

APP 001528

**STORAGE AND HANDLING OF METAL ORES AND
INDUSTRIAL CARGO ON ERF 4409 IN THE INDUSTRIAL
AREA OF WALVIS BAY, ERONGO REGION**

ENVIRONMENTAL ASSESSMENT SCOPING REPORT




Assessed by:



Assessed for:




June 2023

Project:	STORAGE AND HANDLING OF METAL ORES AND INDUSTRIAL CARGO ON ERF 4409 IN THE INDUSTRIAL AREA OF WALVIS BAY, ERONGO REGION: ENVIRONMENTAL ASSESSMENT SCOPING REPORT	
Report: Version/Date:	Final June 2023	
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Cite this document as:	Faul A; Bosman Q; Strauss J; 2023 June; Storage and Handling of Metal Ores and Industrial Cargo on Erf 4409 in the Industrial Area of Walvis Bay, Erongo Region: Environmental Assessment Scoping Report	
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Report Approval	 André Faul Conservation Ecologist	

I Werner Beukes acting as the Proponent's representative (Wesbank Transport, a Division of FP du Toit Transport (Pty) Ltd), hereby approve this report and confirm that the project description contained in herein is a true reflection of the information which the Proponent has provided to Geo Pollution Technologies. All material information in the possession of the Proponent that reasonably has or may have the potential of influencing any decision or the objectivity of this assessment is fairly represented in this report.

Signed at Walvis Bay on the 07 day of June 2023.


Wesbank Transport, a Division of FP du Toit Transport (Pty) Ltd

F68/11154.
Company Registration

EXECUTIVE SUMMARY

Wesbank Transport, a Division of FP du Toit Transport (Pty) Ltd (the Proponent), requested Geo Pollution Technologies (Pty) Ltd to conduct an environmental scoping assessment for their proposed operations on erf 4409, corner of 18th Road and 4th Street East, in the industrial area of Walvis Bay. The Proponent has existing logistics operations on the erf which includes storage, handling and transport of various goods for clients. The Proponent now plans to utilize the facility for the storage and handling of various types of metal ores and industrial cargo. Operations on site may be conducted by the Proponent or by a tenant. The facility will be used to receive and temporarily stockpile the ores of copper, manganese, nickel, lithium, chrome and zinc, as well as cobalt hydroxide. Copper can also include copper concentrates and cathodes. Imported cargo will be the industrial chemicals sulphur, sodium metabisulphite and magnesium oxide. For purposes of this assessment, reference will be made to these products as “metal ores and industrial cargo”, which can thus include any one or combination of the products. This assessment focus on upgrades to the warehouse, the storage and handling of the metal ores and industrial cargo, and general day to day operational activities.

The study is conducted to determine all environmental, safety, health and socio-economic impacts associated with the development and operations of the facility. Relevant environmental data has been compiled by making use of secondary data and a reconnaissance site visit. Potential environmental impacts and associated social impacts were identified and are addressed in this report.

Due to the nature of proposed operations, some impacts can be expected on the surrounding environment. Such impacts are of both a positive and negative nature. It is thus recommended that environmental performance related to enhancement of positive impacts, and prevention and mitigation of negative impacts, be monitored regularly, to ensure regulatory compliance and that corrective measures be taken if necessary.

The operations of the facility will play an important role in the export of metal ores from the Southern African Development Community (SADC) as well as the import of industrial cargo for various mines and industries within SADC. This will result in significant economic benefits for Walvis Bay and Namibia as a whole. Various permits and levies related to the transport of the metal ores and industrial cargo will be paid. The trucking industry will support various service centres as well as purchase tyres and fuel. Truck drivers will support local businesses for food and goods. The facility itself will create and create jobs and increase the spending power of the local workforce. The Port of Walvis Bay will be supported and stevedores contracted for the loading of vessels. Additional investments and business opportunities in the town may result from the proposed warehouse construction and operations of the Proponent. Various subcontractors will be appointed to supply certain services and goods to the facility.

The major concerns related to the operations of the facility are that of health related impacts as a result of metal ore and industrial cargo dust, increased traffic and noise, the possibility of fire as well as visual impacts as a result of metal ore dusts discolouring the environment and structures. These will however be limited by preventative and mitigation measures and adherence to international best practise standards and guidelines as applicable to the facility. By storing and handling all products in an enclosed warehouse the potential dust impacts will be prevented. Dust suppression systems can also be installed should it be required. Furthermore, all loads into and out of the warehouse must be sufficiently covered, if not in containers or bulk bags. Noise should meet the requirements of the health and safety regulations of the labour act and/or World Health Organisation standards for community noise. By appointing local contractors and employees and implementing educational programs the positive socio-economic impacts can be maximised while mitigating any negative impacts.

The environmental management plan (EMP) included in Section 10 of this document should be used as an on-site reference document during all phases of the facility. All monitoring and records kept should be included in a report to ensure compliance with the EMP. Parties responsible for transgression of the EMP should be held responsible for any rehabilitation that may need to be undertaken. A health, safety, environment and quality policy or similar should be used in conjunction with the EMP. Operators and responsible personnel must be taught the contents of these documents. Municipal or national regulations and guidelines must be adhered to and monitored regularly as outlined in the EMP.

