EIA REPORT

Proposed BigenKuumba Port Services Terminal at Namport for Storage and Handling of Industrial Minerals, Base and Rare Metals, Walvis Bay, Erongo Region

Environam Consultants Trading (ECT)

PROPONENT:

BigenKuumba Port Services

Windhoek

Tel: +264 81 124 8123

Fax: +264 886 157 96

Email: titusn@icloud.com

REPORT DATE:

13 May 2022

AUTHOR:

Colin P Namene

P.O. Box 24056

Windhoek

Tel: 061 – 258 394

Fax: 061 – 258 470

Email: colin@environam.com

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Signature

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LIST OF ACRONYMS

AIDS	Acquired immune deficiency syndrome
CRR	Comments and response report
dB	Decibels
DESR	Draft Environmental Scoping Report
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
EAR	Environmental Assessment Report
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
FESR	Final Environmental Scoping Report
ESR	Environmental Scoping Report
GTZ	Gesellschaft für Technische Zusammenarbeit
HIV	Human immunodeficiency virus
I&AP	Interested and Affected Party
IUCN	International Union for Conservation of Nature
MET	Ministry of Environment and Tourism

MEFT: DEA	Ministry of Environment, Forestry and Tourism: Department of Environmental Affairs
MURD	Ministry of Urban and Rural Development
MWTC	Ministry of Works Transport and Communication
PPP	Public participation process
p/km^2	People per square kilometre
SADC	Southern African Development Community
USAID	United States Agency for International Development

1. INTRODUCTION

1.1 Project Background

Namibia has a rich history of mining that spans well over 400 years. The country is home to a diversity of minerals including diamonds, uranium, special high grade zinc, gold, blister copper, lead and zinc concentrate to mention a few. This endowment makes mining the largest contributor to the country's economy in terms of revenue.

Namibia has also made great strides to position itself as a regional logistic hub in the Southern African region. Through the Walvis Bay Corridors, the port of Walvis Bay is linked to major cities and towns in SADC such as Gaborone, Johannesburg, Livingstone, Ndola, Lubumbashi, Santa Clara etc.

Another benefit is that Namibia is seen as a trade logistic alternative to South African and East-African trade channels that are experiencing challenges including multiple inefficient border crossings, worsening security, xenophobia and social instability. Namibia is becoming an increasingly attractive investment option for South African manufacturers, mining companies seeking to beneficiate resources and logistics enterprises seeking a more cost effective location. Customers that understand the comparative advantages of Namibia and the strategic value of utilising BigenKuumba Port Services as a service provider.

Based on the above BigenKuumba saw the opportunity to facilitate trade in commodities between these markets and overseas clients. In addition to contributing to the local economic development of Walvis Bay Town in particular and the country in general, job opportunities will be created with approximately 48 jobs directly and about 400 jobs indirectly.

The above activity is discussed in more detail in Chapter 4. The proponent appointed Environam Consultants Trading cc (ECT) to undertake the Environmental Assessment (EA) in order to obtain an Environmental Clearance Certificate (ECC) for the activity from the Office of the Environmental Commissioner in the Ministry of Environment, Forestry and Tourism (MEFT).

The process will be undertaken in terms of the gazetted Namibian Government Notice No. 30 Environmental Impact Assessment Regulations (herein referred to as EIA Regulations) of the Environmental Management Act (No 7 of 2007) (herein referred to as the EMA). The EIA process will investigate if there are any potential significant bio-physical and socio-economic impacts associated with the proposed development and related infrastructure and services.

The EIA process would also provide an opportunity for the public and key stakeholders to provide comments and participate in the process. It will also serve the purpose of informing the proponent's decision-making, and that of MEFT.

1.2 Project Location

The proposed site is located on a Portion of Erf 1920 within the Walvis Bay Port and is owned by Namibia Ports Authority (Namport). The portion of land is approximately 22,370 m^2. The general area is developed with industrial infrastructure catering for an amalgamation of port-related activities. See **Figures 1 and 2** below for the locality maps of Walvis Bay and the development site.

Figure 1: Locality map of Walvis Bay

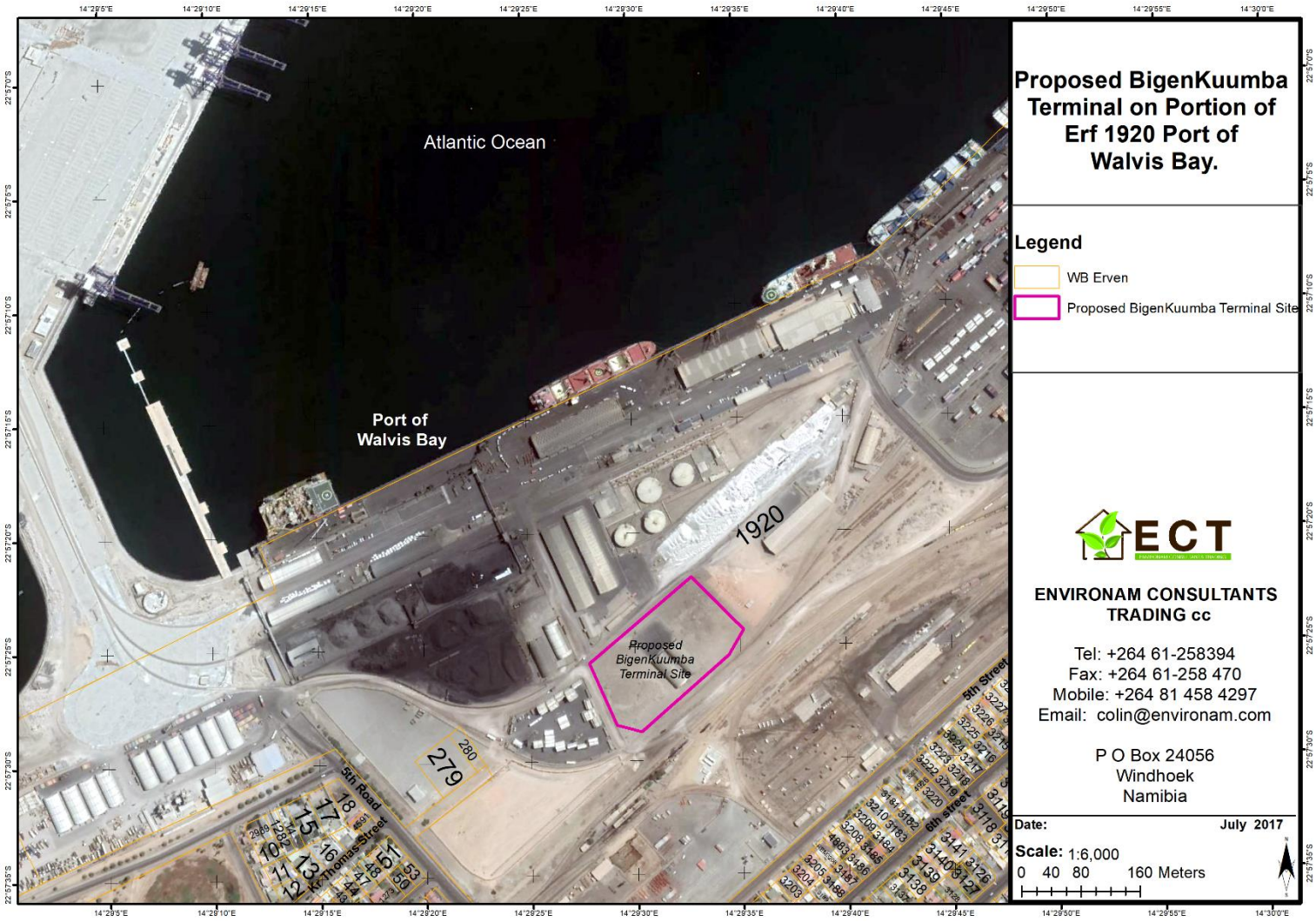

Figure 2: Locality map of the proposed development

1.3 Terms of Reference and Scope of Project

The scope of this project is limited to conducting an environmental impact assessment and applying for an Environmental Clearance Certificate for the Proposed Terminal at Namport for Storage and Handling of Industrial Minerals, Base and Rare Metals at Walvis Bay, Erongo Region and associated infrastructure as indicated in section 1.1 above. This includes consultations with client; site investigations and analysis; stakeholder consultations; impact analysis; mitigation formulation; report writing; and draft Environmental Management Plan.

1.4 Assumptions and Limitations

In undertaking this investigation and compiling the Environmental Assessment, the following assumptions and limitations apply:

- Assumes the information provided by the proponent is accurate and discloses all information available.

1.5 Content of Environmental Scoping Report

In terms of Section 8 of the gazetted EIA Regulations certain aspects must be included in a Scoping Report. **Table 1** below delineate, for ease reference, where this content is found in the Environmental Scoping Report.

Table 1: Contents of the Scoping / Environmental Assessment Report

Section	Description	Section of ESR/ Annexure
8 (a)	The curriculum vitae of the EAPs who prepared the report;	Refer to **Annexure E**
8 (b)	A description of the proposed activity;	Refer to Chapter 4
8 (c)	A description of the site on which the activity is to be undertaken and the location of the activity on the site;	Refer to Chapter 3
8 (d)	A description of the environment that may be affected by the proposed activity and the manner in which the geographical, physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed listed activity;	Refer to Chapter 3
8 (e)	An identification of laws and guidelines that have been considered in the preparation of the scoping report;	Refer to Chapter 2
8 (f)	Details of the public consultation process conducted in terms of regulation 7(1) in connection with the application, including	Refer to Chapter 5

Section	Description	Section of ESR/ Annexure
	(i) the steps that were taken to notify potentially interested and affected parties of the proposed application	Refer to Chapter 5
	(ii) proof that notice boards, advertisements and notices notifying potentially interested and affected parties of the proposed application have been displayed, placed or given;	Refer to **Annexures A** and **B** for site notices and advertisements respectively.
	(iii) a list of all persons, organisations and organs of state that were registered in terms of regulation 22 as interested and affected parties in relation to the application;	Refer to **Annexure D**
	(iv) a summary of the issues raised by interested and affected parties, the date of receipt of and the response of the EAP to those issues;	Refer to **Annexure D**
8 (g)	A description of the need and desirability of the proposed listed activity and any identified alternatives to the proposed activity that are feasible and reasonable, including the advantages and disadvantages that the proposed activity or alternatives have on the environment and on the community that may be affected by the activity;	Refer to Chapter 4
8 (h)	A description and assessment of the significance of any significant effects, including cumulative effects, that may occur as a result of the undertaking of the activity or identified alternatives or as a result of any construction, erection or decommissioning associated with the undertaking of the proposed listed activity;	Refer to Chapter 7
8 (i)	terms of reference for the detailed assessment;	Refer to Chapter 1
8 (j)	An environmental management plan	Refer to **Annexure F**

2. LEGAL, POLICY AND INSTITUTIONAL FRAMEWORK

The principle environmental regulatory agency in Namibia is the Office of the Environmental Commissioner within the Directorate of Environmental Affairs of the Ministry of Environment, Forestry and Tourism. Most of the policies and legislative instruments have their basis in two clauses of the Namibian Constitution, i.e. Article 91 (c) and Article 95 (l); however, good environmental management finds recourse in multiple legal instruments. **Table 2** below provides a summary of the legal framework considered to be relevant to this development and the environmental assessment process.

