

**DRAFT**

**ENVIRONMENTAL IMPACT ASSESSMENT  
REPORT**

**Establishment of Approximately 427 Sectional Title  
Dwelling Units with Ancillary Outbuildings, Walvis  
Bay, Erongo Region of Namibia**



**Resubmitted December 2022**

**EAP / Consultant:**



**Proponent:**



# INDEPENDENCE & CONDITIONS

Erongo Consulting Group is an independent consulting firm that has no interest in the proposed activity other than fair remuneration for services rendered. Remuneration for services is not linked to approval by decision making authorities and Erongo Consulting Group has no interest in secondary or downstream development as a result of this project. There are no circumstances that compromise the objectivity of this Environmental Assessment Report and accompanying Environmental Management Plan. The findings, results, observations and recommendations given here are based on the author's best scientific and professional knowledge and available information. Erongo Consulting Group reserves the right to modify aspects of this report, including the recommendations if new information becomes available which may have a significant impact on the findings of this report.



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- Engineering, Procurement, Construction/Management (EPC, EPCM)
- Climate Adaptation and Sustainability

## **CONTACTS:**

### **Erongo Consulting Group (Pty) Ltd**

Monotoka Street, Ocean View, Swakopmund, Republic of Namibia

Postal Box 7118, Swakopmund Post Office, 13001 | Phone: +264 81 878 6676

Email: [info@erongoconsultinggroup.com](mailto:info@erongoconsultinggroup.com) | Web: [www.erongoconsultinggroup.com](http://www.erongoconsultinggroup.com)

Twitter: @erongoconsult | Facebook: <https://www.facebook.com/erongoconsulting>

- **Details of LEAD Environmental Assessment Practitioner, Expertise, and Curriculum Vitae**

This Final Environmental Impact Report was compiled by Emmanuel M. Hamadziripi -

**Qualifications:**

Emmanuel M. Hamadziripi: BSc (Hons), MBA, MPhil, PostGrad (currently completing) at the University of the Free State, Bloemfontein, South Africa.

**Expertise:**

Emmanuel has over fifteen years of experience within environmental consulting and has worked on private and government projects throughout the SADC Region – Namibia, Zambia, Zimbabwe, South Africa, Malawi and Kenya. Emmanuel joined Erongo Consulting Group in 2015 and is employed as an Environmental Assessment Practitioner (EAP), (Associate), working on various private, Bi Lateral, Municipal, and government projects.

Emmanuel's responsibilities entail the provision of project execution, project management and project delivery of E&H related services for our clients, including:

- Undertaking and leading Environmental Due Diligence Assessment, Environmental Site Assessments, EHS Compliance Audits/Regulatory Support;
- Soil and groundwater investigations and remediation/site solutions related services;
- Project execution which involves data collection and interpretation, site reconnaissance/inspections, report preparations, etc.;
- Project management and client and project team liaison;
- Support business development activities such as marketing activities and proposal preparation;
- Support in mentoring of junior staff.

# EXECUTIVE SUMMARY

## **Introduction**

International Housing Solutions (or IHS) plans to build a new town housing scheme on Erf 5748 Walvis Bay, next to the Dunes Mall. The development will include approximately 427 sectional title dwelling units (two-bedroom units) with ancillary outbuildings (garages), as well as private parks and streets. IHS plans to build and sell townhouses on the local market. Due to the site's location and potential for pests such as flies and mosquitos, including odour, the Walvis Bay Municipality has requested an internal scoping report to assess and reduce these impacts.

Erongo Consulting Group Pty Limited was requested by IHS Fund Two (Namibia GP) (Pty) Ltd to evaluate the need for an Environmental Impact Assessment (EIA) as envisaged in the Environmental Management Act No 7 of 2007 and its Regulations. According to the Environmental Management Act 7 of 2007, residential development on a business erf is not a listed activity, so an EIA/ECC is not mandated by law.

## **Need and Desirability**

Housing is a national need, including in the Walvis Bay Local Municipality. The Walvis Bay Municipality Municipality's aims is to promote socioeconomic development through the eradication of backlogs associated with housing, as well as improve basic services within their area of jurisdiction. In order to meet the needs of the community within Walvis Bay, a new town housing complex is being proposed by the proponent, International Housing Solutions (or IHS), on Erf 5748 Walvis Bay. As per the development scope, a key performance indicator includes the provision of infrastructure and basic service through securing suitable land for human settlement projects. The provision of affordable housing units remains a high priority for the Municipality of Walvis Bay, and this will restore the dignity of previously disadvantaged Namibians by providing shelter and access to basic human rights as enshrined in the Constitution of Namibia.

## **Project Description**

The proposed development will entail construction of approximately 427 (four hundred and twenty-seven) sectional title dwelling units and ancillary outbuildings in the "General Business" zoning in accordance with Clause 17.2.4 of the Walvis Bay Zoning Scheme. It should be noted that separate EIAs will be conducted by the developers for separate activities should they trigger listed activities as per the Environmental Management Act and its EIA regulations.

## **Public Consultation**

Communication with I&APs about the proposed development was facilitated in English through the following means and in this order:

- A Background Information Document (BID) containing descriptive information about the proposed development activities was compiled and sent out to all identified and registered I&APs;
- A site notice was fixed at the site, briefly explaining the activity and its locality, inviting members of the public to register as I&APs;

The comments received during the notification period and the public meeting are presented in the Issues and Response Trail.

### **Conclusions and Recommendations**

The key potential biophysical impacts related to the pre-operational, construction, operational and maintenance and decommissioning phases of the proposed project were identified and assessed. Suitable mitigation measures (where required and possible) were recommended

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# 1. INTRODUCTION

Walvis Bay is an important port town with a thriving fishing industry that serves as an import and export hub for many landlocked SADC countries. The town is expected to become a primary industrial city by 2030, according to the Integrated Urban Spatial Development Framework for Walvis Bay (IUSDF).

The International Housing Solutions (or IHS) intends to construct a new town housing complex on Erf 5748 Walvis Bay, near the Dunes Mall. Around 427 sectional title housing units (two-bedroom flats) with ancillary facilities (garages), as well as private parks and streets, will be included in the development. IHS intends to construct and sell townhouses on the local market. The total area to be developed measures approximately 76,955m<sup>2</sup> or 7.6955 hectares.

## 1.1. The Need for an Environmental Assessment (EA)

Due to the site's location and potential for these pests – mosquitoes, flies, odour and related activities (construction), the Walvis Bay Municipality has requested an internal scoping report to assess and reduce the socio-environmental effects associated with the project.

In order to fulfil the requirements of the Walvis Bay Municipality, the proponent appointed Erongo Consulting Group (Pty) Ltd (ECG hereafter), an independent Environmental Consultant to conduct an Environmental Assessment (EA) inclusive of public consultation for the proposed development. The issues raised by the Walvis Bay Municipality and those identified during the Scoping exercise, are incorporated into an Environmental Scoping Report (this report) and together with the draft Environmental Management Plan (EMP) will be submitted as part of an application for an ECC to the Walvis Bay Municipality.

## 1.2. Need and Desirability of the Project

Walvis Bay is an important port town with a thriving fishing industry that serves as an import and export hub for many landlocked SADC countries. The town is expected to become a primary industrial city by 2030, according to the Integrated Urban Spatial Development Framework for Walvis Bay (IUSDF). As a result, the IHS, as the developer, has identified a need to build a housing development to meet the demands of the fishing town's growing population.

