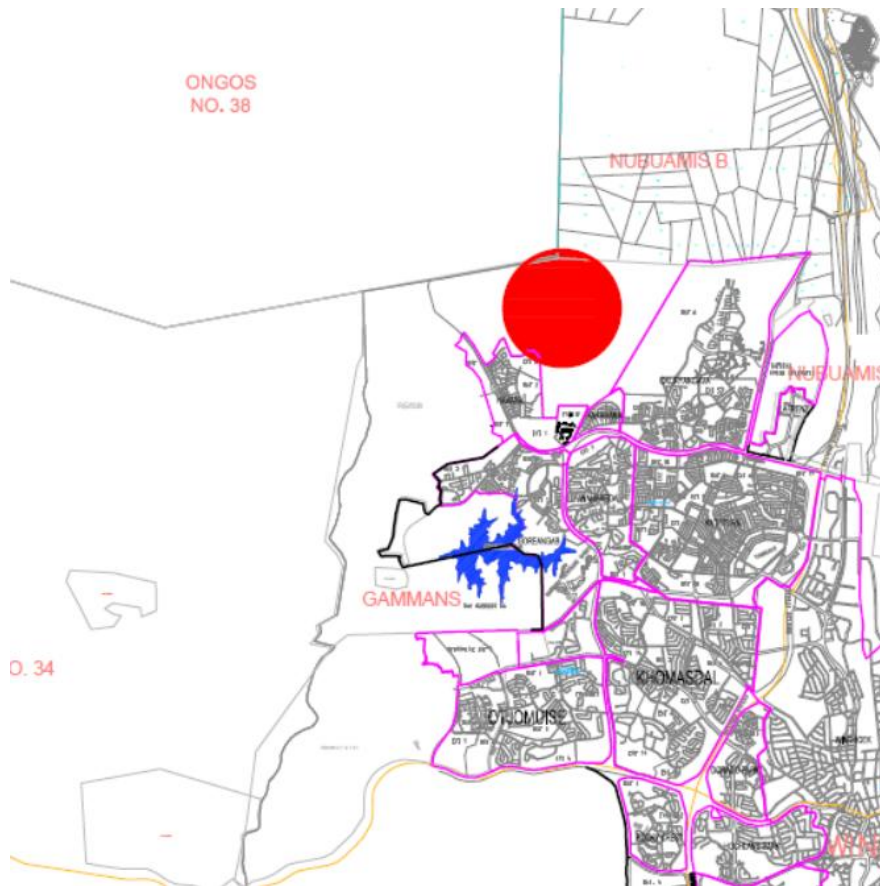


ENVIRONMENTAL SCOPING ASSESSMENT

**PROPOSED HAVANA RELOCATION
TOWNSHIP DEVELOPMENT PROJECT ON PORTION A OF FARM 1030
(FARM 1030 IS A PTN OF FARM RE/508) , WINDHOEK**

AUGUST 2020



CONSULTANT:

MATRIX CONSULTING SERVICES
P.O. Box 25824 Windhoek
Tel: +264-61-224197
Fax: +264-61-212165

PROPONENT:

City of Windhoek
PO Box 59, Windhoek
Tel:+264 (61) 308106
Fax:+264 (61) 308107



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Appendices

Appendix A	Environmental management plan
Appendix B	Background Information Document
Appendix C	Archeological Specialist Study
Appendix D	Lead Consultant Resume
Appendix E	Drawings

List of Abbreviations

EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMA	Environmental Management Act
EMS	Environmental Management System
ESA	Environmental Scoping Assessment
I&Aps	Interested and Affected Parties
PPPPs	Projects, Plans, Programmes and Policies



PROJECT DETAILS

TEAM MEMBERS

NAME	POSITION	COMPANY
C. Ailonga	Environmental Specialist	Matrix Consulting Services
M. Shippiki	Hydrogeologist	Matrix Consulting Services
F. Kangombe	Ecologist	Matrix Consulting Services - A

CLIENT:**CITY OF WINDHOEK****PO Box 59, Windhoek****Tel:+264 (61) 308106****Fax:+264 (61) 308107****ENVIRONMENTAL
CONSULTANT**

Matrix Consulting Services

Chris Ailonga (MSc Env Sci, Wits)

EIA Specialist

P.O. Box 25824 Windhoek

Tel: +264-61 224197

Fax: +264-61 212165

REPORT STATUS:**FINAL**

1. BACKGROUND AND INTRODUCTION

The City of Windhoek is proposing to develop Havana Relocation Township in Windhoek, Khomas Region. The proposed development is aimed at addressing the housing scarcity in Windhoek, and ultimately eradicating the informal settlement mushrooming in the Windhoek and accommodating the beneficiaries in formal housing. This specific is planned for residents who be relocated from the affected areas close to the planned Monte Christo road. Bulk Services and infrastructure that will be installed include provision of sewer lines, water, electricity, and stormwater management.

Matrix Consulting Services, an independent consultant, has been appointed by Ongos Valley Development(Pty) Ltd to undertake an Environmental Impact Assessment (EIA) on the development/servicing of Havana Relocation Township, on behalf of the City of Windhoek.

An assessment will be undertaken to determine the potential impact of the development on the environment and to determine all safety, health and social impacts associated with the proposed development activities. The project location is indicated on the map.

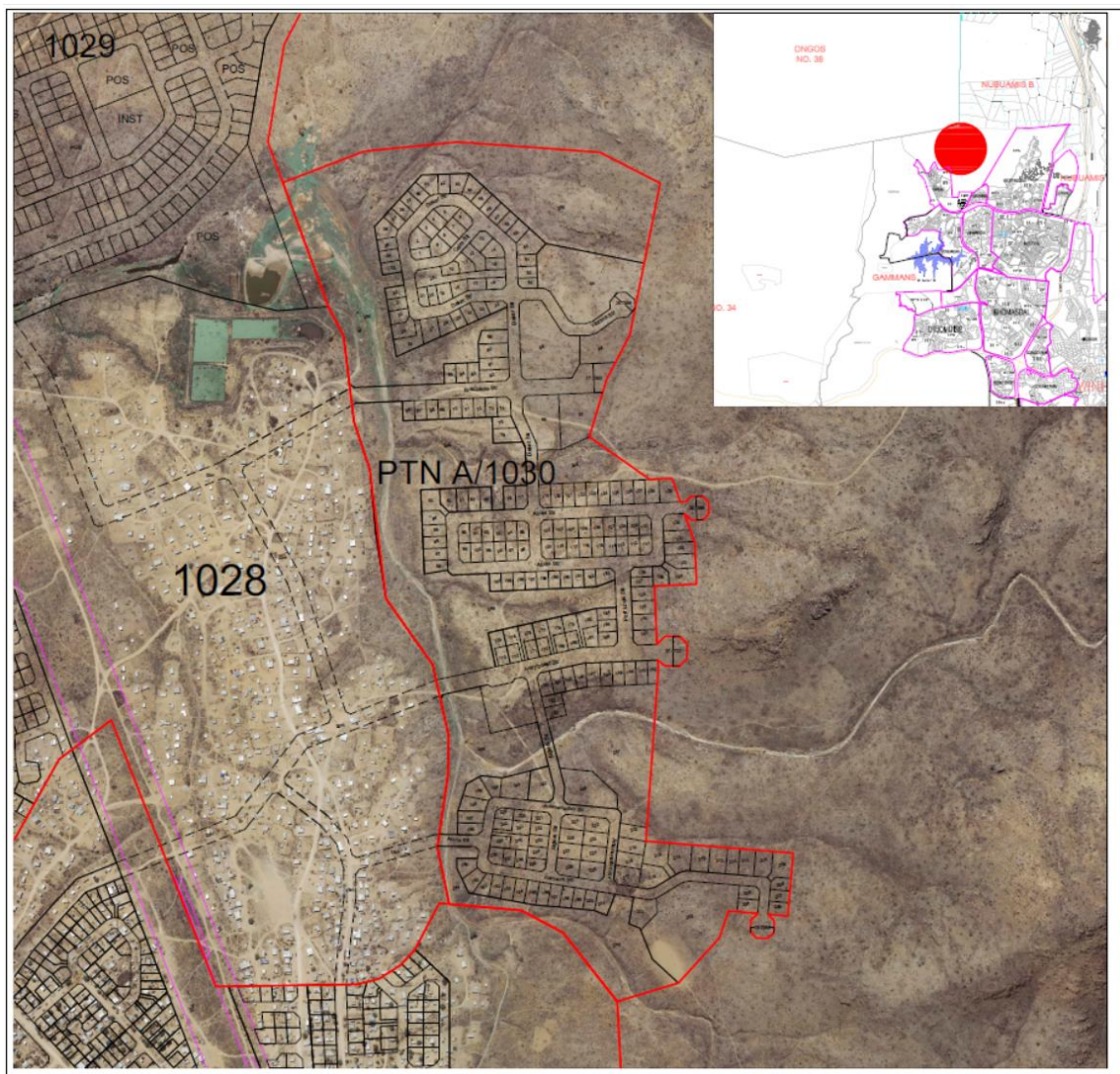


Figure 1. Location Map

The environmental assessment will be conducted as per Namibia's Environmental Assessment Policy and the Environmental Management Act No.7 of 2007 and its regulations of 2012 .

The proposed Havana Relocation Township is currently zoned "undetermined" in the Windhoek structure plan and the City of Windhoek wishes to develop a township consisting of various zonings to be accommodated in the layout, at the same time maintaining the environmental setting of the area e.g vegetation, groundwater etc.