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LIST OF ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
DWA	Department of Water Affairs
EIA	Environmental Impact Assessment
EMA	Environmental Management Act No 7 of 2007
EMP	Environmental Management Plan
EMS	Environmental Management System
GPT	Geo Pollution Technologies
HIV	Human Immunodeficiency Virus
IAPs	Interested and Affected Parties
IBL	Internal Boundary Layer
IUCN	International Union for Conservation of Nature
m/s	Meter per second
MABL	Marine Atmospheric Boundary Layer
mbs	Meters below surface
MEFT	Ministry of Environment, Forestry and Tourism
mm/a	Millimetres per annum
mm/a	Millimetres per annum
MSDS	Material Safety Data Sheet
NaCl	Sodium chloride
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PBL	Planetary Boundary Layer
PEL	Permissible Exposure Level
PM	Particle matter
PPE	Personal Protective Equipment
ppm	Parts per million
REL	Recommended Exposure Level
SADC	Southern African Development Community
SAH	South Atlantic High
SANS	South African National Standards
SO₂	Sulfur dioxide
SOLAS	Safety of Life at Sea
TIBL	Thermal Internal Boundary Layer
TWA	Time weighted averages
WHO	World Health Organization

GLOSSARY OF TERMS

Alternatives - A possible course of action, in place of another, that would meet the same purpose and need but which would avoid or minimize negative impacts or enhance project benefits. These can include alternative locations/sites, routes, layouts, processes, designs, schedules and/or inputs. The “no-go” alternative constitutes the ‘without project’ option and provides a benchmark against which to evaluate changes; development should result in net benefit to society and should avoid undesirable negative impacts.

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

Competent Authority - means a body or person empowered under the local authorities act or Environmental Management Act to enforce the rule of law.

Construction - means the building, erection or modification of a facility, structure or infrastructure that is necessary for the undertaking of an activity, including the modification, alteration, upgrading or decommissioning of such facility, structure or infrastructure.

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

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

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

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

Environmental Management System (EMS) - An Environment Management System, or EMS, is a comprehensive approach to managing environmental issues, integrating environment-oriented thinking into every aspect of business management. An EMS ensures environmental considerations are a priority, along with other concerns such as costs, product quality, investments, PR productivity and strategic planning. An EMS generally makes a positive impact on a company’s bottom line. It increases efficiency and focuses on customer needs and marketplace conditions, improving both the company’s financial and environmental performance. By using an EMS to convert environmental problems into commercial opportunities, companies usually become more competitive.

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

Gangue Material – unwanted material that surrounds, or is closely mixed with, a wanted mineral in an ore deposit or minded ore.

Hazard - Anything that has the potential to cause damage to life, property and/or the environment. The hazard of a particular material or installation is constant; that is, it would present the same hazard wherever it was present.

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

Metal Ore – For purposes of this document “metal ore” refers to any one or combination of copper, manganese, nickel, lithium, chrome and zinc, as well as cobalt hydroxide. Copper can also include copper concentrates and cathodes.

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

Proponent (Applicant) - Any person who has submitted or intends to submit an application for an authorisation, as legislated by the Environmental Management Act no. 7 of 2007, to undertake an activity or activities identified as a listed activity or listed activities; or in any other notice published by the Minister or Ministry of Environment, Forestry & Tourism.

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

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

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

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

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

Sustainable Development - “Development that meets the needs of the current generation without compromising the ability of future generations to meet their own needs and aspirations” – the definition of the World Commission on Environment and Development (1987). “Improving the quality of human life while living within the carrying capacity of supporting ecosystems” – the definition given in a publication called “Caring for the Earth: A Strategy for Sustainable Living” by the International Union for Conservation of Nature (IUCN), the United Nations Environment Programme and the World Wide Fund for Nature (1991).

1 BACKGROUND AND INTRODUCTION

Geo Pollution Technologies (Pty) Ltd was appointed by Wesbank Transport, a Division of FP du Toit Transport (Pty) Ltd (referred to as the Proponent or Wesbank Transport) to prepare an environmental scoping assessment (EIA) and environmental management plan (EMP) for proposed metal ore and industrial cargo storage and handling operations on erf 4409, corner of 18th Road and 4th Street East, in the industrial area of Walvis Bay (Figure 1-1). The Proponent has existing logistics operations on the erf which includes storage, handling and transport of various goods. In order to optimize the facilities on the property, the Proponent now plans to utilize it for storage and handling of metal ores and industrial cargo. These will include ores of copper, manganese, nickel, lithium, chrome and zinc, as well as cobalt hydroxide. Copper can also include copper concentrates and cathodes. Imported cargo will be the industrial chemicals sulphur, sodium metabisulphite and magnesium oxide. Ultimately, operations on the site may be conducted by the Proponent, or by a third party in contract with the Proponent.

General project components considered for the EIA will comprise of construction (upgrades and maintenance), operations and potential decommissioning. Typical operational activities will include receipt of metal ores as bulk, break bulk and/or containerised cargo, storage of cargo within the warehouse, transporting of cargo as bulk product ion skips or in containers to the port for vessel loading, and general operational activities and maintenance procedures associated with the warehouse (administrative tasks, site security and cleaning of the premises).

