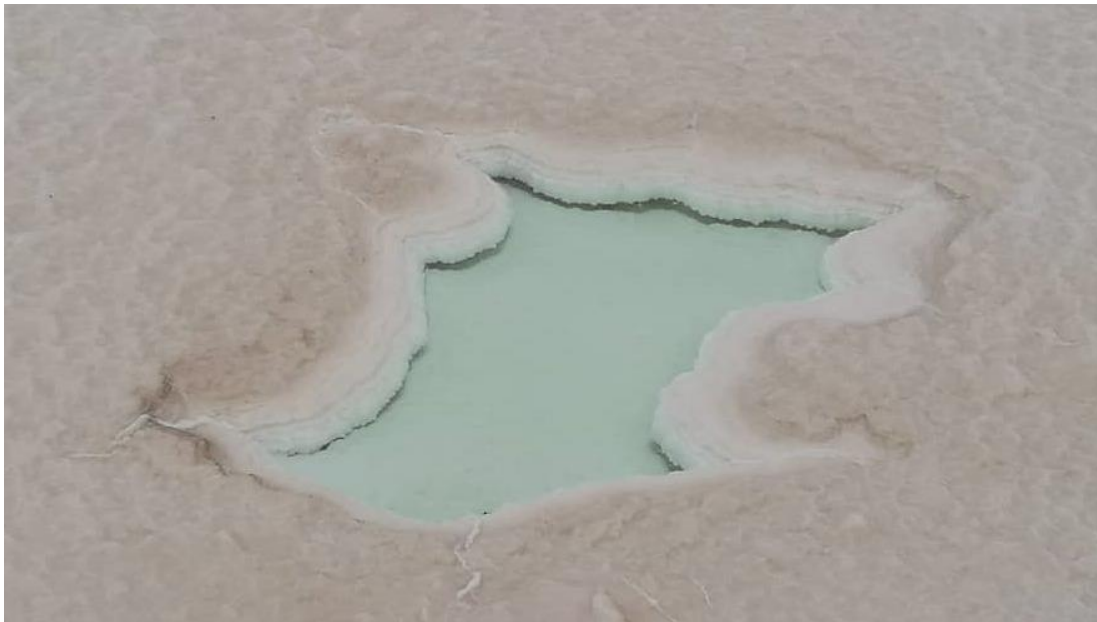


# **Environmental Impact Assessment study for the Construction and Commissioning of an Eco-friendly Seawater Desalination Plant at Farm Hentiesbaai Town and Townlands No. 133 in Henties Bay, Erongo Region**

Report No: 310818A

20 December 2019



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## Document Status

<b>Proponent</b>	Namib Eden Trading CC
<b>Title of the proposed Activity</b>	Environmental Impact Assessment study for the Construction and Commissioning of an Eco-friendly Seawater Desalination Plant at Farm Hentiesbaai Town and Townlands No. 133 in Henties Bay, Erongo Region
<b>Activity Type</b>	Environmental Impact Assessment Study
<b>Location of the Activity</b>	Farm Hentiesbaai Town and Townlands No. 133 in Henties Bay, Erongo Region GPS Coordinates at the Mine: 22°11'32" S and 14°21'24" E
<b>Competent Authority</b>	Environmental Commission (Ministry of Environment and Tourism)
<b>EIA Consultant</b>	KPM Environmental Consulting Contact person: Mr. Festus Kapembe Tel. +264 81 147 3344 E-mail: kpm.consulting@iway.na

## **PURPOSE OF THIS DOCUMENT**

This document, Environmental Impact Assessment (EIA) Report and Environmental Management Plan (EMP) for the Construction and Commissioning of an Eco-friendly Seawater Desalination Plant at Farm Hentiesbaai Town and Townlands No 133 in Henties Bay presents the findings of the impact assessment with respect to issues and concerns raised during the scoping phase of the EIA. The findings are presented in the following reports:

- The Environmental Impact Assessment (this report), with several appendices, including the Issues and Response Report (indicating to stakeholders where their issues have been captured)
- Environmental Management Plan (also part of this report).

### *Appreciation for participation by stakeholders*

Stakeholders were invited to partake in the consultation process. Various media platforms were used to engage the public on the proposed activities as per the Background Information Document (BID) attached on the annexes. Newspaper advertisements were placed in two local daily English newspapers (Republikein Newspaper dated 5 September 2018 and New Era Newspaper dated 12 September 2018). In addition, radio announcements were made via the local languages (NBC Oshiwambo, National Radio and Afrikaans NBC Radio Stations) inviting community members to a Public Consultation meeting. Social Media (Facebook) was also used to engage the stakeholders. Project Background Information Documents were available from the Henties Bay Community Library. The BID was also available from the KPM Offices in Windhoek (the consultant) on request via e-mail.

## **PUBLIC REVIEW OF THE DRAFT ENVIRONMENTAL SCOPING REPORT**

A period of three weeks (from 29<sup>th</sup> of November to 21<sup>st</sup> December 2019) was dedicated to receiving comments and inputs from the public on the proposed Eco-friendly Seawater Desalination Plant at Henties Bay. Copies of the BID were couriered to all registered

Interested and or Affected Parties (I&APs) especially the business community in Henties Bay and all other registered stakeholders. In addition, the availability of the draft EIA Report was announced in the media as well as by way of letters addressed to registered key stakeholders.

### **OPPORTUNITIES FOR PUBLIC REVIEW**

The following methods of public review of the Environmental Impact Assessment Report were available:

- Completing the comment sheet enclosed with the reports;
- Additional written submissions;
- Comment by email or telephone;
- Comment during the public participation meeting at the Henties Bay Community Hall (meeting held on Monday, 25<sup>th</sup> of November 2019 at 17h30).

### **FINAL ENVIRONMENTAL IMPACT REPORT**

Comments received from stakeholders on the draft findings during the review period were assessed and are now included in this Final EIA Report.

## **ACRONYMS AND ABBREVIATIONS**

BID	Background Information Document
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMS	Environmental Management System
I&AP	Interested and Affected Party
KPM	KPM Environmental Consulting
MET	Ministry of Environment and Tourism
NGO	Non-Governmental Organization

## GLOSSARY OF TERMS

**Assessment** - The process of collecting, organizing, analysing, interpreting and communicating information relevant to decision making.

**Competent authority** - means a body or person empowered under the local authority's actor a delegation made under the Pollution Prevention and Waste Management Bill to enforce the rule of law.

**Cumulative Impacts** - in relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

**Evaluation** – means the process of ascertaining the relative importance or significance of information, the light of people's values, preference and judgments in order to make a decision.

**Environment** - As defined in the Environmental Assessment Policy and Environmental Management Act - "land, water and air; all organic and inorganic matter and living organisms as well as biological diversity; the interacting natural systems that include components referred to in sub-paragraphs, the human environment insofar as it represents archaeological, aesthetic, cultural, historic, economic, paleontological or social values".

**Environmental Impact Assessment (EIA)** - the process of assessment of the effects of a development on the environment.

