimise the potential discharge of pollutants onto open soil especially near ephemeral rivers.</p>
Responsible Party	Contractor/Proponent

3.1.3 Habitat Destruction and Loss of Biodiversity

Impact Description	<p>The proposed change in land use will permanently change the present landscape and result in the displacement of existing vegetation and faunal populations, including invertebrates and other living organisms.</p> <p>Removal of the natural vegetation cover to make way for the roads, buildings and other infrastructure is inevitable. This should however be done within a responsible manner to avoid unnecessary removal of ground cover or any protected species.</p>
Mitigation Measures	<p>Conduct a pre-construction vegetation survey to establish protected/endangered species to be marked and incorporated into the development.</p> <p>Avoid clear felling i.e. removal of all the indigenous trees/shrubs and grasses of the area prior to development. If required to remove indigenous trees introduce a policy of re-establishing (i.e. planting) 5 indigenous tree species for each indigenous species removed.</p>

	<p>Incorporate the protected species as well as some of the other bigger tree/shrub species in the overall final landscaping of the area. The bigger tree/shrubs often serve as habitat to a myriad of indigenous fauna – e.g. loose bark, cavities, etc. Indigenous plant species also require less maintenance and water than exotic species.</p> <p>Identify and mark trees or other vegetation that should be protected and that should not be removed during construction.</p> <p>Show overall environmental commitment by adapting a minimalistic damage approach.</p> <p>A Rehabilitation Plan should address all aspects of the natural environment on completion of construction and prior to operation.</p> <p>Restrict construction vehicle movement to the site or beyond the construction site boundaries.</p> <p>No hunting, trapping, setting of snares or any other disturbance of any fauna species.</p> <p>During the planning phase of the construction period, the appointed contractor should identify areas for lay down areas and construction vehicle sites within areas that are already cleared or disturbed.</p> <p>Only prominent gravel tracks should be utilised during the construction phase, to avoid track proliferation. Off-road driving should be strictly prohibited.</p> <p>Permits should be obtained for protected plant species that unavoidably need to be removed.</p> <p>Construction activities should be subject to well-coordinated planning to avoid unnecessary removal of vegetation particularly protected plant species. Unnecessary destruction of habitats within the footprint of the construction site should be avoided.</p>
Responsible Party	Contractor/Proponent

3.1.4 Visual Aesthetics and Sense of Place

Impact Description	<p>Although temporary, construction activities are known to have a visual impact due to the nature of the activity. The surrounding land uses to the proposed project sites are typical uses like institutional, business, and residential uses which are normally associated with a town. The activities to be accommodated on the proposed project area are in line with these.</p>
Mitigation Measures	<p>Keep as much natural vegetation on site as possible to screen construction site and activities. Undertake rehabilitation of the disturbed areas.</p> <p>Restrict the amount of structures on site and restrict the height to a maximum of 3 meters, where possible.</p> <p>If required structures should be painted in natural colours to lessen the visual impact.</p> <p>Keep the construction site tidy and clean of any construction waste, especially over weekends.</p> <p>No accommodation of any staff should be allowed on site.</p> <p>Limit construction vehicle movement in the area to a minimum and use designated pre-demarcated routes having the least possible impacts on residents.</p>
Responsible Party	Contractor/Proponent

3.1.5 Dust & Emissions

Impact Description	<p>The air quality in the area is considered to be good, based on the potential impact that current activities in the area are likely to have on air quality.</p> <p>Dust and emissions are associated with construction activities (i.e. digging; clearing; excavating etc.) of which the severity is directly related to the extent of the development and the nature of the receiving environment. Given the activities within the immediate surroundings, dust is expected to be more of a nuisance than emissions, as a result of construction activities.</p> <p>Considering the prevailing winds throughout the year and the surrounding receptors, dust nuisance is not expected to be of any significance. However, dust control is considered important and requires effective mitigations.</p>
Mitigation Measures	Regular dust suppression, if required, during times of strong

winds, should minimise dust impacts mainly with respect to the contractor's staff. Dust suppression by means of wetting should only be done with treated wastewaters.	<p>Removal of vegetation should be restricted to the minimum and should only be done when necessary.</p> <p>Construction activities during high winds should be limited to those activities not generating dust.</p> <p>Handling and transport of erodible materials should be avoided under high wind conditions.</p> <p>Where possible, topsoil stockpiles should be located in sheltered areas and covered.</p> <p>Appropriate dust suppression measures should be used when dust generation is unavoidable particularly during prolonged dry periods in summer. Such measures shall also include the use of temporary stabilising measures.</p> <p>No fires should be allowed on-site for any purpose and construction waste are not allowed to be burned on-site.</p> <p>It is imperative that all machinery and vehicles on site is road worthy and do not give rise to excessive smoke or emissions.</p> <p>The contractor's workers are to be provided with access to dust masks.</p>
Responsible Party	Contractor/Proponent