2. TERMS OF REFERENCE

Ongos Valley Development (Pty) Ltd has commissioned an Environmental Impact Assessment (**EIA**) for the proposed Havana Relocation Township, in Windhoek. The proposed township is one of the strategic projects that the city of windhoek has engaged to address housing scarcity in Windhoek, and address housing and basic services provision in the informal settlements. The Havana Relocation Township is located at -22.488452, "S, 17.022133"E.

This study will enable decision makers to make an informed decision regarding the development and make sure it does not have significant impacts and that they are mitigated. The environmental impact assessment was conducted to comply with the Environmental Assessment Policy (1995) and the Environmental Management Act (2007) and its regulations of 2012.

3. PROJECT INFORMATION

3.1 Project Rationale

The City of Windhoek is currently experiencing a scarcity of developable land for residential areas and therefore entered into a public private partnership with Fullbright Investments (Pty) Ltd to develop (service) Havana Relocation.

The need for the project relate to the strategic plans of the City of Windhoek to eradicate or minimize all informal settlements in its area of jurisdiction. The aim is to integrate the residents into housing in a sustainable manner.

The proposed project will provide serviced land primarily to the relocated household owners. Other associated land uses of the proposed townships are general residential , business, institutional, public open spaces and municipal. The development will therefore not only benefit the future residents but also the surrounding areas by providing necessary facilities and social services that are not currently in place.

The proposed development of the site is desirable from the perspective of availability and proximity of engineering bulk services, compatibility with adjacent projects, accessibility, size and locality. The proposed development will also create employment, both during the construction and operational phase.



The Havana Relocation Township will consist of about 280 residential ervens. The proposed township will be serviced to level 1, to ensure the provision of all municipal services, such as water, sewerage, roads and electricity.

Other Potential spin-offs from the development of Havana Relocation Township:

- ❖ Potential revenue generation from the sale of Ervens by City of Windhoek.
- ❖ Reduced serviced land scarcity in Windhoek.
- ❖ Reduced housing scarcity in Windhoek.
- ❖ Creation of job opportunities, training and skills development during construction and operational phase. It is estimated that the new jobs will improve the livelihoods of the workers and their families. Given that the unemployment rate of 31% in the region, this in itself is regarded as a significant benefit to the socio-economic situation in the region (2011, Population and Housing Census, Khomas Region).
- ❖ Provision of housing and community facilities.
- ❖ Impact on health and safety of Havana Relocation residents by providing proper housing and sanitation.
- ❖ Change the sense of the place of the area from undeveloped townland to a formal township.
- ❖ Increase in economic opportunities in the area.
- ❖ General enhancement of the quality of life in the Khomas Region and the surrounding area, should the project be economically viable.

4. Havana Relocation Township Development Activities

4.1 Current land-use of Havana Relocation Township Area

The propose site is not developed in any form. The proposed site is previously disturbed, with visible invader plants on some parts of the land and signs previous illegal occupation of the area.



Current state of site

Signs of disturbance on site



4.2 Proposed land-use of Havana Relocation Township.

The proposed Havana Relocation Township is planned to be within the existing Windhoek townlands. The proposed development is aimed at eradicating the spread of informal settlement in Windhoek by accommodating the beneficiaries in formal housing in a development like Havana Relocation Township. The proposed development will offer affordable serviced land as well as other land-use type erven.

The development will consist of a total of 280 Residential erven, General residential erven, Business erven, municipal, Institutional erven (erven that can accommodate schools, churches, crèches, institutional use, community facilities, children’s home), and public open spaces. The proposed layout of the Havana Relocation Township is illustrated in the map below.

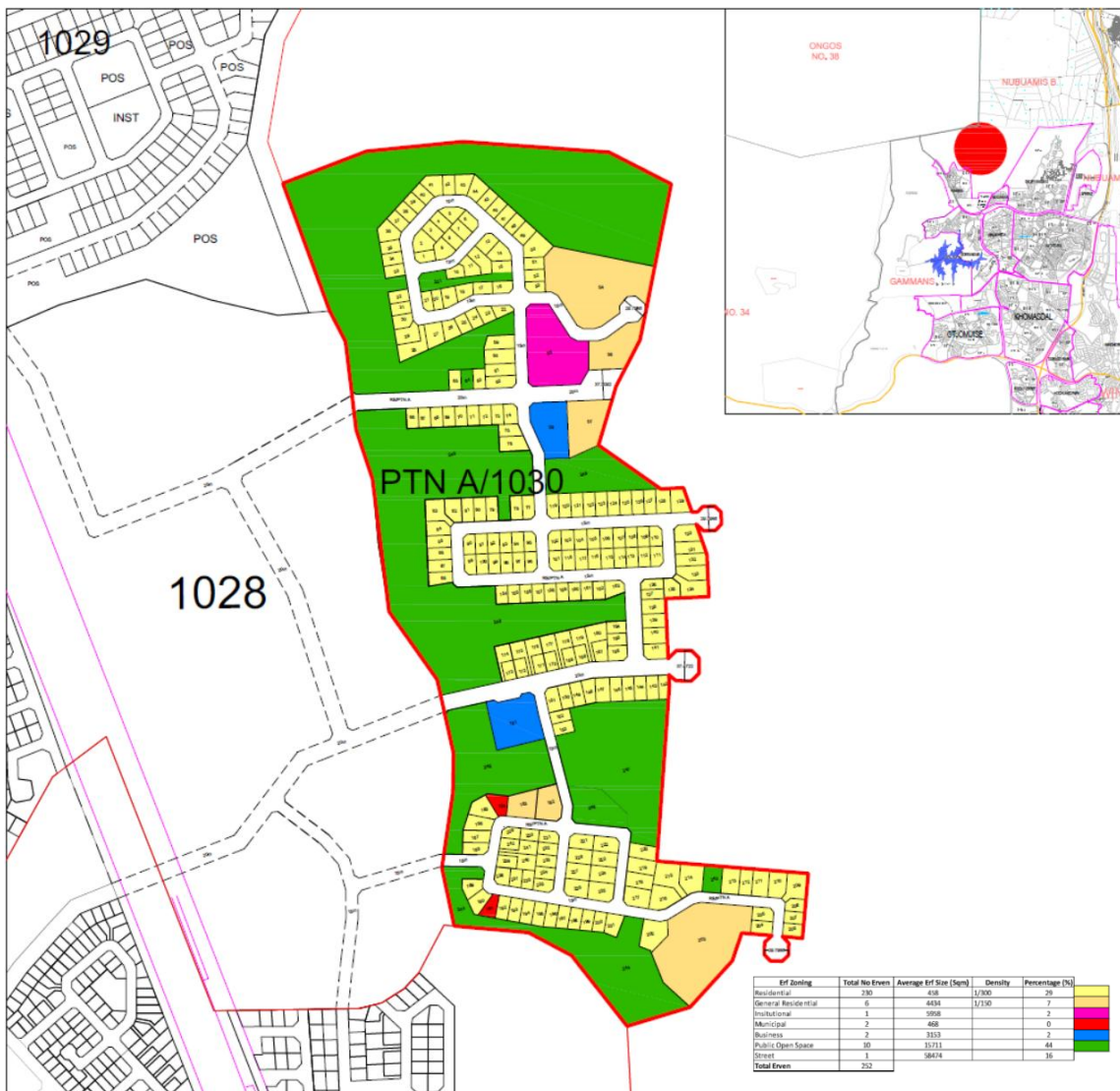


Figure 2: Proposed land-use for Havana Relocation Township

The establishment of the proposed development requires the installation of supporting bulk services infrastructure, and will be serviced to level 1 in accordance to City of Windhoek regulations. The bulk services required for the construction of the development will include the following:

Sewage: A full waterborne sewage system is proposed for Havana Township. Excavations for sewer pipelines will have the maximum depth of 2.8m. Community Toilets will be rolled out for this township, until the City of Windhoek is in position to connect each erven to the bulk sewage network.

Water: City of Windhoek will provide water for the proposed development from the existing Namwater/City of Windhoek reservoirs. Water will be provided by connecting to the existing bulk water main system near the site. Excavation for water pipelines will be $\pm 1.2\text{m}$, with soil cover of a minimum 600mm. Community water points will be rolled out for this township, until the City of Windhoek is in position to connect each erven to the water network.

Electricity: The development will be supplied from the existing Nampower/City of Windhoek grid in future. Power will be connected to the ring network via overhead cables from the Substations.

Roads: The existing road network will be utilised to service the proposed development. Street roads and access roads to Havana Relocation Township will be gravel roads in the mean time, and will only be upgraded to bitumen standards in future. Havana Relocation Township will be accessed via the existing road network linked to Monte Christo Road and Havana Extension 2 & 5 road network.

Stormwater Management Sytem: Provision will be been made for stormwater attenuation to reduce the increase in stormwater run-off resulting from the development compared to pre-development phase, through the incorporation of stormwater stormwater management system.

Waste: City of Windhok waste removal contractors (e.g. Rent a Drum, Kleen Tek, Salute Trading etc) will remove all domestic waste.

4.2.1 Construction Activities

- Transporting relevant building material and equipment.
- Installation of associated electrical supply cables.
- Installation of associated water pipelines.
- Installation of associated sewer lines.
- Installation of stormwater management system



- Roads construction
- Land clearance

4.2.2 Operational Activities

- Operation and maintenance of the sewer , water, electrical services and roads.

4.2.3 Housing

No contractors are allowed to camp on site during all phases of the project.

4.2.4 Access Road

The site will be accessed using Monte Christo road and existing roads in Havana.

4.2.5 Waste Management

All waste generated at the site will be collected in plastic or steel drums and removed from site and disposed at Kupferberg Landfill. Hazardous waste will be collected and stored separately, and disposed off at an appropriate hazardous waste cell at Kupferberg landfill.