Table 2: Legislation applicable to the proposed development

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
The Constitution of the Republic of Namibia as Amended	Article 91 (c) provides for duty to guard against "the degradation and destruction of ecosystems and failure to protect the beauty and character of Namibia." Article 95(l) deals with the "maintenance of ecosystems, essential ecological processes and biological diversity" and sustainable use of the country's natural resources.	Sustainable development should be at the forefront of this development.
Environmental Management Act No. 7 of 2007 (EMA)	Section 2 outlines the objective of the Act and the means to achieve that. Section 3 details the principle of Environmental Management	The development should be informed by the EMA.
EIA Regulations GN 28, 29, and 30 of EMA (2012)	GN 29 Identifies and lists certain activities that cannot be undertaken without an environmental clearance certificate. GN 30 provides the regulations governing the environmental assessment (EA) process.	**Activity 2.2** Any activity entailing a scheduled process referred to in the Atmospheric Pollution Prevention Ordinance, 1976. **Activity 9.1** The manufacturing, storage, handling or processing of a hazardous substance defined in the Hazardous Substances Ordinance, 1974. **Activity 9.2** Any process or activity which requires a permit, licence or other form of authorisation, or the modification of or changes to existing facilities for any process or activity which requires an amendment of an existing permit, licence or authorisation or which requires a new permit, licence or authorisation in terms of a law governing the generation or release of emissions, pollution, effluent or waste. **Activity 9.3** The bulk transportation of dangerous goods using pipeline, funiculars or conveyors with a throughout capacity of 50 tons or 50 cubic meters or more per day. **Activity 9.3** The storage and handling of a dangerous goods, including petrol, diesel, liquid petroleum

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
		gas or paraffin, in containers with a combined capacity of more than 30 cubic meters at any one location.
Convention on Biological Diversity (1992)	Article 1 lists the conservation of biological diversity amongst the objectives of the convention.	The project should consider the impact it will have on the biodiversity of the area.
Draft Procedures and Guidelines for conducting EIAs and compiling EMPs (2008)	Part 1, Stage 8 of the guidelines states that if a proposal is likely to affect people, certain guidelines should be considered by the proponent in the scoping process.	The EA process should incorporate the aspects outlined in the guidelines.
Namibia Vision 2030	Vision 2030 states that the solitude, silence and natural beauty that many areas in Namibia provide are becoming sought after commodities and must be regarded as valuable natural assets.	Care should be taken that the development does not lead to the degradation of the natural beauty of the area.
Water Act No. 54 of 1956	Section 23(1) deals with the prohibition of pollution of underground and surface water bodies.	The pollution of water resources should be avoided during construction and operation of the development.
The Ministry of Environment, Forestry and Tourism (MEFT) Policy on HIV & AIDS	MEFT has developed a policy on HIV and AIDS. In addition, it has also initiated a programme aimed at mainstreaming HIV and gender issues into environmental impact assessments.	The proponent and its contractor/s have to adhere to the guidelines provided to manage the aspects of HIV/AIDS. Experience with construction projects has shown that a significant risk is created when construction workers interact with local communities.
Urban and Regional Planning Act (Act of 2018).	Urban and Regional Planning Act (Act of 2018) regulates subdivisions of portions of land falling within a proclaimed Local Authority area.	Section 16 of Chapter 3 deals with the Ministers' declaration of authorised planning authorities and establishment of joint committees.
Local Authorities Act No. 23 of 1992	The Local Authorities Act prescribes the manner in which a town or municipality should be managed by the Town or Municipal Council. Sections 34-47 make provision for the aspects of water and sewerage.	The development has to be comply with the provisions of the Local Authorities Act
Labour Act no 11 of 2007	Chapter 2 details the fundamental rights and protections. Chapter 3 deals with the basic conditions of employment.	Given the employment opportunities presented by the development, compliance with the labour law is essential.
Public Health Act no 36 of 1919	Section 119 prohibits persons from causing nuisance.	The developer and contractors are to comply with these legal requirements.

LEGISLATION/POLICIES	RELEVANT PROVISIONS	RELEVANCE TO PROJECT
Nature Conservation Ordinance no 4 of 1975	Chapter 6 provides for legislation regarding the protection of indigenous plants	Indigenous and protected plants have to be managed within the legal confines.
Atmospheric Pollution Prevention Ordinance (No. 11 of 1976).	The Ordinance objective is to provide for the prevention of the pollution of the atmosphere, and for matters incidental thereto.	All activities on the site will have to take due consideration of the provisions of this legislation.
Roads Ordinance 17 of 1972	This Ordinance consolidates the laws relating to roads.	The provisions of this legislation have to be taken into consideration in as far as access to the development site is concerned.
Roads Authority Act, 1999	Section 16(5) of this Act places a duty on the Roads Authority to ensure a safe road system.	Some functions of the Roads Ordinance 17 of 1972 have been assigned to the Roads Authority.
Walvis Bay Town Planning Scheme.	The town planning scheme has as its general purpose the co-ordinated and harmonious development of the local authority area, or the area or areas situate therein.	The site fall in the local authority area of Walvis Bay and has to conform to the Walvis Bay Town Planning Scheme.

This EIA process will be undertaken in accordance with the EIA Regulations. A Flow Diagram (refer to **Figure 3** below) provides an outline of the EIA process to be followed.

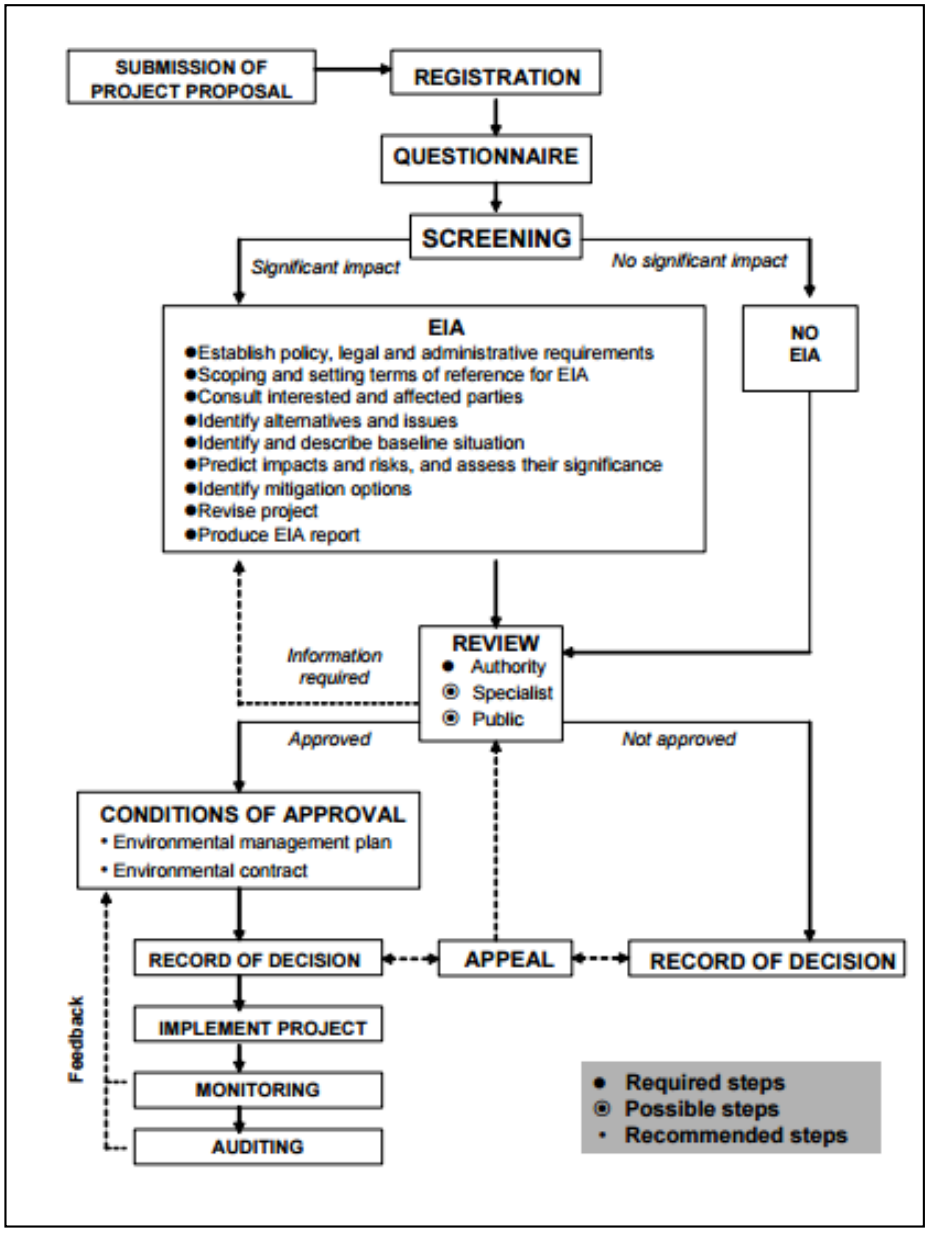

Figure 3: EIA Flowchart for Namibia (SELH, 2012)

3. ENVIRONMENTAL BASELINE DESCRIPTION

3.1. Social Environment

3.1.1. Socio-Economic Context

The statistics shown in **Table 3** below are derived from the 2011 Namibia Population and Housing Census (NSA, 2011):

Table 3: Statistics of Walvis Bay Urban Constituency

WALVIS BAY URBAN CONSTITUENCY	
Population	35,828
Females	16,478
Males	19,350
Private Households	10,317
Population under 5 years	10%
Population aged 5 to 14 years	14%
Population aged 15 to 59 years	72%
Population aged 60 years and above	
Female: male ratio	100:117
Literacy rate of 15 years old and above	99%
Head of household - Females	33%
Head of household - Males	67%
People above 15 years who have never attended school	3%
People above 15 years who are currently attending school	9%
People above 15 years who have left school	86%
People with disability	2%
People aged 15 years and up who belong to the labour force	81%
Population employed	73%
Homemakers	12%
Students	47%
Retired, too old etc.	40%
Income from pension	2%
Income from business and non-farming activities	9%
Income from farming	0%
Income from cash remittance	5%
Wages and salaries	80%

3.1.2. Archaeological and Heritage Context

While many archaeological sites have been found along the Namibian coast and some sites provide evidence of coastal occupation for a long time, many of these are considered "lucky finds" since the chances of artefacts surviving long and then being found are obviously small. As a result, the number of known archaeological sites with very old artefacts is few (Raison, 2016). It is unlikely that the development site will have any significant archaeological resources;

however, an accidental find procedure may be required. If any heritage or culturally significant artefacts are found during the construction, construction must stop and the National Heritage Council of Namibia immediately notified.

3.2. Bio-Physical Environment

3.2.1. Climate

Walvis Bay is considered to have a desert climate. During the year, there is virtually no rainfall. The Köppen-Geiger climate classification is BWk. In Walvis Bay, the average annual temperature is 16.6 °C. In a year, the average rainfall is 11 mm. The least amount of rainfall occurs in May. Most precipitation falls in March, with an average of 5 mm. The temperatures are highest on average in February, at around 19.2 °C. In September, the average temperature is 13.7 °C. It is the lowest average temperature of the whole year (Climate-data, 2019). See **Figure 4** for an average temperature graph and **Figure 5** for an average rainfall data for Walvis Bay.