3.1.6 Traffic Safety

Impact Description	<p>Construction activities are associated with an increase in vehicles of different kinds (i.e. workers' busses, delivery vehicles and construction vehicles) to and from the project site, which inevitably increase risk and conflict. It is important that all vehicle drivers be informed of their potential impact on the environment and on the roads, and that the necessary measures are taken to prevent any accidents as a result of increased traffic.</p>
Mitigation Measures	<p>Contractor's workers should adhere to speed limits.</p> <p>Appropriate signs and flag man should be in place along the roads being used by construction vehicles notifying road users and residents of the construction activity and roads used by construction vehicles.</p>

	<p>Drivers of construction vehicles should have valid driver's licenses with ample experience on proper road usage and manners on-site as well as when making use of public roads.</p> <p>Construction vehicles' need to be in a road worthy condition and maintained throughout the construction phase.</p> <p>Make use of predetermined roads on the construction site and refrain from creating new roads for access purposes.</p> <p>The movement of heavy vehicles to and from the construction site must occur outside of peak traffic hours (thus after 08h30 and before 16h30). Delivery vehicles should preferably stick to the same times to avoid peak hour traffic and resulting nuisance to residents.</p> <p>Provide traffic signals and road markings where necessary to ensure safe traffic movement.</p>
Responsible Party	Contractor/Proponent

3.1.7 Health, Safety & Security

Impact Description	<p>Areas in which construction activities are taking place usually are associated with criminal activity, posing a security risk to those residing in the area. It is not to say that these criminal activities are as a result of the construction staff, but is known to happen in the vicinity of construction sites.</p>
Mitigation Measures	<p>Construction workers should not overnight at the site, but only the security personnel.</p> <p>Ensure that all construction personnel are properly trained.</p> <p>Provide for a first aid kit and properly trained person to apply first aid when necessary.</p> <p>A wellness program should be initiated to raise awareness on health issues, especially the impact of sexually transmitted diseases.</p> <p>Restrict unauthorised access to the site and implement access control measures.</p> <p>Clearly demarcate the construction site boundaries along with signage of no unauthorised access.</p> <p>Clearly demarcate dangerous areas and no go areas on site. Staff and visitors to the site must be fully aware of all health safety measures and emergency procedures.</p>

	<p>The contractor must comply with all applicable occupational health and safety requirements. The workforce should be provided with all necessary Personal Protective Equipment (PPE) including earplugs.</p> <p>All affected land owners should be notified at least one month in advance who the appointed contractor is and provided with details about the proposed construction activities and timeline.</p>
Responsible Party	Contractor/Proponent

3.1.8 Natural Resources

Impact Description	<p>The construction phase requires both water and electricity of which water is currently the source under pressure. The construction of roads would require the highest volume of water followed by dust suppression.</p> <p>Alternative water resources (such as treated wastewater) should be used during the construction phase. A very small part of the construction phase would require potable water.</p>
Mitigation Measures	<p>There should be no tolerance towards water wastage.</p> <p>Treated wastewater should be obtained and used for the bulk of the construction requirements.</p> <p>Temporary catchment dams should be constructed to capture water if construction takes place during the rainy season.</p> <p>Local underground water not fit for human and animal consumption should be used.</p>
Responsible Party	Contractor/Proponent

3.2 OPERATIONAL PHASE

3.2.1 Erosion and Sedimentation

Impact Description	<p>Erosion and sedimentation during the operational phase is highly unlikely, as provision will be made for storm water management, which reduces the occurrence of erosion and sedimentation.</p> <p>It will however take place in the event where open areas are cleared of vegetation, for whatever reason, which would then result in erosion and sedimentation. Open areas should therefore be kept within a natural state and no vegetation removal should be tolerated.</p>
Mitigation Measures	<p>The storm water culverts and system should be well maintained.</p> <p>The occurrence of erosion should be monitored and mitigated.</p>
Responsible Party	Proponent/Residents