## 1.3. Scope of Work

This scoping study was carried out in accordance with the Environmental Management Act (EMA) (7 of 2007) and its 2012 EIA Regulations (GG No. 4878 GN No. 30). This report provides the following:

- The need and desirability of the proposed project
- Project description and the need for it
- Alternatives considered for the proposed project in terms of no-go option, and services infrastructure
- The relevant laws and guidelines pertaining to the proposed project
- Baseline environment in which the proposed activity will be undertaken
- The public consultation process

- The identification of potential impacts, impacts description, assessment, mitigation measures and recommendations
- Recommendations and Conclusions to the report

## 2. PROJECT DESCRIPTION

The International Housing Solutions (or IHS) intends to construct a new town housing complex on Erf 5748 Walvis Bay, near the Dunes Mall. Around 427 sectional title housing units (two-bedroom flats) with ancillary facilities (garages), as well as private parks and streets, will be included in the development. IHS intends to construct and sell townhouses on the local market. The total area to be developed measures approximately 76,955m<sup>2</sup> or 7.6955 hectares.

### 2.1. Description of Activity

#### 2.1.1. Site Location

The proposed development is located on Erf 5748 Walvis Bay, near the Dunes Mall. The proposed development can be classified as "Dwelling Units," "Block of Flats," or "Duplex Flats," which are all primary land uses in the Walvis Bay Zoning Scheme's "General Business" zoning. However, under Clause 17.2.4, the development of more than one dwelling unit on any erf requires Council approval. Furthermore, in accordance with Clause 17.2.9, the ground floor must be used for residential purposes with Council's approval. Coordinates for the site are 22°57'38.5"S and 14°31'23.5"E.

**Figure 1:** Boundary of Erf 5748 Walvis Bay (in red) in relation to the Dunes Mall and surrounding environment.



## 2.1.2. Proposed Development

IHS Fund Two (Namibia GP) (Pty) Ltd (the applicant) intends to develop a new housing scheme on Erf 5748 Walvis Bay that will include approximately 427 sectional title dwelling units.

**Figure 2:** Concept for Two Residential Units (Credit: Howard Krogh Architects)



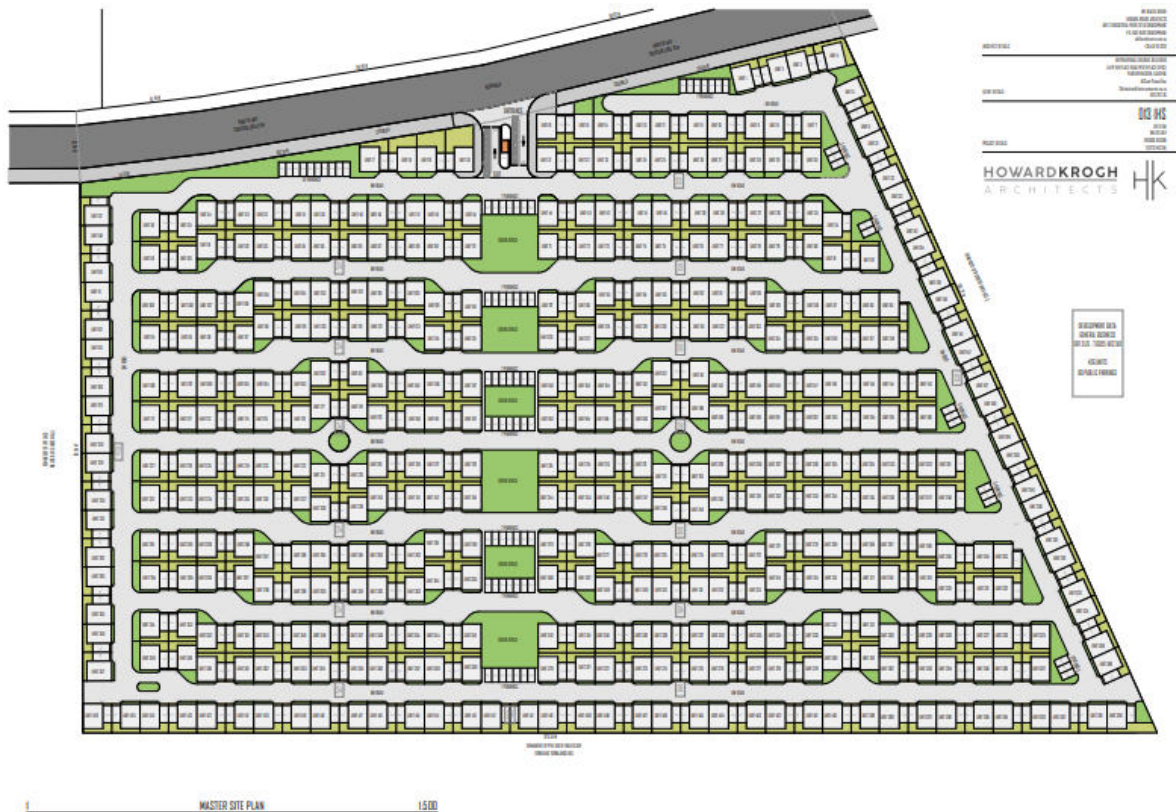
## GROUND FLOOR

The total floor area created by the proposed development is, let's say, 36,000m<sup>2</sup> + 1500m<sup>2</sup> = 37,500m<sup>2</sup>. Thus, the proposed development generates an actual bulk factor of 0.49 and covers roughly 49%

**Table 1:** An overview of the IHS Housing Project's land use schedule

Land use component	Area	Percentage of Erf Size
<b>Dwelling Units (x427)</b>	±36,000m <sup>2</sup>	46.8%
<b>Garages (to be offered as an option to the housing units)</b>	±1,500m <sup>2</sup>	2.0%
<b>Open spaces</b>	±2,500m <sup>2</sup>	3.2%
<b>Street reserve</b>	±30,292m <sup>2</sup>	39.4%
<b>Servitude area</b>	6,663m <sup>2</sup>	8.6%
<b>Total</b>	76,955m <sup>2</sup>	100%

**Figure 3: Site Master Plan for the proposed development** (Credit: Howard Krogh Architects).



The site plan depicts the proposed location of the dwelling units, how each unit will be accessed, and the associated open spaces. The units will be sold under a sectional title scheme, which means that the streets will be privately owned and maintained by the body corporate rather than the Walvis Bay Municipality.

The body corporate will also develop and maintain the parks and open spaces privately. The townhouse development has a small playground in the middle, which will make it easier for people to walk through the hub and into the open space for recreation. Each playground is 11 by 17 meters (187m<sup>2</sup>) in size. 3.2% of the erf area (76,955m<sup>2</sup>), or approximately 2500m<sup>2</sup>, is made up of green open space. To enhance the aesthetics of the townscape, streets will also be landscaped.

**Figure 4: Locality Map** (Credit: Stewart Planning)



### **2.1.3. Municipal Service Delivery**

#### **2.1.3.1. Water**

Namwater provides bulk water to the Municipality of Walvis Bay. Water is drawn from the Kuiseb Aquifer, pumped to the Mile 7 reservoir, and then distributed to customers by the Municipality of Walvis Bay. The Omdel aquifer is also used by the town to pump water.

#### **2.1.3.2. Sewage**

Walvis Bay's sewage is routed through a sewage network to the Wastewater Treatment Plant. Water that has been treated is used to irrigate sports fields and parks. Some of it is stored in a reservoir in the town's south-east.

#### **2.1.3.3. Electricity**

The bulk electricity supply to Walvis Bay is provided by the Paratus Power Station and the Kuiseb Substation located outside of town. Kuiseb Substation is linked to Paratus by two 66kV overhead lines. An adjacent Substation, Paratus Substation, is equipped with two 30MVA 66/11kV transformers at Paratus Power Station. The main in-feed substation to Walvis Bay is the Paratus Substation. Erongo RED is in charge of the Walvis Bay internal electricity network and the provision of electrical services.

