

**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR
THE PROPOSED PERMANENT CLOSURE OF ERF 586 TSUMEB,
EXTENSION 4 – OSHIKOTO REGION NAMIBIA**

ENVIRONMENTAL SCOPING REPORT (ESR)

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APP: 230124000894

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Definitions

TERMS	DEFINITION
BID	Background Information Document
EAP	Environmental Assessment Practitioners
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA (R)	Environmental Impact Assessment (Report)
ESIA	Environmental and Social Impact Assessment
EMP	Environmental Management Plan
EMPr	Environmental Management Plan Report
GHG	Greenhouse Gases
ISO	International Organization for Standardization
I&Aps	Interested and Affected Parties
MEFT: DEAF	Ministry of Environment, Forestry and Tourism's Directorate of Environmental Affairs and Forestry
NHC	National Heritage Council
NEMA	Namibia Environmental Management Act
ToR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change

i. Purpose of This Environmental Impact Assessment Report

This Environmental Scoping Report (ESR) follows the Scope of Work delineated by Shavuka General Dealer cc. Existing information and input from commenting authorities, Interested and Affected Parties (I&APs) was used to identify and evaluate potential environmental impacts (both social and biophysical) associated with the proposed project.

Environmental flaws associated with the proposed project were identified through the Environmental Scoping Report. A conscious decision was made based on the recommendations and guidelines by the Directorate of Environmental Affairs EIA guidelines in order to assess both significant and less significant environmental impacts proposed by the development. The developed Environmental Management Plan (EMP) for this proposed activity will have to be effectively implemented by the client, to ensure that adverse environmental impacts are not considered.

The detailed assessment of the anticipated impacts was undertaken with the purpose of highlighting any areas of concern regarding the proposed project during its construction, and operation. In addition, an independent sensitivity mapping analysis was undertaken. This analysis characterised the development site on the significant environmental aspects in order to reflect the site's suitability.

This EIAR will also be used to motivate and define the previously identified, project alternatives (i.e. site, technology and layout) based on the findings of the environmental baseline study and the suitability of the site to the type of development. This EIAR has been compiled in accordance with the regulatory requirements stipulated in the EIA Regulations (2012), promulgated in terms of the Namibian environmental legislation (Environmental Management Act (No. 7 of 2007))

The EIAR aims to:

- Provide an overall assessment of the social, physical and biophysical environments of the area affected by the proposed establishment of the township establishment;
- Undertake a detailed environmental assessment, in terms of environmental criteria and impacts (direct, indirect and cumulative), and recommend a preferred location for the proposed plant (based on environmental sensitivity);
- Identify and recommend appropriate mitigation measures for potentially significant environmental impacts; and
- Undertake a fully inclusive Public Participation Process (PPP)
- GIS sensitivity mapping was conducted to identify potential impacts, propose mitigation and inform the sensitivity analysis.

A systematic approach was adopted for the successful completion of the EIA in line with the regulated process. The diagram in Figure 1 below indicates the sequential process that will be followed for this study.

ii. Assumptions And Limitations

The following assumptions and limitations underpin the approach to this EIA study:

- The information received from the stakeholders, desktop surveys and baseline assessments are current and valid at the time of the study;
- A precautionary approach was adopted in instances where baseline information was insufficient or unavailable;
- Mandatory timeframes will apply to the review and adjudication of the reports by the competent authority and other government departments; and
- No land claims have been registered for the proposed site at the onset and registration of the study.

NB: The EAP does not accept any responsibility in the event that additional information comes to light at a later stage of the process. All data from unpublished research utilised for the purposed of this project is valid and accurate. The scope of this investigation is limited to assessing the potential biophysical, social and cultural impacts associated with the proposed project.