Mobile toilets will be used by the contractors during the construction phase respectively. The waste must be disposed off at Gammams Waste Water Treatment Works.

4.2.6 Site Rehabilitation

After the construction is complete, the site will be cleared of all chemical and hydrocarbon spills, pipe cuttings, electrical cuttings etc. Excavations for bulk services will need to be covered and levelled properly.

5. ENVIRONMENTAL STUDY REQUIREMENTS

According to the Environmental Management Act no. 7 of 2007 the proponent requires an environmental clearance certificate from the Ministry of Environment and Tourism (Department of Environmental Affairs) to undertake the development of Havana Relocation Township from an undeveloped townland to a township, in Windhoek. The rezoning of land from undetermined townlands to any other land use is a '*listed activity*' as per the *List of Activities requiring an Environmental Clearance Certificate* (Government Notice 29 of 6 February 2012) and accordingly requires an Environmental Impact Assessment (EIA) to be conducted.

The environmental clearance certificate issuance means that the Ministry of Environment and Tourism is satisfied that the activity in question will not have an unduly negative impact on the environment. It may set conditions for the activity to prevent or to minimise harmful impacts on the environment.



6. DESCRIPTION OF ALTERNATIVES

6.1 No-Go Alternative

The no-development alternative is the option of not going ahead with the development of Havana Relocation Township Development. The no-go alternative will keep the site in its current state. This alternative is undesirable in terms of the current housing scarcity in Windhoek. The site is vacant, with part of it previously occupied illegally, and other parts disturbed by sand mining and wood harvesting activities. The informal settlement in Windhoek is growing rapidly. Should the site remain in this state, the possibility and threat of illegal land invasions and squatters settling on the site will persist.

The proposed township will accommodate the households that will be relocated to pave way for Monte Christo road and the new community market. Should the proposed activity not take place, the region could be deprived of developing a township, and ultimately reducing the housing demand in Windhoek. The proposed activity could yield positive results that could provide an alternative serviced land to Windhoek inhabitants. The No-go option will not be a viable alternative at this stage.

6.2 Site Alternative

The existing Havana Relocation Township already exists and belongs to the City of Windhoek. The City of Windhoek wants to provide serviced land and house the people that will be relocated to accommodate the road construction of Monte Christo Road and the planned community market. There are engineering services capacity to support the proposed Havana Relocation Township, thus the site is ideally suited for this type of development.

The area holds less ecological and conservation values, and the best option chosen is to develop with strict consideration of environmental aspects. Mitigation measures on impacts likely to be caused by the activity are incorporated in the planning and execution of the activity. The development of Havana Relocation Township will have minimal impacts on the environment. The environmental footprint of this activity is expected to be minimal.

7. SCOPE OF THE EIA

The scope of the EIA aims at identifying and evaluating potential environmental impacts emanating from the proposed development of Havana Relocation Township. Relevant data have been compiled by making use of secondary sources and from project site visits. Potential environmental impacts and associated social impacts are identified and addressed in this report.

The environmental impact assessment report aims to address the following:

- a) Identification of potential positive and negative environmental impacts.
- b) Provide sufficient information to determine if the proposed project will result in significant adverse impacts.
- c) Identification of “hotspots” which should be avoided where possible due to the significance of impacts.
- d) Evaluation of the nature and extent of potential environmental impacts.
- e) Identify a range of management actions which could mitigate the potential adverse impacts to required levels.
- f) Provide sufficient information to the Ministry of Environment to make an informed decision regarding the proposed project.
- g) Present and incorporate comments made by stakeholders.

8. METHODOLOGY

The following methods were used to investigate the potential impacts on the social and natural environment that could arise from the development of Havana Relocation Township in Windhoek:

- a) Information about the site and its surroundings was obtained from existing secondary information and site visits.
- b) Interested and affected Parties (I&APs) were consulted and their views, comments and opinions are presented in this report.



9. STATUTORY REQUIREMENTS

9.1 National Legislative Requirements

The EIA process is undertaken in terms of Namibia's Environmental Management act no. 7 of 2007 and the Environmental Assessment Policy of 1995, which stipulates activities that may have significant impacts on the environment. Listed activities require the authorisation from the Ministry of Environment and Tourism (DEA). Section 32 of the Environmental Management Act requires that an application for an environmental clearance certificate be made for the listed activities. The following environmental legislations are relevant to this project:

➤ *The Namibian Constitution*

The Namibian Constitution has a section on principles of state policy. These principles cannot be enforced by the courts in the same way as other sections of the Constitution. But they are intended to guide the Government in making laws which can be enforced.

The Constitution clearly indicates that the state shall actively promote and maintain the welfare of the people by adopting policies aimed at management of ecosystems, essential ecological processes and biological diversity of Namibia for the benefit of all Namibians, both present and future.

➤ *Environmental Management Act No.7 of 2007*

This Act provides a list of projects requiring an Environmental Assessment. It aims to promote the sustainable management of the environment and the use of natural resources and to provide for a process of assessment and control of activities which may have significant effects on the environment; and to provide for incidental matters.

The Act defines the term "*environment*" as an interconnected system of natural and human-made elements such as land, water and air; all living organisms and matter arising from nature, cultural, historical, artistic, economic and social heritage and values.

The Environmental Management Act has three main purposes:

- (a) to make sure that people consider the impact of activities on the environment carefully and in good time.
- (b) to make sure that all interested or affected people have a chance to participate in environmental assessments
- (c) to make sure that the findings of environmental assessments are considered before any decisions are made about activities which might affect the environment



The rezoning of land from open space to any other land use is a 'listed activity' as per the *List of Activities requiring Environmental Clearance* (Government Notice 29 of 6 February 2012) and accordingly requires an Environmental Impact Assessment (EIA) to be conducted.

Line Ministry: Ministry of Environment and Tourism
 (Contact: Dr. Freddy Sikabongo, Tel: 061-284 2715, e-mail: freddy@met.na)

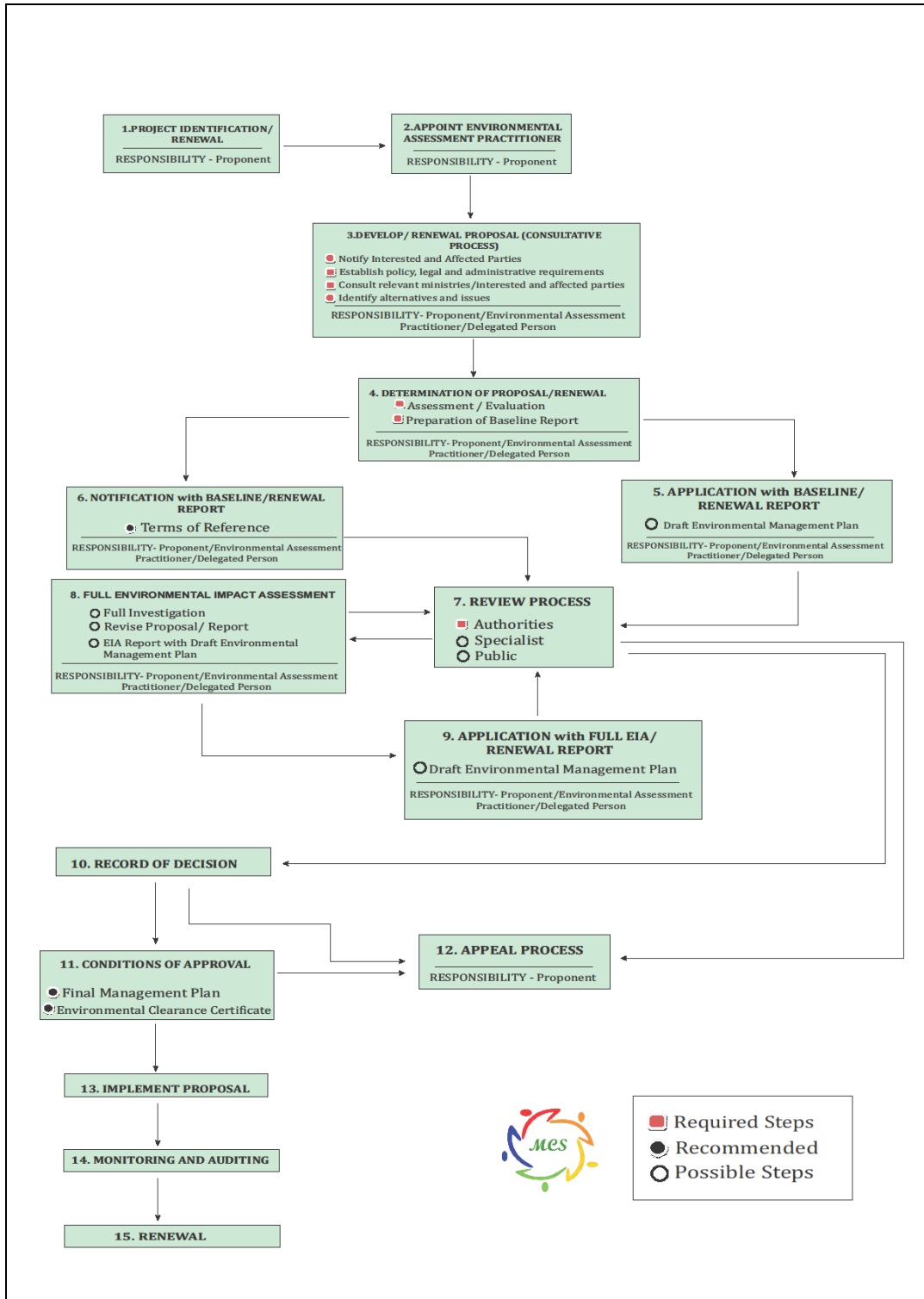


Figure 3. Environmental Assessment Procedure of Namibia

➤ ***Atmosphere Pollution Prevention Ordinance (1976)***

This Ordinance generally provides for the prevention of the pollution of the atmosphere. Part IV of this ordinance deals with dust control. The Ordinance is clear in requiring that any person carrying out an industrial process which is liable to cause a nuisance to persons residing in the vicinity or to cause dust pollution to the atmosphere, shall take the prescribed steps or, where no steps have been prescribed, to adopt the best practicable means for preventing such dust from becoming dispersed and causing a nuisance.

