

ENVIRONMENTAL IMPACT ASSESSMENT

FOR THE PROPOSED TOWNSHIP ESTABLISHMENT OF OPUWO EXTENSION 13 ON PORTION A OF OPUWO TOWNLANDS NO. 876, OPUWO TOWN, KUNENE REGION.



OCTOBER 2022

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Client

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LIST OF ABBREVIATIONS

| TERMS | DEFINITION |
|-------|--|
| EIA | Environmental Impact Assessment |
| EMP | Environmental Management Plan |
| DEA | Department of Environmental Affairs |
| PPPPs | Projects, Plans, Programmes and Policies |
| NDC | Namibia Development Consultants |
| SANS | South African National Standards |
| I&APs | Interested and Affected Parties |
| PM | Particulate Matter |

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1. INTRODUCTION

1.1 Project Overview

The Opuwo Town Council has put forth a proposal to establish Opuwo Extension 13 on proposed Portion A of Opuwo Townlands No. 876 situated in the jurisdiction of Opuwo Town Council located in the Kunene Region in north western Namibia. The township is primarily designed to cater for the youth of Opuwo, who are under the age of 35. The decision to establish a township for the youth of Opuwo was done consciously as the youth of this town and region are the most marginalized in Namibia. It will contain ±309 Erven of mostly residential nature and supporting land uses of businesses, institutional, public open spaces and civic use.

Nghivelwa Planning Consultants, a Town and Regional Planning and Environmental Management Consultancy firm has been appointed to conduct an Environmental Impact Assessment and Environmental Management Plan (EMP) for the proposed Opuwo Extension 13. The Environmental Impact Assessment has been conducted to meet the requirements of the Namibia's Environmental Management Act (No. 7 of 2007).

An EIA may be defined as: a formal process to predict the environmental consequences of human development activities and to plan appropriate measures to eliminate or reduce adverse effects and to augment positive effects.

Thus, an EIA has three main functions:

- To predict environmental problems,
- To find ways to avoid environmental problems, and
- To enhance positive effects.

1.2 Terms of Reference

The proposed establishment of Opuwo Extension 13 as a Township is a listed activity that cannot be undertaken without an Environmental Clearance Certificate. Therefore, as part of the commissioning process an Environmental Impact Assessment (EIA) is required. Thus, the Opuwo Town Council appointed Nghivelwa Planning Consultant to provide consultancy services to undertake an environmental impact assessment to comply with the Environmental Management Act, 2007 (Act no. 7 of 2007).

The Terms of Reference (ToR) for the consultants are, but not limited to the following:

- The collection of all possible data on the environmental, social and natural resource components and necessary parameters;
- A description of the location of the proposed project including the physical area that may be affected by the project activities;
- Description of the design of the proposed project;
- Description of the activities that will be undertaken during the project construction, operation and decommissioning phases;
- Listing of the materials to be used, products and by products, including waste to be generated by the project and the methods of disposal;
- Identification of the potential environmental impacts of the proposed project and
- The mitigation measures to be taken during and after implementation of the project;
- Accidents during the project cycle;
- Establishment of a plan to ensure the health and safety of the workers and neighboring communities;
- Identification of the economic and socio-cultural impacts of the proposed project;
- Economic and social analysis of the project including project risk and measures to mitigate them.
- Establishment of an action plan for the prevention and management of possible (EMP).
- The consultant will prepare recommendation on the project for its future use.

1.3 Acknowledgement

Nghivelwa Planning Consultant has prepared this EIA Report on behalf of the Opuwo Town Council. As the project proponent, the Opuwo Town Council has been extremely positive in providing necessary information and documents and also in providing necessary guidance during the undertaking of the study and during the preparation of this report. The Consultant (Nghivelwa Planning Consultant) gratefully acknowledges the help, advice and information provided by the Opuwo Town Council management as well as the support and interest shown by all the identified stakeholders.

1.4 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

This EIA Report was prepared by the following Environmental Practitioners:

| Name of representative of the EAP | Education qualifications | Professional affiliations |
|-----------------------------------|--|---|
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| Ndati-Onanawa Nangula Ndakunda | Master of Science in Integrated Environmental Management and Sustainable Development | Geoscience Council of Namibia Geoscience Council of Namibia, Environmental Scientist (EAPAN Member) |

2. EIA METHODOLOGY

The objective of the assessment of impacts is to identify and assess all the significant impacts that may arise from the undertaking of an activity and the findings used to inform the competent authority's decision whether the activity should be approved, approved subject to conditions that will reduce the impacts to within acceptable levels, or should be rejected. In this sense impacts are defined as the changes in an environmental or social parameter that result from undertaking the proposed activity. The following general methodology was used in this EIA of the proposed Township Establishment of Opuwo Extension 13; to investigate the potential impacts on the social and natural environment due to the construction and operation of the proposed township:

The key activities undertaken during the assessment included the following:

2.1 Establishment of the environmental baseline

This involved study and description of the receiving environment on which the proposed project is to be implemented. Thus, it involved a site visit, physical inspection of the study area's soil, biology, topography, animal species, water resources, climate and the local socio-economic environment.

2.2 Impact analysis

This involves the identification of impacts that are usually associated with the construction, operation or maintenance and decommissioning of the proposed activity and are generally obvious and quantifiable. These impacts were analyzed and evaluated.

2.3 Impacts mitigation

This involves the identification of the impacts and once impacts have been identified and predicted for a particular activity, then an appropriate mitigation measures need to be established. Mitigation

measures are the modification of certain activity in such a way as to reduce the impacts on the physical- and socio-economic environment. The objectives of mitigation are to:

- Find more environmentally sound ways of doing things;
- Enhance the environmental benefits of a proposed activity;
- Avoid, minimize or remedy negative impacts; and ensure that residual negative impacts are within acceptable levels.

Furthermore, impacts associated with all the stages of the proposed project were identified and mitigated. An Environmental Management Plan has been prepared as framework for mitigation of impacts and environmental monitoring of the project.

2.4 Review of alternatives

This entailed a review of the alternatives to the proposed project. This was aimed at determining better ways of avoiding or minimizing environmental impacts while still realizing the project goals. The review of alternatives provided opportunities for environmental enhancement. The alternatives reviewed were alternative sites and the no project alternative.

2.5 Public Participation Process (PPP)

This process for the public participation was done by contacting relevant stakeholders and Interested and affected parties. Advertisements for the public participation to participate and raise their concerns on the proposed project were placed in two (2) local newspapers of the New Era and Confidante of the 2nd and 9th of September 2022. The public and interested and affected parties were invited to provide comments to the EIA and no interested or affected party registered any comments. A public meeting was scheduled for the 23rd of September 2022. However, there were no participants at the meeting.

3. POLICY AND OTHER RELEVANT LEGISLATION

| SUBJECT | INSTRUMENTS AND CONTENT | APPLICATION TO THE PROJECT |
|---|--|--|
| <p>The Constitution of the Republic of Namibia</p> | <p>General human rights – eliminates discrimination of any kind</p> <p>The right to a safe and healthy environment</p> <p>Affords protection to biodiversity</p> | <p>Ensure these principles are enshrined in the documentation of the exploration project</p> |
| <p>Environmental Management Act EMA (No 7 of 2007)</p> | <p>Requires that projects with significant environmental impact are subject to an environmental assessment process (Section 27). Details principles which are to guide all EAs.</p> | <p>Ensure that the Township Establishment is carried out within the parameters of the Act.</p> |
| <p>Environmental Impact Assessment (EIA) Regulations GN 28-30 (GG 487)</p> | <p>Details requirements for public consultation within a given environmental assessment process (GN 30 S21). Details the requirements for what should be included in a Scoping Report (GN 30 S8) and an Assessment Report (GN 30 S15).</p> | |
| <p>Forestry Act No 27 of 2004</p> | <p>Provision for the protection of various plant species</p> | <p>Some species that occur in the area are protected under the Forestry Act and a permit is therefore required to remove the species</p> |
| <p>Hazardous Substances</p> | <p>Control of substances which may cause injury</p> | <p>The waste generated on site and at the campsite should be suitably</p> |