**Environmental Management Plan (EMP)** - A working document on environmental and socio-economic mitigation measures, which must be implemented by several responsible parties during all the phases of the proposed project.

**Interested and Affected Party (I&AP)** - any person, group of persons or organization interested in, or affected by an activity; and any organ of state that may have jurisdiction over any aspect of the activity.

**Mitigate** - The implementation of practical measures to reduce adverse impacts.

**Proponent (Applicant)** - Any person who has submitted or intends to apply for an authorization, as legislated by the National Environmental Assessment Policy, to undertake an activity or activities identified as a listed activity or listed activities; or in any other notice published by the Minister or Ministry of Environment & Tourism.

**Public** - Citizens who have diverse cultural, educational, political and socio-economic characteristics. The public is not a homogeneous and unified group of people with a set of agreed common interests and aims. There is no single public. There are a number of public, some of whom may emerge at any time during the process depending on their particular concerns and the issues involved.

**Scoping Process** - the process of identifying: issues that will be relevant for consideration of the application; the potential environmental impacts of the proposed activity; and alternatives to the proposed activity that are feasible and reasonable.

**Significant effect/Impact** - means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

**Stakeholders** - A sub-group of the public whose interests may be positively or negatively affected by a proposal or activity and/or who are concerned with a proposal or activity and its consequences. The term, therefore, includes the proponent, authorities (both the lead authority and other authorities) and all interested and affected parties (I&APs). The principle that environmental consultants and stakeholder engagement practitioners should be independent and unbiased excludes these groups from being considered stakeholders.

**Stakeholder engagement** - The process of engagement between stakeholders (the proponent, authorities and I&APs) during the planning, assessment, implementation and/or management of proposals or activities. The level of stakeholder engagement varies depending on the nature of the proposal or activity as well as the level of commitment by stakeholders to the process. Stakeholder engagement can, therefore, be described by a spectrum or continuum of increasing levels of engagement in the decision-making process. The term is considered to be more appropriate than the term "public participation".



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# Executive Summary

## 1. Introduction

This EIA study seeks to identify environmental issues associated with the construction activities and commissioning of an eco-friendly seawater desalination plant. Issues identified through site visits and public participation are put forward in this report. These are further assessed and evaluated through a process developed and presented in this report.

## 2. Activity Description and natural environment

The Proponent intends to construct and commission an eco-friendly seawater desalination plant at Farm Hentiesbaai No. 133 at Henties Bay in Erongo Region. The proponent has been conditionally granted approval by the Henties Bay Council (Resolution No. CR/010/31/01/2018) to lease a portion in extend of approximately 240 hectares of the Farm Hentiesbaai Town and Townlands No. 133 by private treaty to construct and commission an eco-friendly seawater desalination plant.

The proponent aims to employ the distillation process for Its desalination plant which will separate portable water from Its unwanted chemicals and minerals such as salt which will be exported for other uses. the proponent Is thus proposing to build, own and operate a desalination plant, designed to provide freshwater for human consumption, generate electricity for own use and to sell the excess and water for agricultural purpose.

Water Resources Development I.e. the abstraction of groundwater or surface water for Industrial or commercial purposes, the abstraction of groundwater at a volume exceeding the threshold authorised In terms of a law relating to water resources, Irrigation schemes for agriculture excluding domestic Irrigation and the release of brine back Into the ocean by desalination plants are some of the listed activities that cannot be undertaken without Environmental Clearance Certificate. The proponent has, thus, contracted KPM Environmental Consulting to conduct the necessary environmental and social assessment

of the proposed desalination plant and to apply for Environmental Clearance of the proposed activity.



*Figure 1 shows part of the Salt Pan where the proposed plant will be located*



*Figure 2: Shows a channel made to allow salt water to run to another man-made earth dam.*





*Figure 3 Shows one of the few shrubs seen in the location of the proposed site.*



*Figure 4 Shows part of the area proposed for the proposed desalination plant*



*Figure 5 Shows some of the earlier extraction of Salt.*

### 3. Conclusions and Recommendations

The proposed activity has medium to low environmental impacts as per the assessment and identified impacts can be mitigated as per the proposed mitigation measures indicated on the EMP accompanying this Report. It is recommended that the proposed activity be granted Environmental Clearance as the envisaged impacted can be mitigated through the proposed measures. It is also known that the positive impact of establishing and constructing an eco-friendly seawater desalination plant far outweighs the negative impacts.

# Background to the Activity

## 1. Introduction

As the global human population expands, so does the pressure on the environment to provide adequate quantities of clean water for ecological, domestic, industrial and agricultural purposes. Global water supply limits and in many countries, resources are already over exploited, resulting in significant impacts to both social and biophysical environments. The number of people affected by water scarcity is expected to grow from approximately half a billion (1995) to over 4 and half billion (2050). Increasing human population drives ongoing industrial and agricultural development and urbanisation, amongst other water intensive pursuits. This situation is compounded by growing environmental problems such as desertification, soil erosion and deforestation, loss of wetlands and other impacts which either reduce the supply of potential or increase the demand of potential.

This background reveals the growing need to seek and implement alternative water supply strategies in order to secure adequate fresh water and cater for future demand without causing irreparable harm to existing freshwater resources. The world's total water resources are comprised of 97.5% saltwater and only 2.5% fresh water.

For Namibia where water is especially scarce, the situation from the global perspective is critical and becomes more critical with the advent of global warming and the damage to the ozone layer. Desalination of saltwater therefore provides a means to effectively access a vast supply (for all effects and purposes, unlimited) from the world's oceans.

Namibia's coastal area with its arid and therefore growth constrained environment is urgently in need of desalination; since the current demand outstrips the supply of traditional freshwater resources, furthermore demand is increasing as drought threatens to deplete current supply.

Desalination can provide safe, high quality water at virtually any quantity, provided the required energy requirements can be met. Not only is water available during drought periods, but it also alleviates pressure on other traditional freshwater resources, thus eliminating the limited factor for further development in Namibia.

Desalination has emerged as one of the leading alternative water supply strategies internationally.

The construction activities and specifically that of desalination plants are listed as some of the activities that cannot be undertaken without Environmental Clearance Certificate from the Environmental Commission in line with the Regulation No. 29 of 2012 (List of activities that may not be undertaken without Environmental Clearance Certificate) as well as per the Environmental Management Act NO. 7 of 2007.

The construction and commissioning of an eco-friendly seawater desalination plant in itself does not pose a direct threat to the natural environment but the activities associated with the desalination plant such as availability of water, electricity powerlines as well as the construction of a sewerage pond may pose some environmental impacts. Operating or handling a Waste Management facility as well as the construction of a power plant are some of the main activities that cannot be conducted without authorization from the Environmental Commission. Therefore, the desalination plant cannot be undertaken without environmental clearance certificate as per the EIA Regulations and Environmental Management Act No. 7 of 2007. KPM Environmental Consulting was thus appointed by Namib Eden to undertake the required EIA. The process of obtaining an environmental clearance certificate requires the services of a competent and experienced environmental assessment practitioner and Namib Eden was not aware of this until when they were advised of such by the Surveyor.