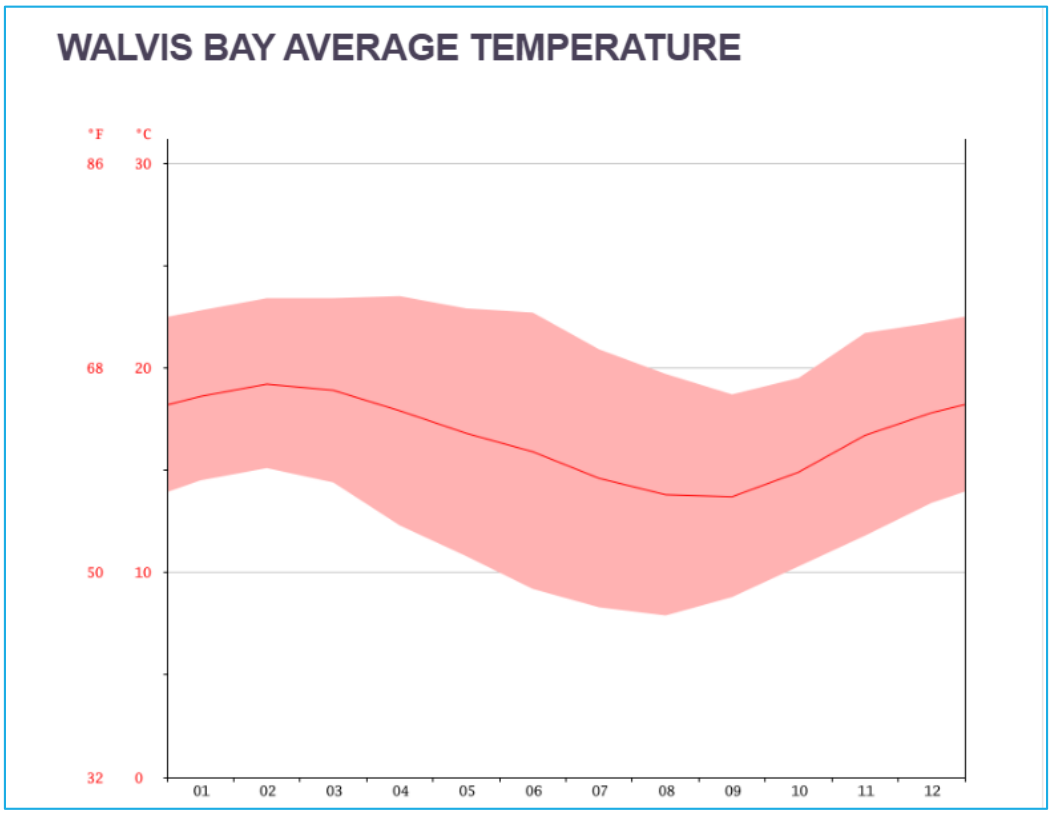

Figure 4: Average temperature graph for Walvis Bay (Climate-data, 2020a)

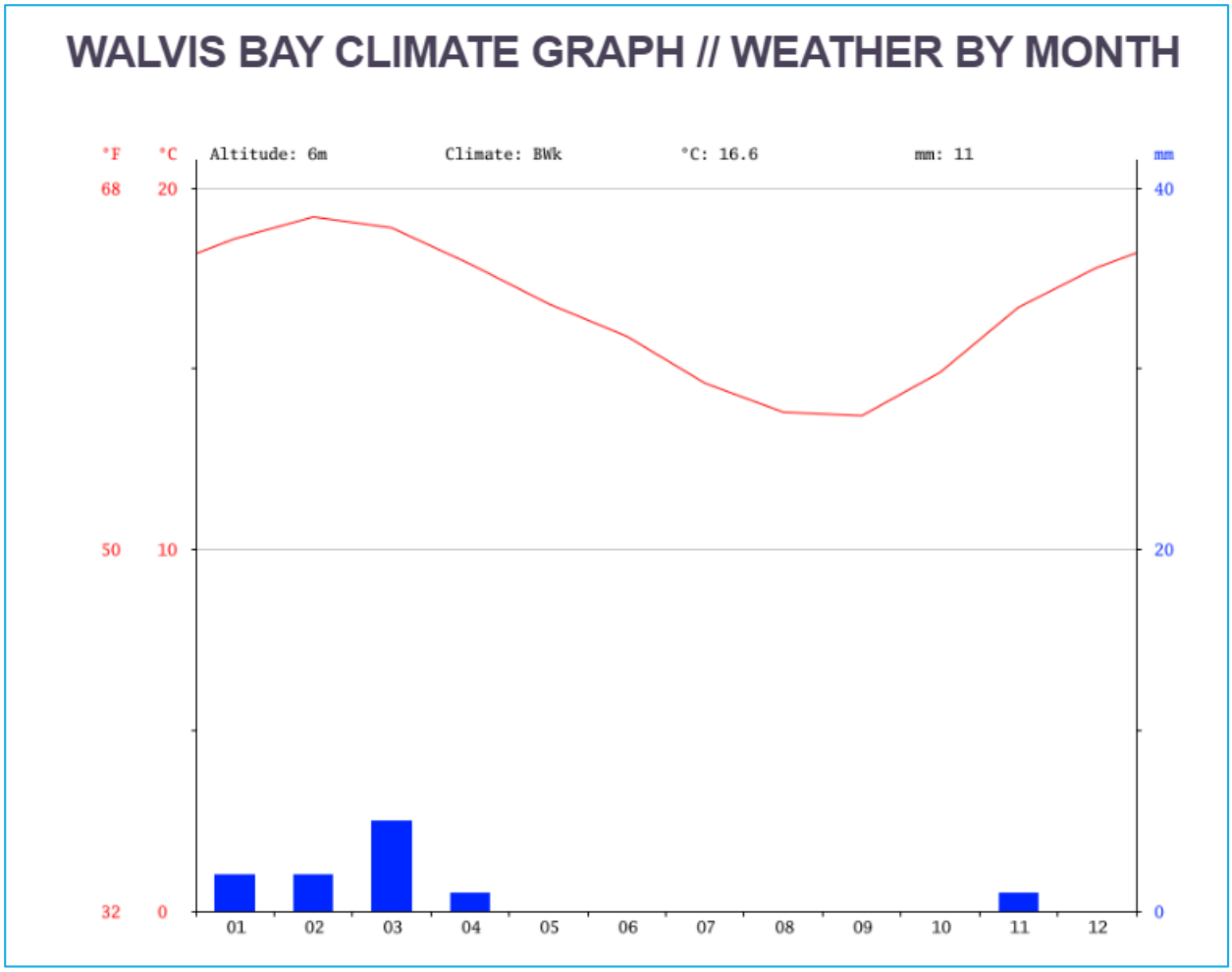

Figure 5: Average monthly rainfall graph for Walvis Bay (Climate-data, 2020b)

3.2.2. Topography, Geology and Hydrogeology

The Erongo Region, stretches from the Central Plateau westwards across the Central-Western Plains and Escarpment to the Central Namibian coast roughly over a distance between 200 and 350 km, and Northwards from the Ugab River in the north to the Kuiseb river in the south over a distance of up to 300 km, covers an area of 63,586 km^2, which is 7.7 per cent of Namibia's total area of about 823,680 km^2. On the Western side it is flanked by the Atlantic Ocean. Erosion cutting eastwards into the higher ground led to the formation of the Central-Western Plains, leading to the formation of the catchment area of several major ephemeral rivers such as the Khan, Omaruru, Swakop and Ugab, the water of these rivers reach the sea when in full flood during a good rainy season (ERC, 2020).

The Southern boundary of the Kuiseb River distinctively divides the gravel plains to the North and the large sea of dunes to the South, however this river does not reach the sea during times of flood but the water instead disappears into the sand at the Kuiseb Delta, from which the town of Walvis Bay extracts underground water for its supplies.

In the Erongo Region, the land rises steadily from sea level to about 1,000 m across the breadth of the Namib. The Namib land surface is mostly flat to undulating gravel plains, punctuated with occasional ridges and isolated 'inselberg' hills and mountains. The eastern edge of the Namib is marked by the base of the escarpment in the southern part of the region. In the northern part, the escarpment is mostly absent and there is a gradual rise in altitude to over 1,500 m (SAIEA, 2011). The proposed site on which the development will be undertaken can be described as relatively flat.

The desert geology consists of sand seas near the coast, while further inland there is an occurrence of gravel plains and scattered mountain outcrops. Some of the highest sand dunes, up to around 300 m high, can be found here (ERC, 2020). Water for domestic and industrial use in Walvis Bay comes mainly from the Kuiseb aquifer in the lower Kuiseb River. These aquifers are recharged by runoff from the central highlands in central Namibia where rainfall is more reliable and more significant than at the coast (Nacoma, 2010). The site earmarked for development is relatively flat with no vegetation across the area.

3.2.3. Terrestrial Ecology

The bare gravel plains within an area of about 40 km of the coast, receive frequent fog moisture providing an ideal home to rich growths of lichens, many of which are endemic to Namibia. Lichen help to bind the soil rendering it less vulnerable to wind erosion, they do this by forming a "carpet" on the surface pavement of small stones and gravel, or by creating a surface crust on the soil (Nacoma, 2010). No vegetation could be found on the proposed sites which is bare for the most part.

Some endemic coastal invertebrates and reptiles inhabit a narrow belt of dune hummocks within the Namibian coastal strip. This zone also supports marine life and surf zone species. Damara terns, which are near endemic to Namibia and near threatened, are found in concentrated numbers along the coastline stretching from south of Walvis Bay to about the Ugab river, where they nest on gravel plains within 3 – 5 km of the shore and forage over the shallow Bay water, over reefs or in salt ponds (Nacoma, 2010).

There are artificially high densities of jackals and gulls due to the increase in numbers of seal colonies and line fishermen which apply heavy predator pressure on the nesting terns. The central Namib coast is also home to the two vulnerable flamingo species, the greater and the lesser (Nacoma, 2010). There are no protected or red data listed plants or animal species found on the site. **Figure 6** below provides a view of the general area and surrounds of the proposed development site.

Figure 6: General area of the proposed development site.

3.3. Surrounding Land Use

The proposed site is mostly surrounded by industrial developments in all directions, such as coal handling facilities for Grindrod to the north-west, Zambia dry port to the west, Protea Chemicals to the north, salt handling facilities to the north-east and Botswana dry port to the south. The proposed site is thus well suited for the proposed development.

3.4. Physical Environment

The infrastructure needs of the proposed project can be categorised into two broad classifications namely:

- Basic infrastructure that includes electricity and roads.
- Environmental infrastructure that consist of water supply, sewage and drainage systems, solid waste management and landscaping.

The area is already provided with bulk service infrastructure. Internal connections will be carried out in consultation with the Municipality and other relevant authorities such as Namport and Erongo Red.

Access to the site will be obtained from the existing access road to the north and is also accessible from the southern entrance.

4. PROJECT DESCRIPTION

4.1. Site Description

BigenKuumba Port Services intends to venture into the exporting and importing of various industrial minerals, and base and rare metals through the port of Walvis Bay, Erongo Region. The proposed site is located on Portion of Erf 1920 within the Walvis Bay Port and is owned by Namibia Ports Authority Namport. The portion of land is approximately 22 370 m^2.

At the moment, the main types of bulk, break-bulk and containerised cargo moving through the Port of Walvis Bay are fish and fish products, salt, sugar, coal, manganese, copper, zinc and lead ore and/or concentrates, uranium as yellow cake, fluorspar, marble and granite, sodium carbonate, sulphuric acid and various other chemicals and products in smaller volumes (Faul, A., Botha, P. Coetzer, W. 2019).