| | | |
|---|---|---|
| <p>Ordinance 14 of 1974:</p> | <p>or ill-health or death of human beings because their toxic, corrosive, irritant, strongly sensitizing or flammable nature</p> | <p>categorised/classified and disposed of properly and in accordance with the measures outlined in the Ordinance and Bill</p> |
| <p>The Nature Conservation Ordinance (No. 4 of 1975)</p> | <p>Prohibits disturbance or destruction of protected birds without a permit. Requires a permit for picking (the definition of “picking” includes damage or destroy) protected plants without a permit</p> | <p>Protected plants will have to be identified during the planning phase of the project. In case there is an intention to remove protected species, then permits will be required</p> |
| <p>Forestry Act 12 of 2001 Nature Conservation Ordinance 4 of 1975</p> | <p>Prohibits the removal of any vegetation within 100 m from a watercourse (Forestry Act S22(1)). Prohibits the removal of and transport of various protected plant species.</p> | <p>Even though the Directorate of Forestry has no jurisdiction within townlands, these provisions will be used as a guideline for conservation of vegetation.</p> |
| <p>Convention on Biological Diversity, 1992</p> | <p>Protection of biodiversity of Namibia</p> | <p>Conservation-worthy species not to be removed if not absolutely necessary.</p> |
| <p>Water Act 54 of 1956 Water Resources Management Act 24 of 2004</p> | <p>The Water Resources Management Act 24 is presently without regulations; therefore, the Water Act 54 is still in force The Act provides for the management and protection of surface and</p> | <p>Obligation not to pollute surface water bodies</p> |

| | | |
|---|---|--|
| | groundwater resources in terms of utilisation and pollution | |
| National Heritage Act 27 of 2004 | Section 48(1) states that “A person may apply to the [National Heritage] Council [NHC] for a permit to carry out works or activities in relation to a protected place or protected object | Any heritage resources (e.g. human remains etc.) discovered during construction requires a permit from the National Heritage Council for relocation |
| Labour Act 11 of 2007 | Details requirements regarding minimum wage and working conditions (S39-47). | Employment and work relations |
| Health and Safety Regulations GN 156/1997 (GG 1617 | Details various requirements regarding health and safety of labourers. | Protection of human health, avoid township establishment at areas that can impact on human health. |
| Public Health Act 36 of 1919 | Section 119 states that “no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.” | The Opuwo Town Council should ensure that all contractors involved during the construction, operation and maintenance of the proposed project comply with the provisions of these legal instrument |
| Water Act 54 of 1956 | The Water Resources Management Act 24 of 2004 is presently without regulations; therefore, the Water Act No 54 of 1956 is still in force: Prohibits the pollution of underground and surface water bodies (S23(1)). Liability of clean-up costs after closure/ abandonment of an activity (S23(2)). | The protection of ground and surface water resources should be a priority. The main threats will most likely be concrete and hydrocarbon spills during construction and hydrocarbon spills during operation and maintenance. |

| | | |
|---|--|---|
| Urban and Regional Planning Act no 5 of 2018 | Details the functions of the Urban and Regional Planning Board including their consideration when assessing an application for Township Establishment (S3) | The proposed layout and land uses should be informed by environmental factors such as water supply, soil etc. as laid out in Section 3. |
|---|--|---|

Table 1: Relevant Legislation

4. NEED AND DESIRABILITY OF THE PROPOSED PROJECT

The Opuwo Town Council aims to provide affordable housing to the towns inhabitants as mandated by the Local Authorities Act, 1992 (Act 23 of 1992) as amended. The Namibian Constitution guarantees the right to shelter as a fundamental human right and it recognizes the need for government to provide affordable housing to the population of the country. Since independence in 1990, The Government of Republic of Namibia has made housing provision as a priority to redress the social and economic inequalities that existed due to apartheid laws.

The government has however met a couple of challenges in the provision of affordable housing in the country and the economic inequality has on gotten worse over the years. Thus, the Opuwo Town Council has resolved to help the central government by developing affordable housing for the people of Namibia. Thus, the town council is in the town planning process for the subdivision of Opuwo Townlands No. 876 into Portion A and Remainder and develop Opuwo Extension 13 on the proposed Portion A/876.

The proposed township will cater for the youth of Opuwo who are under the age of 35 to grant them access to housing and economic activities in the town. It is a well-known fact that the Kunene Region in one of the most marginalized regions in Namibia, the unemployment rate is higher than the countries average. This situation is exacerbated by the fact that a large number of the unemployed do fall in the youth category, the unemployed youth are more vulnerable to take up illegal activities and drive up the crime rate of the town. Therefore, the Opuwo Town Council decided to empower the town's youth by allocating land to unlock the potential economic development of the town.

The development will consist of 309 single residential, general residential, businesses, office, accommodation, institutional, sport, local authority and public open space erven. The development will be encouraged to use energy from renewable sources and will be the first public development of its kind to generate its own electricity from solar power. The sewerage generated will be treated and recycled within the Opuwo Town Council sewer reticulation systems.

5. SCOPE OF THE EIA

The objectives of the scope of the EIA were to ascertain key issues of the environmental impacts that are likely to be important during all the phases of the Project. Relevant environmental data has been compiled by making use of primary data which was collected during the site assessment done on the 9th of September 2022 and by using secondary data already available. Potential environmental impacts and associated social impacts were identified and addressed in this report.

The construction and operational phases of the proposed Township Establishment will involve;

- The preparation of the site, including excavations.
- Transportation of construction materials.
- Off-loading of materials
- The constructions of the buildings and other substructures
- The constructions of the streets (Roads).
- The constructions of bulk services infrastructure such as portable water, electrical infrastructure and sewerage networks.
- The supply of bulk services such as water, electricity, waste disposal plan and waste management
- The Maintenance of the township by Opuwo Town Council.
- Maintance of all service infrastructure constructed will be done by the proponent.

The Environmental Impact Assessment study report includes an impact assessment and mitigation measures for the three phases of the proposed project following:

- The field investigations (site assessment),
- Identifying and involving all stakeholders in the Environmental Impact Assessment process by expressing their views and concerns on the proposed project;
- Identify all potential significant adverse environmental and social impacts of the project and recommend mitigation measures to be well described in the Environmental Monitoring Plan (EMP);
- Coordination with the proponent, regarding the requirements of law of Namibia's Environmental Management Act (No. 7 of 2007) and other relevant policies and administrative framework.
- To define the Terms of Reference for the Environmental Impact Assessment study.
- A review of the policy, and relevant legislations
- To provide overall assessment information of the social and biophysical environments of the affected areas by the proposed development.

6. DESCRIPTION OF THE PROPOSED ACTIVITY

The proposed activity is for the establishment of a ±309 erven township of different land uses to be used for the construction of medium to low cost houses, business and offices buildings etc. The activity involves the constructions of bulk services such as sewer water reticulation, electricity, streets, portable water and constructions of dwellings.

It also includes the maintenance of the site during the operational phase such as waste disposal, noise pollution as well as maintenance of the afore-mentioned municipal services. The proposed site is situated near existing Opuwo Municipal infrastructure of Opuwo Extension 8. The proposed development will obtain access from the main road leading into Opuwo Town.

All new erven to be created will be connected to the bulk services and the water-borne sewage will be connected to the sewerage reticulation system of Opuwo, the harmful residue that is created will be transported to the waste disposal site as provided by the Opuwo Town Council. The land is currently not developed and is not reserved for future townships development. Thus, the proposed township development is consistent with future plans of the town.

6.1 Proposed location and land ownership

The proposed Portion A of Opuwo Townlands No. 876 is owned by the Opuwo Town Council and currently measure 52,3 Hectares in extent. It is situated on the property legally known as Opuwo Townlands No. 876, Opuwo Town, Kunene Region as shown in Figure 1 below. The site is currently vacant. The proposed site is located in the southern corner of Opuwo Townlands. The GPS coordinates of the location of the proposed project site are 377901.00E, 8001638.00S.