3.2.2 Ground and Surface Water Pollution

Impact Description	<p>Ground and surface water pollution can have a negative effect on the receiving environment. Sources of potential pollution include, but are not limited to hazardous liquids (i.e. diesel/petrol/cleaning liquids) stored at homes or businesses; leakages from wastewater network; pesticides; improper storage of domestic waste and dumping of waste within open areas. Increased run-off created as a result of the proposed development (i.e. roofs and other hard surfaces) could enhance pollutant transportation, as well as increase the distance pollutants can be transported from its source.</p> <p>There are no permanent standing water bodies on the project sites that had been identified during the site visits. As mentioned previously, in order for groundwater to be contaminated, large amounts of pollutants will have to seep through the soil over a period of time. It is therefore our opinion that the significance of potential damage to water resources as a result of the proposed development is low. Care should be taken to protect the environment and to prevent any possible pollution.</p> <p>It is important to note that it is not only the quality of the surface water that can be negatively affected, but also the aesthetic component of the natural environment. With the correct attitude and with precautionary measures in place,</p>
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	groundwater contamination and waste pollution in general, can easily be prevented.
Mitigation Measures	<p>Draft and implement a Wastewater Management Plan that aims at monitoring the entire wastewater network and checking for any leakages, by the Local Authority.</p> <p>Continuous awareness of harmful practises and keeping of hazardous liquids should be undertaken by the Local Authority.</p> <p>The discharge of pesticides and herbicides in harmful quantities should be prevented. Pesticides and herbicides should not be used during periods of rainfall; and biodegradable pesticides and herbicides with short half-lives of three days or less should be used. It is recommended to rather use local indigenous flora throughout the landscaped areas and minimise any other plants, trees and lawns as part of the landscaping areas to minimise the necessity for any pesticides and herbicides.</p> <p>Ensure that surface water are channelled and captured through a proper storm water management system to be treated in an appropriate manner before disposal into the environment.</p>
Responsible Party	Proponent/Residents

3.2.3 Habitat Destruction and Loss of Biodiversity

Impact Description	The most destructive disturbance to the local habitat takes place during the construction phase, when the land is prepared for the intended infrastructure. The risk of further habitat destruction during the operational phase depends on the mind-set and environmental awareness of the residing community.
Mitigation Measures	<p>Conduct an erf-specific vegetation survey to establish protected/endangered tree/shrub species to be marked and incorporated into the erf layout. If required to remove indigenous trees, introduce a policy of re-establishing (i.e. planting) 5 indigenous tree species for each indigenous species removed. Permits should be obtained for protected plant species that unavoidably need to be removed.</p> <p>Incorporate the protected species as well as some of the other bigger tree/shrub specimens in the overall final landscaping of the erf. The bigger tree/shrubs often serve as habitat to a myriad of indigenous fauna – e.g. loose bark, cavities, etc. Indigenous species also require less</p>

maintenance and water than exotic species.

Show overall environmental commitment by adapting a minimalistic damage approach.

Avoid introducing potential invasive alien species – e.g. *Lantana*, *Prosopis*, *Opuntia*, *Tecoma*, etc. species – in the eventual landscaping (i.e. ornamental plants) as these have the potential of escaping and infesting the local surroundings.

No hunting, trapping, setting of snares or any other disturbance of any fauna species within the open areas.

Avoid unnecessary and excessive vegetation clearance and disturbance of top soil for purpose of landscaping. With regards to landscaping the following should be done –

- Landscaping should be done using local and indigenous vegetation.
- Lawns as part of the landscaping should be limited to the minimum.
- No alien species should be used as part of the landscaping.

Recreational activities should be done in a coordinated manner and of a minimum impact (e.g. hiking, cycling). Existing tracks should be used for purpose of hiking and cycling to restrict any further impact to the ecology.

Off-road driving should be strictly prohibited.

Residents should be informed and educated not to remove any plants or animals from the open areas.

Eliminate point discharges for storm water outflow and release storm water at the same rate as natural runoff restricting erosion and habitat loss.

Habitat corridors should be created by introducing culverts underneath the planned roads. This will enhance migration of small fauna species through the proposed development area.