The proponent intends to appoint an engineer to prepare a master plan for municipal service delivery to the proposed areas due to an increase in demand for services that may result from the increased number of units to be created. Water pressure and bulk water storage capacity, sewage treatment, electricity supply, and stormwater management are all part of the master plan.

#### **2.1.3.4. Solid Waste Disposal**

Residents of Walvis Bay are given wheeled waste containers by the Municipality of Walvis Bay, which are collected weekly and disposed of at the landfill there. The capacity of the current building is thought to last until 2040, so no expansion is expected to be necessary to handle the growth anticipated in 2030. However, plans are in place for the region to eventually move further east (New Era, December 15, 2021).

### **2.1.4. Site Access**

The Dunes Mall access Road or the C14 road next to the proposed site are the only two ways to get to the proposed development.

### 3. PROJECT ALTERNATIVES CONSIDERED

According to Namibia's Environmental Management Act (2007) [and its regulations (2012)], alternatives are "different means of meeting the general purpose and requirements of the activity." The various approaches to completing the project will be highlighted in this chapter, along with the most practical but environmentally friendly option.

The proposed development and its associated activities have a number of alternatives. The two most important alternatives under consideration are the services infrastructure and the no-go option. The following section discusses the aforementioned options taken into account for the suggested activity.

#### 3.1. No-Go Option

The "No-Go" alternative is the choice to forego the activity, which usually entails maintaining the current situation. None of the potential impacts (both positive and negative) would happen if the proposed development didn't start. Additionally, the topics won't be further developed. This would also imply that the town of Walvis Bay's housing shortage would not be addressed, as well as the potential availability of residential units and other land uses. The current land use on the proposed site will not change if the development is not carried out.

#### 3.2. Services Infrastructure

In terms of the services that may be required during the proposed development's construction and operation, as well as its associated infrastructure.

#### 3.3. Conclusions on the Considered Alternatives

The following are the alternatives considered:

- **No-go vs. continuation of the proposed project:** The no-go alternative is not considered to be the preferred option. Should the proposed development be discontinued, none of the potential impacts (positive and negative) identified would occur. Furthermore, the current land use for the proposed site will remain unchanged and the housing shortage will not be addressed.
- **Infrastructure for services during construction:** During the construction phase, water and electricity from existing municipal service connections can be used to supply water and electricity. Workers will be housed in town in facilities that will be secured. On-site portable toilets will be used; they are easily transportable and have no direct impact on the environment or ecology (if properly disposed). On-site waste bins that are regularly

emptied at the nearest landfill, or alternatively, driving waste to the nearest landfill every day.

- **Services Infrastructure during the operational phase:** The proposed activity will be connected to the town's existing municipal reticulation for its sources of water, electricity, and sewage. If it turns out that there is not enough supply to support the added number of units, alternative sources like solar energy and a decentralized sewage treatment facility should be investigated.

## 4. LEGAL FRAMEWORK

This chapter provides a review of pertinent and applicable Namibian laws, regulations, and policies as they relate to the proposed development. The purpose of this review is to make the Proponent, Interested and Affected Parties, and the Walvis Bay Municipality's decision-makers aware of the conditions and expectations that must be met in accordance with these instruments in order to carry out the proposed activities.

**Table 2:** Summary of land use schedule of the IHS Housing Project

LEGISLATION/ GUIDELINE	RELEVANT PROVISIONS	IMPLICATIONS FOR THIS PROJECT
<b>Namibian Constitution First Amendment Act 34 of 1998</b>	- "The State shall actively promote... maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future" (Article 95(l)).	- Ecological sustainability should inform and guide this EA and the proposed development.
<b>Environmental Management Act EMA (No 7 of 2007)</b>	- Requires that projects with significant environmental impact are subject to an environmental assessment process (Section 27). - Details principles that are to guide all EAs.	- The EMA and its regulations should inform and guide this EA process.
<b>Environmental Impact Assessment (EIA) Regulations GN 28-30 (GG 4878)</b>	- Details requirements for public consultation within a given environmental assessment process (GN 30 S21). - Details the requirements for what should be included in a Scoping	



	Report (GN 30 S8) and an Assessment Report (GN 30 S15).	
<b>Forestry Act 12 of 2001</b> <b>Nature Conservation Ordinance 4 of 1975</b>	<ul style="list-style-type: none"> <li>- Prohibits the removal of any vegetation within 100 m from a watercourse (Forestry Act S22(1)).</li> <li>- Prohibits the removal of and transport of various protected plant species.</li> </ul>	- Even though the Directorate of Forestry has no jurisdiction within townlands, these provisions will be used as a guideline for conservation of vegetation.
<b>Labour Act 11 of 2007</b>	- Details requirements regarding minimum wage and working conditions (S39-47).	The Walvis Bay Municipality and Proponent should ensure that all contractors involved during the construction, operation and maintenance of the proposed project comply with the provisions of these legal instruments.
<b>Health and Safety Regulations GN 156/1997 (GG 1617)</b>	Details various requirements regarding health and safety of labourers.	
<b>Public Health Act 36 of 1919</b>	Section 119 states that “no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.”	
<b>National Heritage Act 27 of 2004</b>	Section 48(1) states that “A person may apply to the [National Heritage] Council [NHC] for a permit to carry out works or activities in relation to a protected place or protected object”.	
<b>Burial Place Ordinance 27 of 1966</b>	Prohibits the desecration or disturbance of graves and regulates how bodies may be unearthed or dug up.	Regulates the exhumation of graves.
<b>Water Resources Management Act 11 of 2013.</b>	To provide for the management, protection, development, use and conservation of water resources; to provide for the regulation and monitoring of water services and to provide for incidental matters.	The protection of ground and surface water resources should be a priority. The main threats will most likely be concrete and hydrocarbon spills during construction and hydrocarbon spills during operation and maintenance.
<b>Namibia Water Corporation Act 12 of 1997</b>	To establish the Namibia Water Corporation Limited; to regulate its powers, duties and functions; to provide for a more efficient use and control of	

	water resources; and to provide for incidental matters.	
<b>Urban and Regional Planning Act (No. 5 of 2018).</b>	- Subdivision of land situated in any area to which an approved Town Planning Scheme applies must be consistent with that scheme (S31).	- The proposed use of the project site must be consistent with the Walvis Bay Town Planning Scheme
<b>Road Ordinance 1972 (Ordinance 17 Of 1972)</b>	- Width of proclaimed roads and road-reserve boundaries (S3.1) - Control of traffic on urban trunk and main roads (S27.1) - Rails, tracks, bridges, wires, cables, subways or culverts across or under proclaimed roads (S36.1) - Infringements and obstructions on and interference with proclaimed roads. (S37.1) - Distance from proclaimed roads at which fences are erected (S38)	The limitations applicable on RA proclaimed roads should inform the proposed layout and zonings where applicable.
<b>Walvis Bay Zoning Scheme.</b>	This statutory document provides land use regulations and development.	Land uses and developments should be in accordance with the Walvis Bay Zoning Scheme
<b>Integrated Urban Spatial Development Framework (IUSDF) of Walvis Bay</b>	Provides future land use planning within the Walvis Bay district.	The IUSDF was utilized to see if the proposed activity is in accordance with the future planning of Walvis Bay.
<b>Walvis Bay Climate Strategic Action Plan</b>	Provides action plans on how Town Planning can help mitigate climate change	To promote two-storey developments, reduce urban sprawl and land competition. Encourage EIA studies with regards to rezoning.
<b>Walvis Bay Biodiversity Report of 2008. (WBBR:2008)</b>	Provides a comprehensive summary and map of sensitive Biodiversity Areas and Zoning in the Walvis Bay district.	To ensure that the proposed activity is not located close to any Biodiversity Area or Zoning.
<b>Sustainable Urban Energy Planning: A handbook for cities and towns in developing countries (SUEP:2004)</b>	Provides a comprehensive list and case studies to implement energy saving measures.	Implementing energy-efficiency and carbon mitigation measures. Conserve natural resources with city planning.
<b>Walvis Bay Public Open Space Policy</b>	Sets criteria of parameters for development of parks (POS) in Walvis Bay	

## 5. ENVIRONMENTAL AND SOCIAL BASELINE

The proposed activities will be carried out in a setting with particular requirements. Understanding the pre-project/development conditions is crucial before any development takes place in a given area and as part of the environmental assessment process. This is crucial for developing a foundational understanding of the subject and for coming to logical conclusions about some issues that might come up years from now, either during or after the project's operations.