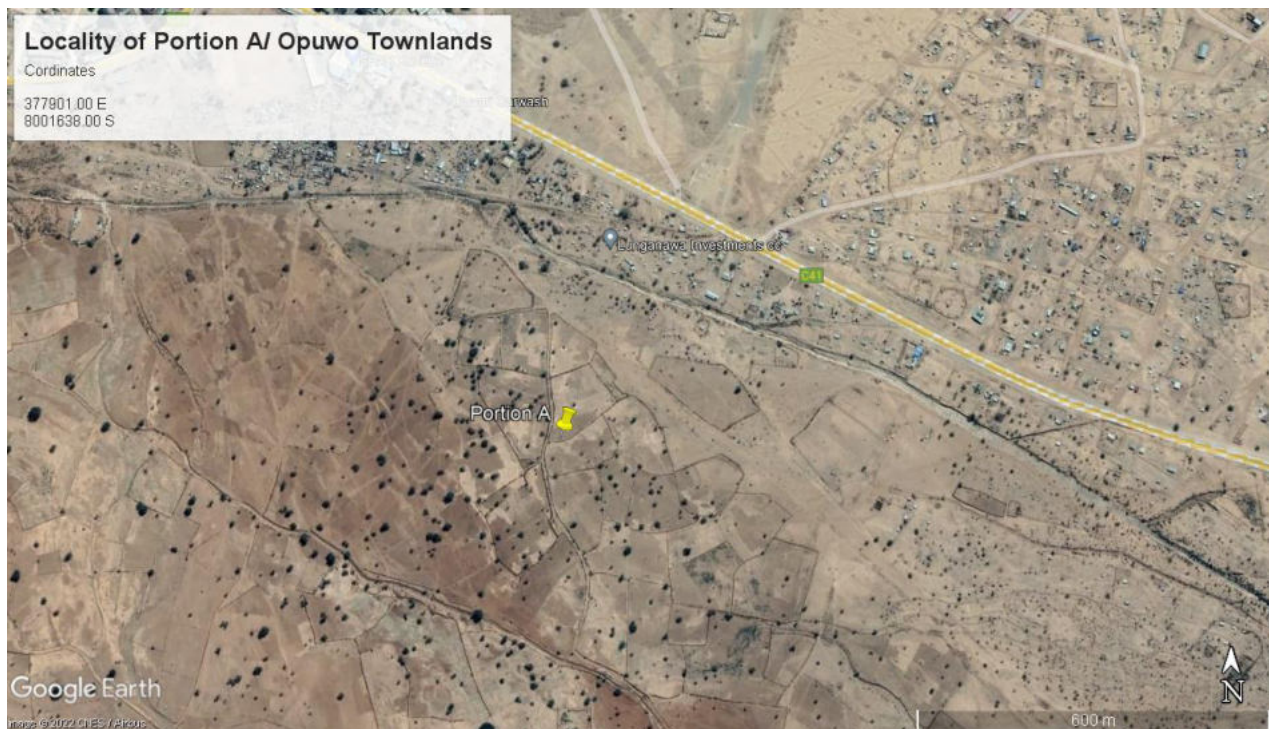


Figure 1: Locality Map

6.2 Ownership

The proposed development is a property of Opuwo Town Council. The Opuwo Town Council will be managing the development during the construction and operational phase. The proposed erven would then be sold to medium to low-income youth residents of Opuwo

6.3 Description of the site

- The slope of the site is relatively flat, with water streams running on the western and eastern edges of the proposed Portion A/876.

- No characteristics of ground slope instability were observed on site.
- There was no ground surface water during the site investigation.
- There is erosion in some areas due to flood water.
- Medium excavations can be expected but no blasting operations are fore seen.

6.4 Photographic History

Below are the photographs indicating the general situation and environment of the proposed site and its surroundings.

1. Typical condition of the proposed site;



6.5 Description of the proposed project

The Opuwo Town Council proposed the establishment of a township to be known as Opuwo Extension 13 situated on Portion A of Opuwo Town Land No. 876 which involves the construction of bulk services such as sewer water reticulation, Electricity, Streets, water, dwellings, the maintenance of the site during operational phase, waste disposal from site and noise pollution control as well as technical maintenance of the afore-mentioned services. The proposed development will be of medium to low cost houses, general residential dwellings, businesses and public open spaces. The development is however still in the designing phase and plans can change pending statutory approval. However, the layout of the site is shown in figure 2 below.

6.6 Proposed Project Activities

The proposed development entails township establishment and related infrastructure of ±309 erven on a 52,3-hectare Portion A of Opuwo Townlands No. 876. The subdivision plan for the proposed township is shown in figure 2 below.



Figure 2: Subdivision layout of Opuwo Extension 13

6.7 Engineering Services

The proponent is proposing the establishment of a “medium to low-income” township, as detailed below. The proposed development of ±309 erven consisting of Residential, General Residential, Business, Office, Institutional, Sport, Accommodation, Civic, Public Open Spaces and public roads. The township establishment will require bulk engineering services as per the standard engineering requirement and to make it safe for habitation of people.

6.7.1 Bulk Infrastructure

The proposed bulk services will be designed and constructed from scratch and will use the latest technology in terms of sustainable use of resources, recycling and sustainable energy generation.

a) Water

The existing infrastructure is not adequate to supply the proposed development thus, the proposed development will require the construction of a new water infrastructure that will be connected to the existing Opuwo water infrastructure systems. All water infrastructure will have to be designed and constructed from scratch to allow for the proposed development to take place. The proposed development will require about 30 cubic meters of water per day.

b) Sewerage

The existing bulk infrastructure is not adequate to carry the load of a further waterborne sewerage reticulation system, thus additional infrastructure as well as additional pump stations will be constructed in this regard so that the infrastructure can be adequate enough to pump the effluent produced by the proposed development.

The proponent will construct additional sewer water infrastructure on site that will be used to pump sewerage water into the existing Opuwo Sewerage water system and pumped into the Opuwo Town sewerage ponds that are situated in the northern side of the town.

c) Electricity

Opuwo Extension 3 will get electricity from the existing electricity network of Opuwo Town through the Otuzemba substation that is located about 1km on the north eastern side of the town. Should existing electricity infrastructure not have sufficient capacity to power the proposed development, the town council is prepared to engage the power utility company to increase this capacity.

d) Storm water

A storm water drainage system will be constructed in the property, using the existing storm water channels that have been accommodated within the layout design. A system of channels will be constructed along the streets of the proposed development to safely guide the storm water out of the site.

e) Waste Produced

The waste to be produced throughout the proposed development will be dumped (disposed of) at the nearest Opuwo Town Council dumping site. The Opuwo Town Council will manage the day to day waste disposal activities of the new township. A standard waste disposal municipal levy will be charged on the residents to make sure that the waste is disposed of in a safe manner.

f) Roads

All roads to be constructed in the proposed development will be tarred roads and the main access to the development will be obtained from the main road that is situated on the eastern side of the property. A 20-meter main street will connect the property to the main road and will be used as the main access artery to the proposed development.

6.7.2 Blasting

The topography of the proposed Portion A of Opuwo Townlands No. 876 is flat and there are no hills or rock formation on the property. Thus, there is no blasting that is required during the construction of houses and services for the proposed development. All ditches to be constructed will utilize traditional non-blasting methods.

6.8 Phases of the project

The project will consist of three (3) phases, namely the construction, operational and possible decommissioning phase.

6.8.1 Activities during the Construction Phase

a) Site Office

The contractor shall construct a temporary site office to run and manage all activities on site during this phase.

b) Site clearance and fencing

This will involve clearance of vegetation that is currently found at the proposed site. The site will then be isolated for public safety and for the security of construction material and equipment.

c) Excavation

Excavations for the installation of bulk services and construction of buildings and other substructures as per the engineering designs. This will use appropriate excavation equipment. This process will generate waste in form of spoil soil and rock particles.

d) Construction of public structures

The Opuwo Town Council will construct the following public structures for the inhabitants of Opuwo Extension 13 as proposed:

- Various public parks long the main water course
- A sports complex and track field
- Constructions of residential erven
- Public recreational areas (Open space)
- Sewage reticulation
- Electricity supply
- Portable water supply
- Associated piping work

6.8.2 Activities during the operation and maintenance phase

During this phase, the Opuwo Town Council, the proponents of this project; will be responsible for the following:

- Maintenance of the site during operational phase such as waste disposal from site to the recognised waste disposal site;
- Controlling the noise pollution in the area;
- Technical maintenance of the bulk services.

6.8.3 Activities at the decommissioning phase

In this stage of the development, it is deemed unnecessary to decommission the project because the area has potential to accommodate the proposed development. The proposed site is located on a fair site with no mineral resources which might lead to the decommissioning of the project. The proposed development will not affect the neighbours and locals in a negative way. Therefore, there will be no need for decommissioning the project in the near future.

7. BASELINE DATA

7.1 Climatic conditions

The Kunene Region annual rainfall figures increase from the west (Namib Desert) towards the eastern part of the region from less than 50 mm to 415 mm per annum and are very sporadic. Like the rest of the country, the region has an arid climate and a very short wet season, mainly extending from February to April. Rainfall also tends to decline from north to south. The first rains, though very little, usually fall in October and November followed by a dry spell in December.