1. CHAPTER ONE: BACKGROUND

1.1. Introduction

Shavuka General Dealer cc referred to as the proponent is the owner of Erf 586 Tsumeb, Extension 4 measuring at $\pm 2\,961\text{m}^2$ in extent. As per the requirements of the Township and Division of Land Ordinance 1963 and the Environmental Management Act No. 7 of 2007, the proponent appointed EnviroPlan Consultants to undertake an Environmental Scoping Assessment (ESA), formulate an Environmental Management Plan (EMP) and apply for an Environmental Clearance Certificate (ECC) to the Ministry of Environment, Forestry and Tourism (MFET): Directorate of Environmental Affairs (DEA).

In this respect, this document forms part of the application to be made to the DEA's office for an Environmental Clearance Certificate (ECC) for the proposed permanent closure of erf 586 Tsumeb, extension 4 – Oshikoto Region Namibia.

1.2. Project Location & Description

Erf 586 is located in Hage Geingob Street in Tsumeb, Extension 4 at coordinates $S19^{\circ}15'03.55''$ $E017^{\circ}42'36.43''$. The proponent entails to rezone Erf 586 from a "Public open space" to business with a bulk of 2.0. The area consists of no vegetation except *Phoenix dactylifera* due to human disturbance such as cars and/or trucks which use the area as parking space. Notable in the surrounding are business establishment buildings such as shopping malls. Fig 1 shows the current open space and Fig 2 illustrates the spatial locality of the project area.



Figure 1: Project Site

1.3.2. INFRASTRUCTURE AND SERVICES

The proponent at the developers' cost shall liaise with the Tsumeb Municipality for the provision of municipal services such as electricity, water reticulation, sewerage reticulation and domestic waste management. The services can easily be easily connected to the proposed project site. Since the site is adjacent to the existing suburbs, water, sewer and electricity services are near and can be connected.

1.3.3. ROADS AND STORM WATER

The rezoning development on Erf 586 Tsumeb, Extension 4 would obtain access from existing water infrastructure. Storm water would be taken off from surface run-off and drain towards the bottom of the site. Adequate and proper drainage should be constructed that avoid instances of waterlogging and flooding of the site. It would be attempted to maintain the natural flow of storm water flow with minimum disruptions.

2. CHAPTER TWO: POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1. Introduction

An important part of the EIA is identifying and reviewing the administrative, policy and legislative frameworks concerning the proposed activity, to inform the proponent about the requirements to be fulfilled in undertaking the proposed project. This section looks at the legislative framework within which the proposed development will conform to; the focus is on the compliance with the legislation during the planning, construction and operational phases. All relevant legislations, policies and international statutes applying to the project are highlighted in the table below as specified in the Environmental Management Act, 2007 (Act No.7 of 2007) and the regulations for Environmental Impact Assessment as set out in the Schedule of Government Notice No. 30 (2012).

Table 2: Policies, legal and Administrative regulations

The pursuit of sustainability is guided by a sound legislative framework. In this section, relevant legal instruments as well as their relevant provisions have been surveyed. An explanation is provided regarding how these provisions apply to this project

Aspect	Legislation	Relevant Provisions	Relevance to the Project
The Constitution	Namibian Constitution First Amendment Act 34 of 1998	<ul style="list-style-type: none"> - Article 16(1) guarantees all persons the right to property. It therefore provides everyone a right to acquire, own and dispose of property, alone or in association with others and to bequeath such property. - “The State shall actively promote and maintain the welfare of the people by adopting policies that are aimed at maintaining ecosystems, essential ecological processes and the biological diversity of Namibia. It further promotes the sustainable utilisation of living natural resources basis for the benefit of all Namibians, both present and future.” (Article 95(I)). 	<ul style="list-style-type: none"> - The project will enable the full execution of right to practice any profession, or carry on any occupation, trade or business by availing necessary provisions such as practicing any profession, or carry on any occupation, trade or business in the country. - Through implementation of the environmental management plan, the proponent will ensure conformity to the constitution in terms of environmental management and sustainability.
National Development Plans		<ul style="list-style-type: none"> - Namibia’s overall Development ambitions are articulated in the National Vision 2030. At the operational level, five-yearly national development plans (NDP’s) are prepared in extensive consultations led by the National Planning Commission in the Office of the President. The Government has so far launched a 4th NDP focusing on high and sustained economic growth, increased income equality Employment creation. 	<ul style="list-style-type: none"> - The proposed project will propel NDP4 targets in land development. Adding on, this will create employment which will work towards the NDP and Vision 2030.
Archaeology	National Heritage Act 27 of 2004	<ul style="list-style-type: none"> - Section 48(1) states that “A person may apply to the Namibian Heritage Council (NHC) for a permit to carry out works or activities in relation to a protected place or protected object” 	<ul style="list-style-type: none"> - Any heritage resources discovered would require a permit from the NHC for relocation.