### 5.1. Biophysical Environment

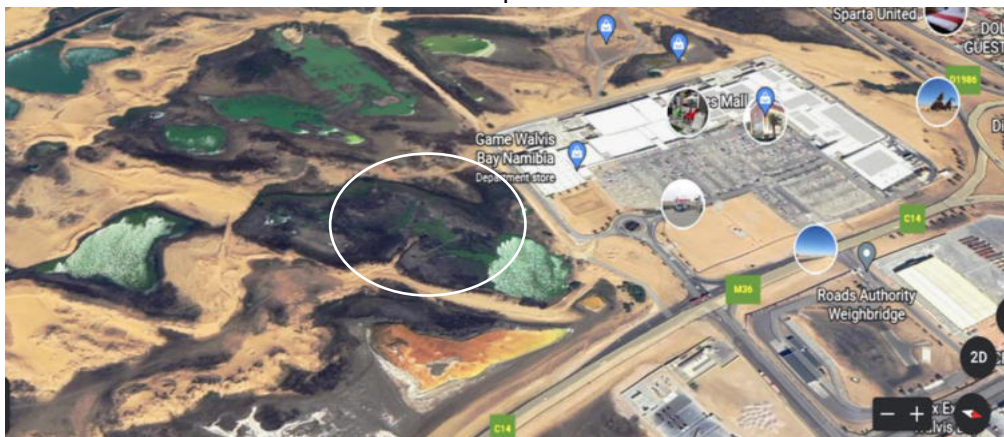
#### 5.1.1. Climate

The Erongo Region's climate can be described as semi-arid. Annual temperatures range between 16 and 20 degrees Celsius, with maximum temperatures between 20 and 28 degrees Celsius and minimum temperatures between 8 and 12 degrees Celsius (Mendelsohn, et al., 2002). Temperatures within the coastal belt are usually above 10 °C due to the coastal winds. Rainfall is mostly recorded in the summer months of January, February, and March, with an average annual rainfall of 100 mm to 150 mm for the subject area (Mendelsohn, et al., 2002).

#### 5.1.2. Topography, Soils and Geology

The proposed development area is dotted with wetlands and has sporadic elevation changes caused by sands deposited by aeolian processes. Granite, gneiss, and shale make up the Precambrian basement that forms the Namib Desert's geology. The majority of the central Namib south of the Kuiseb is covered by the Tsondab-Sandstone-Formation, which contains the oldest Tertiary rocks. A flat gravel plain on a crystalline basement can be found north of the Kuiseb. Granite or calcareous and gypsum metamorphic bedrock make up the underlying rocks.

**Figure 5:** 3D Google Map - Disturbed area, wetlands associated with the proposed site for development.

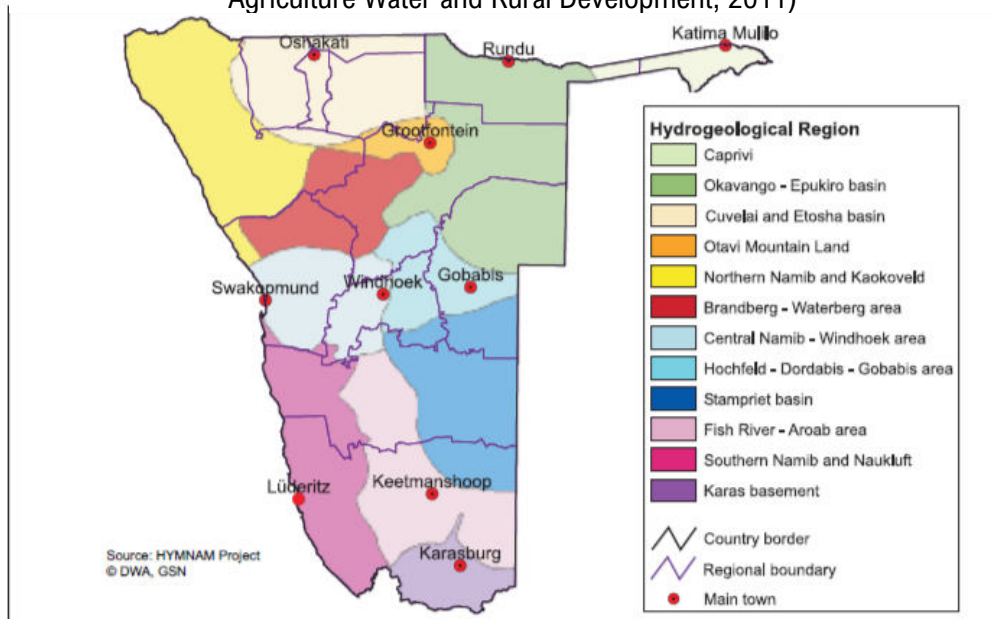


### 5.1.3. Water Resources: Surface and Groundwater

The Namib plain is carved by a few major ephemeral rivers that flow seaward from wetter catchments further inland. The Swakop, Omaruru, Kuiseb, and Ugab rivers are the Erongo Region's four main rivers (Geological Survey of Namibia, 2012).

The study area is located within the Central Namib - Windhoek hydrogeological basin. The Central Namib-Windhoek region stretches from Windhoek to the Atlantic Ocean in the west (near Walvis Bay). The northern and southern boundaries of this hydrogeological basin are formed by the Ugab and Kuiseb rivers.

**Figure 6:** Groundwater basins and hydrogeological regions in Namibia (Ministry of Agriculture Water and Rural Development, 2011)



Water is scarce within the weathered zone, but perched groundwater tables can occur. Groundwater is typically found within granite fractures/fissures and has a very low and limited potential.

There are water supply schemes in the Kuiseb at Gobabeb, Swartbank, and Rooibank, the latter two of which are part of the Central Namib Water Supply Scheme (Geological Survey of Namibia, 2012). NamWater manages the Central Namib Water Supply Scheme, which is based in Swakopmund. The scheme uses groundwater from the Omaruru and Kuiseb rivers' wellfields (Ministry of Agriculture Water and Rural Development, 2011).

### 5.1.4. Fauna and Flora

The subject area is part of the Namib Desert Biome (Mendelsohn, Jarvis, Roberts, & Robertson, 2002). All of the endemic plant species found in the area are drought tolerant,

drought resistant, or succulent. Short-lived annuals that appear after local rainfalls and floods are an important source of food for game grazing on the Namib plains.

#### **5.1.5. Archaeological and Anthropological Resources**

There are no archaeological or heritage sites known to exist within the proposed development area.

### **5.2. Social Environment**

#### **5.2.1. Social Demographics**

According to Namibia Statistics Agency (2011), the population of the Erongo Region is 150 809 people with the population of Walvis Bay being 62 096 people.

#### **5.2.2. Economy**

Fishing is the main source of income in the Erongo region, with other sources of income including wages and salaries, business, and so on. Similarly, wages and salaries are the primary source of income in Walvis Bay (Namibia Statistics Agency, 2011).