The western parts of the region usually receive fewer rains than the eastern parts. The climate of the region is dry for most of the year and characterized by dust storms especially from August to October (Citation: MoHSS). The terrain is semi-arid and gradually becomes desert land towards the skeleton coast.

Summer day temperatures are often very hot reaching up to 35 degrees centigrade with minimum temperatures of 14 degrees centigrade on average. During winter months, the temperatures can range from an average of 5 to 26 degrees centigrade.

7.2 Geology, Topography and drainage

The Kunene Region's physical geography is one of the virgin landscapes in the entire country. The natural mountainous landscape, rocks, minerals, soil, underground water, springs and rivers represent the region's valuable resources. Rock formation presents some mining potential that could benefit the region economically.

The soil, underground aquifers, springs and perennial rivers have a major influence on agricultural production and tourism in the region. Kunene Region is a paradise of geological formations dating back to 250 million years, with interesting spectacular rock formations that are clearly exposed. The region consists of a great variety of rock formations, most of them exposed in landscapes of valleys, escarpments, mountains and open plains.

7.3 Soils

The **Ferralsols** (also known as laterite soils) in the Upper and Middle Kunene are deep, intensively weathered soils and have good physical properties (strong water retention) but are chemically poor. Their low natural fertility is a serious limitation for intensive agriculture. As liming and full fertilization are required for sustainable sedentary agriculture, Ferralsols in the basin are used mainly for shifting cultivation or for grazing.

Arenosols are the dominant soil in the Middle Kunene and are sandy soils that developed from residual rock weathering and have lost all primary minerals other than the coarse grained quartz. The texture is accountable for the high permeability and low water and nutrient storage capacity. However, their ease of cultivation, rooting and harvesting of root and tuber crops, makes them relative intensively cultivated. Under the conditions of the basin, these soils are best left under their natural vegetation as nutrient elements are all concentrated in the biomass in the top 20 cm of the soil.

Luvisols have a clay alluviation horizon formed by the translocation of clay from the surface soil. They have favourable physical properties and are generally fertile soils suitable for a wide range of agricultural uses.

Fluvisols cover only 2 % of the area in the Middle Kunene and are young, azonal soils in alluvial deposits, receiving fresh sediment during floods. The Fluvisols are confined to narrow strips of land adjacent to the actual riverbed. These soils are fertile and are intensively cultivated with food crops and orchards or used for grazing. Flood control, drainage and/or irrigation are often required.

Vertisols are heavy, clay soils with a high proportion of swelling clays and forming deep wide cracks when they dry out. Given their good chemical fertility, these soils have a considerable agricultural potential but appropriate management is a precondition for sustained production. Currently, large areas are still only used for extensive grazing, fuel wood gathering or charcoal burning.

Leptosols cover 75 % of the Lower Kunene. These are generally very shallow soils over hard rock, although they can also be deeper, and are extremely stony. These soils are not used for arable cropping, and have a limited potential for tree crop production or extensive grazing.

Cambisols are young soils with a beginning horizon differentiation derived from slight or moderate weathering of a wide range of rocks. The soils have limited use for agricultural production because of shallowness, stoniness and low base status.

7.4 Fauna

During the site inspection, no large animals were observed on the proposed site. However, borrows of small animals were observed and it is believed that a large number of them reside in the area. Most of these small animals adapt well to urban environments and it is expected that their populations will not be affected by the proposed development. On the contrary, the increase in the foraging food will boost the populations of these small animals.

7.5 Flora

The proposed site has minimal vegetation, apart from shrubs and grass that seasonally grows in the area. Based on the physical observations on the proposed site, it was observed that there was no visible number of vegetation apart from a few large camelthorn trees that will be preserved and incorporated into the town planning designs.

The clearing of land to make way for the development will preserve the large trees that are found in the property. No red data or endangered species were noted / recorded during the site visit, Thus an ecological study was not necessary for this project.

8. SOCIO-ECONOMIC ENVIRONMENT

Kunene Region is home to 86,856 inhabitants (Census, 2011), representing 4% of the Namibian population. The region's population has grown by 26% since the 2001 census. The region is one of five regions with a population less than 100,000. A total of 44,968 (52%) inhabitants live in the northern parts of the region. This relative concentration of people in the northern constituencies is largely a result of communal land use and better conditions for animal husbandry and small-scale crop farming, compared to southern Kunene, which is predominately communal with some commercialized parts.

The region's total population of 86,856 is made up of 43,253 female inhabitants and 43,603 male inhabitants. The male/female population ratio is 50:49 (Census, 2011:30). The Opuwo and Outjo constituencies are the most densely populated areas of the region. The region is predominantly young with a median age of 19, (Census, 2011). The same report indicates that the median age for the region's urban inhabitants is 24 years, which is higher than the rural population. This is due to the migration of the working age population to urban areas.

9. ANALYSIS OF ALTERNATIVES

In terms of environmental impact assessment best practice, assessment of potential impacts from a proposed activity must include the assessment of alternatives. Assessment of alternatives is undertaken to identify the option that will minimise harm to the environment and may include site, technology and other alternatives, but must always include the option of not implementing the activity, known as the "no-go" alternative.

9.1 Alternative Site

The proponent has the option of undertaking the proposed development in a different location other than the chosen site. This could also entail acquiring land elsewhere to carry out the development. However, the Opuwo Town Council is confined to the land within Opuwo Townlands that falls

under its jurisdiction. The proposed Portion A is already earmarked for the future expansion of Opuwo Town and is ideal for this development.

Due to the fact that the proposed portion of land is already earmarked for the development of this kind and is close enough to the existing municipal services, Alternative 1, is the only site that is identified for the establishment of a township. Therefore, no alternative site has been identified or considered during this study.

The following reasons justify the use of the proposed site for the development:

- The land already belongs to Opuwo Town Council;
- The proposed development will empower the youth of Opuwo Town by providing access to residential and commercial opportunities;
- It will accommodate previously disadvantaged individuals who cannot afford houses;
- It will create job opportunities for the local community in both construction and operational phases which will improve their skills.
- There is adequate space for the proposed development on the proposed land which is 52 hectares.
- The proposed site will be located at a suitable location that will avoid problems associated with traffic system.

9.2 The “No Project” Alternative

The No-Go Option is the option not to proceed with the activity, implying a continuation of the current situation/ status quo. Therefore, the No-go Alternative would mean that the proposed township establishment on Portion A of Opuwo Townlands No. 876 for the development of a new township would not be constructed at the proposed site and the land would remain undeveloped.

Should the proposed township establishment not take place, the shortage of housing will persist within the Opuwo Local Authority area and this can have long term negative effects on the social stability of the area. From the environmental-socio-economic point of view, the no project option is the least preferred option due to the following factors:

- Vacant land may result in informal settlement development.
- There will be a backlog in housing, which may lead to social unrest as the community's needs are not addressed.
- No employment opportunities will be created for the locals who would work on the project.
- Poverty will not be eradicated in terms of job creations.
- The local skills would remain underutilized.
- Reduced technology advancement at the village and interaction both at local, national and international levels.
- Promotes vegetation clearing for firewood

This is therefore not a desirable alternative as the option.

10. PUBLIC PARTICIPATION PROCESS (PPP)

This section of the report provides details of Public Participation Process (PPP) undertaken in the compilation of the EIA final report. In terms of Section 26(1)(h) of the Namibian Environmental Assessment Regulations (2012), it is a requirement to provide details of the public participation process conducted in accordance with Section 32 of the Environmental Assessment Regulations.

Furthermore, the Public Participation forms an important component of this EIA. It has been defined by the Ministry of Environment and Tourism that an Environmental Assessment Regulations (2012) of the Environmental Management Act (2007), as a process in which potential interested and affected parties such as neighbouring landowners, local authorities, environmental groups, village councils and communities, to comment on the potential environmental impacts associated with the proposed Township Establishment project are given an opportunity to comment on, or raise issues relevant to the proposed project and its benefits to the nation and to Namibia's economy.

Apart from these legal requirements, Consultations with the general public and other relevant stakeholders to ensure that their inputs are taken into account during the decision-making process was carried out as per the EIA regulations.