BigenKuumba Port Services plans to utilize the portion for handling of storage of the following minerals: manganese and iron ore, copper concentrate, blister copper, lithium, as well as sulphuric acid and coal.

The commodities will mainly be sourced from the Southern African Development Community countries i.e. Namibia, Zambia and Democratic Republic of Congo. Transportation of the material from the supplier will make use of both rail and road, where it will be stockpiled on site until sufficient quantities are realized to load them on the vessels to final destinations. The ore will be stored in bulk bags as well as containerized storage. Upon arrival at the proposed terminal site, the products will be offloaded and stockpiled in the proposed stockyard, reclaimed and finally transported to the existing Berth. A conveyer servitude is provided for from the site to the berth, for more convenient moving of cargo.

In addition to contributing to the local economic development of Walvis Bay Town in particular and the country in general, job opportunities will be created with approximately 48 jobs directly and about 400 jobs indirectly.

4.2. Decision Factors

The following factors served as informants and were considered when preparing the layout designs for the proposed development:

- Walvis Bay Town Planning Scheme.
- Character of the general area.

4.3. No – Go Alternative

The no-go alternative would essentially entail maintaining the current situation, whereby the country is not utilising the comparative advantages offered by the Walvis Bay port. The opportunities will be lost to other coastal cities in the continent. In addition, no operational jobs that come with the envisaged project will be created.

5. PUBLIC PARTICIPATION PROCESS

5.1. Public Consultation Process Phase 1

In terms of Section 21 of the EIA Regulations a call for public consultation with all I&APs during the EIA process is required. This entails consultation with members of the public and providing them an opportunity to comment on the proposed project. The Public Consultation Process does not only incorporate the requirements of Namibia's legislation, but also takes account of national and international best practises. Please see **Table 4** below for the activities undertaken as part of the public participation process.

Table 4: Table of Public Consultation Activities

ACTIVITY	REMARKS
Placement of site notices/posters in Walvis Bay	See **Annexure A**
Placing advertisements in two newspapers for two consecutive weeks, namely Windhoek Observer and Namib Times	See **Annexure B**
Written notice to Interested and Affected Parties via Email	See **Annexure D**
Meeting with Municipality of Walvis Bay Senior Management	15/12/2021
Meeting with Walvis Bay Traffic Department Senior Management	27/01/2022
Direct Communication with 5th Street Residents Association	27/01/2022

A public meeting would normally be held as part of the public consultation process, however due to the restrictions brought about as a result of the Covid-19 pandemic this was not possible. The comment period of the initial public participation process commenced on **22 October 2021** and ended on **04 November 2021.** Minutes of the meetings held with the Walvis Bay Municipality Senior Officials and with the Municipal Traffic Officers, together with the comments received from various stakeholders are attached in **Annexure D**.

5.2. Public Consultation Process Phase 2

The second phase of the Public Consultation Process involved the lodging of the Draft Environmental Scoping Report (DESR) to all registered I&AP for comment. Registered and potential I&APs were informed of the availability of the DESR for public comment. An Executive Summary of the DESR was included in the communication that went out to the registered I&APs. I&APs were given time until **13 May 2022** to submit comments or raise any issues or concerns they may have with regard to the proposed project.

6. ASSSESSMENT METHODOLGY

Impact assessments depend on the nature and magnitude of the proposed activity, as well as the type of environmental control envisaged for the particular project. Given the nature of the proposed activity, i.e. a construction project, the identification and assessment of the potential impacts will be based on the type and scale of the various activities associated with the project.

Assessment of the predicted significance of impacts for a proposed development is by its nature, inherently uncertain. To deal with such uncertainty in a uniform manner, standardised and internationally recognised methodologies have been developed. One such accepted methodology is applied in this study to assess the significance of the potential environmental impacts of the proposed development, outlined as follows in **Table 5**.

Table 5: Impact Assessment Criteria

CRITERIA	CATEGORY
Impact	Description of the expected impact
Nature Describe type of effect	**Positive**: The activity will have a social / economical / environmental benefit. **Neutral**: The activity will have no effect **Negative**: The activity will have a social / economical / environmental harmful effect
Extent Describe the scale of the impact	**Site Specific:** Expanding only as far as the activity itself (onsite) **Small:** restricted to the site's immediate environment within 1 km of the site (limited) **Medium:** Within 5 km of the site (local) **Large:** Beyond 5 km of the site (regional)
Duration Predicts the lifetime of the impact.	**Temporary:** < 1 year (not including construction) **Short-term:** 1 – 5 years **Medium term:** 5 – 15 years **Long-term:** >15 years (Impact will stop after the operational or running life of the activity, either due to natural course or by human interference) **Permanent:** Impact will be where mitigation or moderation by natural course or by human interference will not occur in a particular means or in a particular time period that the impact can be considered temporary
Intensity Describe the magnitude (scale/size) of the Impact	**Zero:** Social and/or natural functions and/ or processes remain unaltered **Very low:** Affects the environment in such a way that natural and/or social functions/processes are not affected **Low:** Natural and/or social functions/processes are slightly altered **Medium:** Natural and/or social functions/processes are notably altered in a modified way **High:** Natural and/or social functions/processes are severely altered and may temporarily or permanently cease
Probability of occurrence Describe the probability of the Impact actually occurring	**Improbable:** Not at all likely **Probable:** Distinctive possibility **Highly probable:** Most likely to happen **Definite:** Impact will occur regardless of any prevention measures
Degree of Confidence in predictions	**Unsure/Low:** Little confidence regarding information available (<40%)

CRITERIA	CATEGORY
State the degree of confidence in predictions based on availability of information and specialist knowledge	**Probable/Med:** Moderate confidence regarding information available (40-80%) **Definite/High:** Great confidence regarding information available (>80%)
Significance Rating The impact on each component is determined by a combination of the above criteria.	**Neutral:** A potential concern which was found to have no impact when evaluated **Very low:** Impacts will be site specific and temporary with no mitigation necessary. **Low:** The impacts will have a minor influence on the proposed development and/or environment. These impacts require some thought to adjustment of the project design where achievable, or alternative mitigation measures **Medium:** Impacts will be experienced in the local and surrounding areas for the life span of the development and may result in long term changes. The impact can be lessened or improved by an amendment in the project design or implementation of effective mitigation measures. **High:** Impacts have a high magnitude and will be experienced regionally for at least the life span of the development, or will be irreversible. The impacts could have the no-go proposition on portions of the development in spite of any mitigation measures that could be implemented.

*NOTE: Where applicable, the magnitude of the impact has to be related to the relevant standard (threshold value specified and source referenced). The magnitude of impact is based on specialist knowledge of that particular field.

For each impact, the EXTENT (spatial scale), MAGNITUDE (size or degree scale) and DURATION (time scale) are described. These criteria are used to ascertain the SIGNIFICANCE of the impact, firstly in the case of no mitigation and then with the most effective mitigation measure(s) in place. The decision as to which combination of alternatives and mitigation measures to apply lies with the proponent, and their acceptance and approval ultimately with the relevant environmental authority.

The SIGNIFICANCE of an impact is derived by taking into account the temporal and spatial scales and magnitude. Such significance is also informed by the context of the impact, i.e. the character and identity of the receptor of the impact.

7. MITIGATION HIERACHY

The mitigation hierarchy is a tool aimed at helping to manage biodiversity risk, and is commonly applied in Environmental Impact Assessments. The most common reference point for banks providing project finance is mitigation measures; this provides the financial institutions with information on how environmental and social risks will be managed (See **Figure 7** below). These cover avoidance, minimization, restoration and compensation amongst other things. It is possible and considered sought after to enhance the environment by ensuring that positive gains are included in the proposed activity or project. If negative impacts occur, then the hierarchy indicates further steps.

Figure 7: Mitigation Hierarchy

Impact avoidance: This step is most effective when applied at an early stage of project planning. It can be achieved by:

- not undertaking certain projects or elements that could result in adverse impacts;
- avoiding areas that are environmentally sensitive; and
- putting in place preventative measures to stop adverse impacts from occurring.

Impact minimization: This step is usually taken during impact identification and prediction to limit or reduce the degree, extent, magnitude, or duration of adverse impacts. It can be achieved by:

- scaling down or relocating the proposal;
- redesigning elements of the project; and
- taking supplementary measures to manage the impacts

Restoration: This step is taken to improve degraded or removed ecosystems following exposure to impacts that cannot be completely avoided or minimised. Restoration tries to return an area to the original ecosystem that occurred before impacts. Restoration is frequently needed towards the end of a project's life-cycle, but may be possible in some areas during operation.

Impact compensation: This step is usually applied to remedy unavoidable residual adverse impacts. It can be achieved by:

- rehabilitation of the affected site or environment, for example, by habitat enhancement;
- restoration of the affected site or environment to its previous state or better; and
- replacement of the same resource values at another location (off-set), for example, by wetland engineering to provide an equivalent area to that lost to drainage or infill. Offsets are often complex and expensive; it is therefore preferable to pay attention to earlier steps in the mitigation hierarchy.

8. POTENTIAL IMPACTS

This Chapter describes the potential impacts on the biophysical and socio-economic environments, which may occur due to the proposed activities. These include potential impacts, which may arise during the planning and design phase, potential construction related impacts (i.e. short to medium term) as well as the operational impacts of the proposed development (i.e. long-term impacts).

The assessment of potential impacts will help to inform and confirm the selection of the preferred project plan and design to be submitted to MEFT: DEA for consideration. In turn, MEFT: DEA's decision on the environmental acceptability of the proposed project and the setting of conditions of authorisation (should the project be authorised) will be informed by this chapter, amongst other information contained in this Report.

The baseline and potential impacts that could result from the proposed development are described and assessed with mitigation measures recommended. Finally, comment is provided on the potential cumulative impacts which could result should this development, and others like it in the area, be approved.

It should also be acknowledged that Namport has got its own Environmental Management Plan for the Operation of the Commercial Harbour: Port of Walvis Bay. It is thus important for the proponent to familiarise himself with the content of that plan so that it is implemented together with the Environmental Management Plan to be developed from this assessment.

8.1. Planning and Design Phase Impacts

During the planning and design phase consideration is given to aspects such as surface and groundwater; air quality, land use; fauna and flora; existing infrastructure; and traffic. Note should be taken that the planning and design phase impacts are applicable during the operational phase as well.

8.1.1. Surface and Groundwater

Walvis Bay port is located in an environmentally sensitive area, particularly its proximity to the Ramsar site which includes the Walvis Bay Lagoon, the salt works and the southern part of the bay, west of the lagoon. Walvis Bay town is terrestrially surrounded by the Dorob National Park, managed by the Ministry of Environment, Forestry and Tourism (Faul, A., Botha, P. Coetzer, W. 2019). The proposed development site is located adjacent to the shoreline of the Atlantic Ocean, this puts the surface and ground water resources in the area at risk of pollution. This is likely to happen in the absence of well designed and constructed storm water drainage infrastructure. Poorly constructed and maintained service infrastructure in general may also for example lead to seepage of waste water into the water bodies. Surface and ground water contamination may result from nonpoint source runoff from nearby activities; urban runoff conveyed to the sea by storm sewer system; and occurrences of bank erosion (Sosiak and Dixon, 2006). Uncontrolled solid waste management is another potential pollutant of the surface water

8.1.2. Air Quality

The activities within the development will result in increased dust and emission impacts, if not managed correctly. Dust and emissions associated with the proposed new development will mostly be generated by transporting, handling and storage of the minerals on site. An Air Quality study was carried out for this assessment and is attached as **Annexure F**. Some remarks will be discussed here.