#### **5.2.3. Land Use**

The subject area is adjacent to Dunes Mall, and its surroundings include industries, the Bird Sanctuary, and the Municipal Waste Treatment Plant. It is adjacent to the C14/M36, allowing accessibility and linking to the existing services infrastructure.

Because of the existing properties, the proposed development will increase the housing footprint in the immediate area while also connecting to existing services, lowering the costs and environmental impact associated with the construction of a stand-alone development in an area where the surrounding land uses are not compatible with the nature of this project. The study area is located within the townlands of Walvis Bay (in accordance with the Municipality's Integrated Urban Spatial Development Framework) (IUSDF). Other than the presence of wetlands and the Purification Works, which are visible from a distance, no other physical characteristics would preclude the site from development.

##### **5.2.3.1. Compatibility With the Surrounding Area**

The proposed location is right next to the Dunes Mall and other industrial properties. As previously stated, this would provide accessibility and allow the proposed development to connect to the existing infrastructure.

## **6. PUBLIC CONSULTATION**

### **6.1. Objective:**

A key component of an Environmental Assessment (EA) process is public consultation, which allows potential Interested and Affected Parties (I&APs) to comment on and raise any issues relevant to the project for consideration as part of the assessment process. The public was consulted in accordance with the EMA and its EIA Regulations.

The public consultation process aids the Environmental Assessment Practitioner (EAP) in identifying all potential impacts and determining the extent to which additional investigations are required. Public consultation can also help in identifying potential mitigation measures.

### **6.2. Approach:**

#### **6.2.1 Interested and Affected Parties (I&APs)**

Specific I&APs believed to be interested in and/or impacted by the proposed activities were identified by Erongo Consulting Group. The Walvis Bay Municipality management and the IHS Project Team were directly consulted by the EAP since this was an internal request for an EIA Report.

#### **6.2.2 Communication with I&APs**

Regulation 21 of the EIA Regulations details steps to be taken during a given public consultation process and these have been used in guiding this process.

- Communication with I&APs about the proposed development was facilitated in English through the following means and in this order:
- A Background Information Document (BID) containing descriptive information about the proposed development activities was compiled and sent out to all identified I&APs;
- A site notice;
- Site Meetings were held in June 2022, followed by consultative Meetings between the IHS Project Team and Walvis Bay Municipality Management in October and November 2022.

## 7. IMPACTS IDENTIFICATION, DESCRIPTION AND ASSESSMENT

### 7.1. Impact Assessment Methodology

Some biophysical and social aspects are impacted by the proposed activities. The identified effects were evaluated for likelihood (likelihood of happening), scale/extent (spatial scale), magnitude (severity), and duration (temporal scale). Each rating scale is associated with a number in order to allow for a scientific analysis of the environmental significance. This methodology guarantees uniformity and allows potential impacts to be addressed in a consistent way, allowing for the comparison of a wide range of impacts.

The significance of a potential impact is thought to be a good predictor of the risk involved in such an impact. Each potential impact will be subject

- A brief explanation of the impact is provided.
- Evaluation of the impact's pre-mitigation significance; and
- A description of the suggested mitigation measures.

The recommended mitigation measures prescribed for each of the potential impacts contribute to the project's achievement of environmentally sustainable operational conditions for various biophysical and social features.

This impact assessment used the following criteria:

#### 7.1.2 Extent (spatial scale)

Extent is an indication of the physical and spatial scale of the impact.

**Table 3:** Extent or spatial impact rating

Low (1)	Low/Medium (2)	Medium (3)	Medium/High (4)	High (5)
Impact is localized within the site boundary: Site only	Impact is beyond The site boundary: Local	Impacts felt within adjacent biophysical and social environments: Regional	Impact widespread far beyond site boundary: Regional	Impact extend National or over international boundaries

#### 7.1.3 Duration

Duration refers to the timeframe over which the impact is expected to occur, measured in relation to the lifetime of the project.

**Table 4:** Duration impact rating

Low (1)	Low/Medium (2)	Medium (3)	Medium/High (4)	High (5)
Immediate mitigating measures, immediate progress	Impact is quickly reversible, short-term impacts (0-5 years)	Reversible over time; medium term (5-15 years)	Impact is long-term	Long term; beyond closure; permanent; irreplaceable or irretrievable commitment of resources

### 7.1.4 Intensity, Magnitude / severity

Intensity refers to the degree or magnitude to which the impact alters the functioning of an element of the environment. The magnitude of alteration can either be positive or negative. These were also taken into consideration during the assessment of severity.

**Table 5:** Intensity, magnitude or severity impact rating

Type of criteria	Negative				
	H- (10)	M/H- (8)	M- (6)	M/L- (4)	L- (2)
Qualitative	<b>Very high</b> deterioration, high quantity of deaths, injury of illness / total loss of habitat, total alteration of ecological processes, extinction of rare species	<b>Substantial</b> deterioration, death, illness or injury, loss of habitat / diversity or resource, severe alteration or disturbance of important processes	<b>Moderate</b> deterioration, discomfort, partial loss of habitat / biodiversity or resource, moderate alteration	<b>Low</b> deterioration, slight noticeable alteration in habitat and biodiversity. Little loss in Species numbers	<b>Minor deterioration, nuisance or irritation, minor change in species / habitat / diversity or resource, no or very little quality deterioration.</b>

### 7.1.5 Probability of occurrence

Probability describes the likelihood of the impacts occurring. This determination is based on previous experience with similar projects and/or based on professional judgment.

**Table 6:** Probability of occurrence impact rating

Low (1)	Medium/Low (2)	Medium (3)	Medium/High (4)	High (5)
Improbable; low likelihood; seldom. No known risk or vulnerability to natural or induced hazards.	Likely to occur from time to time. Low risk or vulnerability to natural or induced hazards	Possible, distinct possibility, frequent. Low to medium risk or vulnerability to natural or induced hazards.	Probable if mitigating measures are not implemented. Medium risk of vulnerability to natural or induced hazards.	Definite (regardless of preventative measures), highly likely, continuous. High risk or vulnerability to natural or induced hazards.



## 7.1.6 Significance

Impact significance is determined through a synthesis of the above impact characteristics. The significance of the impact “without mitigation” is the main determinant of the nature and degree of mitigation required. As stated in the introduction to this chapter, for this assessment, the significance of the impact without prescribed mitigation actions was measured.

Once the above factors have been ranked for each potential impact, the impact significance of each is assessed using the following formula:

$$\text{SP} = (\text{magnitude} + \text{duration} + \text{scale}) \times \text{probability}$$

The maximum value per potential impact is 100 significance points (SP). Potential impacts were rated as high, moderate or low significance, based on the following significance rating scale.

**Table 7:** Significance rating scale

<i>SIGNIFICANCE</i>	<i>ENVIRONMENTAL SIGNIFICANCE POINTS</i>	<i>COLOUR CODE</i>
High (positive)	>60	H
Medium (positive)	30 to 60	M
Low (positive)	<30	L
Neutral	0	N
Low (negative)	>-30	L
Medium (negative)	-30 to -60	M
High (negative)	>-60	H

For an impact with a significance rating of high, mitigation measures are recommended to reduce the impact to a low or medium significance rating, provided that the impact with a medium significance rating can be sufficiently controlled with the recommended mitigation measures. To maintain a low or medium significance rating, monitoring is recommended for a period of time to enable the confirmation of the significance of the impact as low or medium and under control.

## 7.2 Pre-operational Phase Impact Assessment

The pre-operational phase is mostly concerned with the preparation of the site for the proposed development and associated services including laying of pipeline and roads

installations. The potential impacts during this phase include biodiversity impacts.