10.1 Aim for Public Participation Process (PPP)

The aims for the Public Participation Process are but not limited to; -

- Informing Interested and Affected Parties (I&APs) of the proposed project;
- Identifying issues, comments and concerns as raised by I&APs;
- Promoting transparency and an understanding of the project and its consequences;
- Serving as a structure for liaison and communication with I&APs; and
- Providing local knowledge and input in identifying potential environmental (biophysical and social) impacts and “hotspots” associated with the proposed development.

10.2 Compilation of stakeholder database

The first step in the Public Participation Process (PPP) is to identify key stakeholders. A stakeholder database was compiled and the target groups for this project were invited to comment on the proposed development, A site meeting was held on the 9th September 2022. The following were invited to Comment:

- Opuwo Town Council (as the approving authority for town planning projects and service provider for bulk services).
- Opuwo Urban Constituency Councillor
- Kunene Regional Council
- Kunene Directorate of Youth Development

10.3 Background Information Document

This document provides a short summary of the project and the EIA process. Therefore, a background information document (BID) was prepared and was ready to be distributed to Interested & Affected Parties. After all stakeholder and I&APs were informed none of them requested for the Background Information Document (BID). See a copy of the BID attached.

10.4 Notification of I&Aps

The requirements for the notification of potentially interested and affected parties of this application are set out in detail in section 32(2)(b) of the EA regulation. These requirements have been addressed and include;

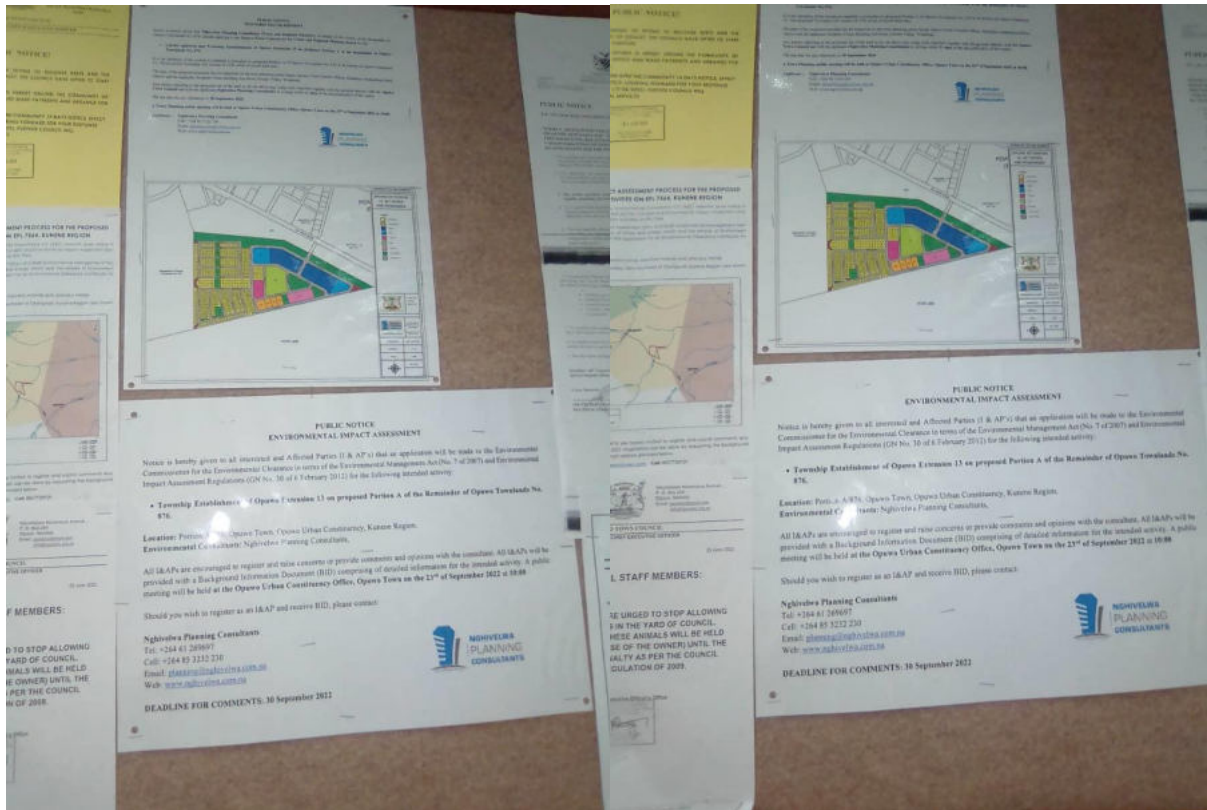
- Forwarding letters to government authorities and other identified relevant stakeholders;
- Fixing a notice board at a place conspicuous to the public in English;
- Placing advertisements twice in at least two local newspapers.

10.5 Advertisement

The advertisement of the public participation and submission of comments for the proposed project were placed in two national newspapers circulating in the Local Authority Area of Opuwo, the New Era and Confidante Newspapers dated: 2nd and 9th September 2022. Proof of advertisements are attached.

10.6 Notice Board

An A3 size notice detailing information about the project and the EIA process was at the Opuwo Town Council notice board on the 2nd September 2022.



A3 notice on notice board

An A3 size notice detailing information about the project and the EIA process was on site on the 2nd September 2022.



A3 notice on site

10.7 Public Meeting

In compliance with the EIA Regulations (2012), public (I&AP) and all stakeholders were notified as a requirement for EIA process. Therefore, to incorporate the varying needs of stakeholders and I&APs, as well as to ensure the relevant interactions between stakeholders and the EIA specialist team; A public meeting took place on the 23rd of September 2022 but none of the I&Aps or stakeholders showed up for the meeting.

10.8 Issues raised by interested and affected parties

Letters for comments were sent to the identified key stakeholders for comments and none of the identified stakeholders shared their comments. This can be attributed to the fact that this is a positive development that will empower the youth of the town and the leaders in the area are in support of this project.

11. ENVIRONMENTAL ASSESSMENT METHODOLOGY

An appraisal of the type of effects the proposed township establishment would have on the affected environment; rate as either positive (beneficial on the environment), neutral (no impact on the environment), or negative (adverse impact on at a cost to the environment).

| Rating | Description |
|--------|---|
| 1 | Negligible / non-harmful / minimal deterioration (0 – 20%) |
| 2 | Minor / potentially harmful / measurable deterioration (20 – 40%) |
| 3 | Moderate / harmful / moderate deterioration (40 – 60%) |
| 4 | Significant / very harmful / substantial deterioration (60 – 80%) |
| 5 | Irreversible / permanent / death (80 – 100%) |

Table 2: Assessment and Rating of Severity

| Rating | Description |
|--------|---|
| 1 | Less than 1 month / quickly reversible |
| 2 | Less than 1 year / quickly reversible |
| 3 | More than 1 year / reversible over time |
| 4 | More than 10 years/ reversible over time/ life of project or facility |
| 5 | Beyond life of project or facility/ permanent |

Table 3: Assessment and Rating of Duration

| Rating | Description |
|--------|--|
| 1 | Within immediate area of the activity |
| 2 | Surrounding area within project boundary |
| 3 | Beyond project boundary |
| 4 | Regional/ Provincial |
| 5 | National/ International |

Table 4: Assessment and Rating of Extent

Consequence is calculated as the average of the sum of the ratings of severity, duration and extent of the environmental impact.

| | |
|----------------------------------|---|
| Determination of Consequence (C) | $(\text{Severity} + \text{Duration} + \text{Extent}) / 3$ |
|----------------------------------|---|

Table 5: Determination of Consequence

| Rating | Description |
|--------|-----------------------|
| 1 | Less than once a year |
| 2 | Once in a year |
| 3 | Quarterly |
| 4 | Weekly |
| 5 | Daily |

Table 6: Assessment and Rating of Frequency

| Rating | Description |
|--------|-------------------|
| 1 | Almost impossible |
| 2 | Unlikely |
| 3 | Probable |
| 4 | Highly likely |
| 5 | Definite |

Table 7: Assessment and Rating of Probability

Likelihood

Likelihood considers the frequency of the activity together with the probability of the environmental impact associated with that activity occurring.

| | |
|-----------------------------------|---|
| Determination of Likelihood (L) = | $(\text{Frequency} + \text{Probability}) / 2$ |
|-----------------------------------|---|

Table 8: Determination of Likelihood

Environmental Significance

Environmental significance is the product of the consequence and likelihood values.