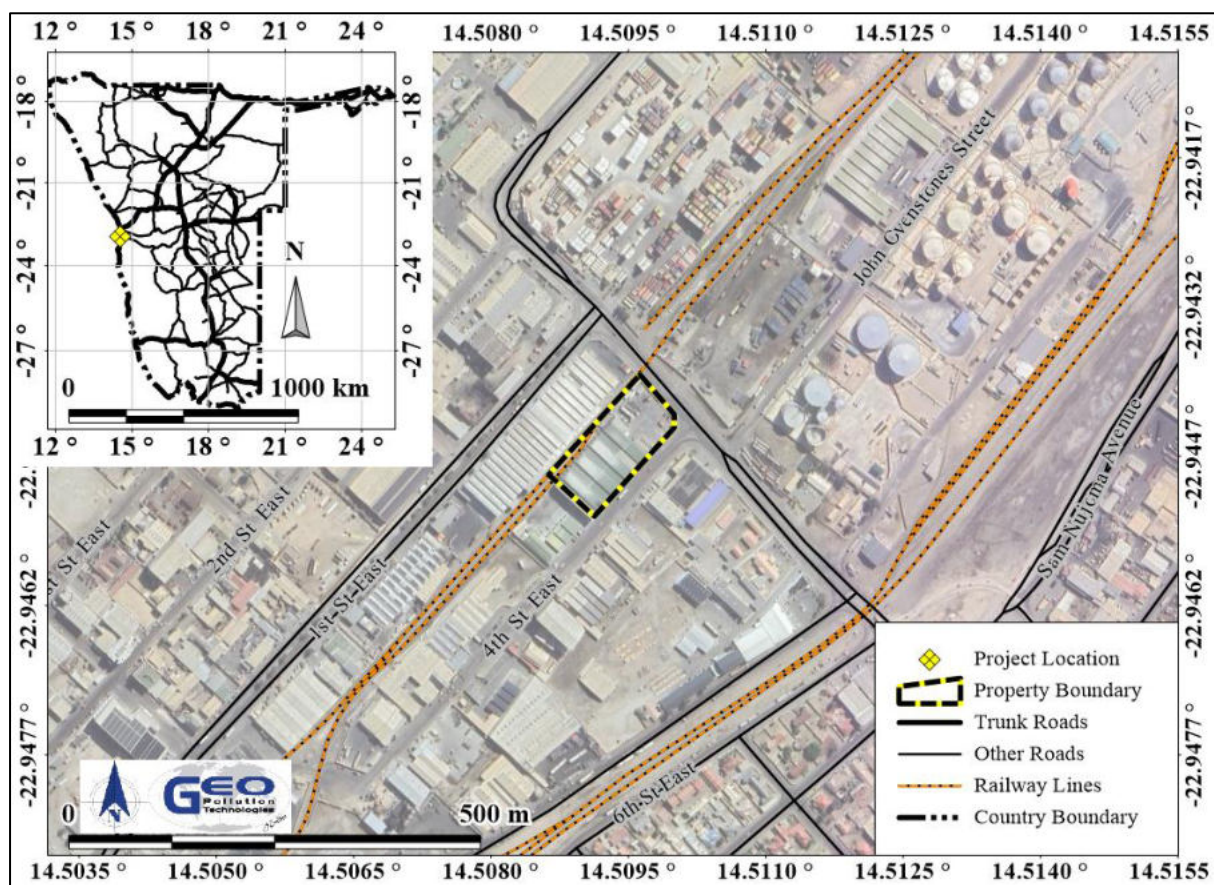


Figure 1-1 Project location

A risk assessment was undertaken to determine the potential impact of the construction, operational and possible decommissioning phases associated with the project on the environment. The environment being defined in the Environmental Assessment Policy and Environmental Management Act as “land, water and air; all organic and inorganic matter and living organisms as well as biological diversity; the interacting natural systems that include components referred to in sub-paragraphs, the human

environment insofar as it represents archaeological, aesthetic, cultural, historic, economic, paleontological or social values”.

The environmental assessment was conducted to apply for an environmental clearance certificate in compliance with Namibia’s Environmental Management Act (Act No 7 of 2007) (EMA).

Project Justification – The Port of Walvis Bay has established itself as one of the most reliable and efficient ports of call in southern Africa. It is thus in a favourable position to serve not only Namibia, but also landlocked countries like Zambia and the Democratic Republic of the Congo. Recent years have seen tremendous growth in the demand for port services for the export and import of, among others, metal ores and industrial cargo, mainly associated with the mining industry. Wesbank Transport has for many years been involved in the logistics of metal ore and industrial cargo transport, storage and handling. By optimizing the facilities on the industrial property, erf 4409, the Proponent can significantly increase the throughput of the warehouse and thus contribute to the local and regional mining industries, and the Walvis Bay Corridor Group’s aims of developing and promoting Namibia as the leading trade route for the Southern African Development Community (SADC). This will be achieved through established corridor routes connecting the Port of Walvis Bay with the Namibian interior and its neighbours and beyond. The main benefits of the project include:

- ◆ Revenue generation for Walvis Bay and Namibia as a whole;
- ◆ Reliable export of mining products from mining sectors of Namibian and SADC countries;
- ◆ Reliable import of industrial cargo into Namibia and SADC countries for mainly the mining sector;
- ◆ Employment, education and skills transfer;
- ◆ Diversification of economic activity;
- ◆ Potential inducement of additional investments and business opportunities.

2 SCOPE

The scope of the environmental assessment is to:

1. Determine the potential environmental impacts emanating from the proposed activities.
2. Identify a range of management actions which could mitigate the potential adverse impacts to acceptable levels.
3. Comply with Namibia’s Environmental Management Act (2007).
4. Provide sufficient information to the Ministry of Environment, Forestry and Tourism (MEFT) and related authorities to make an informed decision regarding the proposed operations, construction activities and possible decommissioning of the facility.

3 METHODOLOGY

The following methods were used to investigate the potential impacts on the social and natural environment due to the operations of the facility:

1. Baseline information about the site and its surroundings was obtained from existing secondary information as well as from primary information obtained during a reconnaissance site visit.
2. As part of the scoping process to determine potential environmental impacts, interested and affected parties (IAPs) were consulted about their views, comments and opinions and these are put forward in this report.
3. Based on gathered information and public and stakeholder consultation, an assessment of potential impacts was conducted and a management plan prepared.

4 FACILITY OPERATIONS AND RELATED ACTIVITIES

The Proponent's existing operations on erf 4409 are focussed on general non-hazardous cargo in a single 5,000 m³ bonded warehouse. The following sections provide details on existing infrastructure and future planned operations on the site.

4.1 EXISTING INFRASTRUCTURE

The main, existing infrastructure components of the erf are indicated on Figure 4-1 and include a 5,000 m² bonded warehouse (Photo 4-1), 708 m² offices, 73 m² (Photo 4-2), ablutions and rest rooms, and 3,200 m² of paved yard (operational area) (Photo 4-3). The site has a perimeter wall with three security gates and access control (Photo 4-4).



Photo 4-1 Warehouse interior



Photo 4-2 Offices



Photo 4-3 Paved yard with rest rooms in rear corner



Photo 4-4 Main entrance with security

The inside of the warehouse has existing bays for segregation of products (Photo 4-5). The bays are separated by concrete walls with wire mesh fencing on top. It also has existing firefighting equipment throughout the facility (Photo 4-6). Sliding doors are present at the two entrance/exit points.