Fencing of erven should be done not to restrict smaller animals from migrating. Fences should provide for the necessary spacing in between wires to allow smaller animals from moving freely. In the event of electrification, the bottom

	<p>wires should be for alarming purpose only and not for electrocuting as this will result in various deaths, especially smaller reptiles.</p> <p>Prevent the killing of species viewed as dangerous – e.g. various snakes – setting of snares (i.e. poaching) or collection of veld foods (e.g. tortoises).</p>
Responsible Party	Proponent/Residents

3.2.4 Visual Aesthetics and Sense of Place

Impact Description	<p>The operational phase consisting of various buildings and infrastructure will have an urban sense of place. The lasting visual aesthetics is determined by the architecture and scale of buildings, emphasised by the receiving environment's topography and vegetation cover.</p>
Mitigation Measures	<p>Keeping as much natural vegetation within the entire property to enable screening. Landscaping on ground level with indigenous trees and shrubs can soften the visual impact from the larger and immediate surroundings. This will increase the sense of place and make the development easier on the eye. Landscaping will further reduce noise impacts, glare and heat.</p> <p>Structures and buildings can be constructed or cladded with natural stone to blend with the colours of the immediate surroundings. Buildings should be painted with natural colours to promote blending with the natural environment and to lessen the visual impact.</p> <p>Care needs to be taken with reflective or bright surfaces so that glare is avoided.</p> <p>Large areas of bright colours are to be avoided although small areas of colourful accent may be used provided that the colours are chosen to compliment the environment. Generally, darker colours and neutral greys are proposed.</p> <p>Roofs are usually most visible and the finishes need to be chosen to reduce the visual impact from elevated positions. Neutral greys are generally most useful in making structures recessive.</p> <p>Light sources must be placed in such a way, or shielded, so as to provide light only to the area that needs to be lit. Light spillage and pollution must be minimised.</p> <p>Introduce architectural guidelines to minimise the impact (i.e.</p>

	reduce height of structure to the minimum; cover residential dwellings like structures to appear as natural as possible; etc.)
Responsible Party	Contractor/Proponent/Residents

3.2.5 Noise & Disturbance

Impact Description	<p>Apart from vehicle movement, no other noises of significance are associated with the operational activities. Noise disturbance from the C34 main road running through the town is to be expected.</p> <p>Urban developments of this scale and nature are not associated with activities generating unhealthy noise levels, such as industrial activities or agricultural activities. The increase in vehicle movement to and from the proposed developments will have a slight increase in traffic noise compared to the current status, but is expected to be of low significance.</p>
Mitigation Measures	Consider the existence of traffic along the roads during the design and orientation of dwellings.
Responsible Party	Contractor/Architects

3.2.6 Traffic & Safety

Impact Description	Operational activities in this respect are associated with vehicle movement of residents' and visitors' to and from the proposed developments.
Mitigation Measures	Proper road designs (soft bends, circles etc.) should be incorporated to limit speeding and maintained for the duration of the lifetime of the development.
Responsible Party	Contractor/Proponent

NEWSPAPER ADVERTISEMENTS

LOUIS JACQUES ESTERHUIZEN

NAME OF CONSULTANT: Louis Jacques Esterhuizen
PROFESSION: Town and Regional Planner /
 Development Planner / Environmental
 Practitioner
DATE OF BIRTH: 10 April 1971
NATIONALITY: Namibian
MEMBERSHIP IN PROFESSIONAL BODIES: Member of the Namibia Institute of Town
 and Regional Planners
 Registered at the Namibian Council for
 Town and Regional Planners

EDUCATION:

Institution:	Qualification:	Year Obtained:
University of the Free State, South Africa	B.A. (Sociology & Geography))	1993
University of Free State, South Africa	B.A. (Urban Geography)	1993
University of Free State, South Africa	MTRP (Masters in town & regional planning)	1995

RECENT WORK UNDERTAKEN THAT BEST ILLUSTRATES CAPABILITY TO HANDLE THE TASKS ASSIGNED:

Year: 2018
Location: Okahao
Client: Okahao Town Council
Main Project Features: Assisting with Scoping Assessment for Township Establishment of 3
 new Extensions in Okahao
Status: Clearance Certificate Obtained

Year: 2019
Location: Karasburg (Karas Region)
Client: Karasburg Town Council
Main Project Features: Scoping Assessment for Township Establishment of two extensions
 in Karasburg
Status: Approval Obtained

Year: 2019
Location: Tsandi (Omusati Region)
Client: Tsandi Village Council
Main Project Features: Scoping Assessment for Township Establishment of five extensions
 in Tsandi
Status: Approval Obtained

Year: 2021
Location: Tsandi (Omusati Region)

Client: Tsandi Village Council
Main Project Features: Assessment for the Township Establishment of Extension 12, Tsandi
Status: Awaiting Approval

EMPLOYMENT RECORD:

From: **2005 to date**
Employer: Winplan
Position Held: Town & Regional Planner / Environmental Practitioner

From: **2002 to 2004**
Employer: Urban Dynamics Africa
Position Held: Town & Regional Planner