| Rating | Description |
|----------------|--|
| L (1 - 4.9) | Low environmental significance |
| LM (5 - 9.9) | Low to medium environmental significance |
| M (10 - 14.99) | Medium environmental significance |
| MH (15 - 19.9) | Medium to high environmental significance |
| H (20 - 25) | High environmental significance. Likely to be a fatal flaw |

Table 9: Determination of Environmental Significance

11.1 Impacts Associated with Construction Phase

Potential effects on the environment and their mitigation measures during construction are:

Air Quality Impacts- These are expected to be site specific, short-termed and will most probably pose a negligible nuisance and health threat to those residing nearby. The construction of the proposed township will have impact on the surrounding air quality as construction vehicle will be frequenting the site and surrounding areas. The clearing of vegetation in preparation for construction exposes the soil to dust which increases the Particulate Matter concentration in the atmosphere. PM is contributing to respiratory tract infections, especially in rural areas much like the proposed site.

| | Severity | Duration | Extent | Consequence | Frequency | Probability | Likelihood | Status | Confidence/ Significance |
|---|----------|----------|--------|-------------|-----------|-------------|------------|----------|-----------------------------|
| Unmitigated | 5 | 5 | 3 | 4.33 | 5 | 5 | 5 | Negative | 9.33(LM) |
| Mitigation measures: Dust may be generated during the construction/decommissioning phase and might be aggravated when strong winds occur therefore; dust suppression during the construction process is advised if dust becomes an issue. Vehicles travelling to and from the construction site must adhere to the speed limits so as to avoid producing excessive dust. A speed limit of 40 km/hr should be set for all vehicles travelling over exposed areas. Loads of sand could be covered to avoid loss of materials during transport, especially if material is transported off site. | | | | | | | | | |
| Mitigated | 2 | 2 | 1 | 1.66 | 1 | 2 | 1.5 | Negative | 3.16 (L) |

Employment Creation (Positive Impact) job creation and economic benefit to the local community since the construction activities associates with the municipal infrastructure will require labourers from Opuwo.

| | Severity | Duration | Extent | Consequence | Frequency | Probability | Likelihood | Status | Confidence/ Significance |
|---|----------|----------|--------|-------------|-----------|-------------|------------|----------|-----------------------------|
| Unmitigated | 1 | 2 | 2 | 1.66 | 2 | 5 | 3.5 | Positive | 5.16 (LM) |
| <p>Mitigation measures:</p> <p>Various employment opportunities will be created during all phases of the development, ranging from highly skilled to unskilled. The development is expected to create more than 50 skilled and unskilled jobs. Preference should be given to local residence and to Namibian Citizens.</p> <p>When recruiting, the responsible contractor should ensure gender equality is taken into account and that both men and women are employed equally.</p> <p>Equity, transparency, should be taken into account when hiring and recruiting and that Public Participation I.e. Community Leaders or Community committees should also take part in the recruiting process.</p> <p>In terms of human resource development and capacity building, the contractor must enforce training programs that allows skilled workers to train unskilled workers when necessary, in order for them to enhance their performances and to gain experience for future employment oppportunities.</p> | | | | | | | | | |
| Mitigated | 1 | 2 | 5 | 2.66 | 3 | 5 | 4 | Positive | 6.66 (LM) |

Noise caused by construction activities- Noise levels are expected to rise during the construction phase of the development. Construction activities that can cause noise include construction vehicles, electricity generators, pressure hammers and voices of construction workers and earthmoving equipment which will be utilized during the construction phase. However, all neighboring buildings are at least 50m from the proposed site. The project site is currently adjacent to business area and an informal residential area that will be relocated in future. The construction of the township will disturb residents at a limited extent as the construction activities will be isolated from the existing properties. Therefore, the noise levels that are likely to occur during this phase are not assessed to be a nuisance to the residents.

| | Severity | Duration | Extent | Consequence | Frequency | Probability | Likelihood | Status | Confidence/ Significance |
|---|----------|----------|--------|-------------|-----------|-------------|------------|----------|-----------------------------|
| Unmitigated | 4 | 5 | 2 | 3.66 | 5 | 5 | 5 | Negative | 8.66 (LM) |
| <p>Mitigation measures:</p> <p>Construction should be limited to normal working days and office hours from 08h00 to 17h00 and 7:30 – 13:00 on Saturdays.</p> <p>No construction activities may be undertaken on Sunday.</p> <p>Provide ear plugs and ear muffs to staff undertaking the noisy activity or working within close proximity thereof or alternatively, all construction workers should be equipped with ear protection equipment.</p> <p>Noise pollution should be addressed and mitigated at an early stage of construction phase.</p> | | | | | | | | | |
| Mitigated | 1 | 1 | 1 | 1 | 1 | 1 | 1 | Negative | 2 (L) |

Soil Loss and Erosion- Loss of topsoil during the construction period caused by the clearing and removal of vegetation, the digging of structure foundations, and earthworks may expose soils to wind and rain and could result in localized erosion.

| | Severity | Duration | Extent | Consequence | Frequency | Probability | Likelihood | Status | Confidence/ Significance |
|--|----------|----------|--------|-------------|-----------|-------------|------------|----------|-----------------------------|
| Unmitigated | 4 | 3 | 3 | 3.33 | 5 | 5 | 5 | Negative | 8.33 (LM) |
| Mitigation measures: Removal of vegetation to take place only within demarcated construction site. No work is to be conducted within 30 metres of all drainage lines; Topsoil should only be exposed for minimal periods of time and adequately stockpiled to prevent the topsoil loss and run-off. Planting more indigenous trees on public open spaces should be done carried out. Reuse topsoil to rehabilitate disturbed areas. | | | | | | | | | |
| Mitigated | 1 | 1 | 1 | 1 | 2 | 2 | 2 | Negative | 3 (L) |

Removal and use of local flora for firewood- collection of local flora for firewood may lead to the removal of the protected flora due to the lack of knowledge of the types of protected flora.

| | Severity | Duration | Extent | Consequence | Frequency | Probability | Likelihood | Status | Confidence/ Significance |
|---|----------|----------|--------|-------------|-----------|-------------|------------|----------|-----------------------------|
| Unmitigated | 2 | 3 | 3 | 2.66 | 4 | 5 | 4.5 | Negative | 7.16 (LM) |
| Mitigation measures: No cutting down of trees for firewood. Utilise commercially sold wood or other sources of energy. Training of contractors on environmental awareness and the importance of flora. | | | | | | | | | |

| | | | | | | | | | |
|-----------|---|---|---|---|---|---|-----|----------|---------|
| Mitigated | 1 | 1 | 1 | 1 | 1 | 2 | 1.5 | Negative | 2.5 (L) |
|-----------|---|---|---|---|---|---|-----|----------|---------|

Health and Safety- Health and Safety Regulations pertaining to personal protective clothing, first aid kits being available on site, warning signs, etc. should be adhered to. During construction phase, there is a possibility of injuries to occur if no measures are taken into consideration.

| | Severity | Duration | Extent | Consequence | Frequency | Probability | Likelihood | Status | Confidence/ Significance |
|-------------|----------|----------|--------|-------------|-----------|-------------|------------|----------|-----------------------------|
| Unmitigated | 5 | 5 | 4 | 4.66 | 5 | 5 | 5 | Negative | 9.66 (LM) |

Mitigation measures:

A health and safety plan is to be developed and implemented as soon as land clearing commences.

During construction, earthmoving equipment will be used on site. This increases the possibility of injuries. Thus, the responsible contractor must ensure that all staff members are briefed about the potential risks of injuries on site.

Ensure the appointment of a Safety Officer to continuously monitor the safety conditions during construction.

The contractor should further ensure that adequate emergency facilities are available on site.

The construction staff handling chemicals or hazardous materials must be trained in the use of these materials and the environmental, health and safety consequences if not properly handled.