Photo 4-5 Segregated bays



Photo 4-6 Fire extinguishers



Figure 4-1 Existing site layout

4.2 INFRASTRUCTURE UPGRADES

Some infrastructure upgrades will be required to get the facility ready for the planned operations. The following is a list of some of the main infrastructure upgrades to be performed:

- ◆ Most of the existing segregating walls and offices inside the warehouse will be removed.
- ◆ The main entrance gate will be constructed at the existing north-eastern gate and will host a security room, booms and biometric access control.
- ◆ The gate at the southern corner of the warehouse will be upgraded and will serve as truck exit with a boom and biometric access control.
- ◆ The existing side entrance gate will be removed.
- ◆ The yard will be re-surfaced to fix existing damaged paving.
- ◆ A state of the art security system with closed circuit television will be installed.
- ◆ A state of the art container recognition system will be installed.

- ◆ An automatic fire detection and suppression system will be installed should cargo presenting a fire risk be stored in the warehouse.
- ◆ Should it become necessary, a dust suppression system (water based misting) will be installed inside the warehouse.
- ◆ Telecommunications inclusive of cables and server rooms will be upgraded and/or newly installed.
- ◆ Lighting inside the warehouse to be upgraded in accordance with the Health and Safety Regulations of the Labour Act (minimum 20 Lumens).

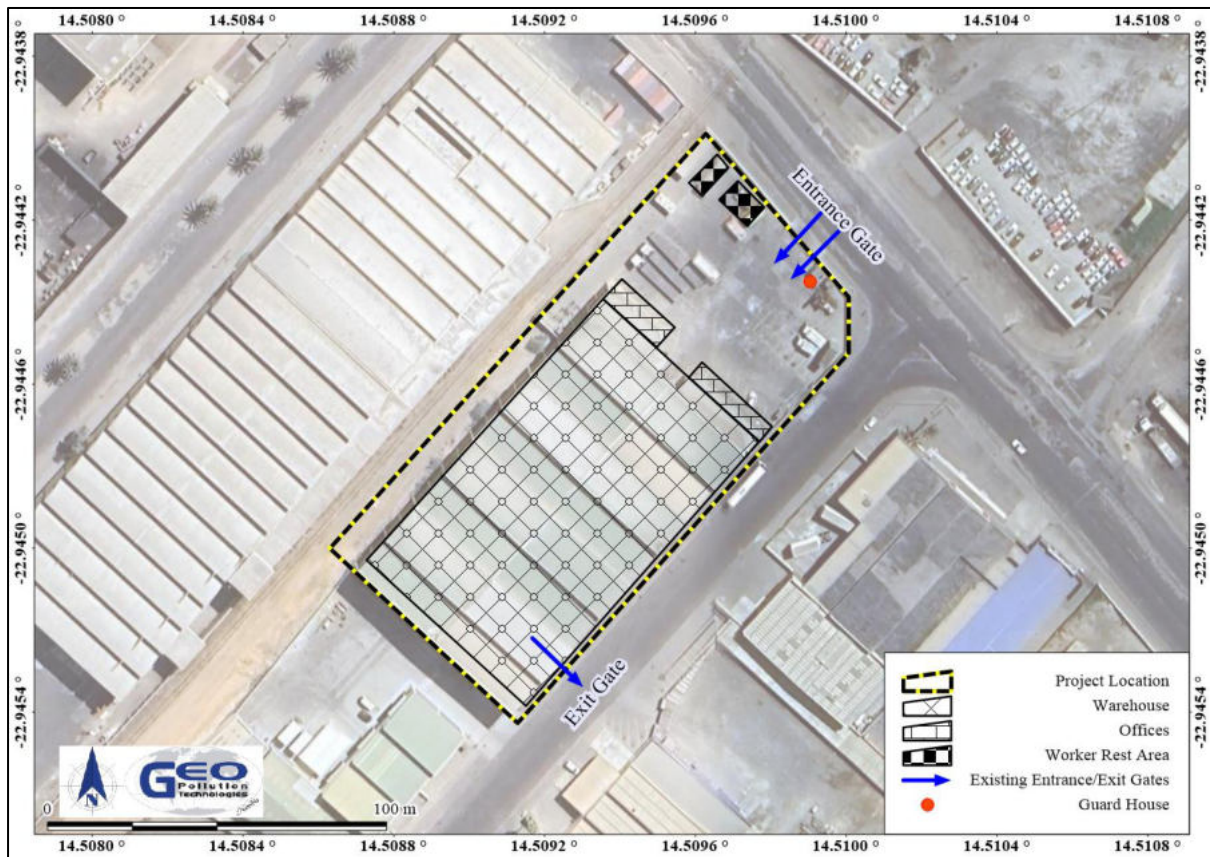


Figure 4-2 Planned site layout

4.3 OPERATIONAL ACTIVITIES

The warehouse will function as a receipt, storage and handling facility for import and export metal ores and industrial cargo. The following is a short description of the proposed operations.

4.3.1 Cargo Types

The products listed in Table 4-1 are planned to be stored and handled on erf 4409. It is possible that handling and storage of only some of the products will ultimately realise, but provision is made in this assessment for all products mentioned.

4.3.2 Handling and Storage

Table 4-1 provides a short summary of the proposed handling and storage for each type of product. Except for manganese ore and copper cathodes, all products will be received at the warehouse in bulk bags. While some of the bulk bags may be stuffed directly into containers for further transport and shipment, others will be emptied onto stockpiles as this allows for storage of larger volumes, than bagged storage, and also prepares the ore for shipment as bulk cargo in bulk vessels. Only cobalt hydroxide and the imported products sulphur, sodium metabisulphite and magnesium oxide will at all times remain bagged.