## 2. The Environmental Assessment Practitioner

The proponent has contracted KPM Environmental Consulting as the Environmental Assessment Practitioner (EAP) to manage the assessment process. KPM Environmental



Consulting is a Namibian company based in Windhoek with a broadly skilled and educated researcher, social scientist, mapping and environmental specialist as Managing Director, Festus Kapembe.

The entire consulting team, whose overall services have been utilized for this assignment, comprised of the following members:

**Table 1: List of Consultant's Key Team Members**

<b>Role</b>	<b>Organisation</b>	<b>Individual</b>	<b>Contact No.</b>	<b>Email</b>
<i>Project Manager &amp; Lead EA Practitioner</i>	KPM Environmental Consulting	Mr. F. Kapembe	+264811473344	kpm.consulting@iway.na
<i>Civil Engineer</i>	Independent Consultant	Ms. P. Shikongo	+264817129739	kpm.consulting@yahoo.com
<i>Geo-Hydrological Specialist Input</i>	KPM Environmental Consulting	Ms. F. Shagama	+264814075536	kpm.consulting@yahoo.com

All the above KPM Environmental Consulting team members' CVs are contained in Annexure F and meet the general requirement for EAPs as indicated in section 4 (a) of the Environmental Impact Assessment Regulations. The team consists of project management skills; a range of technical skills and experience, and qualified environmental assessment practitioners.

KPM Environmental Consulting consultancy team as the EAP designated:

- a. Have knowledge of and experience in conducting assessments, including knowledge of the Environmental Management Act, the Environmental Impact Assessment Regulations and guidelines that have relevance to this proposed activity;

- b. Have performed the work relating to the application in an objective manner, even if this results in view and findings that may not be favourable to the Proponent;
- c. Have complied with the Environmental Management Act, the Environmental Impact Assessment Regulations, guidelines and other applicable laws, and
- d. Have disclosed to the proponent, competent authority and the Environmental Commissioner all material information in its possession that reasonably has or may have the potential of influencing –
  - i. Any decision to be taken with respect to the application in terms of the Environmental Management
  - ii. Act, the Environmental Impact Assessment Regulations; or The objectivity of any report, plan or document prepared by the EAP in terms of the Act and its regulations.

### 3. Purpose and Scope of EIA and EMP

The aim of this EIA is to identify and assess the significance of impacts, and where appropriate to make recommendations that may then be used by the relevant authorities as conditions of approval and be incorporated into the Environmental Management System (EMS). The ultimate aim is to minimize the number of residual negative impacts of HIGH significance during the construction of the proposed institution.

### 4. Summary of the Proposed Activities

The Proponent intends to establish a state-of-the-art eco-friendly seawater desalination plant that would see Namibia having enough freshwater for human consumption and other uses.

Namib Eden Trading cc is therefore proposing to build, own and operate a desalination plant, designed to provide fresh water for human consumption and for sale and water for

agricultural purposes. The development of the freshwater resources from seawater will greatly expand all the commercial possibilities at the coastal region and the whole of Namibia.

The proposed desalination plant will have immediate commercial benefits, as the revenue of the plant will far exceed the costs and payment of the initial investment. The plant will be highly expandable and capacity can be increased dramatically with minimum further investments. The plant will be operated by Namib Eden Trading providing supply certainty.

The final design drawings are currently in the process of being finalized and thus could not be availed of this report. However, these could be availed as soon as they are finalized.

The construction of the desalination plant can only commence after receipt of the environmental clearance from the Ministry of Environment and Tourism (MET). Construction of the plant will last between 18 and 28 months. However, due to the strategic national significant of the project construction time can be accelerated and possibly completion time could be 12 to 16 months, provided that all the agreements and licences are processed timeously.

Namib Eden Trading and its subcontractors will commence by establishing the various work areas and temporarily construction yards. The main construction yard will be adjacent to the distillation chamber and smaller construction yards or laydown areas will be established at the main barn and administration building and at the saltwater ponds and growth tunnels. The construction areas will be temporarily fenced for safety and security purposes.

The entire area for the desalination plant will be fenced off and therefore, there will not be any possibility of students poaching or stealing from nearby farms. Other control measures will also be put in place such as surveillance cameras to curb the possibility of such behaviours.

## 5. Alternatives

The 'do nothing' alternative is the option not to construct the proposed eco-friendly seawater desalination plant. This alternative is counterproductive as currently the proposed area is underutilised and there is not much happening except for some small stock grazing the area. The 'do nothing' option will not have a dent in the economy of the country as things will remain the same for years to come.

In addition, the 'do nothing' alternative is not consistent with the Vision 2030 and Namibian government's commitment of employment creation, poverty reduction and economic growth as highlighted in the fifth National Development Plan (NDP 5).

# Regulatory Framework

## 1. Introduction

Namibia has a number of legislation dealing with environmental issues. Environmental legislation determines the objectives guiding, and the strategies to be used in order to strengthen the respect for environmental values, considering the existing social, cultural and economic situation. The foundation for the Namibian environmental policy framework is Article 95 (l) of the Constitution. It stipulates that the state shall actively promote and maintain the welfare of the people by adopting policies which include the “maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefits of all Namibians (The Namibia Constitution).

The State is further committed to actively promote and maintain the environmental welfare of all Namibians by entrenching the principles of sound environmental management practice in the Namibian Constitution and formulating and institutionalizing policies that can realize the sustainable development objectives (Ruppel, 2013).

## 2. Environmental Legislation

To give effect to articles 91(c) and 95(l) of the Constitution of Namibia, general principles for sound management of the environment and natural resources in an integrated manner were formulated in Namibia’s Environmental Assessment Policy of 1994. The Environmental Assessment and Management Act was approved in 2007 to give statutory effect to the Policy and gazetted on 27 December 2007 as the Environmental Management Act (Act No. 7 of 2007), Government Gazette No. 3966. Regulations for Environmental Impact Assessment, in terms of the Act, were published in January 2012. The Act defines “the environment” as including “the human environment that is the landscape and natural, cultural, historical, aesthetic and social heritage and values.”

These policies and Acts, both promulgated and in draft form, were identified in this EIA and the proposed institution has been developed in compliance with these requirements.

Table 1 provides a summary of the Namibian policies and laws and indicates how the requirements have been applied, or are still to be applied.

The process followed for this EIA study is outlined in Figure 1 below.