All construction staff must have the appropriate PPE.

| | | | | | | | | | |
|-----------|---|---|---|------|---|---|-----|----------|----------|
| Mitigated | 2 | 1 | 2 | 1.66 | 1 | 2 | 1.5 | Negative | 3.16 (L) |
|-----------|---|---|---|------|---|---|-----|----------|----------|

Traffic - Potential impact due to increase in traffic because the increase in traffic due to construction activities on site. Construction related activities are expected to have a minimal impact on the movement of traffic along the road. Accidents might occur if unqualified drivers are employed on the proposed development.

| | Severity | Duration | Extent | Consequence | Frequency | Probability | Likelihood | Status | Confidence/ Significance |
|--|----------|----------|--------|-------------|-----------|-------------|------------|----------|-----------------------------|
| Unmitigated | 5 | 5 | 3 | 4.33 | 5 | 3 | 4 | Positive | 8.33 (LM) |
| <p>Mitigation measures:</p> <p>No diversion of traffic or closure of the road is expected.</p> <p>Flag men and traffic controllers should be appointed to regulate traffic flow of construction vehicles.</p> <p>The responsible contractor must ensure that all drivers employed are licenced for the type of vehicle they operate and that they have experience in driving those types of vehicles.</p> <p>The contractor must ensure that there is always a supervisor on site to ensure that no driver operates construction vehicle while under the influence of alcohol or narcotics. The construction vehicle's speed limit should be 40km/h and must consider other road users</p> | | | | | | | | | |
| Mitigated | 2 | 1 | 1 | 1.33 | 1 | 2 | 1.5 | Positive | 2.83 (L) |

Waste Impacts- The construction phase of the development is likely to generate waste from clearing of vegetation, builder's rubble, general construction refuse and minor hazardous waste including paint tins, cleaning acids, asphalt's and oils. The development could therefore impact on the environment by generating solid waste pollution.

| | Severity | Duration | Extent | Consequence | Frequency | Probability | Likelihood | Status | Confidence/ Significance |
|---|----------|----------|--------|-------------|-----------|-------------|------------|----------|-----------------------------|
| Unmitigated | 5 | 5 | 3 | 4.33 | 5 | 5 | 5 | Negative | 8 (M) |
| <p>Mitigation measures:</p> <p>Ensure that no excavated soil, refuse or building rubble generated on site are placed or dumped on surrounding properties or land. Contaminated waste in the form of soil, litter, building rubble and other material must be disposed of at an appropriate disposal site. The contractor and developer should ensure that all the waste generated by the development is appropriately disposed of at the recommended waste disposal sites close to the area.</p> <p>Strictly, no burning of waste on the site or at the disposal site is allowed as it possess environmental and public health impacts; No construction waste should enter the surrounding environment no cleared vegetation to be burnt on-site.</p> <p>To avoid contaminating the soil and underground ecosystem, no wastewater should be disposed on soil.</p> | | | | | | | | | |
| Mitigated | 1 | 1 | 1 | 1 | 4 | 2 | 3 | Negative | 4 (L) |

Groundwater Contamination – Leakages from equipment and machinery might occur during the construction phase or mixing of cement and the use of ablution facilities will lead to the contamination of the groundwater.

| | Severity | Duration | Extent | Consequence | Frequency | Probability | Likelihood | Status | Confidence/ Significance |
|---|----------|----------|--------|-------------|-----------|-------------|------------|----------|-----------------------------|
| Unmitigated | 5 | 5 | 5 | 5 | 5 | 4 | 5 | Negative | 9.5 (LM) |
| <p>Mitigation measures:</p> <p>Chemicals used during construction e.g. paint and paint remover are a risk. Care must be taken to avoid contamination of soil and groundwater.</p> <p>Ensure no cement or cement containers should be left lying around.</p> <p>Mixing of cement should be done at specifically selected areas on mortar boards or similar structures to contain surface run-off.</p> <p>Proper ablution facilities should be installed at the construction site and at the camping site or alternative arrangements made.</p> <p>The contractor shall ensure that there is no spillage when the ablution facilities are cleaned or during normal operation and that the contents are properly disposed off.</p> <p>Cleaning of cement mixing equipment should be done on proper cleaning trays.</p> <p>Prevent spillage of contaminants or of water potentially contaminated by cement, chemicals, sewage</p> <p>Fuel (diesel and petrol) and oil containers shall be in good condition and placed in a bunded area or on plastic sheeting covered with sand (temporary bunding).</p> | | | | | | | | | |
| Mitigated | 3 | 1 | 1 | 1.66 | 5 | 3 | 4 | Negative | 5.66 (LM) |

Increased Spread of Communicable diseases- migrant workers with HIV/AIDS or Covid -19 may infect local people leading to a high rate of HIV/AIDS, covid-19 and other communicable diseases in Opuwo.

| | Severity | Duration | Extent | Consequence | Frequency | Probability | Likelihood | Status | Confidence/ Significance |
|---|----------|----------|--------|-------------|-----------|-------------|------------|----------|-----------------------------|
| Unmitigated | 5 | 5 | 5 | 5 | 5 | 5 | 5 | Negative | 10(M) |
| <p>Mitigation measures:</p> <p>The spending power of locals and expatriates working for the developer and/or its contractors are likely to increase, and this might be a perfect opportunity for sex workers to explore. Migrant labourers from other regions and expatriates are normally vulnerable and may use the services rendered by the sex workers. A key initiative should be to educate workers. See section 9 (Socio-economic Environment) for details on region statistics.</p> <p>External construction workers should be housed in secure camp and are to abide by rules of the EMP to prevent public disruption (i.e. Spread of HIV/AIDS, crime, public disturbance).</p> <p>Contractors should be encouraged to source labour from surrounding areas to prevent the spread of HIV/AIDSs and Covid – 19 from external workers.</p> <p>Condoms as a contraceptive should be distributed to construction employees.</p> <p>All government protocols on Covid – 19 (i.e., wearing masks and social distancing) should be practiced on site.</p> | | | | | | | | | |
| Mitigated | 2 | 1 | 4 | 2.33 | 2 | 3 | 2.5 | Negative | 4.8(L) |

Heritage Impacts – There are no known heritage areas or artefacts that were identified on the site. However, there is a potential damage or destruction to undiscovered heritage sites in the area

| | Severity | Duration | Extent | Consequence | Frequency | Probability | Likelihood | Status | Confidence/ Significance |
|---|----------|----------|--------|-------------|-----------|-------------|------------|----------|-----------------------------|
| Unmitigated | 5 | 5 | 5 | 5 | 2 | 1 | 1.5 | Negative | 6.5 (LM) |
| <p>Mitigation measures:</p> <p>There were no sites or objects of archaeological finds, Graves, historical and cultural significance identified, however, if during construction any possible finds are made, the operations must be halted and a qualified archaeologist be contacted for an assessment of the findings. Work may only commence once approval is given from the heritage agency.</p> <p>No specific mitigation measures are required at the moment.</p> | | | | | | | | | |
| Mitigated | 1 | 1 | 1 | 1 | 1 | 2 | 1.5 | Negative | 2.5 (L) |

Ecological Impacts

| | Severity | Duration | Extent | Consequence | Frequency | Probability | Likelihood | Status | Confidence/ Significance |
|--|----------|----------|--------|-------------|-----------|-------------|------------|----------|-----------------------------|
| Unmitigated | 1 | 1 | 1 | 1 | 1 | 1 | 1 | Negative | 1 (L) |
| <p>Mitigation measures:</p> <p>No known conservation worthy vegetation are located on the proposed facility, except trees with stem diameter > 20mm.that are recommended to be conserved and be included in the town planning design of the development</p> | | | | | | | | | |
| Mitigated | 1 | 1 | 1 | 1 | 1 | 1 | 1 | Negative | 1 (L) |

11.2 Impacts Associated with Operational Phase

Storm water usually runs off the area and flow into the water bodies without any kind of treatment. This can pollute the water bodies like creeks, lakes and rivers and have adverse effects on their chemical as well as biological nature. From this background plans for storm water drainage and collection have been proposed to accommodate the storm water during the rainy season.

| | Severity | Duration | Extent | Consequence | Frequency | Probability | Likelihood | Status | Confidence/ Significance |
|--|----------|----------|--------|-------------|-----------|-------------|------------|----------|-----------------------------|
| Unmitigated | 4 | 5 | 3 | 4 | 2 | 5 | 3.5 | Negative | 7.5 (LM) |
| <p>Mitigation measures:</p> <p>Storm water drains to be constructed along the streets in the development and be channelled through the natural water courses, excess storm water to be collected for consumption and recreational use.</p> <p>Storm water will be collected through network of storm drains from gardens, parking areas, paved and unpaved areas, and roadways.</p> <p>The storm water drainage system should have the capacity to prevent flooding of the site and surrounding areas.</p> | | | | | | | | | |
| Mitigated | 1 | 1 | 2 | 1.33 | 1 | 2 | 1.5 | Negative | 2.83 (L) |