## 7.2.1 Impact Assessment of Biodiversity Loss

The preparation of the site for the proposed development usually involves clearing of certain areas on site. This may impact the existing biodiversity in the area. The construction of access roads within the development may further impact biodiversity in the area. The subject site is sparsely vegetated as such, is not expected to be of such a magnitude and/or significance that it will have irreversible impacts on the biodiversity and endemism of the area and Namibia at large.

**Table 8:** Assessment of the impacts of the proposed activities on biodiversity loss

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 2	M - 2	M - 6	M - 3	M - 30
Post-mitigation	L - 1	L - 1	M/L - 4	M/L - 2	L - 16

### 7.2.1.1 Mitigations and recommendation to mitigate biodiversity loss

- Vegetation should be cleared only where absolutely necessary and if cleared, numbers of protected, endemic and near endemic species removed should be documented.
- Trees with a trunk size of 150 mm and bigger should be surveyed, marked with paint (readily visible) and protected.
- Trees and plants protected under the Forest Act No 12 of 2001 are not to be removed without a valid permit from the local Department of Forestry.

## 7.3 Construction Phase Impact Assessment

The construction phase is mostly concerned with the impacts on the biophysical and socio- economic environment that is likely to occur during the construction phase of the development. These potential impacts are likely to be temporary in duration but may have longer lasting effects.

### 7.3.1 Impact Assessment of Biodiversity Loss

During the construction phase the existing biodiversity in the area may be impacted. The construction of access roads and installation of services within the development may further impact biodiversity in the area. The subject site is sparsely vegetated as such the envisaged impact on biodiversity at the project site, is not expected to be of such a magnitude and/or significance that it will have irreversible impacts on the biodiversity and endemism of the area and Namibia at large.

**Table 9:** Assessment of the impacts of the proposed activities on biodiversity loss

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 2	L/M - 2	M - 6	M - 3	M - 30
Post-mitigation	L - 1	L - 1	M/L - 4	M/L - 2	L - 12

### 7.3.1.1 Mitigations and recommendations to address biodiversity loss

- Vegetation should be cleared only where absolutely necessary and if cleared, numbers of protected, endemic and near endemic species removed should be documented.
- Trees with a trunk size of 150 mm and bigger should be surveyed, marked with paint (readily visible) and protected.
- Trees and plants protected under the Forest Act No 12 of 2001 are not to be removed without a valid permit from the local Department of Forestry.

### 7.3.2 Impact Assessment of Surface and Groundwater Impacts

Improper handling, storage and disposal of hydrocarbon products and hazardous materials at the site may lead to soil and groundwater contamination, in case of spills and leakages. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to “low” rating.

**Table 10:** Assessment of the impacts of the proposed activities on surface and groundwater

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 3	M - 2	M - 6	M - 4	M - 44
Post-mitigation	L - 1	L - 1	L - 2	M/L - 1	L - 4

#### 7.3.2.1 Mitigations and recommendations to address surface and groundwater impacts

- Careful storage and handling of hydrocarbons on site is essential.
- Workers responsible for the storage and handling of hydrocarbons should be suitably trained to do so and trained on spill prevention (e.g. the use of drip trays) and the handling of potential spills should they occur to be able to ensure implementation on site.
- Potential contaminants such as wastewater should be contained on site and disposed of in accordance with municipal wastewater discharge standards so that they do not contaminate surrounding soils and eventually groundwater.
- Contaminants such as hydrocarbons should be stored, handled, and managed appropriately. These must be collected on site and disposed at an appropriate facility that is licenced to receive such waste. A waste manifest with proof of disposal must be kept.
- An emergency plan should be available for major / minor spills at the site during operation activities (with consideration of air, groundwater, soil and surface water) and during the transportation of the product(s) to the site.

### 7.3.2 Impact Assessment of Soil Erosion Impacts

Soil erosion is likely to occur on site given the characteristics of the site and the fact that the site is sparsely vegetated. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to “low” rating.

**Table 11:** Assessment of the impacts of the proposed activities on soil erosion

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 2	M - 2	M - 6	M - 3	M - 30
Post-mitigation	L - 1	L - 1	M/L - 4	M/L - 2	L - 12

#### 7.3.2.1 Mitigations and recommendations to address soil erosion impacts

- Erosion control measures should be implemented to ensure that the topsoil is not washed away.
- Checks must be carried out at regular intervals to identify areas where erosion is occurring.
- Appropriate remedial actions are to be undertaken wherever erosion is evident.

### 7.3.3 Impact Assessment of Archaeological and Heritage Impacts

The proposed activity is not taking place in an area that has significant archaeological or heritage resources. However, should these be encountered during the rehabilitation activities, mitigation measures need to be in place to ensure that these resources are not harmed. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to “low” rating.

**Table 12:** Assessment of the impacts of the proposed activities on Archaeological and Heritage Impacts

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 1	L/M - 4	M - 6	M - 1	M - 11
Post-mitigation	L - 1	L - 1	L - 2	L - 1	L - 4

#### 7.3.3.1 Mitigations and recommendations to address Archaeological and Heritage Impacts

- All works are to be immediately ceased in an affected area should an archaeological or heritage resource be discovered.
- The National Heritage Council of Namibia (NHCN) should advise with regards to the removal, packaging and transfer of the potential resource

### 7.3.4 Impact Assessment of Odour, Flies and Mosquitoes

The proposed activity is not taking place in a mosquitoes and flies infested area. Mitigation measures need to be in place to ensure that these pests nuisance is addressed. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to “low” rating.

**Table 13:** Assessment of the odour, flies and mosquitoes impacts on the proposed activities

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 1	L/M - 4	M - 6	M - 1	M - 11
Post-mitigation	L - 1	L - 1	L - 2	L - 1	L - 4

#### 7.3.4.1 Mitigations and recommendations to address odour, flies and mosquitos' impacts

- **laying a pipeline** +/- 1,9km from the sewerage station to the current exit point, this should resolve most of the problems (Flies, mosquitos and smell)
- The pipeline route to be kept in the existing channel – because it will have a continuous fall up to the discharge point.
- **Wetlands Reduction:**
  - o all wetlands (source of pest nuisance) on Erf 5747 and 5748 will be filled as a result of the extensive bulk earthworks required as required as part of the development
  - o should there be any excess soil materials resulting from the bulk earthwork process, this can be utilized to fill ponds surrounding the site
- **Plant Willow Trees to dry up the surrounding ponds:**
  - o In addition to the drying out of the ponds – the Willows will also fulfill the function of Phytoremediation.
  - o The value of Phytoremediation should not be underestimated from an environmental perspective.
  - o The process will remediate the contaminated soil, sediments, groundwater and surface water by degrading organic and other toxins and chemicals.

#### 6 mechanisms will be present during remediation:

- o Phytoextraction – uptake and translocation of contaminants into plant tissue.
- o Phytovolatilization – transfer of contaminants to air via plant transpiration.
- o Rhizosphere degradation – breakdown of contaminants in soil surrounding

roots by microbes.

- Phytodegradation – breakdown of contaminants in plant tissue.
- Phytostabilization – stabilization of contaminants in soil through absorption – plant roots
- Hydraulic control – Interception and transpiration of large quantities of water to control migration of contaminants.
- Phytoremediation will in the long have a very positive outcome with relation to Flies, Mosquitos and smell – since the area will be remediated.

### 7.3.5 Impact Assessment of Health and Safety

Construction activities may cause health and safety risks to people operating on the site. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to “low” rating.

**Table 14:** Assessment of the impacts of the proposed activities on health and safety

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 1	L/M - 4	M - 6	M - 1	L - 11
Post-mitigation	L - 1	L - 1	L - 2	L - 1	L - 4

#### 7.3.5.1 Mitigations and recommendations to address health and safety impacts

- Construction workers should be provided with awareness training about the risks associated with the proposed construction work such as hydrocarbon handling and storage, the handling of heavy machinery etc.
- During the works conducted, workers should be properly equipped with personal protective equipment (PPE) such as coveralls, gloves, safety boots, safety glasses etc.
- The contractors should comply with the provisions with regards to health and safety as outlined in the Labour Act (No. 6 of 1992).