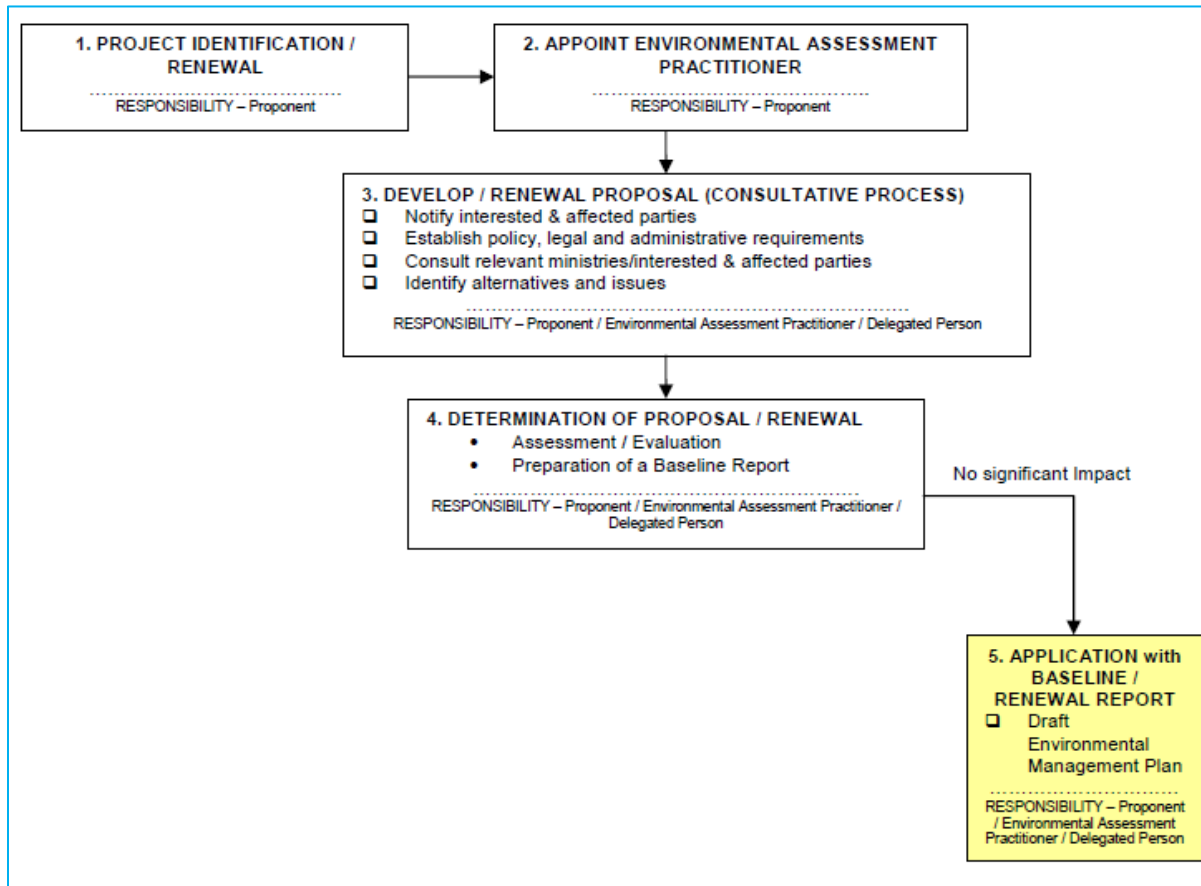


Figure 6: EIA scoping process as per the Environmental Management Act (7 of 2007)

As the organ of state responsible for the management and protection of its natural resources, MET is committed to pursuing these principles of environmental management.

The Act also provides for ensuring that there are opportunities for timeous participation of Interested and Affected Parties (I&APs) throughout the assessment process in matters affecting their lives.

### 3. Environmental Impact Assessment Policy

Namibia's Environmental Assessment Policy recognizes that EIAs seek to ensure that the environmental consequences of development projects and policies are considered, understood and incorporated into the planning process. The term 'environment' is broadly interpreted to include biophysical, social, economic, cultural, historical and political components. The Policy defines the required steps for an EIA, the required contents of an EIA report, the need for post-implementation monitoring, and the system of appeals. All these aspects have since been taken up in the subsequent Environmental Management Act (EMA) and the accompanying Regulations, which were drafted in response to the Environmental Assessment Policy.

### 4. Local Authorities Act

The Local Authority Act (23 of 1992) makes provisions for municipalities, towns and villages to make regulations and rules regarding the activities that may be conducted within the municipal, town or village jurisdiction. Incidents such as pollution, spillages or contamination may be investigated by the Health and Safety Officer at the Municipality, Town or Village Council and the offender may be fined an amount as per the rules and regulations of that Local Authority.

The Local Authority at Henties Bay, have been informed about the proposed institution and are ready to accommodate some of the needs for the institution such waste management etc during the early stage of the operational stage.

### 5. Soil Conservation Act

To consolidate and amend the law relating to the combating and prevention of soil erosion, the conservation, improvement and manner of use of the soil and vegetation and the protection of the water sources in the Republic and the territory of Namibia. Considering the proposed activity, care should be exercised to ensure that no contamination or pollution of soil through leakage or wind blowing of any materials that

might not be good for the natural environment. Specific measures regarding these possible impacts will be proposed further in EMP.

#### 6. Hazardous Substance Ordinance (Ordinance No. 14 of 1974)

A substance is considered hazardous if it has one or more of the following hazardous properties i.e. explosive, flammable, oxidizes, corrosive or toxic to people. The proponent has not indicated what explosive materials that will be used for the academic purpose of for the veterinary clinic. However, it is important to ensure that all activities that may involve hazardous substances are handled with care and in line with the provisions of this Ordinance.

#### 7. Atmospheric Pollution Prevention Ordinance of 1976

The Atmospheric Pollution Ordinance makes provision for the prevention of any activity that contributes to the pollution of the atmosphere. Provisions will be made in the EMP to direct staff responsible for waste management to ensure that all activities do not cause atmospheric pollution.

#### 8. Water Resources Management Act, 2004 (Act No. 24 of 2004)

The Water Resources Management Act provides for the management, development, protection, conservation and use of water resources throughout Namibia. Provisions have been made in the EMP to ensure that sea water is not contaminated with throughout the lifespan of the institution.



# Baseline Description of the Environment and Project Setting

## 1. General

Namib Eden Trading cc intends to construct an eco-friendly seawater desalination plant in Hentiesbaai, in Erongo Region. The proposed site for the proposed development is currently unoccupied and lay between the Hentiesbaai farmland and the National Park. The Proponent has appointed KPM Environmental Consulting to conduct the Environmental Impact Assessment and to apply for an Environmental Clearance Certificate from the Environmental Commission.

## 6. Socio-economic Environment

Henties Bay is one of the three coastal towns in Erongo Region and is regarded as holiday town by most holiday makers. The population of Henties Bay is approximately 3000 permanent residents. There are limited employment opportunities in the area with most local people working as fishermen.

Erongo Region is one of the 14 regions in Namibia and is located in the western part of the country. Because of its geographical location and the fact that the region contains the harbour towns of Swakopmund, Walvis Bay and Henties Bay, it serves as a hub in terms of the movement of people and goods. There has also been something of a mining boom in Erongo in recent times. There are a number of established mines such as Rössing and Langer Heinrich, while a growing number of mines are starting up in the region, and many more are in the exploratory stages. Uranium is the main commodity being mined in the region. Tourism and fishing are the other major contributors to Erongo's economy.