Line Ministry: Ministry of Environment and Tourism

(Contact: Dr. Freddy Sikabongo, Tel: 061-284 2715, e-mail: freddy@met.na)

➤ ***Water Resources Management Act of Namibia (2004)***

This act repealed the existing South African Water Act No.54 of 1956 which was used by Namibia. This Act ensures that Namibia's water resources are managed, developed, protected, conserved and used in ways which are consistent with fundamental principles depicted in section 3 of this Act. Part IX regulates the control and protection of groundwater resources. Part XI, titled Water Pollution Control, regulates discharge of effluent by permit. Thus developers are required to efficiently plan for sewage disposal.

Line Ministry: Ministry of Agriculture, Water Affairs and Forestry

(Contact: Ms Elizabeth Amagola, Tel: 061-208 7719)

➤ ***Water Act No.54 of 1956***

This Act provides for Constitutional demands including pollution prevention, ecological and resource conservation and sustainable utilisation. In terms of this Act, all water resources are the property of the State and the EIA process is used as a fundamental management tool.

A water resource includes a watercourse, surface water, estuary or aquifer, and, where relevant, its bed and banks. A watercourse means a river or spring; a natural channel in which water flows regularly or intermittently; a wetland lake or dam, into which or from which water flows; and any collection of water that the Minister may declare to be a watercourse. Permits are required in terms of the Act for the undertaking of the following activities relevant to the proposed project:

- ✓ Discharge of waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit in terms of Section 21 (f); and



- ✓ Disposal of waste in a manner that may detrimentally impact on a water resource in terms of Section 21 (g).

Line Ministry: Ministry of Agriculture, Water Affairs and Forestry

(Contact: Ms Elizabeth Amagola, Tel: 061-208 7719)

➤ ***The Draft Wetland Policy (1993)***

Requires that any wetlands and its associated hydrological functions form a part, to be managed in such a way that their biodiversity, vital ecological functions and life support systems are protected for the benefit of present and future generations.

Line Ministry: Ministry of Environment and Tourism

(Contact: Dr. Freddy Sikabongo, Tel: 061-284 2715, e-mail: freddy@met.na)

➤ ***Environmental Assessment Policy of Namibia (1995)***

Environmental Assessments (EA's) seek to ensure that the environmental consequences of development projects and policies are considered, understood and incorporated into the planning process, and that the term ENVIRONMENT (in the context of IEM and EA's) is broadly interpreted to include biophysical, social, economic, cultural, historical and political components.

All listed policies, programmes and projects, whether initiated by the government or the private sector, should be subjected to the established EA procedure as set out in Figure 2.

Line Ministry: Ministry of Environment and Tourism

(Contact: Dr. Freddy Sikabongo, Tel: 061-284 2715, e-mail: freddy@met.na)

➤ ***Forestry Act (No.12 of 2001)***

This Act makes provision for the protection various plant species. Harvesting permits are required from the Directorate of Forestry to clear certain protected vegetation species from the site.

Line Ministry: Ministry of Agriculture, Water Affairs and Forestry

(Contact: Andries Uugwanga, Tel: 062-501925)

➤ ***Townships and Division of Land Amendment Act (No.28 of 1992)***

Article (l) of this Act stipulates that "Whenever any area of land constitutes, by reason of its situation, a portion of an approved township, or adjoins an approved township, the Executive Committee may, by proclamation notice in the Gazette and after consultation with the Board, extend the boundaries of the township to include such an area". Thus the new township needs to be approved by the Namibian Planning Advisory Board and the Townships Board.



Line Ministry: Ministry of Urban and Rural Development

(Contact: Tel: 061-297 2911)

➤ ***Sewerage and Drainage Regulations(amendments)Local authorities act, section 23 (1992).***

The regulations makes provision for proper construction of pipelines in drainage lines. The regulations also stipualate the prevention of pollution and environmental damage caused by improper construction of sewerage and water pipelines in drainage lines.

Line Ministry: Ministry of Regional and Local Government, Housing and Rural Development

(Contact: Tel: 061-297 2911)

➤ ***Soil Conservation Act (No.76 of 1969).***

The Act advocates for the Prevention and combating of soil erosion, conservation, improvement and manner of use of soil and vegetation, and protection of water resources.

(Contact: Dr. Freddy Sikabongo, Tel: 061-284 2715, e-mail: freddy@met.na)

➤ ***Draft Pollution Control and Waste Management Bill***

The proposed project of Havana Relocation Township Development, only applies to Parts 2 and 7 of the Bill.

Part 2 stipulates that no person shall discharge or cause to be discharged any pollutant to the air from a process except under and in accordance with the provisions of an air pollution licence issued under section 23. It further provides for procedures to be followed in licence application, fees to be paid and required terms of conditions for air pollution licences.

Part 7 states that any person who sells, stores, transports or uses any hazardous substances or products containing hazardous substances shall notify the competent authority, in accordance with sub-section (2), of the presence and quantity of those substances.

➤ ***Hazardous Substances Ordinance No. 14 of 1974***

The Ordinance applies to the manufacture, sale, use, disposal and dumping of hazardous substances, as well as their import and export and is administered by the Minister of Health and Social Welfare. Its primary purpose is to prevent hazardous substances from causing injury, ill-health or the death of human beings.

Line Ministry: Ministry of Health and Social Services



➤ **Public Health Act 36 of 1919 and Subsequent Amendments**

The Act, with emphasis to Section 119 prohibits the presence of nuisance on any land occupied. The term nuisance for the purpose of this EIA is specifically relevant specified, where relevant in Section 122 as follows:

- ✓ any dwelling or premises which is or are of such construction as to be injurious or dangerous to health or which is or are liable to favour the spread of any infectious disease;
- ✓ any area of land kept or permitted to remain in such a state as to be offensive, or liable to cause any infectious, communicable or preventable disease or injury or danger to health; or
- ✓ any other condition whatever which is offensive, injurious or dangerous to health.

Potential impacts associated with the development of Havana Relocation Township project are expected to include dust, air quality impacts, noise nuisance and smoke emissions.

Line Ministry: Ministry of Health and Social Services

➤ **National Heritage Act (No.76 of 1969).**

The Act calls for the protection and conservation of heritage resources and artefacts. Should any archaeological material, e.g. old weapons, coins, bones found during the construction, work should stop immediately and the National Heritage Council of Namibia must be informed as soon as possible. The Heritage Council will then decide to clear the area or decide to conserve the site or material.

(Contact: Rev. Salomon April, Tel: 061-244375, National Heritage Council of Namibia)

9.2 International Conventions and Regulations

Article 144 of the Namibian Constitution states that “the general rules of public international law and international agreements binding upon Namibia form part of the law of Namibia.” This means that all the international agreements that Namibia signed become part of the law of our country. These laws and/or agreements are:

- ✓ Convention on Biological Diversity, 1992;
- ✓ United Nations Framework Convention on Climate Change, 1992;
- ✓ Kyoto Protocol on the Framework Convention on Climate Change, 1998;
- ✓ Stockholm Convention of Persistent Organic Pollutants, 2001.



9.3 Municipal By-laws (City of Windhoek)

➤ Groundwater Protection Regulations

The protection of the groundwater resource in a development scenario should be provided for, in a formally documented and legislated EIA process. The EIA process or procedure provides for the institutionalization of decision making regarding the potential impact development activities will have on the receiving natural, social and cultural environment. Further, the process makes provision for the identification and listing of types of activities that would be required to follow the process before any authorisation will be given.

(Contact: Mr. Olavi Makuti, Tel: 061-290 3518, e-mail: olm@windhoekcc.org.na)

➤ Environmental Structure Plan and Policy

The Environmental Structural Plan & Policy provides sufficient information for those making decisions regarding a particular development so that proper environmental evaluation can be conducted, which is appropriate to the scale of the proposed project and the risks to the environment which it may pose.

It establishes where there are potential and real problem environmental areas, such as land degradation, pollution, indiscriminate resource use etc. The Environmental Structural Plan is the baseline upon which the policy is established.

(Contact: Mr. Olavi Makuti, Tel: 061-290 3518, e-mail: olm@windhoekcc.org.na)

➤ Windhoek Town Planning Scheme (2005)

The Town Planning Scheme enables the comprehensive management of all property and related public sector functions across the city. The guidelines on the Conservation of Natural Resources should be addressed in this project.

(Contact: Mr. Olavi Makuti, Tel: 061-290 3518, e-mail: olm@windhoekcc.org.na)

➤ Policy for the Distribution and Future Usage of Public Open Spaces in Windhoek (2000)

The policy provides guidelines for the establishment of open spaces and green corridors along drainage lines and sensitive environmental areas. The policy advocates for the provision of land for the explicit development of open spaces.

(Contact: Mr. Olavi Makuti, Tel: 061-290 3518, e-mail: olm@windhoekcc.org.na)



10. GENERAL ENVIRONMENT OF THE STUDY AREA

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

10.1 *Location and Land Use*

The proposed Havana Relocation Township (-22.488452, "S, 17.022133"E) is located on Portion A of Farm 1030 (Farm 1030 is a PTN of Farm RE/508). See Figure 1.