Given that the project will be associated with fugitive emissions such as vehicle entrainment dust, increased noise and possible mineral dust, it has the potential of impacting on receptors in the near and medium fields depending on the wind speed and wind direction. The neighbouring residential areas in the vicinity of the proposed operations in Walvis Bay is approximately 500 meters to the south east and about 1 kilometre south west of the proposed site.

Climatic condition variations play a major role in determining the diffusion, direction, distribution and transportation of atmospheric pollutants of the area. The factors that are vital for dust emission rates are wind speed and direction, temperature (which influences evaporation) and rainfall.

Walvis Bay is considered to have a desert climate. During the year, there is nearly no rainfall. The predominant wind direction in Walvis Bay is south westerly (See **Figure 8** below) with strong wind speeds of up to 19km/h. Walvis Bay temperature in the year ranges from 20- 40 degree Celsius (Meteoblue, 2021).

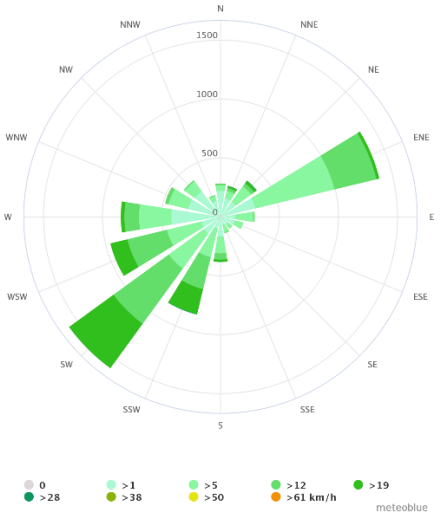

Figure 8: Predominant Wind direction graph in Walvis Bay (Meteoblue, 2021)

Air pollution occurs when gases, dust particles, fumes or odour are introduced into the atmosphere in a way that makes it harmful to humans, animals and plant. Air pollution threatens the health of humans and other living beings in our planet (Mahendra & Vaibhaw,

2013). One way to determine the air pollutant levels resulting from emission sources would be to measure the levels of all substances emitted to the surrounding community. However, actual measurements are not always available for proposed projects as they have not yet been constructed (DiGiovanni & Countinho, 2017).

No baseline assessment was conducted. The main pollutant of concern expected on the proposed activity is particulate matter as well as noise. These pollutants are described below.

8.1.2.1. Particulate Matter

The California Air Resources Board (2021) has defined particulate matter (PM) as a complex mixture of solids and aerosols composed of small droplets of liquid, dry solid fragments, rather than a single pollutant. These particles vary widely in size, shape and chemical composition, and may contain inorganic ions, metallic compounds, elemental carbon, organic compounds, as well as compounds from the earth's crust.

The impact of particulate on human health is largely dependent on (i) particle characteristics, particularly particle size and chemical composition, and (ii) the duration, frequency and magnitude of exposure. The potential of particles to be inhaled and deposited in the lung is a function of the aerodynamic characteristics of particles in flow streams. The aerodynamic properties of particles are related to their size, shape and density. The deposition of particles in different regions of the respiratory system depends on their size. The nasal openings permit very large dust particles to enter the nasal region, along with much finer airborne particulates.

Particles are defined by their diameter for air quality regulatory purposes. Those with a diameter of 10 microns or less (PM10 and PM2.5) are inhalable into the tracheobronchial and pulmonary regions of the lungs.

The assessment of the minerals to be handled by the proposed project will be regarded as particulate matter although they have different effects on human health. The various expected particulates that were assessed in the assessment are described below.

8.1.2.1.1 Particulate from Vehicle entrainment on unpaved roads

Dust emissions occurs as a result of vehicle-entrained dust from paved and unpaved roads, wind erosion from open areas and material handling. Vehicle–entrained dust emission from unpaved roads potentially represents a significant source of fugitive dust. When vehicles travel on unpaved road, the force of the wheels on the road surface results in the grinding of surface material and particles are lifted and dropped from the rolling wheels (USEPA, 2006).

The quantity of dust emission from a given segment of unpaved road varies with the volume of traffic, speed, vehicle weights. Dust emissions from unpaved road usually results in high

fugitive dust emissions, these impacts are usually close to the source (USEPA 2006). The dust particulate from vehicle entrainment on unpaved roads is expected during the operations of the proposed project.

8.1.2.1.2 Manganese dust particulates

Manganese dioxide is the organic compound with the formula MnO_2. Manganese dioxide is a blackish powder and occurs naturally as the mineral pyrolusite (Hooks, 2020).

There is a risk of manganese spilling when transporting, storing and handling, leading to manganese dust particles released into the air. This may then affect human health as soil and air pollution. Manganese is toxic to humans and the environment at high concentrations. It is important to highlight the risk associated with manganese for the personnel handling the bags as they need to know the potential impact on them, especially if the project will be prolonged. Therefore, a personnel monitoring programme needs to be set up in accordance with the guidelines of existing accepted practice and the Labour Act of Namibia.

8.1.2.1.3 Iron ore dust particulates

Iron ore is the inorganic compound with the formula Fe_2O_3. It is ferromagnetic, dark red, and readily attacked by acids. Iron oxide is often called rust, and to some extent this label is useful, because rust shares several properties and has a similar composition. Release of iron oxide dust in the air is expected during transport, handling and storing of the proposed project and can have negative impact on the environment and on human health.

8.1.2.1.4 Copper blister

Copper that is 97 to 98 percent pure, produced by smelting is called Blister Copper. It has a blistery surface caused by sulfur dioxide bubbles. The purity of this product is up to 98%, it is known as blister because of the broken surface created by the escape of sulfur dioxide gas as blister copper pigs or ingots are cooled. By-products generated in the process are sulfur dioxide and slag. The various particle sizes of copper blister if not handled well could also contribute to the emission of particulate matters in the environment during handling in the proposed project.

8.1.2.1.5 Lithium oxide

Lithium (from Greek: Lithos) is a chemical element (i.e. alkali metal) with the atomic number three located in the second period and in the first main group of the periodic table of elements. In elemental form, lithium is a soft silvery-white alkali metal. Under standard conditions, it is the lightest of all solid elements. According to Schmidt. M, 2020, lithium is very reactive and reacts with many elements. Upon contact with oxygen, lithium reacts violently to lithium oxide. Many products contain lithium due to its very specific properties. By far the most important use of lithium is in the field of rechargeable batteries (Schmidt, 2020). Lithium will also be handled at the proposed project and, based on the form in which it will be handled, could also be

released in the atmosphere and have an impact on the environment as well as the human health.

8.1.2.1.6 Coal

Coal is delivered and stored at the site until there is a sufficient quantities available to load them on the vessels. Coal stockpiles emit fine particulate pollution in several ways. First, wind blowing over uncovered coal stockpiles results in fugitive coal dust emissions that are a source of PM2.5. Second, coal stockpiles emit volatile gases that can also lead to formation of PM2.5. Finally, when coal is delivered to a storage facility, it goes through a lot of handling, including unloading and separating "light dust" from the coal.

In the process, fine particulates, gases (Carbon monoxide and Sulphur dioxide) and Particulate matters are emitted, as well as during spontaneous combustion of coal on stockpiles. Transportation of coal by trains and trucks can be a source of pollution especially if these vehicles are not properly covered (Akshaya, 2017). Uncontrolled and unmitigated handling and storage of coal can have serious health implications on people directly handling it as well as nearby communities.

8.1.3. Land Use Change

The proposed site is mostly surrounded by industrial developments in all directions, such as coal handling facilities for Grindrod to the north-west, Zambia dry port to the west, Protea Chemicals to the north, salt handling facilities to the north-east and Botswana dry port to the south. The proposed development is aligned to the character of the existing developments in the immediate surrounds. The proposed site is thus well suited for the proposed development.

8.1.4. Fauna and Flora (Biodiversity)

Walvis Bay falls within Important Bird Area (IBA) NA014 and NA013, with IBA NA014 renowned as the most important coastal wetland area in Southern Africa. It serves as an over-wintering area for important birds such as Greater and Lesser Flamingos, Great White Pelican, and Chestnut-Banded Plovers (Faul, A., Botha, P. Coetzer, W. 2019).

Duck and geese populations are also supported by the artificial wetland, the sewerage ponds, in the vicinity. IBA NA013, consisting of the coastal area between Walvis Bay and Swakopmund is known to host approximately 13 000 shorebirds of approximately 31 species. It also supports the densest colony of breeding Damara Terns known. There is also a bird island (guano platform), that provides roosting and breeding sites to large numbers of birds. Pollution events, such as oil spills, in the areas surrounding the port can have serious negative impacts on the bird breeding and feeding grounds and for species such as the Bank Cormorant (Faul, A., Botha, P. Coetzer, W. 2019).

The marine animals found in the Walvis Bay area are mainly cetaceans such as the Common Bottlenose Dolphins, the Namibian endemic Heaveside's Dolphins, Dusky Dolphins, Humpback Whales, Southern Right Whales and Pigmy Right Whales. Cape Fur Seals are also a common

occurrence. Five species of turtles are found in the Namibian coastal waters generally, the most common in the area of interest being the Leatherback, and the Green Sea Turtles and to a lesser extent, the Hawksbill Sea Turtle (Faul, A., Botha, P. Coetzer, W. 2019).

These marine animal serve as an important tourist attraction, contributing a great deal to this million-dollar industry. Therefore, pollution of the marine environment will have a damaging effect on the populations of these mammals. The population levels may also be impacted by increased ship strikes due to increased ship traffic. Equally, excessive noise producing events in the marine environment may also negatively impact on marine mammals (Faul, A., Botha, P. Coetzer, W. 2019).

8.1.5. Existing Service Infrastructure Impacts

The area is already provided with bulk service infrastructure. Internal connections will be carried out in consultation with the Municipality and other relevant authorities such as Namport and Erongo Red.

Access to the site will be obtained from the existing access road to the north and is also accessible from the southern entrance. It is important to note that the country in general is constrained and faced with a crisis in terms of water and electricity availability; and an increased demand for these amenities will further add to the predicament.

The proposed development will make use of added infrastructure specifically regarding electricity and water. This additional demand is expected to be fairly Medium-Low. The operations are not water intensive; however, a reasonable amount of water may be required to for dust emission control.

By applying a series of the mitigation measures as proposed for the development it is believed that any potential impacts can be significantly reduced. The water volumes and electrical demands for the project is not expected to have a significant negative impact on the infrastructure. It is critical that any service infrastructure should be designed and construction supervised by qualified and registered engineering professionals. No structures are allowed to be built on or over the existing 11 Kva cable. The cable must be protected before any vehicle traffic is allowed to cross it. The protection must be done to the Port Engineer’s satisfaction.

8.1.6. Traffic Impacts

There will be movement of traffic during the operational phase of the project. Due to the nature of the development and the land use vehicles that will frequent the area would mostly consist of vehicles used to transport the commodities to and from the site. Access into and out of the port area is permit controlled, with vehicular traffic regulated at the security controlled gates. Vehicle traffic into and out of the port is regulated at security controlled gates. Access is permit controlled and regular alcohol testing is conducted. The main access gate is off 3rd Street East and limited off-street parking space for light vehicles is provided outside the access

gate. A truck staging area is located near the gate in 4th Street East (Faul, A., Botha, P. Coetzer, W. 2019).