From: **1996 - 2002**
Employer: Government of Namibia: Ministry of Regional and Local
Government and Housing
Position Held: Town and Regional Planner

LANGUAGES:

LANGUAGES	SPEAKING	READING	WRITING
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent

CERTIFICATION

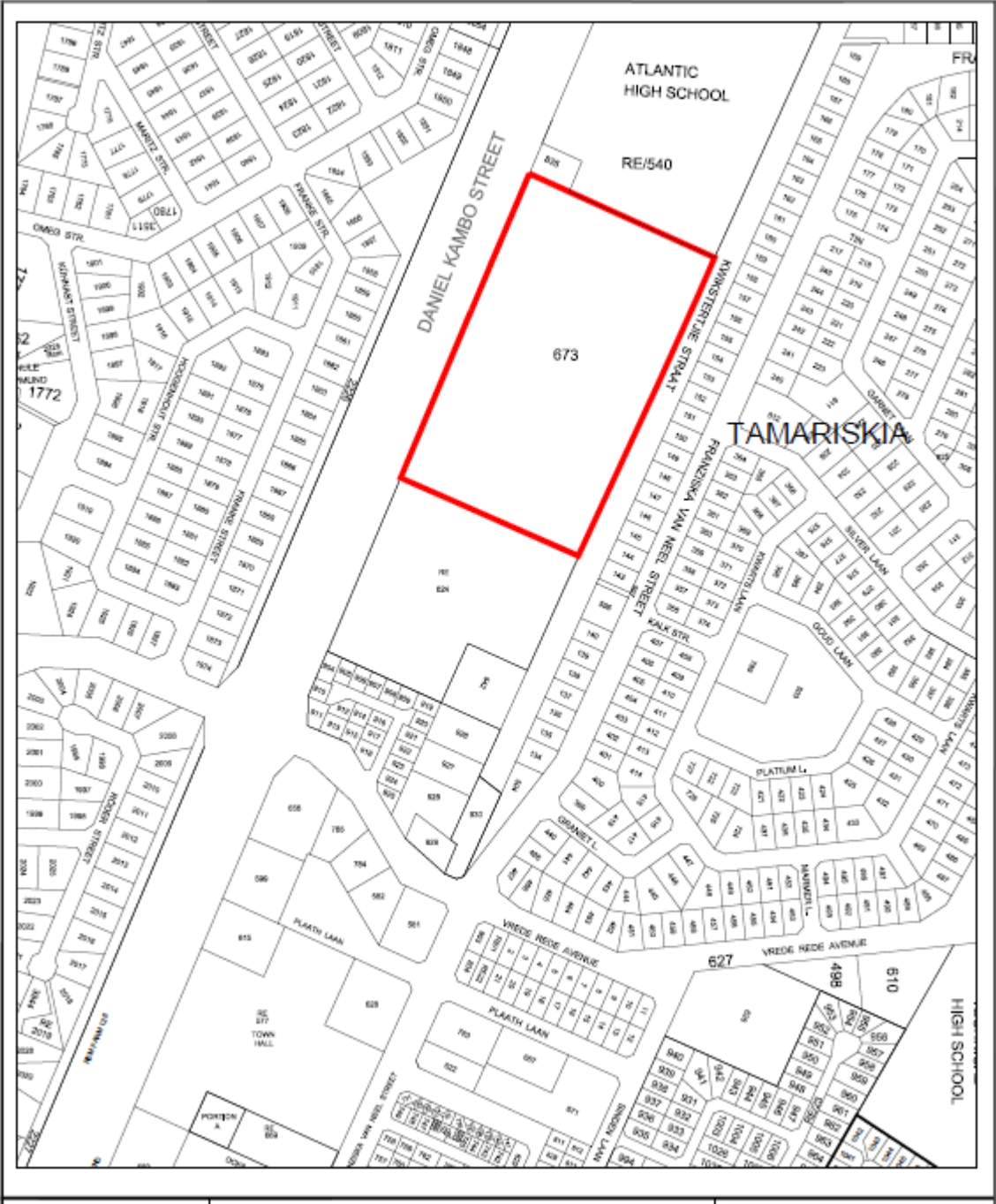
I, the undersigned, certify that to the best of my knowledge and belief, these data correctly describe me, my qualifications and experience.

Date: 1 March 2021



LOUIS JACQUES ESTERHUIZEN

LOCALITY MAPS OF THE PROPOSED AREAS



PRELIMINARY TOWNSHIP LAYOUTS