The site is located within an undeveloped townlands, as per local municipal regulations, which is surrounded by Havana Extension 2 and 5 on western side, the northern part of the new township lies an undeveloped portion and Ongos farm No.38 while Okuryangava extension 6 lies on the eastern side. South of new township is the Hakahana Informal Settlement.

10.2 *Topography and Surface Water*

The landscape of the Havana Relocation Township is classified as being in the Khomas Hochland Plateau region, which is characterized by rolling hills in the west with many summit heights equivalent reflecting older land surfaces.

The township development lies in the Aretaragas River catchment. Drainage is well developed and runoff takes place through small streams (rivers) running through the site. This streams eventually join the Aretaragas River course, flowing towards the north into the Swakop River. Care should be taken to avoid contamination of these surface water bodies in the area, especially during rainy seasons.

10.3 *Climate (Mandelsohn et al, 2003)*

Table 1. Climate Data

Classification of climate:	Sub-tropical area
Average rainfall:	Rainfall in the area is averaged to be between 300-350 mm per year.
Variation in rainfall:	Variation in rainfall is averaged to be 30-40 % per year.
Average evaporation:	Evaporation in the area is averaged to be between 2100-2240 mm per year.
Precipitation:	The highest summer rains are experienced in February.
Water Deficit:	Water deficit in the area is averaged to be between 1700- 1900mm per year.
Temperatures:	Temperatures in the area are averaged to be between 18- 20 °C per year.



Wind direction: Wind directions in the area are predominantly easterly winds.

10.4 Geology of the Area

The project location has a very thin soil cover (less than 35cm), however this differs in the in the rivers and tributaries. The general geology or rock formations underlying the township development consists mainly of mica rich schist and quartz rich schist (quartzite), containing quartz veins. All of the intersected rock formations belong to the Kuiseb formation of the Damara Sequence. In this area the formation is known to have a dip of $\pm 30^\circ$ in a northerly direction. The schist has an abundance of layers (schistosity) consisting of quartz rich and mica rich layers. Some major Amphibolite intrusions are also present in the area.

North-southerly faults are common in the area. The Aretaragas River that runs through the project location also follows a major north-south striking fault. The Amphibolite intrusions in the area are clearly affected by the faults and large displacements are visible.

The overall complex geology of the Windhoek area is a result of numerous folding and faulting episodes, including thrusting and rifting, to which the area has been subjected. Metasedimentary rocks of the Swakop Group, which is part of the Damara Sequence, constitute the Windhoek Aquifer.

10.5 Hydrogeological Characteristics

A number of north-southerly striking faults and joints found in Windhoek form the major underground water conduits of the Windhoek Aquifer and hence determine the conditions of the aquifer. Secondary porosity giving rise to high aquifer transmissivity is best developed in faults with post-hydrothermal alteration brecciation in quartzitic environments. Moreover host rock fracturing along fault planes results in better development of secondary porosity in quartzite compared to schistose terrain such that the aquifer reaches its maximum potential in this type of setting. The sedimentary formations of the study area strike in an east-north-easterly direction and dip $25-30^\circ$ to the north-northwest.

The micaceous schist found in the area, is prone to plastic deformation rather than brittle, fracturing, exhibiting significantly lower secondary porosity and permeability. Groundwater flow would be mostly through secondary porosity along fractures, faults and other geological structures present within the underlying formations in the area.

On the other hand, the more competent quartzite is subject to brittle deformation and thus exhibits relatively high secondary porosity and

permeability due to jointing. The joints of the quartzite show evidence of fluid flow by carbonate and quartz infill and iron staining.

Groundwater flow from the site is expected from south to north, towards the Goreangab Dam. According to the City of Windhoek, Namwater, Department of Water Affairs (DWA) and MCS database approximately 3 boreholes are present within a 1km radius of the project location. Groundwater table in the area is expected to be about 5m below ground level (mbgl).

Groundwater belongs to the government of the Republic of Namibia; hence the area does fall within the Windhoek-Gobabis Subterranean Water Control Area, of Government Notice 189 of 6 February 1970. This means that Government controls groundwater usage in this area.

The area is outside the mapped area considered in the Vulnerability Study of the Windhoek Aquifer (City of Windhoek, 2000) , However due to the presence of a highly sensitive faults present in the area, it should be regarded as a sensitive area. These geological features might form preferential pathways to the underlying aquifer.

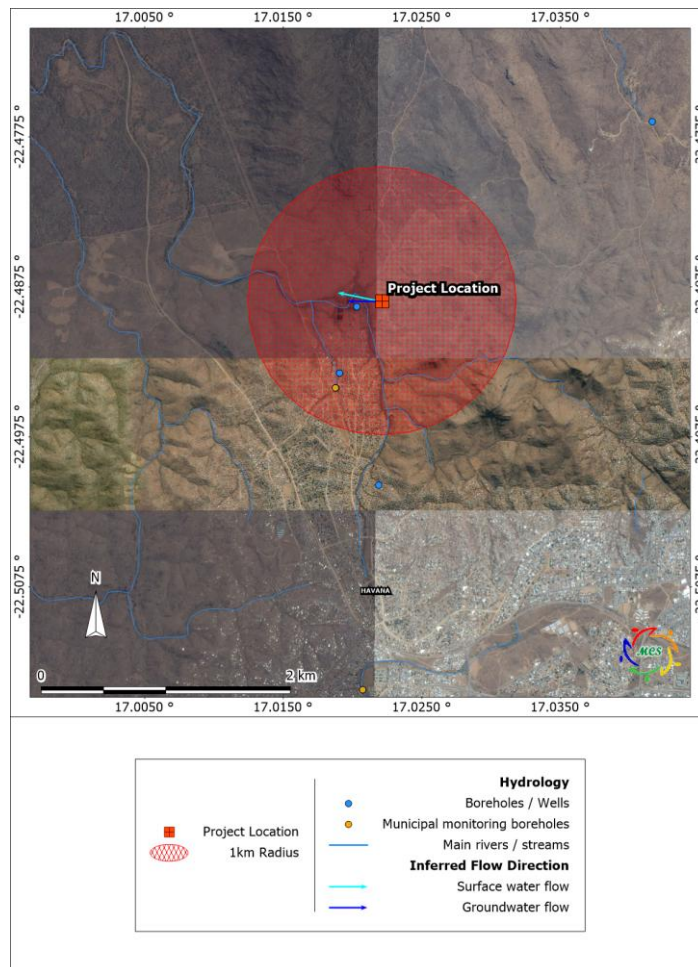


Figure 4. Hydrogeological map

10.6 General Ecology

The vegetation at Havana Relocation Township is typically a highland savannah with a dominance of *A. mellifera* and *C.alexandrii* that are known to occur commonly in this area. No red-listed species were encountered during the survey. It is strongly recommended that the remaining trees in the area should rather be factored into the development as far as possible, as they can be used for shade and can contribute positively to the general aesthetics of the proposed development. Invasive species were also encountered at the site, which is a sign of disturbance.

The following photos illustrate the vegetation on site.



Vegetation on site



Deducing from the Atlas of Namibia, the proposed site is within the area that is known to have >500 plant species (Mandelsohn et al, 2003).

With regards to fauna, it is estimated that at least 71 to 80 reptile, 8 to 11 amphibian, 61 to 75 mammal (e.g. Baboons) and 201 to 230 bird species (breeding residents e.g. Guinea fowl) are known to or are expected to occur in the project area of which only a very few proportion are endemics. However,

there were very few birds observed at the study area, because of current movements in the highly populated neighbouring informal settlement.

11. SOCIO-ECONOMIC ASPECTS

This section provides an overview of socio-economic characteristics of the study area. It provides regional and local information on the, economic activities, population dynamics, vulnerability, and social services currently available in the area.

11.1 Regional Information

The proposed Havana Relocation Township project will be situated in the Khomas Region of Namibia. The total current population is estimated to be 250,262 (126,648 males and 123,613 females) (NPC, 2001). Ninety-four percent of the population of the Khomas Region over 15 years of age are literate. The estimated unemployment rate in Khomas region is 29%, whilst it is 35 to 40% in Windhoek. The population density in Khomas region is relatively high at 6.8 persons per km², compared to the national average of 2 persons per km².

The life expectancy in Khomas region is 56 years in females and 54 years in males. The Human Poverty Index in Khomas region is 17.09, meaning almost a quarter of all people living in Khomas are poverty stricken.

11.2 Windhoek

11.2.1 Economic Activities

The City of Windhoek is the capital city of Namibia and is often referred to as the cleanest city in Africa. The city is the hub for all economic activities in the Khomas Region and is linked to Namibia's air, rail and road network, making it well situated to service Zambia, Zimbabwe, Botswana, Southern Angola and South Africa.

Havana Relocation Township project is a win-win opportunity for all parties involved, whether they are the potential residents or the local authority, or the surrounding community. The Havana Relocation Township project will address the housing scarcity that is currently rife in Windhoek and also cater for the displaced households as a result of the construction of Monte Christo Road and Community Market.

11.2.2. Employment (Job Opportunities)

Unemployment still hampers most of the developing world and Windhoek is not an exception. The proposed project is likely to increase the job opportunities in Windhoek. The construction phase of the project will provide job opportunities, of which 80% are expected to be unskilled and semi-skilled people and can be sourced from the unemployed labour force of Windhoek (unemployment rate is 35 to 40% in Windhoek).



Even before projects produce profits from the sale of erven or use of bulk services, they produce a related benefit for the surrounding communities and the city at large, which is job creation. Bulk services construction involve engineers, construction firms, equipment vendors, and utilities. All of these cost will be spent locally for piping, construction, and operational personnel, contractors, providing additional economic benefits to the community through increased employment and local sales.