Commercialization of the area - The project will transform the area into a commercial hub that will see the increase in economic activities and it will bring much needed development and services closer to the people living in the area.

| | Severity | Duration | Extent | Consequence | Frequency | Probability | Likelihood | Status | Confidence/ Significance |
|---|----------|----------|--------|-------------|-----------|-------------|------------|----------|-----------------------------|
| Unmitigated | 1 | 1 | 1 | 2 | 5 | 5 | 5 | Positive | 7 (LM) |
| <p>Mitigation measures:</p> <p>This project will contribute to the improvement of the services and infrastructure for the surrounding communities, as it will provide more social services within the area.</p> <p>Will create job opportunities for the local community which will improve their skills.</p> <p>Jobs emanating from the construction and operation of the proposed development will be outsourced to small medium enterprises in the area.</p> <p>Residents to be provided with all the basic amenities and utilities required by the community for them to live in a quality life style.</p> | | | | | | | | | |
| Mitigated | 1 | 2 | 1 | 1.33 | 5 | 3 | 4 | Positive | 5.33 (LM) |

Improved aesthetic look of the area- The development is essential to improve the aesthetics of the area while turning it into an environmentally friendly settlement with improved infrastructure services. This potential impact of the infrastructure on the economic structure is of a positive nature. The construction should be completed without delays to avoid the site becoming an eyesore;

| | Severity | Duration | Extent | Consequence | Frequency | Probability | Likelihood | Status | Confidence/ Significance |
|---|----------|----------|--------|-------------|-----------|-------------|------------|----------|-----------------------------|
| Unmitigated | 2 | 2 | 2 | 2 | 1 | 1 | 1 | Positive | 3 (L) |
| <p>Mitigation measures:</p> <p>No mitigation required because it's a positive impact. However, the developer should create awareness among the residents about energy conservation and other resources as well as to implement measures to prevent or minimize any adverse effects on the environment.</p> <p>This project should provide a quality of life that can be expected in an urban area in relation to the utilities, convenience, amenities and security.</p> <p>This project will provide quality residential accommodation to the previously disadvantaged youths from the middle to low income segments of the town.</p> <p>It should provide convenient transport system, accessibility to utilities and social centres to enhance the social quality of life.</p> <p>Public open space and parks should be vegetated to look greener and to minimize soil exposure to erosion.</p> <p>Camouflaged infrastructure should be utilized to blend in with the natural environment.</p> | | | | | | | | | |
| Mitigated | 1 | 5 | 4 | 3.33 | 3 | 5 | 4 | Positive | 7.33 (LM) |

Increased employment opportunities-

| | Severity | Duration | Extent | Consequence | Frequency | Probability | Likelihood | Status | Confidence/ Significance |
|---|----------|----------|--------|-------------|-----------|-------------|------------|----------|-----------------------------|
| Unmitigated | 2 | 3 | 5 | 3.33 | 3 | 3 | 3 | Positive | 6.33 (LM) |
| <p>Mitigation measures:</p> <p>The principles of gender equality, maximising local employment should be implemented in the provision of jobs on site. Priority should be given to local people when recruiting, therefore unskilled labourers from the local community should be employed. Jobs for maintenance of infrastructure and services will be created following the completion of the development. These jobs might be made available to existing labour there creating long term employment.</p> <p>Jobs for security personnel to patrol the construction site and the surrounding areas will also be created.</p> <p>Equity, transparency, should be put into account when hiring and recruiting and that Public Participation i.e. Community Leaders or Community committees should also take part in the recruitment process.</p> | | | | | | | | | |
| Mitigated | 1 | 4 | 4 | 3 | 2 | 5 | 4 | Positive | 6.5 (LM) |

Traffic - Potential impact due to increase in traffic because the new inhabitants that will settle in the new township and the increased economic activities in the area.

| | Severity | Duration | Extent | Consequence | Frequency | Probability | Likelihood | Status | Confidence/ Significance |
|--|----------|----------|--------|-------------|-----------|-------------|------------|----------|-----------------------------|
| Unmitigated | 5 | 5 | 3 | 4.33 | 5 | 3 | 4 | Positive | 8.33 (LM) |
| <p>Mitigation measures:</p> <p>An extra lane should be added to the main road to cater for people turning off into the new township.</p> | | | | | | | | | |

| | | | | | | | | | |
|--|---|---|---|------|---|---|-----|----------|----------|
| <p>Sidewalks for pedestrians should be provided along the property.</p> <p>Appropriate road signs and markings should be provided throughout the new township and to the entrance and exit points of the new township.</p> <p>Signs should be provided at intersections particularly at higher order intersections.</p> <p>Speed bumps should be installed to control the speed of traffic.</p> <p>Traffic circles to be utilized at high intensity intersections.</p> | | | | | | | | | |
| Mitigated | 2 | 1 | 1 | 1.33 | 1 | 2 | 1.5 | Positive | 2.83 (L) |

Waste management-

| | Severity | Duration | Extent | Consequence | Frequency | Probability | Likelihood | Status | Confidence/ Significance |
|--|----------|----------|--------|-------------|-----------|-------------|------------|----------|-----------------------------|
| Unmitigated | 5 | 3 | 3 | 3.66 | 5 | 5 | 5 | Negative | 8.66 (LM) |
| <p>Mitigation measures:</p> <p>During the operations phase, the Opuwo Town Council waste management team will service the proposed estate.</p> <p>Opuwo Town Council to develop a formal waste collection strategy and that the waste is to be collected regularly and to be disposed of at an authorized dumping or disposal site.</p> <p>Illegal dumping of waste in any form is prohibited.</p> | | | | | | | | | |
| Mitigated | 1 | 1 | 1 | 1 | 1 | 2 | 1.5 | Negative | 2.5 (L) |

Land use -The proposed development will not result in a change in land use but, the density will change with some loss of grazing taking place. However, it will impact positively on the current housing shortage within the Opuwo Local Authority area because it will aim to provide housing to previously disadvantaged individuals who cannot afford houses in. It is expected that 280 new units will be built on the proposed site, providing as many families with housing.

| | Severity | Duration | Extent | Consequence | Frequency | Probability | Likelihood | Status | Confidence/ Significance |
|---|----------|----------|--------|-------------|-----------|-------------|------------|----------|-----------------------------|
| Unmitigated | 1 | 5 | 4 | 3.33 | 1 | 5 | 3 | Positive | 6.33 (LM) |
| <p>Mitigation measures:</p> <p>The land use will remain residential However, the density will change as this will be a township development. The development will be compatible with the surrounding land use on completion of the construction phase.</p> <p>Houses should will be sold to local youths from middle to low income backgrounds.</p> <p>No informal settlements should occupy the land</p> | | | | | | | | | |
| Mitigated | 1 | 2 | 1 | 1.33 | 5 | 3 | 4 | Positive | 5.32 (LM) |

11.5 Impacts Associated with Decommissioning Phase

At this point, it is difficult to visualise and assess the decommissioning phase, although the procedures for decommissioning phase should be the same as for the construction phase however, there will be possible pollution during the decommissioning phase of the project. Furthermore, during the decommissioning phase, an Environmental Impact Assessment (EIA) will be required and the disposal of decommissioned equipment and hazardous contaminated materials should be disposed following the disposal of hazardous material legislation.

12. CONCLUSIONS

In conclusion, the Opuwo Town Council has put forth a proposal to establish Opuwo Extension 13 on proposed Portion A of Opuwo Townlands No. 876 situated in the jurisdiction of Opuwo Town Council located in the Kunene Region in north western Namibia. The township is primarily designed to cater for the youth of Opuwo, who are under the age of 35. The decision to establish a township for the youth of Opuwo was done consciously as the youth of this town and region are the most marginalized in Namibia. It will contain ±309 Erven of mostly residential nature and supporting land uses of businesses, institutional, public open spaces and civic use.

Nghivelwa Planning Consultants, a Town and Regional Planning and Environmental Management Consultancy firm has been appointed to conduct an Environmental Impact Assessment and Environmental Management Plan (EMP) for the proposed Opuwo Extension 13. The Environmental Impact Assessment has been conducted to meet the requirements of the Namibia's Environmental Management Act (No. 7 of 2007).

We further conclude that the proposed development has more positive than negative impacts to the natural environment and will provide much needed housing to the middle and low income portion of the population. The development will complement the efforts of the Government of the Republic of Namibia and help to shorten the housing backlog that is being experienced in the country.

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