Erongo comprises the Walvis Bay and Swakopmund Magisterial districts up to the Ugab River and also includes the Omaruru and Karibib magisterial districts. To the west, Erongo is bordered by the Atlantic Ocean while on land it borders with the following regions: Kunene – North, Otjozondjupa – east, Khomas – Southeast and Hardap – south. The region has a total land area of 63,579 km<sup>2</sup> which is approximately 7.7% of the country's total land surface (NPC, Census Indicators, 2001). The National Population and Housing

Census of 2001 estimated the population of the region to be 107,663 (up from 55,470 in 1991) with a 53.5%:46.5% male to female ratio.

Although Swakopmund serves as the administrative centre of Erongo, Henties Bay is of much greater economic and strategic importance as it is a holiday town to many people. It is also an important trade link to other SADC countries through the Trans-Kalahari and Trans-Caprivi and Trans-Cunene highways. The town is also home to many people who work on the adjacent mines. In addition the Walvis Bay lagoon is a designated Ramsar wetland site of international importance which attracts many tourists to the town. Because of these factors, the town is growing rapidly and is attracting migrants seeking employment from all over Namibia and other countries.

## 7. Biophysical Environment

The Henties Bay physical environment and the surrounding desert offer an attractive and diversified natural environment with many sites of interest such as outstretched beaches, sensitive lichen fields and a wide variety of desert plants. Interesting geological phenomena and archaeological sites attract more and more visitors every year, which contributes to tourism development in Henties Bay. The selected site is mostly covered by sand with minimal shrubs as can be seen on the picture below.



*Figure 7 Shows the open natural environment outside of Henties Bay town*

## 8. Climate

The effects of climate change are being felt in the Erongo region. It is for the most part an extremely arid region, relying on ephemeral rivers to supply water to its increasing population and industrial development, while sea level rise is also a threat for the coastal towns, particularly Walvis Bay. Energy for the increasing needs of the region is also typically imported from fossil-fuel burning power stations in Southern Africa.

A desalination plant has recently been opened to address the water needs of the region, and this renewable energy project would represent a considerable additional response to the threat of climate change. It would contribute to reduced greenhouse gas emissions. It was estimated in 2007 that Namibia was able to produce 384MW of energy from the hydro plant at Ruacana and the fuel burning stations at Walvis Bay and Windhoek. If this project goes on to produce 300MW it will be a major source of cleanly generated energy

for Namibia. In addition the project will not require any supply of water to produce the energy.

## 9. Geology of the area

According to the Coastal Profile for Erongo (August 1999), the onshore coastal succession in Erongo Region consists of old crystalline rocks that form the basement to the Permo-Triassic Karoo Sequence and the young deposits of the Namib Desert. About 130 million years ago, several large and scattered magmatic complexes, now deeply eroded, were emplaced in central Namibia in a broad zone extending from the coastal area of the Erongo Region in a north easterly direction.

The general geology of the Henties Bay area and particularly the identified site consist of fine sand and some dunes observed at most areas.

## 10. Terrain forms and habitats

The terrain forms vary from one area to another. There are hilltops on some areas with others that are flat and dominated by grassland and some few shrubs. Savanna and shrubs have also been observed during the visits.

## 11. The soil of the area

The type of soil found in the Henties Bay area varies from soil with high clay content in the middle to a sandy silty clay towards the main road from Swakopmund to Henties Bay. From visual inspection, the possibility of underground water seems promising. This, has been confirm by the Geohydrological Assessment Report attached, in which it was confirmed that the underground aquifer has abundant underground water available in the area.

## 12. Vegetation of the area

Compound transverse sand dunes is present in a north-east band, east of main road from Swakopmund to Henties Bay. East these dunes is a gravel plain with some inselbergs. To the west of the dunes is a relative flat area with a mainly gentle slope towards the ocean. Various small barchan dunes are present in project area with few dune hummocks as can be seen by the pictures below.

## 13. Animals (moths, butterflies, reptiles, birds and mammals) of the area

During the site visit, a number of small desert animals have been observed in the area. Few reptiles, birds and were seen around the proposed area and also along the main Hentiesbaai farm area. It is important that, the contractor preserve the natural ecosystem as possible. While it may not be possible to avoid disturbance to the natural ecosystem, High Value Animal Species (HVAS) should be protected where possible.

## 14. Surrounding land uses

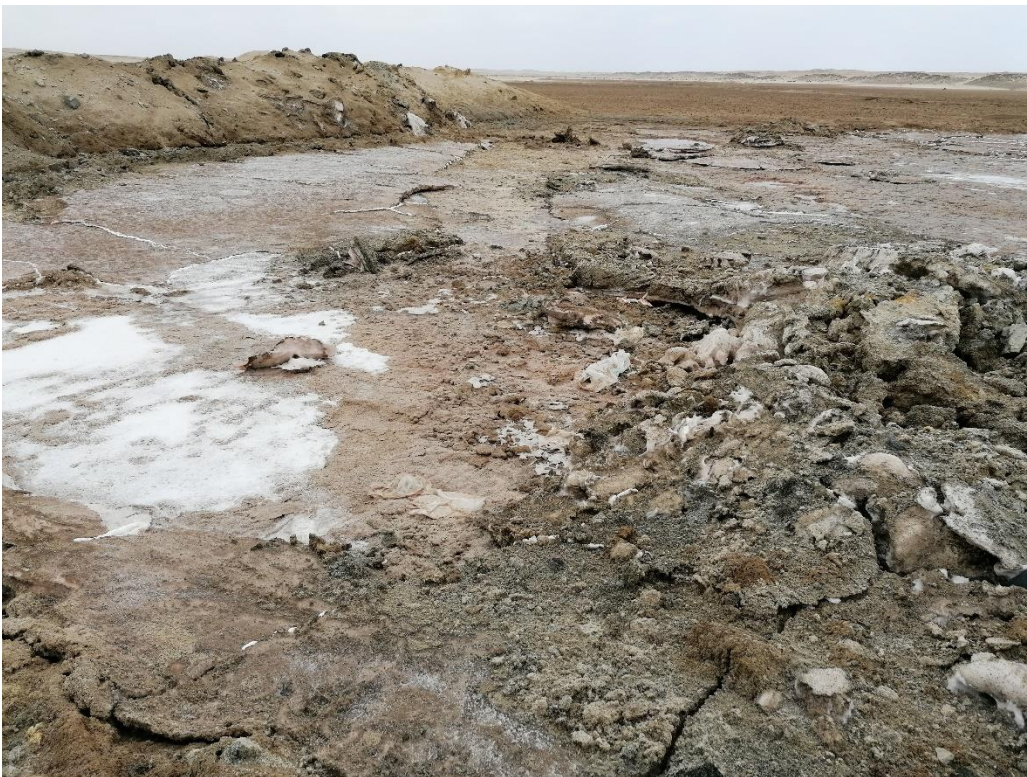
The area proposed for the institution is mainly a flat area comprised of woodlands and shrubs. According to the proponent, the area has not been used for any development before but was mainly used for exploration and also mining salt. Walking around the area, one notice that the entire area is dominated by salty sand content. There is hardly any significant plant species as most of them are small trees and shrubs.