Some of the services in the operational phase will be outsourced e.g. maintenance of bulk services, waste removal etc. The outsourcing of these services will strengthen existing business operating in the area and provide employment to people.

11.2.3 Livelihoods

Economic activities in Windhoek and the surrounding areas are limited and livelihoods are heavily dependent on the business sector and salaries of civil servants. The livelihoods of the locals are likely to be positively impacted therefore predicted to be better than before the development of the township project in the area.

11.2.4 Tourism

Windhoek is the major tourism gateway to the rest of Namibia. The city itself also attracts a lot of tourists from all over the world, due to its range of attractions in and around the city; and the rich cultural diversity found in the capital.

This tourist city is renowned for being one of the cleanest in the world, therefore the Havana Relocation Township Project helps combat the lack of housing available for low-middle-high income groups.

Excessive waste, dust, noise, vibrations and appalling air quality can have negative impacts on the tourism industry in the area, as it can become a nuisance to tourists.

11.2.5 In - Migration

Due to enhanced employment opportunities that could be created by the envisaged project, some in-migration of job seekers to Windhoek can be expected. Depending on the amount of in-migration, local areas may start experiencing overcrowdings, over use of infrastructure, local conflicts, increase of goods prices due to increased demand etc.

11.2.6 HIV & Prostitution

Namibia has a high incidence of HIV/AIDS, which has a strong and adverse socio-economic impact on livelihoods of people in the region. The HIV prevalence rate for the age group 15 to 49 is estimated at 21.3% for Namibia (UNDP, 2005).



The spending power of locals working on this project 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.

Should the HIV prevalence increase, the following consequential issues could arise:

- ✓ Reduced workforce in the Khomas Region.
- ✓ Diversion of income expenditure to medical care.
- ✓ Increase in orphans and household headed by children.
- ✓ Increase in pregnancy related mortality.
- ✓ The current rate of 3,129 people per doctor could increase.

11. 2.7 Infrastructure & Increased Traffic

The traffic in the area would be expected to increase slightly and it might contribute to heavy traffic during peak hours and a higher number of car accidents. Infrastructure like roads will be affected due to increased traffic and heavy-duty cargo trucks accessing the site from Monte Christo road and existing road network in Havana extension 2 & 5.

12. STAKEHOLDER PARTICIPATION

Consultation with the public forms an integral component of an EIA investigation and enables I&APs e.g. neighbouring landowners, local authorities, environmental groups, civic associations and communities, to comment on the potential environmental impacts associated with the proposed development and to identify additional issues which they feel should be addressed in the EIA. The primary aims of public participation were:

- ❖ To initiate participation of Interested and affected parties (I&APs), e.g. local authorities and communities.
- ❖ To inform I&APs and key stakeholders about the proposed development.
- ❖ To identify issues and concerns of key stakeholders and I&APs with regards to the proposed development.
- ❖ To provide information to enable informed decision making
- ❖ To develop a communication structure with stakeholder and I&APs
- ❖ To promote transparency of the project
- ❖ To ensure the public and stakeholders comments are considered for the development.
- ❖ To provide answers to I&APs queries
- ❖ To encourage shared responsibility and sense of ownership.

Decision-making authorities were consulted throughout from the outset of the study, and have been engaged throughout the project process. Consultation with the department of Environmental Affairs (MET) included the environmental assessment procedure and application procedure.

Public Consultation Meetings were with the affected communities on various occasions. The main issues that came from this exercise was the need to accommodate affected illegal traders in the area and invaders of the Community Market area.

It was resolved that traders be accommodated in the proposed Community Market. The affected households will be accommodated the new Havana Relocation Township. No environmental issues were raised during the consultation, besides the need to provide basic municipal services. The following table indicates the interested and affected parties of the project.

Table 2: I & APs

Affected Households - Monte Christo Road (incl. Informal market)				
MRP.NO	Name and Surname	Contact Details	ERF.NO	Comments
1	Martin Iipumbu	814007781	906-B	move back
2	Tabita .N. Kronelius	813654143		
3	Rauna .T. Ndiwashimwe	812774120	907-B	move back
4	Matheus .S. Ndakolute	813128396	908-B	move back
5			909-B	move back
6			910-B	move back
7	Jonas .N. Shifidi	812216477		
8	Abed Shuumbwa	814002055		
9			911-B	move back
10				
11				
12	Daniel .M. Shiingidwa	818393724		
13	Fridrick Ekandjo	817557056		
14	Martha Sakaria	812923104		
15	Abniel .T. Haukongo	815518767		
16	Simeon Nghiyangelwa	816600736		
17	Lukas Stefanus	813446314		House with business
18	Justus .F.N. Nghiteke	818426112		House with business
19	Aina Hamutenya	812853425		
20	Moses Sakaria	812075797		
21	Paulus Haiyinge	816361975		
22	Phillimon .S. Wileinge	814372587		
23	Olavi Nashima	812911411		
24	Andreas .B. Nepela	814639891		
25	Klaudia .H. Muzile	816036559		
26	Diina Kuume	812168582		
27	Jekonia Gottlieb	817161836		House with business
28	Filipus .E. Petrus	813715419		House with business
29	Seboloni Erastus	812375420		
30	Titus .N. Elifas	812537683		
31	Andreas Josef	812818880		House with business
32	Laimmy Mungongolo	812335654		
33				
34	Salomo Mundondonga	817903634		
35	Martha .N. Shihenuka	812983725		
36				
37	Absai Elago	812866992		House with business
38	Olivia Shihepo	813367228	821-B	move back
39	Ester .H. Nandjembo	816728767		
40	Martha Nambahu	813258104		
41			822-B	move back
42	Johanna Nandjembo	813147454		
43	Helena .M. Nakagumbo	812532191	823-B	move back
44				
45	Hilma .L. Shivute	812810812	824-B	move back
46			825-B	move back
47			826-B	move back
48				
49	Silas .P. Nghoshi	812961480		
50				

51	Michael Shemunketa	815829969		
52	Herman .N. Paulus	812205625		
53	Mathias Shikuleni	812024741		
54				
55	Julia .P. Mandume	814043135		
56	Theresia Ugwanga	817944529		
57	Eliaser .E. Uupindi	813442757		
58	Drotea .N. Shipopyeni	812254188		
59	Isaskar Kafo	814562229		
60	Rauha .M. Shipopyeni	812301662		
61				
62	Lyonga Muryana	817028355		
63	Kleopas Mupetami	812332933		
64	Tobias Shikongo	817447291		
65	Isak Shituleni	812191536		
66	Ashipala .N. Malima	814198124		
67	Sem Nangombe	812691015		
68	Victori .N. Nangombe	812323889	744-B	move back
69	Taapopi Angula	814179795	743-B	move back
70	Immanuel Aluteni	813459776		
71	Kiliana .N. Alweendo	812779203		House with business
72	Frieda .M. Sakeus	812525010		
73	Hileni lileka	812793116		
74			742-B	move back
75	Abraham .A. Kendjele	813193496		
76				
77	Penomukulili .N. Muhaluka	812454335		church
78	Erastus .N. Namhongo	817394905		
79	Rachel .N. Hamukoto	813326580		
80			737-B	move back
81			736-B	move back
82	Luise Namholo	813265490		House with business
83			735-B	move back- church
84			734-B	move back
85			732-B	move back
86	Lucas .N. Mikael	813300686		House with business
87	Felico .N. Nguitwasa	814751412		
88	Selma Nghipunya	812012272		
89				
90	James .T. Niinkoti	812097351		
91	Petrina .N. Thomas	816119201		
92				House with business
93	Eino .N. Mbango	813920720		
94	Lukas Indombo	818963404		
95	Job .I. Lukas	812445853		
96	Lamek Johannes	812775818		
97	Fillemon Festus	813983722		House with business
98	Aina Intamba	812126833		
99	Job Katjinangara	815628028		
100	France Nangolo	816533285		
101	Festus .A. Andreas	812282814		House with business
102	Martha .T. Shitaleni	813034241		
103	Shekuza Bonifatius	812989229		
104	Abisai .S. Abisai	814627922		House with business
105	Lauha .M. Ambambi	814377757		House with business

106	Junias Negumbo	812999409	
107	Ruben Shigwedha	812985126	House with business
108			
109	Josefina .N. Shipingana	816449761	
110	Silvanus Hamon	811479084	House with business
111	Wilbard .U. Iipinga	816394795	
112	Ester Tomas	812975114	
113	Taimi .N.N. Shaanika	813300416	
114	Nestory .N. Shatjohamba	813066092	
115	Sakeus Nendongo	812727747	
116	Amenenge .N. Ashipala	812524055	
117	Jona .H. Kalombo	814482812	
118			
119	Tuurkie Kaluwa	818631572	
120	Janus .S. Haufiku	812935874	
121	Suama .N. Ipaadhi	812200533	
122			House with business
123			
124	Gustav Hengari	812105889	
125	Bens Kazengurura	816734920	
126	Gajus .M. Kauapirura	812602480	
127	Simon .S. Karembera	812041275	
128	Jesaja Ngurungunda	813451538	
129	Tjiratjiza Murema	812897350	
130	Isaak Mungendje	818096744	
131	Salom .S. Amweenye	818472683	
132	Hafeni .N. Kautwima	812895123	
133	Petrus Frans	813949121	House with business
134	Jackson Tjazirapi	812601716	
135	Titus .N. Johannes	818115166	
136	Presly Tjirimuje	814465090	
137	Engenesia Katjingisua	813080961	
138	Brigitte Katjivikua	812125669	
139	Naomi Kaengombe	812605101	
140	Timotheus .A. Shikwa	812804864	House with business
141	Selma Toivo	816235540	
142	Phillip .S. Namalemo	812975076	House with business
143	Johannes Kanyolo	812210955	
144			House with business
145	Benhard .K. Ugwanga	812264506	House with business
146	Naemi Awala	812505032	
147			House with business
148	Anna .N.N. Amunime	812049007	Business
149	Simeon Mpuka	812309940	
150	Petrus .N.M.E. Nghiyalwa	812689775	
151			House with business
152	Erastus .D.K. Ashipala	812009823	
153			House with business
154	Tomas Hamukoto	814421331	
155	Simon .N. Heita	813521573	House with business
156	Josef Sheehama	812491912	House with business
157	Simion .H. Haukuti	813446440	House with business
158	Aguste .O. Iipinga	817148566	
159	Maria .M. Paulus	814252684	
160	Petrus Johannes	816603144	
161	Viktorija .N. Mongongo	817536233	House with business