	National Monuments Act of Namibia (No. 28 of 1969) as amended until 1979	<ul style="list-style-type: none"> - “No person shall destroy, damage, excavate, alter, remove from its original site or export from Namibia: - Meteorites, fossils, petroglyphs, ornamental infrastructure graves, caves, rock shelters, middens, shells that came into existence before the year 1900 AD; or - any other archaeological or palaeontological finds 	<ul style="list-style-type: none"> - The proposed site of development is not within any known monument sites, both movable and immovable as specified in the Act, however in finding any materials specified in the Act, contractors on site will take the required route and notify the relevant commission.
Environmental	Environmental Management Act 7 of 2007	<ul style="list-style-type: none"> - Requires that projects with significant environmental impacts are subject to an environmental assessment process (Section 27). - Requires for adequate public participation during the environmental assessment process for interested and affected parties to voice their opinions about a project (Section 2(b-c)). - According to Section 5(4) a person may not discard waste as defined in Section 5(1)(b) in any way other than at a disposal site declared by the Minister of Environment and Tourism or in a manner prescribed by the Minister. - Details principles which are to guide all EIAs 	<ul style="list-style-type: none"> - This Act and its regulations should inform and guide this EIA process.
	EIA Regulations GN 57/2007 (GG 3812)	<ul style="list-style-type: none"> - Details requirements for public consultation within a given environmental assessment process (GN No 30 S21). - Details the requirements for what should be included in a Scoping Report (GN No 30 S8) an EIA report (GN No 30 S15). 	<ul style="list-style-type: none"> - This Act and its regulations should inform and guide this EIA process.
	Pollution and Waste Management Bill (draft)	<ul style="list-style-type: none"> - This bill defines pollution and the different types of pollution. It also points out how the Government intends to regulate the different types of pollution to maintain a clean and safe environment. - The bill also describes how waste should be managed to reduce environmental pollution. Failure to comply with the requirements considered an offence and is punishable. 	<ul style="list-style-type: none"> - The project should be executed in harmony with the requirements of the act to reduce negative impacts on the surrounding environs from waste during construction or operation. Gobabis waste management by-laws will be abide to during construction and operation.
	Soil Conservation Act 76 of 1969	<ul style="list-style-type: none"> - This acts makes provision for combating and for the prevention of soil erosion, it promotes the conservation, protection and 	<ul style="list-style-type: none"> - The Project impact on soil will rather be localised, however the Act should provide for guidelines of operation during construction to

		improvement of the soil, vegetation, sources and resources of the Republic of Namibia.	prevent soil erosion and contamination during operation.
	National Biodiversity Strategy and Action Plan (NBSAP2)	<ul style="list-style-type: none"> - The action plan was operationalised in a bid to make aware the critical importance of biodiversity conservation in Namibia, putting together management of matters to do with ecosystems protection, biosafety, and biosystematics protection on both terrestrial and aquatic systems. 	<ul style="list-style-type: none"> - Forming part of the EIA of and EMP for this Project, the proponent will consider all associated impacts, both acute and long term, and will propose methods and ways to sustain the local biodiversity.
Forestry	Forest Act 12 of 2001	<ul style="list-style-type: none"> - Tree species and any vegetation within 100m from a watercourse may not be removed without a permit (S22(1)) - Provision for the protection of various plant species. 	<ul style="list-style-type: none"> - The clearing of vegetation is prohibited (subject to a permit) 100m either side of a river. Certain tree species occurring in the area are protected under this Act. Permits must be obtained from MAWF in accordance with the Act. However, on site there are no trees that require clearing permit.
Water	Water Act 54 of 1956	<ul style="list-style-type: none"> - The Water Resources Management Act 24 of 2004 is presently without regulations; therefore, the Water Act No 54 of 1956 is still in force: - A permit application in terms of Sections 21(1) and 21(2) of the Water Act is required for the disposal of industrial or domestic wastewater and effluent. - Prohibits the pollution of underground and surface water bodies (S23(1)). - Liability of clean-up costs after closure/ abandonment of an activity (S23(2)). - Protection from surface and underground water pollution 	<ul style="list-style-type: none"> - The protection of ground and surface water resources should guide development's layout plans.
Health and Safety	Labour Act (No 11 of 2007) in conjunction with Regulation 156,	<ul style="list-style-type: none"> - 135 (f): "the steps to be taken by the owners of premises used or intended for use as factories or places where machinery is used, or by occupiers of such premises or by users of machinery about the 	The proponent will employ several people from the local and shall ensure securing a safe environment and preserving the health and welfare of