The envisaged transportation route of the trucks to the port will follow the C14 as it comes through the new interchange from Swakopmund, from where it proceeds across the traffic circle along Hanna Mupetami Road and joins 3rd Street East into the port area, which is also the preferred route by the Walvis Bay Municipality Traffic Department officers, the B2 road from Swakopmund should be avoided at all costs. See **Figure 9** below for the route map (blue line).

The number of trucks moving goods to and fro the site is estimated to be four per day. The Port is a very busy area, which is important to the Walvis Bay economy. Some of the concerns of trucks entering and exiting the port is that the trucks tend to pile up along 3rd Street East because there is no designated waiting area. It is important that drivers ferrying dangerous goods need to have their licences endorsed to ensure the safety of transporting the minerals.

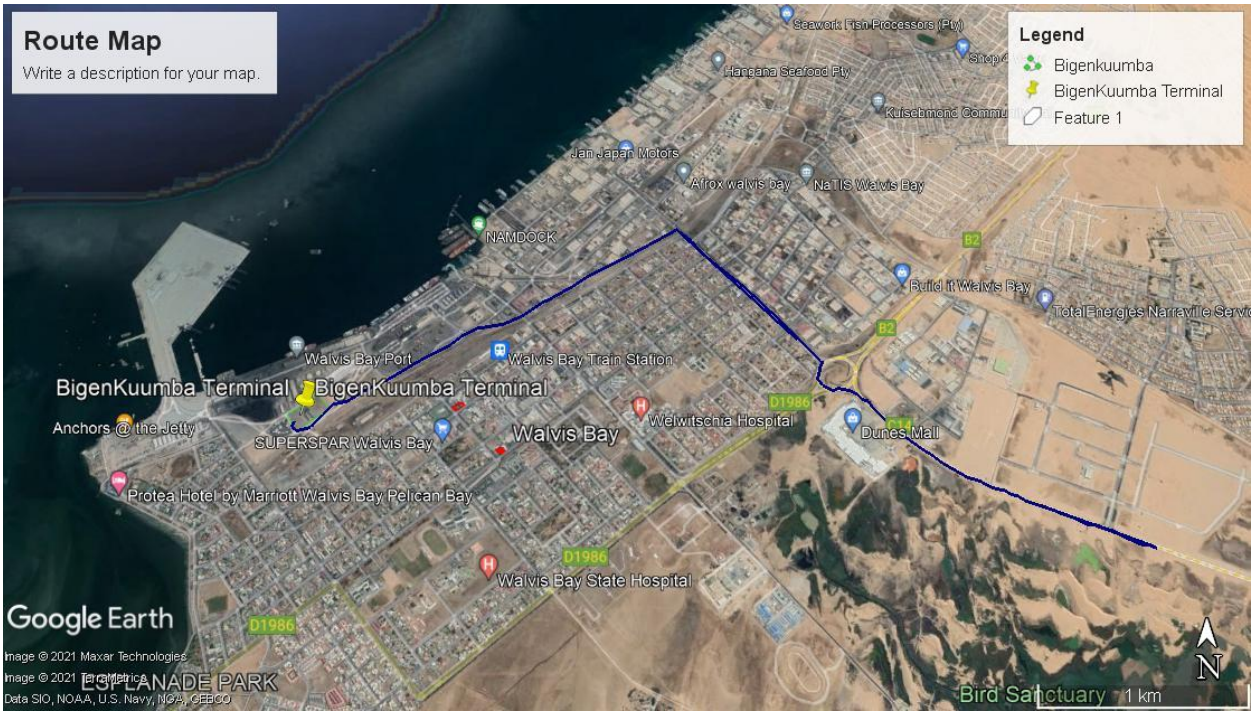

Figure 9: Transportation Route

8.2. Construction Phase Impacts

Not major construction activities are envisaged to take place on site, as there are two large rub halls found on site already that can be utilised for storage purposes. The site is also partly fenced to a large extent and the fencing may need expansion to cover the entire site. Additional slabs may need to be constructed to ensure containment and impermeability. During the construction phase the following potential impacts have been identified: fauna and flora; pressure on the existing infrastructure; surface and ground water; health, safety and security

impacts; air quality; noise, traffic; solid waste management; hazardous substances; and social impact.

8.2.1. Flora and Fauna

There are no protected or red data listed plants or animal species found on the site however care should be taken that no risk is posed to the adjacent marine ecosystem, including seabirds, that may be found in the area during the construction phase. See also **8.1.4** in the planning and design phase impacts.

8.2.2. Pressure on existing infrastructure

During the construction phase there will be an additional demand for basic municipal services such as water, electricity and sewer. The services will be used for both human consumption and for construction purposes. These impacts will however only be limited to the construction phase and will thus have minimal short term impact. The risk of wastage and pollution may occur if no proper management actions are implemented.

8.2.3. Surface and Ground Water Impacts

Surface and ground water impacts may be encountered during the construction phase. The risk of contaminating such water sources can be increased by accidental spillage of oils and fuels and any other equipment used during construction; chemical contamination from construction materials such as cement, paint and mechanical fluids. This risk is minimised by the fact that the construction period will be a short term activity.

8.2.4. Health, Safety and Security Impacts

Health, safety and security aspects are a critical part of any construction activity and high standards have to be upheld for the duration of the construction period

8.2.5. Air Quality

During the construction phase fugitive dust and exhaust gases generated have a potential impact on the air quality of the area and its surroundings. Dust is a major component of air pollution and could negatively affect the health of nearby communities if not mitigated. These are however short-term impacts. Dust is generated mainly from the following activities:

- Excavations and stockpiles during site clearance;
- Use of heavy vehicles, machinery and equipment;
- Procurement and transport of construction materials to the site.

It is important that dust is managed well to avoid a negative impact to the surrounding communities and other developments in the vicinity during the short-term construction phase.

8.2.6. Noise Impacts

Noise is perceived as one of the most undesirable consequences of a construction activity. The most common reported impacts are interference in oral communication and sleep disturbance.

The construction of the services, and other structures will result in associated noise impacts. These noise impacts will mainly be associated with construction machinery and vehicles, concrete and mixing; and excavation for foundations. It is important that noise is managed well to avoid a negative impact to the surrounding communities and other developments in the vicinity during the short-term construction phase.

8.2.7. Traffic Impacts

Traffic is expected to increase during the construction phase of the project. Trucks and other heavy machinery will be required to deliver, handle and position construction materials as well as to remove spoil material. Not only will the increase in traffic result in associated noise impacts, it will also impact on the vehicular traffic in the area. The use of slow moving heavy construction trucks has the potential to cause traffic jams.

8.2.8. Solid Waste Management

The construction activities will lead to the generation of significant amounts of solid waste mainly in the form of construction building rubble. This could have a negative environmental impact if not managed well. Therefore, enough waste bins and skip containers should be availed to manage the solid waste. All solid waste should be disposed of at the designated landfill site of Walvis Bay as approved by the local authority. It is a condition by Namport that the proponent should remove the contaminated soil found on the south-western end of the site at own cost. This should also be disposed of at the hazardous landfill site at Walvis Bay, as dumping of soil in any part of the port is not allowed.

8.2.9. Storage and Utilisation of Hazardous Substances

Hazardous substances are regarded by the Hazardous Substance Ordinance (No. 14 of 1974) as those substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure in certain circumstances. It covers manufacture, sale, use, disposal and dumping as well as import and export. During the construction period, the use and storage of these types of hazardous substances, such as shutter oil, curing compounds, types of solvents, primers and adhesives and diesel, on-site, could have negative impact on the surrounding environment, if these substances spill and enter the environment.

8.2.10. Social Impacts

The project will result in long-term positive impacts as far as the social welfare of the affected community is concerned. There is potential of an influx of migrant workers into the town of Walvis Bay. This would boost the local economic development of the town as a result of an increase in consumers of goods, and spending power. The local community will benefit through preferential recruitment of local labour and procurement as far as possible.

8.3. Operational Phase Impacts

The operational phase impacts that have been identified are: environmental monitoring and evaluation; noise; impact on human health; waste management; social; and visual impact.

8.3.1. Environmental Monitoring and Evaluation

The Environmental Commissioner requires regular environmental monitoring and evaluation on environmental performance to be conducted on approved developments, as well as the setting and monitoring of targets for improvement. As part of this exercise bi-annual reports have to be submitted to the Office of the Environmental Commissioner for the duration of the environmental clearance certificate.

8.3.2. Noise Impacts

The operational phase could typically generate noise through the amount and frequency of use of the various types of vehicles that will be used to bring the minerals and machineries while manoeuvring around the site during the handling and storing of these minerals. Road noise from the vehicles engines and the tyres contact with the road surface as well as noise from the warning devices on the trucks i.e. hooters contributed to the reason this aspect was considered in the assessment as pollution of this project.

Namibia has no environmental noise and impact guidelines reference is made to guidelines published by the International Finance Corporation (IFC, 2007) (See **Table 6** below) and the South African Bureau of Standards (SABS) (SANS 10103, 2008). Both these guidelines are in line with the World Health Organisation (WHO) Guidelines for Community Noise (WHO, 1999).

Table 6: Environmental Noise standard

Noise Level Guidelines (IFC, 2007)		
Area	**One Hour LAeq (dBA) 07:00 to 22:0**	**One Hour LAeq (dBA) 22:00 to 07:00**
Industrial receptors	70	70
Residential, institutional and educational receptors	55	45

By applying a series of the mitigation measures as proposed for general developments of this nature it is believed that any potential nuisance can be significantly reduced.

8.3.3. Impact on Human Health

As discussed in 5.1.2.1. Dust emissions from unpaved road usually results in high fugitive dust emissions. The impact of particulate on human health is largely dependent on (i) particle characteristics, particularly particle size and chemical composition, and (ii) the duration, frequency and magnitude of exposure. The potential of particles to be inhaled and deposited in the lung is a function of the aerodynamic characteristics of particles in flow streams. The aerodynamic properties of particles are related to their size, shape and density. The deposition of particles in different regions of the respiratory system depends on their size. The nasal openings permit very large dust particles to enter the nasal region, along with much finer airborne particulates.

Manganese is toxic to humans and the environment at high concentrations. It is important to highlight the risk associated with manganese for the personnel handling the bags as they need to know the potential impact on them, especially if the project will be prolonged. Therefore, a personnel monitoring programme needs to be set up in accordance with the guidelines of existing accepted practice and the Labour Act of Namibia.

Release of iron oxide dust in the air is expected during transport, handling and storing of the proposed project and can have negative impact on the environment and on human health.

The various particle sizes of copper blister if not handled well could also contribute to the emission of particulate matters in the environment during handling in the proposed project.

Lithium will also be handled at the proposed project and, based on the form in which it will be handled, could also be released in the atmosphere and have an impact on the environment as well as the human health.

8.3.4. Waste Management

Namport follows its in-house operating procedures for waste management, which is currently outsourced to the Walvis Bay Municipality. This is in line with the requirements of the International Maritime Organization (IMO) which obliges all ports to provide sufficient waste disposal facilities for visiting vessels. General and hazardous waste are removed by the municipality and sorted at the municipal landfill site or hazardous waste site as necessary (Faul, A., Botha, P. Coetzer, W. 2019).