Bagged cargo may be offloaded directly into the warehouse or on the paved surface in front of the warehouse. When offloaded in front of the warehouse they will immediately be moved into the warehouse. Offloading and moving of bags will be with forklifts. Frontend loaders will be used to move bulk ore inside the warehouse onto stockpiles and to load ore into skips.

All operations will be according to the Proponent's standard operational procedures which will include adherence to industry standards for shipping of goods (e.g. Safety of Life at Sea (SOLAS) standards).

Table 4-1 Cargo types and summary of storage and handling

Cargo Type	Transport and Handling
Import	
Sulphur	Received from the port in bulk bags. Short term storage in warehouse in bags and loaded onto trucks for transport to clients.
Sodium Metabisulphite	
Magnesium oxide	
Export	
Manganese ore	Transported to the warehouse in side tipper trucks. Offloaded inside the warehouse and stockpiled in dedicated bays using frontend loaders to move the ore into the bays and onto stockpiles. Once the vessel arrives in port, the ore is loaded into skips on flatbed trucks inside the warehouse. Skips are covered and transported to the specified berth in the port for loading into the vessel.
Copper ore, concentrates and cathodes Nickel ore Lithium ore Chrome ore Zinc ore	<p>Ore and concentrates are received in bulk bags. Cathodes received as thick copper plates (unpacked). Ore and concentrates can be stored in the bags when they will ultimately be shipped in containers. Such bags are then stuffed into containers prior to shipping. Copper cathodes will also be placed in containers. The bags of ore and concentrates can be emptied inside the warehouse into their respective bays for stockpiling and ultimate shipping as bulk cargo.</p> <p>For containerised product, once the vessel arrives in the port, containers are loaded onto a flatbed truck and transported to the container terminal.</p> <p>For bulk copper ore and/or concentrates, when the vessel arrives in the port, frontend loaders are used to fill skips on flatbed trucks inside the warehouse. Skips are covered and transported to the specified berth in the port for loading into the vessel.</p>
Cobalt hydroxide	Received in bulk bags. Short term storage in warehouse before stuffing into containers. Once the vessel arrives in the port, containers are loaded onto flatbed trucks and transported to the container terminal for shipping.

4.3.3 Maintenance and Upgrades

Throughout operations, regular inspections and maintenance of the infrastructure on site will be performed. This may include regular cleaning and painting of structures. Some infrastructure may be replaced or upgraded when required. During such maintenance and upgrade activities some waste may be produced that will require disposal.

4.3.4 General

The workforce which will be present on site will consist of between 12 and 18 forklift operators, tally clerks, and general workers. In addition, site supervisors and managers will be

present on site. Security personnel will also be on site as part of security measures to be implemented.

Existing utilities such as water, sewers and electricity are already installed and will be used for the proposed warehouse operations. Disposal of domestic waste will continue to be performed at the waste disposal site of the Municipality of Walvis Bay. Third party contractors may be used to safely dispose of hazardous waste or contaminated products where such wastes are present on site. This includes torn bulk bags or bulk bags that has reached the end of its useable life.

5 ALTERNATIVES TO THE PROPOSED FACILITY

The Proponent is the owner of the property and an existing warehouse is present, thus no site alternatives were considered. A warehouse is present on site and all cargo will be stored inside the warehouse, this is the best method to prevent generation of dust, and no storage of product outside the warehouse is considered. No alternatives to the storage method and location are thus considered. The Proponent can investigate and install photovoltaic panels as an alternative power source which will aid in alleviating pressure on the electricity supply network. Such possibility will add to the benefits of the project, should it be realised. The practice of reduce, re-use, recycle should be adopted as an alternative to simply disposing of all waste at a landfill. The no-go option will negate all benefits, risks and possible impacts of the proposed project, should it be considered.

6 ADMINISTRATIVE, LEGAL AND POLICY REQUIREMENTS

To protect the environment and achieve sustainable development, all projects, plans, programmes and policies deemed to have adverse impacts on the environment require an environmental assessment, as per the Namibian legislation. The legislation and standards provided Table 6-1 to Table 6-4 govern the environmental assessment process in Namibia and/or are relevant to the facility.

Table 6-1 Namibian law applicable to the facility and related operations

Law	Key Aspects
The Namibian Constitution	<ul style="list-style-type: none"> ◆ Promote the welfare of people ◆ Incorporates a high level of environmental protection ◆ Incorporates international agreements as part of Namibian law
Environmental Management Act Act No. 7 of 2007, Government Notice No. 232 of 2007	<ul style="list-style-type: none"> ◆ Defines the environment ◆ Promote sustainable management of the environment and the use of natural resources ◆ Provide a process of assessment and control of activities with possible significant effects on the environment
Environmental Management Act Regulations Government Notice No. 28-30 of 2012	<ul style="list-style-type: none"> ◆ Commencement of the Environmental Management Act ◆ List activities that requires an environmental clearance certificate ◆ Provide Environmental Impact Assessment Regulations
Local Authorities Act Act No. 23 of 1992, Government Notice No. 116 of 1992	<ul style="list-style-type: none"> ◆ Define the powers, duties and functions of local authority councils ◆ Regulates discharges into sewers