### 7.3.6 Impact Assessment of Noise Generation Impacts

Construction activities and the presence of construction vehicles may lead to the generation of noise which could impact the local surrounding residents negatively, if not properly handled. This may pose a disturbance on the surrounding residents. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to “low” rating.

**Table 15:** Assessment of the impacts of the proposed activities on noise generation

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 1	M - 2	M - 6	M - 3	L - 27

Post-mitigation	L - 1	L - 1	L - 2	L - 1	L - 4
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### 7.3.6.1 Mitigations and recommendations to address noise generation impacts

- Construction activities should be limited to daytime hours (between 08h00 and 17h00) unless otherwise arranged with community members and businesses in the area.
- No amplified music should be allowed on site.
- Technology such as silencers should be installed on construction machinery.
- The use of horns as a general communication tool should not be allowed, they should only be used when necessary, as a safety measure.

### 7.3.7 Impact Assessment of Dust Generation Impacts

Construction activities and the presence of construction vehicles may lead to the generation of dust which could impact the local residents and businesses negatively, if not properly handled. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to “low” rating.

**Table 16:** Assessment of the impacts of the proposed activities on dust generation

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 1	L/M - 2	M - 6	M - 3	L - 27
Post-mitigation	L - 1	L - 1	L - 2	L - 1	L - 4

### 7.3.7.1 Mitigations and recommendations to address dust generation impacts

- Dust abatement techniques should be implemented e.g. spraying of water on site to reduce dust levels to an acceptable standard.
- The local community and surrounding businesses should be continuously consulted to ensure that the dust levels are acceptable.
- Residents and businesses should be informed prior to construction commencing so that they are aware of the planned construction.
- During high wind conditions the contractor must make the decision to cease works until the wind has settled.
- Stockpiles and sand being transported should be covered with plastic to reduce windblown dust.
- Workers should be provided with dust masks.

### 7.3.8 Impact Assessment of Waste Generation Impacts

Construction activities usually generate wastes which leads to environmental pollution, if not properly handled. This may result in blocked waterways should waste be blown into

water pipelines; animals may choke on waste when ingested and additionally it may pose a negative visual impact on the surrounding environment. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to low rating.

**Table 17:** Assessment of the impacts of the proposed activities on waste generation

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L - 1	L/M - 2	M/L - 4	M - 4	L - 28
Post-mitigation	L - 1	L - 1	L - 2	L - 1	L - 4

#### 7.3.8.1 Mitigations and recommendations to address waste generation impacts

- The construction site should be kept tidy at all times.
- All domestic and general construction waste produced on a daily basis should be cleaned and contained.
- No waste may be buried or burned on site or anywhere else.
- Waste containers (bins) should be emptied during and after the construction and the waste removed from site to the municipal waste disposal site.
- Separate waste containers (bins) for hazardous and domestic / general waste must be provided on site.
- Construction labourers should be sensitised to dispose of waste in a responsible manner and not to litter.
- No waste may remain on site after the completion of the project.
- The recycling of waste should be considered and implemented as far as possible

#### 7.3.9 Impact Assessment of Temporary Employment Creation

The proposed activity may provide employment opportunities for the local people during construction. The impact can be rated as of a “low-positive” significance.

**Table 18:** Assessment of the impacts of the proposed activities on temporary employment creation

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M + 1	L/M + 2	M + 2	M + 3	M + 15
Post-mitigation	L + 4	L + 3	L + 2	L + 3	L + 27

#### 7.3.9.1 Mitigations and recommendations to address temporary employment creation

- Should any job opportunities result, they should be made available to the local people in the area as far as reasonably possible.



## 7.4 Operational Phase Impact Assessment

The potential impacts associated with the operational phase of the activities have been identified and assessed in this subchapter. The main impacts identified are; – odour, flies and mosquitoes, traffic, surface and groundwater, noise, and waste. Temporary potential impacts identified include dust and noise impacts.

### 7.4.1 Impact Assessment of Traffic Impacts

The intended development may have an impact on traffic in the subject area. The traffic is not expected to increase significantly as the erven are located in close proximity to an already developed area within the town. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to “low” rating.

**Table 19:** Assessment of the impacts of the activities on traffic

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	M - 3	M - 3	M - 6	M - 3	M - 36
Post-mitigation	L/M - 2	L/M - 2	L/M - 4	L/M - 2	L - 16

#### 7.4.1.1 Mitigations and recommendation to traffic

- Ensure that road junctions have good sightlines.
- Provide formal road crossings at relevant areas.
- Provide for speed reducing interventions such as speed bumps at relevant road sections

### 7.4.2 Impact Assessment of Soil, Surface and Groundwater

Surface and groundwater impacts may be encountered during the operation phase, especially if development takes place within the rainy season. The operational activities on site should be conducted in a manner to avoid the contamination of surface and groundwater. The pre- mitigation impact is assessed to be “medium” in significance and after mitigation the impact is assessed to have a “low” significance.

**Table 20:** Assessment of the impacts of the activities on soil, surface, and groundwater

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	M/H - 4	M/H - 4	M/H - 8	M - 3	M - 48
Post-mitigation	M - 3	L/M - 2	M - 6	L/M - 2	L - 22

#### 7.4.2.1 Mitigations and recommendations to address soil, surface, and groundwater impacts

- Contaminated runoff from the various operational activities should be prevented from entering any surface or ground water bodies.
- Ensure that surface water accumulating on-site are channelled and captured

through a proper storm water management system to be treated in an appropriate manner before disposal into the environment.

- Disposal of waste from the various activities should be properly managed.

### 7.4.3 Impact Assessment of Noise

The operational activities may result in associated noise impacts, depending on the exact type of activities taking place on the properties. However due to the nature of the land uses proposed for the subject erven, which is predominantly Residential, it is not expected that the noise levels will be significant if managed well. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to “low” rating.

**Table 21:** Assessment of the impacts of the activities on noise

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	M/H - 4	M/H - 4	M/H - 8	M - 3	M - 48
Post-mitigation	M - 3	L/M - 2	M - 6	L/M - 2	L - 22

#### 7.4.3.1 Mitigations and recommendations to address noise impacts

- Do not allow commercial activities that generate excessive noise levels.
- No activity having a potential noise impact should be allowed to operate after 18h00 if possible.

### 7.4.4 Impact Assessment of Waste

Improper disposal of waste materials at the development may lead to pollution of the neighbourhood and resultant environmental degradation. The pre-mitigation impact is assessed to be “low” in significance and after mitigation the impact is assessed to have a “low” significance.

**Table 22:** Assessment of the impacts of the activities on waste

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	M/L - 2	M/L - 2	M/L - 4	M - 3	L - 24
Post-mitigation	L - 1	L - 1	L - 2	M/L - 2	L - 8

#### 7.4.4.1 Mitigations and recommendations to address waste impacts

- Waste generated on site is to be collected and disposed of weekly at the nearest licenced landfill.
- Households are to adhere to the municipal regulations with regards to waste disposal.
- No waste may be buried or burned on site or anywhere else.

### 7.4.5 Impact Assessment of Hazardous Waste

Improper disposal of hazardous waste materials at the development may lead to pollution

of the soils, surface and groundwater resources and resultant environmental degradation. The pre- mitigation impact is assessed to be “low” in significance and after mitigation the impact is assessed to have a “low” significance.