Waste is then categorised into various types such as hazardous, general and recyclable. This may include the following: black sand (oil polluted), boxes, general domestic waste, industrial waste, metals, tyres and other. Development of the port, increases cargo throughput, and leads to an increase in population of the town, resulting in an increase of the amount of waste generated. The landfill site itself currently has sufficient capacity in terms of the space available, and sand resource to cover the waste, to cope with the expected increases. Planning is more critical for the conveyance efficiencies that will be challenged as volumes and tonnage increase (Faul, A., Botha, P. Coetzer, W. 2019). The proponent should manage their waste in consultation with the Municipality of Walvis Bay in line with the in-house procedures of Namport.

Development of the port will only contribute a small portion to the total waste received by the waste disposal site. Domestic waste due to the population increase in Walvis Bay may is likely to have a greater impact. As responsible authority, the Walvis Bay Municipality must ensure that provision is made for waste disposal and sewage removal given the projected growth of the town (Faul, A., Botha, P. Coetzer, W. 2019).

8.3.5. Social Impact

The construction and operation of the terminal will have a positive impact on the socio-economic status of Walvis Bay and its residents. This is due to the job opportunities that will be created both directly related to the terminal operations and indirectly from supporting services; as well as the opportunities for skills development and on-site training. During the construction phase a few temporary jobs will be created but more permanent jobs will be created when operations commences. The establishment of the terminal will have a positive effect on increased port services.

8.3.6. Visual and Sense of Place Impacts

The proposed site is mostly surrounded by industrial developments in all directions, such as coal handling facilities for Grindrod to the north-west, Zambia dry port to the west, Protea Chemicals to the north, salt handling facilities to the north-east and Botswana dry port to the south. The proposed development is not expected to deviate significantly from the character of the development area and would therefore not be significantly visually intrusive. It is however, still important that the aesthetics quality of any new structures has to be pleasing and designed to blend in with the natural surrounds.

9. SUMMARY OF POTENTIAL IMPACTS

A summary of the significance of the potential impacts from the proposed project assessed above is included in **Table 7**. The **Tables 8 - 10** provide a summary of the mitigation measures proposed for the impacts.

Table 7: Summary of potential impacts

Impacts	Negative		Positive		No Impact
	Short Term	Long Term	Short Term	Long Term	
Planning and Design Phase					
1. Surface and ground water	X				
2. Air quality		X			
3. Land use				X	
4. Fauna and flora		X			
5. Existing infrastructure	X				
6. Traffic		X			
Construction Phase					
7. Fauna and flora	X				
8. Pressure on existing infrastructure	X				
9. Surface and groundwater	X				
10. Health, safety and security	X				
11. Air quality	X				
12. Noise	X				
13. Traffic	X				
14. Waste management	X				
15. Hazardous substances	X				
16. Social	X				

Operational Phase					
17. Environmental Monitoring and evaluation		X			
18. Noise		X			
19. Impact on human health		X			
20. Waste Management		X			
21. Social				X	
22. Visual	X				

Table 8: Proposed mitigation measures for the planning and design phase

PLANNING AND DESIGN PHASE IMPACTS	
Impact	**Mitigation Measures**
Surface and Ground Water	• Appoint professional engineers to develop a detailed storm water management design as part of the infrastructure service provision of the development. • The service infrastructure should be designed and constructed by suitably qualified engineering professionals. • Develop and implement a preventative maintenance plan for the service infrastructure. • No dumping of waste products of any kind in or in close proximity to any 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. • Wastewater should not be discharged directly into the environment. • Disposal of waste from the development should be properly managed. • Spill control structures and procedures related to fuel installations including the bulk fuel storage facility must be in place according to SANS standards or better. • Any leaks detected must be repaired without delay and any maintenance that must occur within the port area must be performed on spill containment slabs or over drip trays. • Hazardous waste and contaminated water and soil must be disposed of at an appropriately classified facility or by approved contractors. Hazardous waste disposal certificates must be kept on file. • Warehouses for mineral ore and chemical storage must remain closed with adequate dust suppression systems to limit or prevent the formation of windblown dust. • Any mineral ore and / or chemicals trapped in tyres must be cleaned prior to vehicles leaving warehouses or bulk storage areas of these products. The use of rumble grids and physical inspection of tyres should be implemented. • For bulk bags the stacking heights must be observed to prevent bag damage and product spillage. • All hazardous substances, such as sulphuric acid and fuel, must be stored in a properly bunded area to prevent any spillages from entering the surrounding environment. • Any fuel spillage of more than 200 litres must be reported to the Ministry of Mines and Energy. • Emergency response plans and spill contingency plans must be in place and include all fuels, chemicals or hazardous substances being handled. In the case of tenants, copies of these documents must be submitted to Namport. • Spill containment equipment such as booms and absorbents must be readily accessible. Training in the use of these are paramount.

PLANNING AND DESIGN PHASE IMPACTS	
Impact	**Mitigation Measures**
	• During bulk fuel offloading, temporary booms must be installed around the offloading area to prevent the spread of fuel, should a spill or leak occur. • Any mineral ore, chemical dust (e.g. sulphur), hydrocarbon spills or any other hazardous substance spill on the quay area must be cleaned and disposed of to prevent it from entering the ocean either by wind or water runoff. • For any chemicals that may form part of effluent to be discharged into the ocean, environmental effects must be considered and alternative chemicals investigated if needed. • Effluent must meet standards as per the effluent discharge permits. • Use of reputable and well trained contractors are essential.
Air Quality	• Ensure that personnel handling the bags and storage equipment are made aware of the risk associated with manganese so that they know the potential impact on them. • Ensure a personnel monitoring programme needs is set up in accordance with the guidelines of existing accepted practice and the Labour Act of Namibia. • Conduct regular air quality monitoring on site. The dust should be analysed for hazardous substances such as asbestos, radioactivity etc. • Report any incidents immediately. • Make use of the rub halls already on site for storage and handling of material. • Ensure that storage areas are paved with impermeable material to guarantee containment and prevent seepage into the underground. • Minimise the duration of stockpiles. • Use dust suppressant technologies to manage dispersal and pollution. • Maintain roads. • Limit movement and number of vehicles and adhere to off road speed limit. • Ensure personnel wears correct PPE to prevent exposure to particulate matters. • Building interiors and surfaces should be cleaned regularly. Strict adherence to housekeeping practices will help reduce dust levels. • Air quality in Walvis Bay or receptors on any part of the transport route and at receptors may not increase above 0.0003 mg/m3. • Air quality monitoring must be conducted on site and at the port area to monitor ore dust fallout • Check all bulk bags prior to filling to ensure they are not damaged.

PLANNING AND DESIGN PHASE IMPACTS	
Impact	**Mitigation Measures**
	• Ensure that forklift, front-end loaders and other machine operators suitably trained. • All truck loads must be suitably covered to prevent the escape of dust from the load bin. This include empty trucks that may still contain some dust. • Once dust plumes that cannot be contained becomes visible, all operations must cease with immediate effect and only restart once sufficient mitigation measures have been implemented or when the cause of dust subsides. Operational processes include activities such as handling and loading / offloading of ore at the bulk storage yard, transport through town, offloading in the port, etc. • Ensure all machinery and vehicles are kept in good condition and maintained/ serviced regularly. • Sprinklers should be installed at the coal stockpiles. • Coal should be wetted before transportation. • Coal at stockpiles should be compacted. • Temperature monitoring and removal of coal from staith when temperature is above 40 degree Celsius. • Coal staith and Conveyors are partially enclosed to minimise fugitive emissions. • Wind breakers and sprinkler system should be installed along the stockpile perimeter to reduce the formation of fugitive dust from coal storage. • Preventative and corrective maintenance should be done on equipment and machinery. • Dust suppression infrastructure should be in good working order. • Spills on conveyor routes must be cleaned up. • Plant improvements should be done to prevent recurring spills. • Any complaints received regarding ore dust along the transport routes and sites of handling of ore must be recorded, investigated and the problem rectified. Any incidents must be recorded with action taken to prevent future occurrences. • A report should be compiled every 6 months of all incidents reported and monitoring performed. The report should contain dates when safety equipment and structures were inspected and maintained.
Fauna and Flora	• Report any extraordinary fauna sightings to the Ministry of Environment, Forestry and Tourism and / or Ministry of Fisheries and Marine Resources. • Ensure waste cannot be blown away by wind. • The establishment of habitats and of roosting and nesting sites for birds in the port area must be prevented where possible. • To prevent bird collisions with structures at night, all lights used at the site should be directed downwards to the working surfaces and only be switched on when and where necessary.

PLANNING AND DESIGN PHASE IMPACTS	
Impact	**Mitigation Measures**
Existing Service Infrastructure	• Ensure professional design and construction of service infrastructure from qualified and registered engineers. • Ensure consultation and compliance with relevant authorities responsible for services, such as the Municipality, Erongo Red and Namwater. • Properly documenting all construction activities undertaken in the port through 'as-built' drawings and associated documents. • The contractor must determine exactly where services amenities and pipelines are situated before construction / maintenance commences (utility clearance e.g. ground penetrating radar surveys). • Designs and building materials should be as such to reduce dependency on artificial heating and cooling in order to limit the overall energy demand. • Water saving mechanisms should be incorporated within the proposed development's design and plans in order to further reduce water demands. • Train employees on the importance of water and energy savings. • Adhere to water quality guidelines in terms of The Water Act, 1956. • No structures are allowed to be built on or over the existing 11 Kva cable. The cable must be protected before any vehicle traffic is allowed to cross it. The protection must be done to the Port Engineer's satisfaction.
Traffic	• Confirm acceptable transport route with the Municipality Traffic Department, and adhere to it. • Ensure drivers overnighting in Walvis Bay have proper facilities to do so. • Drivers to comply to local traffic rules. • Ensure drivers are endorsed to operate trucks and vehicles, with hazardous substances. • Ensure that road junctions have good sightlines. • Limit the type of vehicles to use the internal roads e.g. heavy trucks. • Adhere to the speed limit. • Implement traffic control measures where necessary. • In cooperation with the local authority, erect clear signage regarding restricted areas and roads, access and exit points to the port, speed limits, traffic rules, rail level crossings, etc. • Trucks should not be allowed to obstruct any traffic or access points to any other businesses and facilities on the routes through Walvis Bay. • If any extraordinary traffic impacts are expected, traffic management should be performed in conjunction with the local traffic department.

PLANNING AND DESIGN PHASE IMPACTS	
Impact	**Mitigation Measures**
	• Should hazardous cargo be transported, cognisance should be taken of Namport's operating procedures for Handling and Storage of Dangerous Cargo. This will involve planning of the route as well as arrangements with the Municipality and the Ministry of Safety and Security.