	‘Regulations Relating to the Health and Safety of Employees at work’.	<p>structure of such buildings of otherwise to prevent or extinguish fires, and to ensure the safety in the event of fire, of persons in such building;” (Ministry of Labour and Social Welfare).</p> <ul style="list-style-type: none"> - This act emphasizes and regulates basic terms and conditions of employment, it guarantees prospective health, safety and welfare of employees and protects employees from unfair labour practices. 	<p>employees at work. This will include applying appropriate hazard management plans and enforcing Occupational Health and Safety (OHS) enforcement by contractors.</p>
	Public Health and Environmental Act, 2015	<ul style="list-style-type: none"> - Under this act, in section 119: “No person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.” 	<ul style="list-style-type: none"> - The project will comply with the requirements of the Act.
Services and Infrastructure	Road Ordinance 1972 (Ordinance 17 Of 1972)	<ul style="list-style-type: none"> - Width of proclaimed roads and road reserve boundaries (S3.1) - Control of traffic during construction activities on trunk and main roads (S27.1) - Infringements and obstructions on and interference with proclaimed roads. (S37.1) - Distance from proclaimed roads at which fences are erected (S38) 	<ul style="list-style-type: none"> - Although the project is a major boost for the suburb and the commodities market, the proponent needs to ensure that the development do not affect the major roads within their vicinity during construction and operation phases.
	Townships and Division of Land Amendment Act, 1992 (Act 28 of 1992)	<ul style="list-style-type: none"> - “(l) Whenever any area of land constitutes, by reason of its situation, a portion of an approved township, or adjoins an approved township, the Executive Committee may, by proclamation notice in the Gazette and after consultation with the Board, extend the boundaries of that township to include such area”. (Minister of Regional and Local Government) - A new township needs to be created for approval by the Namibian Planning Advisory Board and the Township Board. 	<ul style="list-style-type: none"> - Through conducting this EIA and preparation of The townships board already approved this project, however the construction and operation will need to be regulated accordingly.

3. CHAPTER THREE: RECEIVING ENVIRONMENT

3.1. Socio-economic

The 2011 Namibia Population and Housing Census results shows that, Oshikoto had a population of 181 ,973 people of which 94 ,907 were women and 87 ,066 were men. The town is well known for its copper and lead smelters. Tsumeb boasts the biggest lead-producing mine in Africa, and is the fifth largest lead producer in the world. A standard-gauge Trans Namib rail connection links Tsumeb with Windhoek, Walvis Bay and the Republic of South Africa. The project area is surrounded business establishment such as malls. retails and distributor shops.



Figure 3: Surrounding area at project site

3.2. Climate

Tsumeb has a subtropical climate, with very hot summers and mild winters. The mean maximum temperature lies at 29,7 C, while the mean minimum temperature is 14,4 C. Occasional thunderstorms occur during the summer rainfall months, October to March. The average rainfall is 555 mm per annum.