**Table 23:** Assessment of the impacts of the activities on hazardous waste

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 2	L/M - 2	M/H - 8	M - 3	M - 36
Post-mitigation	L - 1	L - 1	M- 6	M/L - 2	L - 16

#### 7.4.5.1 Mitigations and recommendation to hazardous waste

- Prevent the uncontrolled release of hazardous materials to the environment.
- Engineering management controls to be implemented to minimise the risk.
- Implement prevention and control measures for the use, handling, and storage of hazardous materials.
- Ensure the active use and provision of PPE to employees on site.

#### 7.4.6 Impact Assessment of Dust

Dust generation may occur during operational activities. The pre-mitigation impact is assessed to be “medium” in significance and after mitigation the impact is assessed to have a “low” significance.

**Table 24:** Assessment of the impacts of the activities on dust generation

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 2	L/M - 2	M/H - 8	M - 3	M - 36
Post-mitigation	L - 1	L - 1	M- 6	M/L - 2	L - 16

#### 7.4.6.1 Mitigations and recommendation to dust generation

- If dust levels become excessive dust abatement techniques should be implemented e.g., spraying of water. However, caution should be taken during times of low water availability then waterless dust suppression means should be considered.
- Consider the tarring of the internal street network.

#### 7.4.7 Impact Assessment of Emissions

Varying activities on site may result in the emission of various types depending on the type of activities present on site. Emissions may impact the air quality within the area. The pre-mitigation impact is assessed to be “medium” in significance and after mitigation the impact is assessed to have a “low” significance.

**Table 25:** Assessment of the impacts of the activities on emissions

	<b>Extent</b>	<b>Duration</b>	<b>Intensity</b>	<b>Probability</b>	<b>Significance</b>
<b>Pre-mitigation</b>	L/M - 2	L/M - 2	M/H - 8	M - 3	<b>M - 36</b>
<b>Post-mitigation</b>	L - 1	L - 1	M - 6	M/L - 2	L - 16

#### 7.4.8 Impact Assessment of Visual Impacts on the loss / relocation of the wetlands

The subject site is currently mostly undeveloped with a few areas being developed. Once developed, and wetlands relocated, there will be a change in the visual characteristics of the area. Individuals who frequent the area on a regular or infrequent basis will experience a change in their sense of place of the area. Particularly those who visit the nearby Dunes Mall shopping centre. The extent of this disturbance will depend on how highly they valued the initial aesthetic quality of the area. This impact would mostly affect the surrounding property owners within the neighbourhood and the people who frequently visit the area. The pre-mitigation impact is assessed to be “medium” in significance and after mitigation the impact is assessed to have a “low” significance.

**Table 26:** Assessment of the impacts of the activities on visual

	<b>Extent</b>	<b>Duration</b>	<b>Intensity</b>	<b>Probability</b>	<b>Significance</b>
<b>Pre-mitigation</b>	L/M - 2	L/M - 2	M/H - 8	M - 3	<b>M - 36</b>
<b>Post-mitigation</b>	L - 1	L - 1	M - 6	M/L - 2	L - 16

##### 7.4.8.1 Mitigations and recommendation to visual

- It is recommended that more ‘green’ technologies be implemented within the architectural designs and building materials of the development where possible in order to minimise the visual prominence of such a development within the more natural surrounding landscape.
- Natural colours and building materials such as wood and stone should be incorporated as well as the use of indigenous vegetation in order to help beautify the development.
- Visual pollutants can further be prevented through mitigations (i.e., keep structures unpainted and minimising large advertising billboards).

#### 7.4.9 Impact Assessment of Social Environment

Some activities within the proposed development may provide employment opportunities for the local people.

**Table 27:** Assessment of the impacts of the activities on social environment

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L - 1	L/M - 2	L - 2	M - 3	L - 15
Post-mitigation	L - 2	M- 3	M- 6	M/H - 4	M - 44

#### 7.4.9.1 Mitigations and recommendation to social environment

- Should any job opportunities result it should be made available to the local people in the area.

### 7.5 Decommissioning Phase

The proposed activities are expected to be a permanent activity and is thus not anticipated to be decommissioned in future. As such the decommissioning impacts for the proposed activity is not discussed.

## 8 RECOMMENDATIONS AND CONCLUSION

The most significant potential biophysical effects of the proposed project's pre-operational, construction, operational, maintenance, and decommissioning phases were identified and evaluated. When necessary and practical, appropriate mitigation measures were advised, and the following impacts can be summed up:

- **Impacts on biodiversity loss (during pre-operational phase and construction):** There is the possibility of loss of vegetation during the site clearing and construction for the proposed activity. However, the site is sparsely vegetated and thus the impact can be adequately addressed by the recommendations and management actions given in the EMP.
- **Impacts on soil, surface and groundwater (during construction and operational phases):** Improper handling, storage and disposal of hydrocarbon products and hazardous materials at the site may lead to soil and groundwater contamination, in case of spills and leakages. The impact can be adequately addressed by the recommendations and management actions given in the EMP
- **Impacts of erosion (during construction phase):** Soil erosion is likely to occur on site and along the pipeline route given the characteristics of the site and the fact that the site is sparsely vegetated. The impact can be adequately addressed by the recommendations given by the EAP and management actions given in the EMP.

- **Impacts on archeological and heritage resources (during construction phase):** The proposed activity is not taking place in an area that has significant archaeological or heritage resources. However, should these be encountered during the rehabilitation activities, mitigation measures need to be in place to ensure that these resources are not harmed. The impact can be adequately addressed by the recommendations and management actions given in the EMP.
- **Impacts on health and safety (during construction phase):** Construction activities may cause health and safety risks to people operating on the site. The impact can be adequately addressed by the recommendations and management actions given in the EMP.
- **Impacts on dust and noise (during construction phase):** Construction activities may increase dust and noise generated around the site area. The impact can be adequately addressed by the recommendations and management actions given in the EMP.
- **Impacts on waste (during construction and operation phase):** Improper disposal of waste materials at the site may lead to pollution of the site and resultant environmental degradation. The impact can be adequately addressed by the recommendations and management actions given in the EMP.
- **Impact on social environment (during construction and operational phase):** The proposed activity may provide employment opportunities for the local people. The impact can be adequately addressed by the recommendations given and management actions given in the EMP.
- **Impact on traffic (during operational phase):** The intended development may have an impact on traffic in the subject area. Traffic is expected to increase within the area, as the area will become increasingly developed. The impact can be adequately addressed by the recommendations given in this Report and management actions given in the EMP.
- **Visual Impact (during operational phase):** The subject site is currently mostly undeveloped. Once developed, visual impact on the loss (and/or relocation) of the wetlands, including the construction of the 2km long pipeline, there will be a change in the visual characteristics of the area. Individuals who frequent the area on a regular or infrequent basis will experience a change in their sense of place of the area. Particularly those who visit the nearby Dunes Mall. The extent of this disturbance will depend on how highly they valued the initial aesthetic quality of the area. This impact would mostly affect the surrounding property owners within the neighbourhood and the people who frequently visit the area. The impact can be adequately addressed by the recommendations given in this Report and management actions given in the EMP.

Based on the information provided in this report, Erongo Consulting Group is confident the identified risks associated with the proposed development can be reduced to acceptable levels, should the measures recommended in the EMP be implemented and monitored effectively. It is therefore recommended that the project receive Environmental Clearance, provided that the EMP be implemented.

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# APPENDICES

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- **Appendix A :** Draft Environmental Mangement Plan
- **Appendix B:** IHS Housing / Dunes Estate – Specific Mitigation & Impact Management Framework
- **Appendix C:** Support Letter from Element Consulting Engineers: Proposed Mitigation Action – Municipal Sewer Effluent Disposal
- **Appendix D:** Official Support Letter: International Housing Solutions Namibia (Proprietary) Limited