There is no wildlife noticed during the assessment process. Below is the example of the natural environment around the proposed site:





*Figure 8 Open land with few shrubs on the dunes*



*Figure 9 Salty content seen around the Salt Pan*





*Figure 10 Open land nearby the proposed area and the dunes*



*Figure 11 Salty content observed during the site visit*

## 15. Historical, archaeological or cultural sites

The Henties Bay town is dominated mostly by a combination of German speaking people, Damara>Nama, OtjiHerero, Oshiwambo who are mostly working as fisherman. There are no notable archaeological sites nearby the proposed site. However, due to the historical presence of the San people, care should be exercised during excavations to ensure that where archaeological artefacts are found, that they are reported to the relevant authorities for further archaeological assessment.

## 16. Geology Soils

The geological formation of the Erongo Region varies from one area to another. The region is well known as having abundance groundwater and often receive good rainfall on a yearly basis and vast natural resources and contribute a large chunk to the country's revenue.

## 17. Bio-physical Environment

Henties Bay is centrally located on the Namibian coastline in the arid Namib Desert. The arid conditions are as a result of dry descending air and upwelling of the cold Benguela Current. Thick fog or low stratus clouds are a regular occurrence in Walvis Bay. This is due to the influence of the Benguela Current and forms the major source of water for the succulent and lichen flora in the Namib Desert.

Winds generated from the high-pressure cell over the Atlantic Ocean blow from a southerly direction when they reach the Namibian coastline. As the Namibian interior is warm (particularly in summer), localised low-pressure systems are created which draws the cold southerly winds towards the inland desert areas. These winds manifest themselves in the form of strong prevailing south-westerly winds, which range from an average of 20 knots (37 km/h) during winter months to as high as 60 knots (110 km/h) during the summer. Winds near Walvis Bay display two main trends; high velocity and frequency south to south-westerly winds in summer and high velocity, low frequency east to north-easterly winds during winter. During winter, the east winds generated over the



hot Namib Desert have a strong effect on temperature, resulting in temperature in the upper 30 degrees Celsius and tend to transport plenty of sand.



*Figure 12: Partial shrubs observed along to the National Road nearby the proposed site*

## 18. Social Environment

The Erongo Region, and Henties Bay specifically, is one of the fastest growing regions in terms of population size in the coastal region. The population growth rate of Henties Bay for the period 2001 to 2011 is 2.7% while that of the Erongo Region is 3.4% and that of Namibia 1.4%. In Henties Bay, this growth can firstly be attributed to in-migration of job-seekers (42.63%) and secondly to in-migration by people who obtained jobs in Henties Bay prior to moving. This goes hand in hand with a decline in rural populations of the Erongo Region.

During the last census of 2011, unemployment in Henties Bay was 27% which is significantly lower than the Namibian level of 37%. The average annual household income in the Erongo Region during the 2009/2010 Namibian Household Income and Expenditure

Survey was N\$ 84,989 which is second to only the Khomas Region with N\$ 132,209 (Namibia Statistics Agency, 2012). The main source of income in the Erongo Region is from salaries and wages with about 80% of households relying on this type of income (Namibia Statistics Agency, 2012).

## 19. Current Infrastructure in the area

Henties Bay has a number of visible infrastructures, ranging from the national road network which connects the Henties Bay to other coastal towns such as Walvis Bay and Swakopmund. The national road network between Henties Bay and Swakopmund looks well maintained and other gravel roads that connects the proposed site with town also looks well taken care off. There are also lots of development such as housing mostly holiday homes and also a few Government institutions. The proposed desalination plant is expected to boost the economy of the area as well as reducing the distance between Henties Bay and Swakopmund as the transportation of workers at the site will also improve significantly. The electricity connection covers the entire Henties Bay area and most farms are connected to both water and electricity.

## Description of the proposed activity

### 1. Introduction

In this section, a short description of the approach and methodology that has been followed in this study is provided and is described in the following subsections.

### 20. Project Management

KPM Environmental Consulting has been contracted by Namib Eden Trading cc to carry out the required EIA study in order for the project to receive the Environmental Clearance from the Environmental Commissioner and in fulfilment of the Environmental Management Act No. 7 of 2007. As lead consultant, KPM coordinated and managed a project team of several specialist consultants to produce a well-integrated EIA process and report. The project team and specialists who participated in this study are listed in section table 1 above.

### 21. Inception phase

Key documents and data relevant to this project were collected during the Project Inception Phase in November 2019, which is also the period when the consultant's methodology and work plan for this project was reviewed and updated. Other important activities that took place during this phase were: a review of all relevant previous studies and other available resources to validate and update the baseline conditions at each of the targeted sites; carry out initial consultations with Namib Eden Trading, Henties Bay Municipality and other key stakeholders on the assignment and recommend any necessary additions to the Scope of Work. It was also during the inception phase when Background Information Document on the project was developed; shared with all identified key stakeholders and invited to register their concerns about the proposed activity. Inception phase also allowed the consultant to formally register the project and launch an Environmental Clearance Certificate application with the Environmental Commission.

In addition to the project management and inception phase outlined above, the methodology utilised for this activity has been divided into four components which are later discussed in details in specific sections of this report. These are:

- Scoping
- Specialist investigation
- Impact assessment
- Public and stakeholders consultation

## 22. Scoping

The scoping process consisted of two phases, the desktop review of the project to identify all potential environmental impacts, and the field work to all project sites to verify baseline information and collect additional information. Although key data about the activity, particularly all the background information, technical data on the proposed site were provided for by the client, some information could be collected through reconnaissance field trips undertaken by the EIA team to the proposed area. The following activities and objectives were carried out and realised during those reconnaissance field trips.

- Verification of baseline data reviewed during the desktop review
- Collect additional and missing baseline information to fill the gaps in historical data
- Analyse potential changes in available and assessed baseline information to establish the current baseline biophysical environmental state
- Collect additional socio-economic information and data to verify socio-economic assessments carried out by the client
- Conduct targeted consultations with key stakeholders living in proximity to those sites

The construction of major infrastructures i.e. may have some direct impact on the natural environment or the community in which these operations will be undertaken. Therefore, it is for that reasons that construction activities cannot be undertaken without

Environmental Clearance Certificate as per the EIA Regulations and Environmental Management Act No. 7 of 2007.

### 23. Environmental Management

This study has identified potential environmental and social impacts. An Environmental Management Plan for construction of the proposed desalination plant has been developed to ensure that all activities during construction are in line with the Environmental Management Act No. 7 of 2007. Therefore, mitigation measures are proposed where issues have been identified and where positive impacts are identified; measures to enhance those have also been identified.

### 24. Public and Stakeholders Consultation

A key to a successful development and application of the EIA has been the liaison with the stakeholders during the entire project. The EIA regulations call for an open consultation with all interested and affected parties (I&APs) at defined stages of the EIA process. This entails participatory consultation with members of the public by providing an opportunity to review and comment on the proposed project. Public Participation has thus been undertaken to fulfil the requirements of Namibia's legislation, but also takes account of other acceptable best and practical approaches used in other areas in Southern Africa.

During this study, more public and key stakeholders consultations were carried out with main objectives to present the intended activity as known to the consultants to all stakeholders and IAP; and to provide stakeholders and I&APs the opportunity to raise their concerns regarding the proposed activity.