3.1. Fauna

Fauna varies depending on the type of vegetation, climate, and topography. The Kalahari woodland in the region is mainly dominated by species such as palm trees (*Phoenix dactylifera*), Burkea (**Burkea Africana**), Camel Thorn (*Acacia erioloba*), Makalani Palm (*Hyphaene petersiana*) and Leadwood

(*Combretum imberbe*). During the rainy season, bird life picks up in 18 the western part of the Region. However, other places get high numbers of individual species such as Abdim's stork and rather than a wide variety of species. During the site inspection, no animals were seen due to human presence, activity, and clearing of land. Therefore, the project will have no impact on fauna.

3.2. Flora

The Oshikoto Region is largely characterized by semi-arid conditions with the area experiencing more than the country's average rainfall annually. Its landscape is characterized by open grassland and shrubland. The area experiences high temperatures in the summer and relatively low temperatures in the winter. The area is dominated by indigenous trees, such as palm trees (*Phoenix dactylifera*), Burkea (*Burkea Africana*), Camel Thorn (*Acacia erioloba*), Makalani Palm (*Hyphaene petersiana*) and Leadwood (*Combretum imberbe*). The low-lying areas are occupied by few shrubs, grass and herbs species, Eragrostis and Schmidtia species. However, no plant species were present on the project site as the area has been disturbed by human activities. Therefore, the project will not have any impact on the flora



Figure 4: Project site

The site illustrated on figure 4 is clear with Phoenix dactylifera. The area has been affected gravely by urban developments in its vicinity and residents were already using the open area as a parking spot as illustrated in the picture.

3.3. Geology

Dominant soils prevailing in the Tsumeb area rock outcrops (representing the karst) with a band of Chromic Luvisols running approximately east to west through the area. Chromic refers to soils with bright colours and luvisols are a soil unit which only occurs (in Namibia) in two small areas west of Grootfontein, which have good water holding capacity and are well drained with a porous and aerated structure. Luvisols typically comprise an accumulation of clay that has settled some depth below the surface.

3.4. Hydrology

In terms of groundwater, the area falls within the Cuvelai-Etосha groundwater basin depicted. The hydrogeological Cuvelai Basin comprises the Omusati, Oshana, Ohangwena, and Oshikoto Regions and parts of the Kunene Region. The Cuvelai Basin consists of thousands of drainage channels or oshanas which flow during the rainy season. The oshanas are “shallow, often vegetated and poorly defined, interconnected flood channels and pans through which surface water flows slowly or may form pools depending on the intensity of the flood. Tsumeb mostly use underground water for water.

4. CHAPTER FOUR: PUBLIC CONSULTATION

4.1. Overview

The public consultation process forms an important component of the Environmental Assessment process. It is defined in the EIA Regulations (2012), as a “*process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to, specific matters*” (S1). Section 21 of the Regulations details steps to be taken during a given public consultation process and these have been used in guiding our process.

Formal public participation has taken place via public consultations and focal meetings, newspaper announcements to inform the public that such a large-scale project is under consideration. The public consultation process has been guided by the requirements of Environmental Management Act (EMA) No. 7 of 2007 and the process has been conducted in terms of regulation 7(1) as well as in terms of the EMA Regulations of GN 30 of 6 February 2012 and the World Bank EIA standards and project ToR.

Its overriding goals have been to ensure transparency in decision making and to.

- ✓ Ensure stakeholder concerns are incorporated in project design and planning;
- ✓ Increase public awareness and understanding of the project and
- ✓ Enhance positive development initiatives through the direct involvement of affected people.

The objectives of the public participation is to build credibility through instilling integrity and of conducting the EIA, Educate the stakeholders on the process to be undertaken and opportunities for their involvement and build stakeholders by establishing an agreed framework accordingly. This requires accessible, fair, transparent and constructive participation at every stage of process. Inform stakeholders on the proposed project and associate issues, impacts and mitigation and using the most effective manner to disseminate information.

In this section of the report, the results of consultations with various classes of stakeholders are summarized. The results of consultations with other stakeholders and community members who took part in this EIA are attached as Appendices.