Table 9: Proposed mitigation measures for the construction phase

CONSTRUCTION PHASE IMPACTS	
Impact	**Mitigation Measures**
Fauna and flora	• Report any extraordinary fauna sightings to the Ministry of Environment, Forestry and Tourism and / or Ministry of Fisheries and Marine Resources. • Ensure waste cannot be blown away by wind. • The establishment of habitats and of roosting and nesting sites for birds in the port area must be prevented where possible. • To prevent bird collisions with structures at night, all lights used at the site should be directed downwards to the working surfaces and only be switched on when and where necessary.
Pressure on existing infrastructure	• Educate workforce on water saving measures. • Ensure all potable water points are metered and regularly read. • Ensure that the workforce is provided with temporary toilets during the construction phase.
Surface and Ground Water	• It is recommended that construction takes place outside of the rainy season in order to limit flooding on site and to limit the risk of ground and surface water pollution. • No dumping of waste products of any kind in or in close proximity to water bodies. • Heavy construction vehicles should be kept out of any surface water bodies and the movement of construction vehicles should be limited where possible to the existing roads and tracks. • Ensure that oil/ fuel spillages from construction vehicles and machinery are minimised and that where these occur, that they are appropriately dealt with. • Drip trays must be placed underneath construction vehicles when not in use to contain all oil and spillages that might be leaking from these vehicles.

CONSTRUCTION PHASE IMPACTS	
Impact	**Mitigation Measures**
	• Contaminated runoff from the construction sites should be prevented from entering the surface and ground water bodies. • All materials on the construction site should be properly stored. • Disposal of waste from the site should be properly managed and taken to the Walvis Bay landfill site. • Construction workers should be given ablution facilities at the construction site that are located at least 30 m away from any surface water and these should be regularly serviced. • Washing of personnel or any equipment should not be allowed on site. Should it be necessary to wash construction equipment this should be done at an area properly suited and prepared to receive and contain contaminated waters.
Health, Safety and Security	• Construction personnel should not overnight at the site, except for security personnel. • Ensure that all construction personnel are properly trained depending on the nature of their work. • Provide for a first aid kit and properly trained personnel to apply first aid when necessary. • A wellness program should be initiated to raise awareness on health issues, especially the impact of sexually transmitted diseases and Covid-19. • Provide free condoms in the workplace throughout the construction phase. • Facilitate access to Antiretroviral medication for construction personnel. • Conform to the stipulated protocols related to Covid-19. • Restrict unauthorised access to the site and implement access control measures. • Clearly demarcate the construction site boundaries along with signage of no unauthorised access. • Clearly demarcate dangerous areas and no go areas on site. • Staff and visitors to the site must be fully aware of all health and safety measures and emergency procedures. • The contractor/s must comply with all applicable occupational health and safety requirements. The workforce should be provided with all necessary Personal Protective Equipment where appropriate.
Air quality	• All loose material should be kept on site for the shortest possible time. • It is recommended that dust suppressants such as Dustex be applied to all the construction clearing activities to minimise dust. • Construction vehicles to only use designated roads.

CONSTRUCTION PHASE IMPACTS	
Impact	**Mitigation Measures**
	• During high wind conditions the contractor must make the decision to cease works until the wind has calmed down. • Cover any stockpiles with plastic to minimise windblown dust. • Ensure construction vehicles are well maintained to prevent excessive emission of smoke.
Noise	• No amplified music should be allowed on site. • Inform neighbouring communities and companies of construction activities to commence and provide for continuous communication between them and contractor. • Limit construction times to acceptable daylight hours. • Install technology such as silencers on construction machinery. • Do not allow the use of horns/hooters as a general communication tool, but use it only where necessary as a safety measure. • Provide protective equipment such as ear muffs, masks and ear plugs to workers.
Traffic	• Limit and control the number of access points to the site. • Ensure that road junctions have good sightlines. • Construction vehicles' need to be in a road worthy condition and maintained throughout the construction phase. • Transport the materials in the least amount of trips as possible. • Adhere to the speed limit. • Implement traffic control measures where necessary. • Minimise the movement of heavy vehicles during peak time.
Waste Management	• It is recommended that waste from the temporary toilets be disposed of at the Walvis Bay Wastewater Treatment Works, on a regular basis. • A sufficient number of waste bins should be placed around the site for the soft refuse. • A sufficient number of skip containers for the heavy waste and rubble should be provided for around the site. • The waste containers should be able to be closed to prevent birds and other animals from scavenging. • Solid waste will be collected and disposed of at an appropriate local landfill in Walvis Bay, in consultation with the local authority.

CONSTRUCTION PHASE IMPACTS	
Impact	**Mitigation Measures**
Hazardous Substances	• All chemicals and other hazardous substances must be stored and maintained in accordance with the Hazardous Substances Ordinance (No. 14 of 1974), with all relevant licences and permits to be obtained where applicable. • Given the potential harm to human health during handling and use of any of hazardous substances it is essential that all staff be trained with regards to the proper handling of these substances as well as First Aid in the case of spillage or intoxication. • Storage areas for all substances should be bunded and capable to hold 120% of the total volume of a given substance stored on site.
Social	• Ensure locals enjoy priority in terms of job opportunities, to the extent possible, for skills that are available locally. • Ensure local procurement where commodities are available locally.

Table 10: Proposed mitigation measures for the operational phase

OPERATIONAL PHASE IMPACTS	
Impact	**Mitigation Measures**
Environmental monitoring and Evaluation	• An Environmental Practitioner should monitor the implementation of the EMP, and recommend any changes to this document when necessary. • The Environmental Practitioner should inspect the site on a regular basis (preferably monthly or bi-monthly). • Biannual reports are to be submitted to the Environmental Commissioner.
Visual and Sense of Place	• The proposed development is not expected to deviate significantly from the character of the development area and would therefore not be significantly visually intrusive. It is however, still important that the aesthetics quality of any new structures has to be pleasing and designed to blend in with the natural surrounds.

OPERATIONAL PHASE IMPACTS	
Impact	**Mitigation Measures**
Noise	• Follow Labour Act Regulations - Noise Regulations (Regulation 197), and / or WHO guidelines on maximum noise levels (Guidelines for Community Noise, 1999), to prevent hearing impairment for workers on site and a nuisance for nearby residential areas / neighbours. • Minimize or prevent noise producing activities and plan to restrict these to daytime as far as practically possible. • Limit construction work to daylight hours. • All machinery must be regularly serviced to ensure minimal noise production. • The use of low frequency white noise or flashing lights should be considered instead of audible high frequency warning signals for moving forklifts or trucks. • Erect temporary or permanent noise barriers / sound baffles, should the need arise. • Placement of noise producing equipment, e.g. compressors, in such a way that noise is directed away from receptors and / or are attenuated. • Where possible, use infrastructure to act as noise barriers to sensitive environments. • Hearing protectors as standard PPE for workers in situations with elevated noise levels.
Impact on human health	• Ensure that personnel handling the bags and storage equipment are made aware of the risk associated with manganese and other minerals so that they know the potential impact on them. • Ensure a personnel monitoring programme needs is set up in accordance with the guidelines of existing accepted practice and the Labour Act of Namibia. • Conduct regular air quality monitoring on site. The dust should be analysed for hazardous substances such as asbestos, radioactivity etc. • Report any incidents immediately. • Make use of the rub halls already on site for storage and handling of material. • Use dust suppressant technologies to manage dispersal and pollution. • Ensure personnel wears correct PPE to prevent exposure to particulate matters. • Air quality monitoring must be conducted on site and at the port area to monitor ore dust fallout • Once dust plumes that cannot be contained becomes visible, all operations must cease with immediate effect and only restart once sufficient mitigation measures have been implemented or when the cause of dust subsides. Operational processes include activities such as handling and loading / offloading of ore at the bulk storage yard, transport through town, offloading in the port, etc.

OPERATIONAL PHASE IMPACTS	
Impact	**Mitigation Measures**
Waste management	• The area will be kept free of waste, except in designated waste storage areas. Any wastes distributed by winds will be regularly cleaned up. • A sufficient number of waste bins should be placed around the site for the soft refuse. • A sufficient number of skip containers for the heavy waste and rubble should be provided for around the site. • Solid waste will be collected and disposed of at an appropriate local land fill. • Categorise waste into various types such as hazardous, general and recyclable. • Hazardous waste to be disposed of at the appropriate facilities of the Walvis Bay Municipality. • Place priority on waste reduction, waste reuse and waste recycling, in that order.
Social	• The proponent must employ local Namibians where possible. • If the skills exist locally, employees must first be sourced from the town, then the region and then nationally. • Deviations from this practice must be justified. • Local businesses and industries should be supported.

10. DECOMMISSIONING

It is not envisaged to decommission the terminal in the immediate future. However, should this be considered at the end of its useful life, the development will be dismantled so as to restore the area to *ante operam* conditions. A full decommissioning plan should be developed within the first 24 months of operation.

11. CONCLUSION AND RECOMMENDATIONS

11.1. Construction Phase Impacts

With reference to **Table 9**, most of the construction phase impacts were deemed to have a negative impact without mitigation. However, these were mostly short-term and can be significantly reduced with the mitigation measures proposed.

11.2. Planning and Design Phase

During the planning and design phase the impacts of air quality, fauna and flora, and traffic were assessed to have a long-term negative effect without mitigation. The impacts will however be significantly reduced when the recommended mitigation measures in the scoping report and environmental management plan (EMP) are implemented.

The impacts on the land use, and social are deemed to be high positive. This development is not only important to provide services to the Port of Walvis Bay, but it also promotes local economic development.

11.3. Level of Confidence in Assessment

With reference to the information available at this stage, the confidence in the environmental assessment undertaken is regarded as being acceptable for decision-making, in terms of the environmental impacts and risks. The Environmental Assessment Practitioner believes that the information contained within this ESR is adequate to allow MEFT: DEA to determine the environmental viability of the proposed project.

It is acknowledged that the project details may evolve during the detailed design and construction phases. However, these are unlikely to change the overall environmental acceptability of the proposed project and any significant deviation from what was assessed in this ESR should be subject to further assessment. If this was to occur, an amendment to the Environmental Authorisation may be required in which case the prescribed process would be followed.

11.4. Mitigation Measures

With the implementation of the recommended mitigation measures in this report as well as in the EMP, the significance of the planning and design, construction and operational phase

impacts is likely to be reduced to a ***Low (negative)***. It is further extremely important to include an Environmental Control Officer (ECO) on site during the construction phase of the proposed project to ensure that all the mitigation measures discussed in this report and the EMP are enforced.

It is strongly advised that the proponent appoint suitably qualified professionals to design and supervise the construction of the services and other infrastructure. It is also advised to develop and implement a preventative maintenance plan, which shall be monitored and evaluated regularly.

It is noted that where appropriate, these mitigation measures and any others identified by the EC could be enforced as Conditions of Approval in the Environmental Authorisation.

11.5. Opinion with respect to the Environmental Authorisation

Regulation 15(j) of the EMA, requires *that the EAP include an opinion as to whether the listed activity must be authorised and if the opinion is that it must be authorised, any condition that must be made in respect of that authorisation*.

Namibia has made great strides to position itself as a regional logistic hub in the Southern African region. Through the Walvis Bay Corridors, the port of Walvis Bay is linked to major cities and towns in SADC such as Gaborone, Johannesburg, Livingstone, Ndola, Lubumbashi, Santa Clara etc.

Namibia is also seen as a trade logistic alternative to South African and East-African trade channels that are experiencing challenges including multiple inefficient border crossings, worsening security, xenophobia and social instability. The country is becoming an increasingly attractive investment option for South African manufacturers, mining companies seeking to beneficiate resources and logistics enterprises seeking a more cost effective location.

It is thus important that Namibian entrepreneurs take advantage of this position to elevate the country's economic profile and augment the local and national economic development.

Based on the evidence produced during the assessment process, it is very unlikely that this project will have any significant negative impacts on the environment. It is therefore recommended that a clearance certificate be issued for the project.

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