*Figure 13: Public Consultation meeting at Henties Bay Community Hall*

The following activities were undertaken by the consultant to successfully complete this process:

- The project was registered with the Office of Environmental Commissioner in MET.
- The planned public consultation approach was discussed with MET and their principle approval of the approach was obtained
- All the key stakeholders, both public and private were identified
- Notices advertising the proposed project and inviting the public to register as I&APs as well as to provide and register their concerns appeared in the RePublikein and New Era Newspaper during September 2018 (Annexure C)



- A written notification including the Background Information Document (BID) was hand-delivered and emailed to all relevant government offices at national, regional and local levels, including a few copies left at the Henties Bay Community Library, commercial farmers in the area and community members and to relevant traditional authorities and private offices.
- A list of stakeholders was established for the study. Key stakeholders include people and institution at the national, regional and local levels. At National and regional levels, the consultation focused mainly at government institutions such as Ministries, regional and Local Authority. At a local level, the consultation targeted institutions, communities and people in close proximity to the identified site in Henties Bay. As indicated in this report most of the sites are more than a kilometre from any residential areas or institutions, in that case, the Local Authorities and other government institutions that represent the interest of the people were registered as a key stakeholder and forwarded all relevant documentation regarding the project.
- A Background Information Document (BID), which contained concise background information about the proposed activity was compiled and widely circulated to all key stakeholders at the specific study sites. Copies of the BID were also left at government offices at national, regional and local levels as well as at public facilities such as municipal offices, Police offices, shops, post offices, regional councillors' offices, schools, etc. for further distribution to Interested & Affected Parties (IAP). An electronic copy of the BID was forwarded to regional and local authorities and other institutions for further dissemination.
- Notices were placed in the local daily newspapers (Namib Times). The notice provided a brief description of the project and the project sites and invited Interested and Affected Parties to register as such (Annexure E).

- Where applicable, people living within the vicinity of the Henties Bay town were directly contacted and provided with a brief explanation about the proposed initiative in the language of their preference and were also provided with copies of the BID.
- The BID was accompanied by a stakeholder registration form which made provision for a stakeholder to raise their issues of concern and return the form to the project office through the contact details provided on the form.

The consultant also provided the opportunities to the public and private stakeholders to contribute and or comment on this project by completing and returning a registration form, sending an email, or registering via telephonic communication with the consultants or by sending a cell phone text message to the number provided on the advert.

Targeted briefing and consultation meetings with key stakeholders were undertaken with all interested and affected parties.



## IMPACT ASSESSMENT

This Chapter provides details of the potential impacts that will emanate from construction activities. It should be noted that the proposed construction will be done in an area that has never been developed before. The only activity that has taken place at the proposed site is exploration activities as well as salt mining. The proposed site is currently open and no fence has been elected on the piece of land. Below is the picture showing the current status of the area:



*Figure 14 An open area at the proposed site*



*Figure 15 Some residue from the exploration activities*



*Figure 16 Area where salt mining has been done*

During the construction stage, the first step would be to clear the area of the vegetation and shrubs that are currently occupying the area. Then excavation and actual construction would commence. Therefore, the impact assessment will also be confined to this operation. This Chapter also provides baseline information for the sites covered in this study in terms of their location, infrastructure and the receiving environment. The overall impacts of the activity are also discussed and potential mitigation measures recommended. Key findings of specialist studies are also summarized in this Chapter.

The environmental impacts associated with the proposed extension were identified through the following avenues:

- Desktop literature research on aspects related to EIA study;
- Public Consultation and Participation Process;
- Comments from Interested and Affected Parties; and

- Site visits to the proposed area.

Some of the envisaged environmental impacts associated with construction activities are such as:

- Aesthetic issues (change of landscape);
- Employment creation;
- Noise & Vibration (installation phase);
- Dust (installation phase);
- Traffic (installation phase);

The table below depicts that criteria used to assess the various description of the area:

<b>Assessment Criteria</b>	<b>Description of criteria</b>
<b>Magnitude (MA)</b>	The absolute or relative change in the size or value of the environmental feature. 0 – None 2 – Minor 4 – Low 6 – Moderate 8 – High 10 – Very high/don't know
<b>Direction (DI)</b>	Will the impact represent beneficial or adverse change? Positive (P) versus negative (N) impacts. Negative impacts are a cause for concern. 0 – Positive Impact 1 – Negative Impact
<b>Extent (EX)</b>	The extent of environmental impacts associated with the proposed activity. 1 - Immediate (the site and immediate surrounds) 2 - Local (Henties Bay) 3 - Regional (Erongo Region) 4 - National (Namibia) 5 - International

Assessment Criteria	Description of criteria
<b>Duration (DU)</b>	The time period over which the impact will be felt. 1 – Immediate 2 – Short-term (0-5 years) 3 – Medium Term (5-15 years) 4 – Long-term (impact ceases after the operation) 5 - Permanent
<b>Frequency (FR)</b>	Refers to the return period for impacts which will recur over and over again. 0 - Annually or less 1 - 1 to 10 years 2 - 10 to 100 years
<b>Reversibility (RE)</b>	Refers to the permanence of the impact. 0 -Temporary 1 - Permanent
<b>Likelihood (LI) of occurrence</b>	Refers to the possibility of the particular impact occurring as forecast. 0 - None 1 - Improbable 2 – Low probability (possibility of the impact occurring is low) 3 – Medium Probability 4 - Highly probable (where the impact is most likely to occur) 5 - Definite (where the impact will occur)

Once the above factors have been ranked for each impact, the overall risk (environmental significance) of each impact was assessed using the following formula:

$$\text{SP} = (\text{magnitude} + \text{direction} + \text{extent} + \text{duration} + \text{frequency} + \text{reversibility}) \times \text{Likelihood}$$

The maximum value is 120 significance points (SP). Environmental impacts were rated as either **High**, **Moderate** or **Low** significance on the following basis:

SP ≥ 60: indicates high environmental significance: **HIGH**

SP 40 ≥ 59: indicates moderate environmental significance: **MEDIUM**

SP <40: indicates low environmental significance: **LOW**

		ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION									
POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	MA	DI	EX	DU	FR	PE	TOTAL	LI	SP	RECOMMENDED MITIGATION MEASURES	MA	DI	EX	DU	FR	PE	TOTAL	LI	SP

		ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION									
POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	MA	DI	EX	DU	FR	PE	TOTAL	LI	SP	RECOMMENDED MITIGATION MEASURES	MA	DI	EX	DU	FR	PE	TOTAL	LI	SP





		ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION										ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION									
POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	MA	DI	EX	DU	FR	PE	TOTAL	LI	SP	RECOMMENDED MITIGATION MEASURES	MA	DI	EX	DU	FR	PE	TOTAL	LI	SP	
<b>Noise &amp; Vibration (construction phase)</b>	Machinery used during construction will cause a noise-related	8	1	2	2	1	0	14	4	<b>56</b>	Work hours should be restricted to between 08h00 and 17h00 where installation involving the use of heavy equipment, power tools and the movement of heavy	8	1	2	2	1	0	14	3	<b>42</b>	

		ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION										
POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	MA	DI	EX	DU	FR	PE	TOTAL	LI	SP	RECOMMENDED MITIGATION MEASURES	MA	DI	EX	DU	FR	PE	TOTAL	LI	SP	
<b>Dust (construction and installation phase)</b>	Dust could be generated during the land clearing process due to	8	1	2	2	1	0	14	4	<b>56</b>	A watering truck should be used on gravel roads with the heaviest vehicle movement, especially during delivery transportation. However, due consideration should be given	8	1	2	2	1	0	14	2	<b>28</b>	

		ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION										ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION									
POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	MA	DI	EX	DU	FR	PE	TOTAL	LI	SP	RECOMMENDED MITIGATION MEASURES	MA	DI	EX	DU	FR	PE	TOTAL	LI	SP	
<b>Traffic congestion (Construction &amp; Operational phase)</b>	Increase in traffic in the area is expected due to construction and installation activities.	4	1	2	2	1	1	12	3	<b>36</b>	Provide traffic calming measures and speed limits along strategic routes.	4	1	2	2	1	1	12	2	<b>24</b>	

		ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION										ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION									
POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	MA	DI	EX	DU	FR	PE	TOTAL	LI	SP	RECOMMENDED MITIGATION MEASURES	MA	DI	EX	DU	FR	PE	TOTAL	LI	SP	
<b>Air Pollution</b>	Air pollution might occur during excavation and transportation of construction materials.	8	1	2	2	2	1	16	4	<b>64</b>	The contractor should ensure that containers of construction materials are secured.	8	1	2	2	1	1	15	4	<b>60</b>	
<b>Potential economic</b>	Clearing of the land and	10	1	1	3	1	1	17	3	<b>51</b>	Deemed a positive impact.	10	1	1	2	1	1	17	3	<b>51</b>	

		ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION										
POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	MA	DI	EX	DU	FR	PE	TOTAL	LI	SP	RECOMMENDED MITIGATION MEASURES	MA	DI	EX	DU	FR	PE	TOTAL	LI	SP	
																					<b>opportunities for local contractors providing services and supplies</b>
<b>Increased soil erosion risks due to heavy trucks impact on vegetation</b>	Increased erosion risks due to clearance of vegetation	8	1	2	2	2	1	16	4	<b>64</b>	<ul style="list-style-type: none"> <li>When excavating, topsoil should be stockpiled in a demarcated area.</li> <li>Stockpiled topsoil should be used to rehabilitate the</li> </ul>	8	1	2	2	2	1	16	3	<b>48</b>	



		ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION								ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION																														
POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	MA	DI	EX	DU	FR	PE	TOTAL	LI	SP	RECOMMENDED MITIGATION MEASURES																													
											MA	DI	EX	DU	FR	PE	TOTAL	LI	SP																					
<b>and conservation</b>	and the associated increase in sediment loads to soil erosion.										nearest borrow area (existing borrow pits), if such an area is located less than 20 km from the stockpile.																													

		ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION									
POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	MA	DI	EX	DU	FR	PE	TOTAL	LI	SP	RECOMMENDED MITIGATION MEASURES									
											MA	DI	EX	DU	FR	PE	TOTAL	LI	SP	
<b>Soil Contamination</b>	Spillages of hazardous substances on the development site could impact on water bodies and downstream users.  Soil, surface and groundwater pollution from potential disposal of domestic	8	1	2	2	2	1	16	3	48	<ul style="list-style-type: none"> <li>• Store all hazardous waste in bunded areas on concrete slabs.</li> <li>• Recycle or sell liquid wastes and by-products where possible.</li> <li>• Separate oily and non-oily areas and route all oily drainage via an oil separator.</li> <li>• Separated oil to be collected for recycling.</li> <li>• Use environmentally friendly detergents.</li> </ul>	8	1	2	2	2	1	16	3	48



## 25. Discussion of Impacts

All potential impacts have been screened and the applicable impacts have been subjected to the criteria outlined in Table 1. All impacts outlined in Table 1 have been addressed in the EMP (Annexure A). The following should be noted regarding some of the key negative impacts associated with the proposed activity and their corresponding mitigation measures:

- **Increase investor confidence:** The proposed desalination plant will enhance the development of Henties Bay area and boost business opportunities within the Erongo Region.
- **Increase international trade:** the proposed development will improve international trade in the country as the proposed desalination plant may acquire some materials/equipment from outside of the country and also an exchange of students during the operational stage i.e students from the Agricultural College at the Welwitchia Univesrity in Otjozondjupa Region.
- **Employment opportunities:** the proposed activities will create employment opportunities for local people as the main Contractor may opt to employ and sub-contract local Small and Medium Contractors from Henties Bay, Swakopmund or Walvis Bay.
- **Solid Waste Management:** the Proponent needs to make arrangement for the disposal of solid waste from the site during construction as well as other waste during operational stage of the proposed desalination plant.

## CONCLUSION AND RECOMMENDATIONS

The Environmental Impact Assessment process did not identify any serious threat that the proposed eco-friendly seawater desalination plant may have on the natural and socio-economic environment. Potential impacts associated with construction have been identified and their significance determined. Impacts on the groundwater availability were identified as significant for the proposed desalination plant as some farmers might complain that the activities during construction and operational stage are using more water.

The other impacts identified in this study can be addressed through the implementation of the EMP and are therefore not expected to have any detrimental impacts on the surrounding communities. Mitigation measures are described in greater details in the EMP. Hence, the activity, as proposed in this report, can be undertaken with no significant impacts if executed according to the EMP.

It is, therefore, concluded that construction of the proposed eco-friendly seawater desalination plant can be undertaken without posing any serious health effects on the surrounding communities and habitats. It is considered that the benefits of establishing the proposed desalination plant at Henties Bay far outweigh the minor risks that can be avoided through EMP implementation. It is recommended that the EMP should be implemented fully in order to ensure that all potential environmental and social impacts are satisfactorily addressed.

### 1. Recommendations

The Environmental Management Plan contained in this report must be strictly implemented and must become part and parcel of the Contractor's contract for construction of the plant. Contractors should adhere to all proposed mitigation measure proposed in the EMP. Namib Eden Trading cc should ensure that all Contractors and staff working on site during the construction stage are inducted on how they should conduct

themselves on construction site. It is therefore recommended that Environmental Clearance be granted for the proposed institution.



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## LIST OF ANNEXURES

### **Annexure A: Environmental Management Plan**

## **Annexure B: Background Information Document**

## **Annexure C: Newspaper Adverts to Interested and Affected Parties**

## **Annexure D: Minutes of the Consultation Meetings, Attendance Register and PowerPoint Presentation**

## **Annexure E: List of Registered Interested & Affected Parties**



## **Annexure F: Curriculum Vitae of the Environmental Assessment Practitioners and Company Profile**

## **Annexure G: Map of the Proposed Area**

## **Annexure H: Geohydrological Assessment Report**