Law	Key Aspects
Public and Environmental Health Act Act No. 1 of 2015, Government Notice No. 86 of 2015	<ul style="list-style-type: none"> ◆ Provides a framework for a structured more uniform public and environmental health system, and for incidental matters ◆ Deals with Integrated Waste Management including waste collection disposal and recycling; waste generation and storage; and sanitation
Petroleum Products and Energy Act Act No. 13 of 1990, Government Notice No. 45 of 1990	<ul style="list-style-type: none"> ◆ Regulates petroleum industry ◆ Makes provision for impact assessment ◆ Petroleum Products Regulations (Government Notice No. 155 of 2000) ◆ Prescribes South African National Standards (SANS) or equivalents for construction, operation and decommissioning of petroleum facilities (refer to Government Notice No. 21 of 2002)
Labour Act Act No 11 of 2007, Government Notice No. 236 of 2007	<ul style="list-style-type: none"> ◆ Provides for Labour Law and the protection and safety of employees ◆ Labour Act, 1992: Regulations relating to the health and safety of employees at work (Government Notice No. 156 of 1997)
Atmospheric Pollution Prevention Ordinance Ordinance No. 11 of 1976	<ul style="list-style-type: none"> ◆ Governs the control of noxious or offensive gases ◆ Prohibits scheduled process without a registration certificate in a controlled area ◆ Requires best practical means for preventing or reducing the escape into the atmosphere of noxious or offensive gases produced by the scheduled process
Hazardous Substances Ordinance Ordinance No. 14 of 1974	<ul style="list-style-type: none"> ◆ Applies to the manufacture, sale, use, disposal and dumping of hazardous substances as well as their import and export ◆ Aims to prevent hazardous substances from causing injury, ill-health or the death of human beings
Pollution Control and Waste Management Bill (draft document)	<ul style="list-style-type: none"> ◆ Not in force yet ◆ Provides for prevention and control of pollution and waste ◆ Provides for procedures to be followed for licence applications
Road Traffic and Transport Act Act No. 52 of 1999 Government Notice No. 282 of 1999	<ul style="list-style-type: none"> ◆ Provides for the control of traffic on public roads and the regulations pertaining to road transport
Road Traffic and Transport Regulations Government Notice No 53 of 2001	<ul style="list-style-type: none"> ◆ Prohibits the transport of goods which are not safely contained within the body of the vehicle; or securely fastened to that vehicle, and which are not properly protected from being dislodged or spilled from that vehicle
Foreign Investment Act 27 of 1990 (as amended by Foreign Investment Amendment Act 24 of 1993)	<ul style="list-style-type: none"> ◆ Provides for the promotion of foreign investment in Namibia ◆ Considers environmental impacts associated with foreign investments.

Table 6-2 Municipal by-laws, guidelines and regulations

Municipal By-laws, Guidelines or Regulations	Key Aspects
Integrated Urban Spatial Development Framework for Walvis Bay	<ul style="list-style-type: none"> ◆ Overall vision to transform Walvis Bay to being the primary industrial city in Namibia

	<ul style="list-style-type: none"> ◆ Aims to ensure that appropriate levels of environmental management is enforced for all developments in Walvis Bay
Integrated Environmental Policy of Walvis Bay (Agenda 21 Project)	<ul style="list-style-type: none"> ◆ Indicates the directions that the Municipality of Walvis Bay will move towards in the forthcoming years to fulfil its responsibilities to manage the environment of Walvis Bay together with the town's residents and institutions ◆ Strong focus on conservation and protection of environment
Municipal By-law 19 and 20 on Effluents Entering Sewers	<ul style="list-style-type: none"> ◆ Regulates the discharge of effluent into sewers and prohibits the introduction of certain wastes or products including steam into the sewers system.
Town Planning Scheme No. 35	<ul style="list-style-type: none"> ◆ Manages and regulates development related to land use ◆ Proposes and identifies areas for specific future land use

Table 6-3 Relevant multilateral environmental agreements

Agreement	Key Aspects
Stockholm Declaration on the Human Environment, Stockholm 1972	<ul style="list-style-type: none"> ◆ Recognizes the need for a common outlook and common principles to inspire and guide the people of the world in the preservation and enhancement of the human environment
1985 Vienna Convention for the Protection of the Ozone Layer	<ul style="list-style-type: none"> ◆ Aims to protect human health and the environment against adverse effects from modification of the Ozone Layer are considered ◆ Adopted to regulate levels of greenhouse gas concentration in the atmosphere
United Nations Framework Convention on Climate Change (UNFCCC)	<ul style="list-style-type: none"> ◆ The Convention recognises that developing countries should be accorded appropriate assistance to enable them to fulfil the terms of the Convention

Table 6-4 Standards or codes of practise

Standard or Code of practise	Key Aspects
International Dangerous Goods Code (IMDG Version 10 of 2010)	<ul style="list-style-type: none"> ◆ For handling and storage of dangerous cargo
Various Seafaring Codes and Standards	<ul style="list-style-type: none"> ◆ The transport of cargo at sea is regulated by numerous codes and standards. Key to the Proponent are those pertaining to the loading and transport of cargo like the International Convention for the Safety of Life at Sea (SOLAS), 1974 which has the regulations: <ul style="list-style-type: none"> ○ Chapter VI - Carriage of cargoes ○ Chapter VII - Carriage of dangerous goods

No listed activities as per the Environmental Management Act is triggered for the handling and storage of metal ores. The only Namibian legislation pertaining to the metal ores in question is the Namibian Labour Act's regulations that provides time weighted average exposure limits for some dust producing materials. The Road Traffic and Transport Act Regulations regulate transport in general. This pertains mainly to axel loads and covering of all loads to prevent fly-off.

7 ENVIRONMENTAL CHARACTERISTICS

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

7.1 LOCALITY AND SURROUNDING LAND USE

The facility is located on erf 4409, at the corner of 18th Road and 4th Street East, within the industrial area of Walvis Bay (22.944768°S, 14.509367°E). The erf is zoned for industrial use with the primary use including “warehouse” and “storage premises”. The property is neighboured to the north, east and south by activities of an industrial nature (Figure 7-1).