162	Frieda Shilongo	813731073		
163	Johannes Angula	816132430		
164	Rosaria Shimbode	817301955		House with business
165	Daniel .N. Mokaxwa	812375501		
166	Tomas .N. Ipinge	812484484		House with business
167	Daniel .H. Shinongodo	818730229		
168	Nakakalepo Amutenya	812301977		House with business
169	Tobias Karukuma	813359728		
170				
171	Stella .U. Tjihuno	814053958		
172	Tobias Ndyimba	814844863		
173				
174	Hilen .N. Veijo	814715563		
175	Petrus .S. Haufiku	814566935		
176	Samuel Nakalila	812852700	741-B	move back
177	Frans Shilepa	818285848		
178	Albertina .T. Shikongo	812201416		House with business
179	Elize .E. Hamunyela	813991942		House with business
180	Loide .A. Katsimine	818289982		
181	Frieda Moses	818997687		
182	Teopolina .N. Kashimbode	812804872		House with business
183	Twindileni .N. Kashopola	812424858		House with business
184	Josef .V. Hanyemweshitya	814235205		House with business
185	Viktorija .S. Iiyambo	817893118		House with business
186	Simon .A. Iiyambo	813791436		House with business
187	Stefanus .U. Sheya	813553418		House with business
188	David .J. Kamati	812739877		
189				House with business
190				House with business
191				House with business
192				House with business
193				
194				
195				
196				House with business
197				House with business
198	Timotheus Hangula	812881089		
199	Petrus .T. Shigwedha	813048544		
200				
201	Lyosina Kalembe	813930730		
202	Beata Ndove	817558025		
203	Aili .J. Haindongo	812309884		
204	Josua .T. Ndove	816612115		
205	Abraham .S. Sheelekeni	813003257		
206	Tuyenikelao Vaendjele	818429809		
207	Sakeus .M. Imene	812332200		House with business
208	Fransina .M. Jashon	812371822		
209	Michael .A. Kalola	812772495		
210	Thomas .M. Nuleipo	812730375		House with business
211				House with business
212	Wilbard .U. Hango	812717107		House with business
213	Salom Lukas	813071530		House with business
214	David Sheendelwako	816328728		
215	Lukas .K. Kaluwapa	816548488		House with business
216	Matias .S. Kaluwapa	816548488		House with business
217				House with business

218				
219	Janus Erastus	812739100		House with business
220				House with business
221	Sesilia .K. Tuukondjele	817993769		House with business
222				House with business
223				House with business
224				House with business
225				move back- business
226	Gideon Itula	812847094		House with business
227	Selma .F. Mathias	814060434		
228	Immanuel Nashivela	812459084		
229	Elifas .N. Puleri	813491105		
230	Anna .K. Haukongo	818171198		House with business
231	Matheus Muundjua	817333515		
232	Fransina Kamati	812755946		
233				
234				
235	Thomas .H. Nangolo	815900009		
236				
237	Ruben Teofelus	812310374		
238	Helena Haipinge	812319698		
239	Helvi .K. Ndjodhi	812432493		
240	Salomo .T. Nambobola	814497860		
241				
242				
243	Wilhelm Nambwele	812687918		
244				
245	S .T. Shiyanga	812478640		
246				
247	Lusia .N. Kashedi	816591140		
250	Festus .W. Shituka	813015864		
251				church
252	Andreas .T.N. Fernandu	817239909		House with business
256	Fillemon .H.M. Shilipavali	816384977		
257	Levy Shikongo	812263637		
258	Seblon Kamati	812279972		
259	Leonard .N. Nghinyekwa	812750289		
260	Albertina Mureko	812818996		
261	Fulunias Haihambo	813491060		
262	Justina .N. Ihuhwa	816180832		
279				
280	Lazarus .N. Mandume	812148827		
281				
282	Marthin Muleka	812062222		
		268		
		273		
		274		
	Summary			
	208 houses are affected by the Monte Cristo road construction			
	48 house are affected by informal market construction site			
	Total houses to be relocated are 256			

13. ENVIRONMENTAL IMPACT EVALUATION

The Environmental Impact Assessment sets out potential positive and negative environmental impacts associated with the proposed Havana Relocation Township Development. The following assessment methodology will be used to examine each impact identified, see Table 3:

Table 3. Impact Evaluation Criterion (DEAT 2006)

Criteria	Rating (Severity)	
Impact Type	+VE	Positive
	0	No Impact
	-VE	Negative
Significance of impact being either	L	Low (Little or no impact)
	M	Medium (Manageable impacts).
	H	High (Adverse impact).

Probability:	Duration:
5 - Definite/don't know	5 - Permanent
4 - Highly probable	4 - Long-term (impact ceases)
3 - Medium probability	3 - Medium-term (5-15 years)
2 - Low probability	2 - Short-term (0-5 years)
1 - Improbable	1 - Immediate
0 - None	
Scale:	Magnitude:
5 - International	10 - Very high/don't know
4 - National	8 - High
3 - Regional	6 - Moderate
2 - Local	4 - Low
1 - Site only	2 - Minor
	0 - None

13.1 Construction Activities of the Havana Relocation Township.

13.1.1 Dust Pollution and Air Quality

Dust will be generated during the construction and installation of bulk services, and problems thereof are expected to be site specific. Dust is expected to be worse during the winter months when strong winds occur. Release of various particulates from the site during the construction phase and exhaust fumes from vehicles and machinery related to the construction of bulk services are also expected to take place. Dust is regarded as a nuisance as it reduces visibility, affects the human health and retards plant growth.

It is recommended that regular dust suppression be included in the construction activities, when dust becomes an issue. No unnecessary revving of engines or operation of vehicles is allowed. In general, the servicing of Havana Relocation Township is envisaged to have minimal impacts on the surrounding air quality.

Impact
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Dust & Air Quality	-VE	2	1	2	1	M	L



13.1.2 Noise Impact

An increase of ambient noise levels at Havana Relocation Township site is expected due to the construction activities. Noise pollution due to heavy-duty equipment and machinery will be generated.

It is not expected that the noise generated during construction will impact any third parties. Ensure all mufflers on vehicles are in full operational order; and any audio equipment should not be played at levels considered intrusive by others. The construction staff should be equipped with ear protection equipment.

Impact
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Noise	-VE	1	1	4	4	M	L

13.1.3 Safety and Security

Safety issues could arise from the earthmoving equipment and tools that will be used on site during the construction phase. This increases the possibility of injuries and the contractor must ensure that all staff members are made aware of the potential risks of injuries on site. The presence of equipment lying around on site may also encourage criminal activities (theft).

Sensitize operators of earthmoving equipment and tools to switch off engines of vehicles or machinery not being used. The contractor is advised to ensure that the team is equipped with first aid kits and that they are available on site, at all times. Workers should be equipped with adequate personal protective gear and properly trained in first aid and safety awareness.

No open flames, smoking or any potential sources of ignition should be allowed at the project location. Signs such as 'NO SMOKING' must be prominently displayed in parts where inflammable materials are stored on the premises. Proper barricading and/or fencing around the work sites should be erected to avoid entrance of animals and/or unauthorized persons. Safety regulatory signs should be placed at strategic locations to ensure awareness. Adequate lighting within and around the construction locations should be erected, when visibility becomes an issue.

Impact
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Safety & Security	-VE	1	1	4	2	M	L



13.1.4 Contamination of Groundwater

Groundwater quality could be impacted through oil leakages, lubricants and grease from the equipment and machinery utilised during the bulk servicing of Havana Relocation Township. Possibility of contamination from surface sources exist in the proximity of fault zones.

Care must be taken to avoid contamination of soil and groundwater. Use drip trays when doing maintenance on machinery. Maintenance should be done on dedicated areas with linings or concrete floor. The risk can be lowered further through proper training of staff.

All spills must be cleaned up immediately. Excavations should be backfilled and sealed with appropriate material, if it is not to be used further.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Groundwater	-VE	2	2	2	2	M	L

13.1.5 Contamination of Surface Water

Contamination of surface water might occur through oil leakages, lubricants and grease from the equipment and machinery during the installation and maintenance of bulk services at Havana Relocation Township. Oil spills may form a film on water surfaces in the nearby streams causing physical damage to water-borne organisms.

Machinery should not be serviced at the construction site to avoid spills. All spills should be cleaned up as soon as possible. Hydrocarbon contaminated clothing or equipments should not be washed within 25m of any surface water body.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Surface water	-VE	2	2	2	3	M	L

13.1.6 Generation of Waste

This can be in a form of rubble, cement bags, pipe 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.