The consultation was facilitated through the following means:

- ❖ A Background Information Document (BID) containing brief project description, the EIA process and notice of invitation to participate. BID was shared with stakeholders and community members.
- ❖ Invitation to participate as published in the local newspapers (The Namibian and the New Era) as shown in Table 3 below and Appendix A of this document.
- ❖ Announcement of EIA process verbally in the common public meeting points.

- ❖ Placement of a public notice at the project site and Traditional Authority offices.

Table 3: Details of public notification of the EIA study

Method	Area of Distribution	Language	Date Placed
New Era Newspaper	Country Wide	English	23, July 2012
New Era Newspaper	Country Wide	English	30, July 2012
Site notices	Project site	English	04 November 20222
	Tsumeb Municipality Notice Board	English	04 November 20222
Public Meeting	Erven: 566, 570, 581, 590, 592, 617, 717, 718, 719	English	09 November 20222

✓ *Key Stakeholder Engagement Meeting*

A consultation meeting was organised, however, there was not attended. The consultant notified surrounding landowners of the project development. Four people representing nine (9) neighboring erven (566, 570, 581, 590, 592, 617, 717, 718, 719) were consulted.

✓ *Identification of Interested and Affected Parties (I&APs)*

The EIA team identified and consulted the following I&APs & key stakeholders for the proposed project:

- ❖ Tsumeb Municipality,
- ❖ Surrounding land owners,

Other I&APs were allowed to register on a willing basis to the EIA team. A database was compiled containing their names and correspondence details. The registration was accomplished over a period of 30 days.

✓ *Draft Scoping Report*

All stakeholder's comments received were incorporated and gave rise to the final Environmental Scoping Report incorporated herein.

4.1.1. COMMENTS AND REVIEW PERIOD

From the onset of the public consultation process and the initial information sharing through the BID, newspaper and site notices, various stakeholders have registered and provided comments. All of the immediate neighbors who were consulted on the development. They understand the notice very well and no object of the project activity was received. The Scoping Report and Environmental Management Plan were made available to the public and stakeholders for comment and review. Proof of stakeholder engagement are attached in appendix B of this EAR.

5. CHAPTER FIVE: ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS

5.1. Overview

The proponent has committed to sustainability and environmental compliance by coming up with a corrective action plan for all anticipated environmental impacts associated with the project. This is also in line with the Namibian Environmental Management legislation and International best practices on hydrocarbon handling. The proponent will implement an Environmental Management Plan (EMP) in order to prevent, minimise and mitigate negative impacts. The environmental management plan is being developed to address all the identified expected impacts, the plan will be monitored and updated on a continuous basis with the aim for continuous improvement to address impacts.

5.2. Assessment Of Impacts

This section sets out the overall approach that was adopted to assess the potential environmental and social impacts associated with the project. To fully understand the significance of each of the potential impacts each impact must be evaluated and assessed. The definitions and explanations for each criterion are set out below in Table 5: Assessment Criteria.

Table 5: Assessment Criteria

Duration – What is the length of the negative impact?	
None	No Effect
Short	Less than one year
Moderate	One to ten years
Permanent	Irreversible
Magnitude – What is the effect on the resource within the study area?	
None	No Effect
Small	Affecting less than 1% of the resource
Moderate	Affecting 1-10% of the resource
Great	Affecting greater than 10% of the resource
Spatial Extent – what is the scale of the impact in terms of area, considering cumulative impacts and international importance?	
Local	In the immediate area of the impact
Regional / National	Having large scale impacts
International	Having international importance
Type – What is the impact	
Direct	Caused by the project and occur simultaneously with project activities
Indirect	Associated with the project and may occur at a later time or wider area
Cumulative	Combined effects of the project with other existing / planned activities

Duration – What is the length of the negative impact?	
Probability	
Low	<25%
Medium	25-75%
High	>75%

(Adopted from ECC-Namibia, 2017)