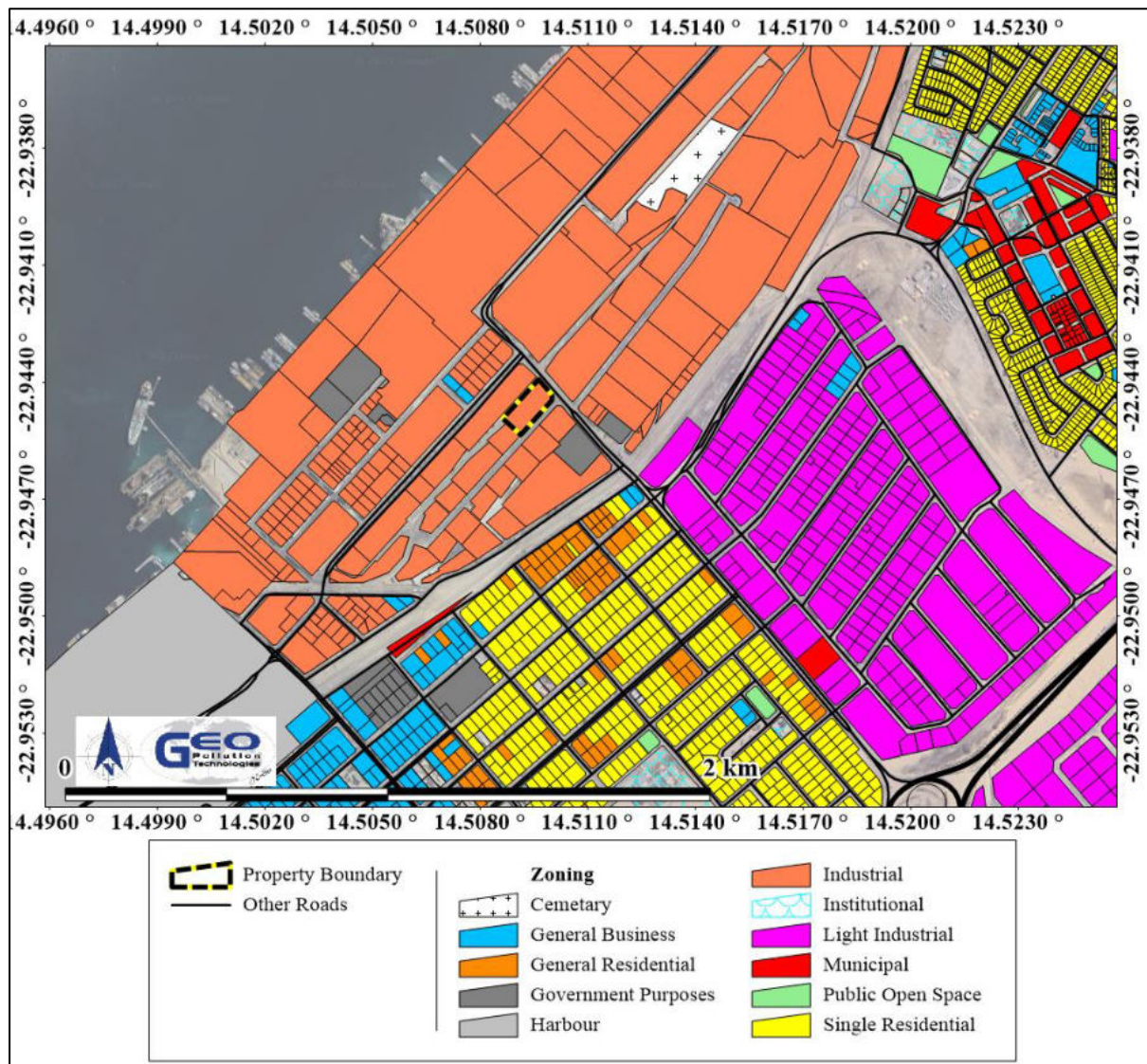


Figure 7-1 Site and surrounding property zoning

Implications and Impacts

The site itself is situated in an area intended for industrial use. Activities surrounding the site is of similar nature. However, consent use will be applied for from the local municipality. All storage and handling activities will take place within the warehouse to ensure impacts on neighbours are minimised. Operations may increase traffic within the area.

7.2 CLIMATE

Namibia's climate is dominated by dry conditions for most of the year and particularly so in the west. The location of Namibia with respect to the Intertropical Convergence Zone, Subtropical

High Pressure Zone and Temperate Zone is what determines the climate, with the Subtropical High Pressure Zone being the major contributor to the dry conditions (Atlas of Namibia Project, 2002; Bryant, 2010), see Figure 7-2.

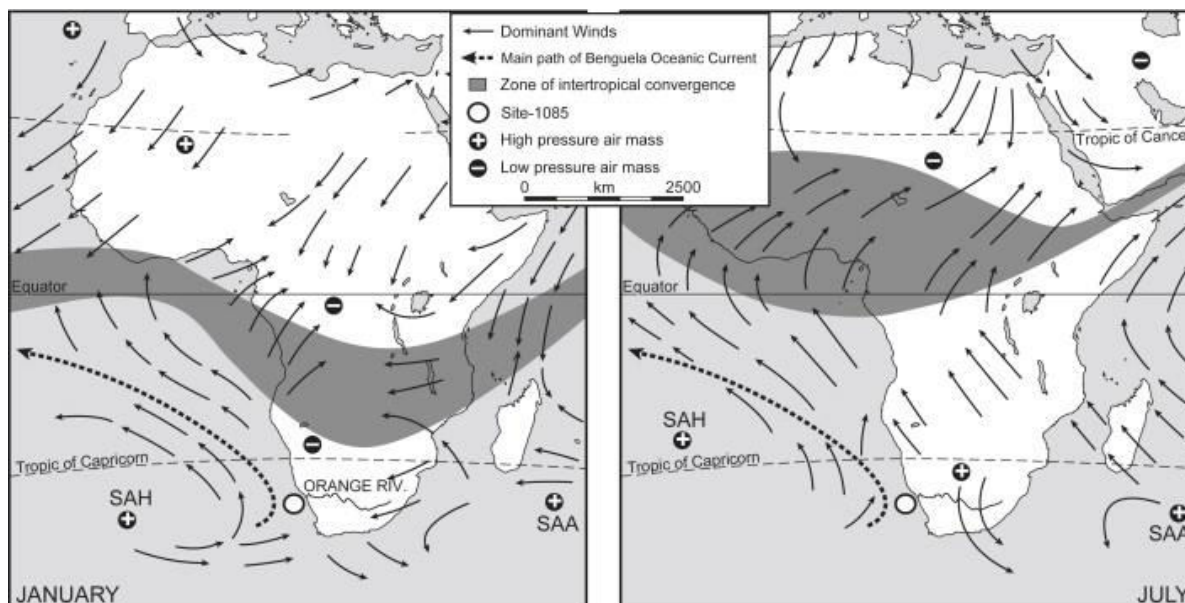


Figure 7-2 Map indicating the Intertropical Convergence Zone, Subtropical High Pressure Zone (SAH+), Benguela Current and Temperate Zone south of Tropic of Capricorn (not indicated) (from: <http://www.meteoweb.eu>)