The oil leakages, lubricants and grease must be addressed. Contaminated soil must be removed and disposed off at the hazardous waste cell at Kupferberg Landfill. The contractor must provide containers on-site, to store any hazardous waste produced. Regular inspection and housekeeping procedure monitoring should be maintained by the contractor.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Waste	-VE	1	1	4	4	M	L



13.1.7 Traffic

The bulk servicing of Havana Relocation Township activities are expected to have a minor impact on the movement of traffic along Monte Cristo road and existing road network of Havana Extension 2 and 5. No diversion of traffic or closure of roads are expected.

Speed limit warning signs must be erected to minimise accidents. Heavy-duty vehicles and machinery must be tagged with reflective signs or tapes to maximise visibility and avoid accidents.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Traffic	-VE	2	1	4	3	M	L

13.1.8 Fires and Explosions

There should be sufficient water available for fire fighting purposes. Ensure that all fire-fighting devices are in good working order and they are serviced. All personnel have to be trained about responsible fire protection measures and good housekeeping such as the removal of flammable materials on site. Regular inspections should be carried out to inspect and test fire fighting equipment by the contractor.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Fires and Explosions	-VE	1	1	4	2	M	L

13.1.9 Nuisance Pollution

Aesthetics and inconvenience caused to persons in surrounding areas. The construction activities would not be visible from the Monte Cristo road section. It would only be visible from the existing Havana Extension 2 & 5, thus the supervisor should maintain tidiness on site at all times. Take cognition when parking vehicles and placing equipment.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Nuisance Pollution	-VE	1	1	2	2	L	L

13.1.10 Erosion and Sedimentation

Vegetation clearance and creation of impermeable surfaces could result in erosion in areas across Havana Relocation Township. The clearance of vegetation will further reduce the capacity of the land surface to slow down the flow of surface water, thus decreasing infiltration, and increasing both the quantity and velocity of surface water runoff. The particles in suspension will be transported towards the north and could increase the sedimentation in the Aretaragas river tributary flowing in the northern direction.

The proposed development will increase the amount of impermeable surfaces and therefore decrease the amount of groundwater infiltration. As a result, the amount of stormwater during rainfall events could increase. If proper stormwater management measures are not implemented this will impact negatively on the water courses close to the site.



Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Erosion and Sedimentation	-VE	1	1	4	2	M	L

13.1.10 Ecological Impacts

The proposed Havana Relocation Township is an already disturbed area, with no conservation worthy vegetation and fauna. The trees larger than 150mm in girth should be left intact, and let the residents decide on whether to incorporate it in their residence plans. Land will be cleared, leaving the bigger trees to maintain the vegetation within Havana Relocation Township. However, impacts on fauna and flora are expected to be minimal. Disturbance of areas outside the designated working zone is not allowed.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Ecology	-VE	1	1	4	2	L	L

13.1.11 Heritage Impacts

There is a an old grave of Amalia /Homes within the planned Havana Relocation Township. The same grave was also observes by theArcheological specialist John Kinahan.



This grave is of heritage importance, and should not be disturbed in any way. The planners must dedicate this specific portion of the township as a grave. Any other heritage artefacts observed during the construction phase , must be conserved and reported to the National Heritage Council of Namibia.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Heritage	-VE	1	1	4	1	H	L



Summary of all potential impacts expected during the construction of the bulk services of Havana Relocation Township:

In general, impacts are expected to be low to medium, mostly short lived and site specific. Mitigation options recommended in the Environmental Management Plan (EMP) will guide and ensure that the impacts during the construction activities are minimised.

The contractor on site should be made aware of the content and environmental requirements of this report through proper induction training.

13.2 Operational Activities of Havana Relocation Township

13.2.1 Dust Pollution and Air Quality

Vehicles that will be accessing Havana Relocation Township will contribute to the release of hydrocarbon vapours, carbon monoxide and sulphur oxides into the air. Possible release of sewer odour, due to sewer system failure or maintenance might also occur. All maintenance of bulk services of Havana Relocation Township procedures have to be designed to enable environmental protection .

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Dust & Air Quality	-VE	2	1	2	1	M	L

13.2.2 Noise Impact

Noise pollution already exists around the site in the form of noise generated from vehicles frequenting the existing access road. Noise pollution due to this project in the operational phase is expected to be mainly from generators or pumps, road maintenance machinery during maintenance.

Ensure that generator engines are fitted with mufflers. Operators working in close proximity to the generators should be equipped with ear protection equipment, when noise becomes an issue. Observation of on-site noise levels by the Manager or Supervisor of Bulk Services Maintenance Department.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Noise	-VE	1	3	4	4	M	L

13.2.3 Contamination of Groundwater and Surface Water

Spillages might also occur during maintenance of the sewer system. This could have negative impacts on surface and groundwater especially in cases of large sewer spills.

Potential health impact on groundwater users do exist. Potential impact on the natural environment from possible polluted groundwater also exists. The area is subjected to north-northwest structures, which might act as preferential pathways for any contaminants entering the saturated zone. Proper



containment should be used in cases of sewerage system maintenance to avoid any possible leakages.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Groundwater contamination	-VE	2	3	3	3	M	L

13.2.5 Generation of Waste

Waste in the form of solid waste from households, businesses and institutions will be generated. Waste will be removed and disposed off at Kupferberg Landfill by City of Windhoek Waste Removal Contractors e.g. Rent-a-Drum, Kleen Tek etc.

The City of Windhoek will have waste skips around Havana Relocation Township like the rest of the suburbs in Windhoek.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Waste Generation	-VE	1	1	2	4	M	L

13.2.6 Failure of Reticulation Pipelines

Potential release of sewage, storm-water, water, into the environment environment due to pipeline/system failure. As a result, the spillage could be released into the environment and could potentially be a health hazard to surface and groundwater.

Proper reticulation pipelines and drainage systems should be installed. Regular bulk services infrastructure and system inspection should be conducted.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Failure of Reticulation Pipelines	-VE	1	1	4	2	L	L

13.2.7 Ecological Impacts

No impacts are expected as the proposed Havana Relocation Township in the operational phase. Vegetation in open spaces should not be disturbed or removed during the operational phase. Minimise the area of disturbance by restricting movement to the designated working areas during Maintenance.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Ecology Impacts	-VE	1	1	4	2	L	L



13.2.8 Traffic

Traffic around the Havana Relocation Township should be monitored, to avoid traffic congestion in the area. Speed limits and road signs as set out by City of Windhoek Traffic Department should be adhered to in order to minimise accidents. It is advisable that traffic flow measures be implemented at Havana Relocation Township on problematic areas to ease traffic flow around the new township.

Impact
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Traffic	-VE	1	3	4	4	M	L

13.2.9 Safety and Security

A number of health and safety threats exist during operational activities of Havana Relocation Township. Individuals in the community can suffer from noise from maintenance activities around the proposed township. Accidents on roads as a result of increased traffic and deteriorated.

The contractors are advised to ensure that proper personal protective gear and first aid kits are available, at all times. Workers should also be properly trained in first aid and safety awareness.

Impact
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Safety and Security	-VE	1	3	6	3	M	L

Summary of all potential impacts expected during the operations of the Havana Relocation:

In general, impacts are expected to be low, short lived and site to local specific. An Environmental Management Plan (EMP) will ensure that the impacts during the operational activities are minimised and includes measures to reduce all impacts identified.

The contractor should be made aware of the content and environmental requirements of this report through proper induction training.



14. CUMULATIVE IMPACTS

These are impacts on the environment, which results from the incremental impacts of the Havana Relocation Township when added to other past, present, and reasonably foreseeable future actions regardless of what person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. In relation to an activity, it means the impact of an activity that in itself may not be significant, but may become significant when added to the existing and potential impacts resulting from similar or diverse activities or undertakings in the area.

Possible cumulative impacts associated with the development of Havana Relocation Township includes, noise emissions, land disturbance, possible Aretegas River pollution, and traffic impacts involving vehicles frequenting the area. These impacts could become significant. This could collectively impact on the environmental conditions in the area. Cumulative impacts could occur in both the operational and the construction phase.

Impact
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Cumulative impacts	-VE	1	3	4	3	M	L

15. ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management Plan (**EMP**) provides management options to ensure impacts of the proposed servicing of Havana Relocation Township are minimised. An EMP is an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the Havana Relocation Township project are prevented, and the positive benefits of the projects are enhanced.

The objectives of the EMP are:

- ✓ to include all components of the Havana Relocation Township project;
- ✓ to prescribe the best practicable control methods to lessen the environmental impacts associated with the Havana Relocation Township project;
- ✓ to monitor and audit the performance of the project personnel in applying such controls; and
- ✓ to ensure that appropriate environmental training is provided to responsible project personnel.

The EMP acts as a stand-alone document, which can be used during the various phases of the proposed project. All contractors taking part in the bulk services construction activities should be made aware of the contents of the EMP. An EMP for the construction and operational phases of Havana Relocation Township project is attached as Appendix A.



16. CONCLUSIONS

All known environmental and social risks can be minimised and managed through implementing preventative measures and sound management systems. It is recommended that environmental performance be monitored regularly to ensure compliance and that corrective measures be taken if necessary. It is also recommended that this information be made available to the surrounding communities on a regular basis.

In general, the Havana Relocation Township project would pose limited environmental risks, provided the EMP for the activity is used properly during planning, construction and operational phase. The Environmental Management Plan should be used as an on-site tool during all phases of the Havana Relocation township project. Parties responsible for non-conformances of the EMP will be held responsible for any rehabilitation that may need to be undertaken.

Should the Havana Relocation Township project be modified or extended to a different area, it is recommended that a different EIA be done for the probable new location.

Matrix Consulting Services



Chris Ailonga (MSc Env Sci, Wits)
Principal Environmental Scientist
August 2020



17. REFERENCES

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