Table 6: Impact Significance

Class	Significance	Descriptions
1	Major Impact	Impacts are expected to be permanent and non- reversible on a national scale and/or have international significance or result in a legislative non- compliance.
2	Moderate Impact	Impacts are long term, but reversible and/or have regional significance.
3	Minor	Impacts are considered short term, reversible and/or localized in extent.
4	Insignificant	No impact is expected.
5	Unknown	There are insufficient data on which to assess significance.
6	Positive	Impacts are beneficial

(Adopted from ECC-Namibia, 2017)

Table 7: Environmental Impacts and Aspects Assessment

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance
TOPOGRAPHY	Landscape Scenery	Visual aesthetic impact	Construction	Moderate	Moderate	Local	Direct	Medium 25 - 75%	Minor
	Clearing of a large portion of land	Visual aesthetic impact	Construction	Moderate	Moderate	Local	Direct	Medium 25 - 75%	Minor
SOIL	Soil	Contamination to soil from waste disposal	Construction	Moderate	Small	Local	Direct	Low <25%	Minor
	Soil	Spillages of fuel, oil and lubricants.	Construction	Short	Small	Local	Direct	Low <25%	Minor
	Soil	Erosion from road opening and trenching	Construction	Moderate	Small	Local	Direct	Low <25%	Minor
LAND CAPABILITY	Terrestrial ecology and aquatic ecosystems	Change in land use	Construction	Permanent	Great	Local	Direct	Low <25%	Moderate
WATER	Surface water quality	Water pollution from oils and lubricants from vehicles and machinery.	Construction	Moderate	Moderate	Local	Direct	Medium 25 - 75%	Moderate
	Groundwater quality	Water pollution from oils and lubricants	Operation	Moderate	Small	Local	Direct	Low <25%	Moderate
AIR QUALITY	Noise Pollution	-Noise During Construction and operation	Construction	Moderate	Moderate	Local	Direct	Medium 25 - 75%	Moderate
	Dust Pollution	-Construction dust	Construction	Moderate	Moderate	Local	Direct	High >75%	High
WASTE	Groundwater quality	Hazardous waste such as waste oil and lubricants.	Construction	Short	Small	Local	Direct	Low <25%	Minor

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance
	Topography and Landscape	Visual impacts due to infrastructure and unsustainable handling and disposal of waste.	Construction	Short	Small	Local	Direct	Low <25%	Minor
FAUNA	Aquatic life	Antifouling paints, eutrophication and sedimentation of streams.	Construction,	Moderate	Small	local	Direct	Low <25%	Minor
	Terrestrial ecology and biodiversity	Destruction of vertebrate fauna (e.g. road kills; fence and construction /land clearing mortalities)	Construction	Long	Moderate	Local	Direct	Low <25%	Minor
FLORA	Terrestrial ecology and biodiversity	Proliferation of invasive species inland	Construction	Long	Moderate	Local	Direct	High >75%	Moderate
	Terrestrial ecology and biodiversity	Loss of unique flora and special habitats in the local environment because of general nuisance and animal migrate.	Construction	None	Moderate	Regional	Direct	Low <25%	Moderate
SOCIAL	Noise Pollution	Increased noise levels	Construction	Moderate	Small	Local	Direct	Low <25%	Minor
	Socio Economic Activities	Temporary and permanent employment prospects.	Construction	Long	Moderate	Regional	Direct	Medium 25 – 75%	Positive

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance
	Contribution to National Economy	Employment, local procurement, duties and taxes.	Construction	Short	None	Regional / National	Direct	Low <25%	Positive
HERITAGE/ARCHAEOLOGY	Artefacts, archaeological high value components	Destruction or affecting paleontological and archaeological artefacts	Construction	Moderate	Moderate	Local	Direct	Medium 25 – 75%	Moderate
HEALTH AND SAFETY	Health Sanitation	Poor ablution and waste management facilities may be detrimental to human health.	Construction	Moderate	Moderate	Local	Direct	Medium 25 – 75%	Moderate
	Property and human life	Electrical hazards and fires may result in fatalities, damage to properties and power surges.	Construction	Moderate	Great	Local	Direct	Medium 25 – 75%	Major

6. CONCLUSION

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

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

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