Precipitation over Namibia is mainly controlled by the South Atlantic High (SAH), a high pressure cell (anticyclone) situated west of Namibia in the Subtropical High Pressure Zone. The SAH shifts during the year and is at higher latitudes in winter and lower latitudes in summer. In winter, as a result of being situated more north, the high pressure cell pushes any moisture originating from the Intertropical Convergence Zone northwards, preventing rain over Namibia. In summer, because the high pressure cell moves further south, and has less of an effect on the Intertropical Convergence Zone, moist air reaches Namibia, resulting in summer rains.

Studies indicate the presence of a thermal inversion layer at Walvis Bay. Originally this was thought to be at approximately 500 mamsl (Taljaard and Schumann 1940), but recent studies indicate it as low as 200 mamsl (Patricola and Chang, 2017; Corbett, 2018). A marine atmospheric boundary layer (MBL) exists offshore of the coastline that thins from more than 500 mamsl to 200 mamsl as it nears the coast (Figure 7-3). The MBL is a layer of cool, well-mixed, stable air that is capped by a thermal inversion (Patricola and Chang, 2016; Corbett 2018). This thermal layer or inversion layer will prevent the escape of pollutants such as smoke higher into the atmosphere. The MBL however contribute to high velocity wind speeds by funnelling the winds created by the SAH, resulting in what is referred to as the Benguela Low-Level Coastal Jet (Figure 7-3). Since the MBL overlap partially with the coastal plain, the wind generated by the Benguela Low-Level Coastal Jet also reaches inland, but diminishes relatively quickly further inland.

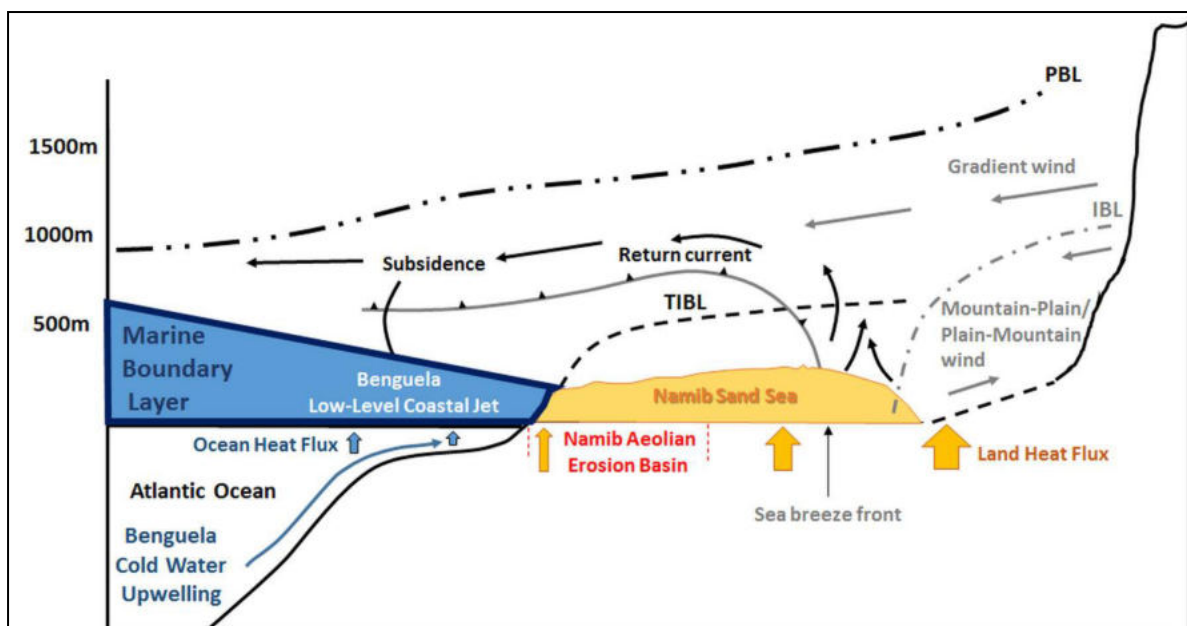


Figure 7-3 Marine atmospheric boundary layer (from: Corbett, 2018)

On a more localised scale, the climatic conditions on the central Namibian coast, and inland thereof (coastal plains), are strongly influenced by the cold Benguela Current, the SAH and the relatively flat coastal plains that are separated from the central highlands by a steep escarpment.

The anticlockwise circulation of the high pressure SAH and the action of the earth's Coriolis force results in strong southerly (longshore) winds blowing northwards up the coastline of Namibia (Bryant, 2010; Corbett, 2018). This longshore wind is responsible for upwelling of the cold, deep waters of the Benguela Current. As a result of the temperature difference between the cold surface water of the Benguela Current and the warm coastal plains, the southerly wind is diverted to a south south-westerly to south-westerly wind along the coast. At Walvis Bay the temperature gradient that forms over the warmer darker sands south of the Kuiseb River, compared with the cooler, lighter coloured gravel plain to the north of the river, leads to the formation of cyclonic circulation (localised low-pressure systems) centred over the dune area, due to warm air that rises over the dune area. This, together with topographical changes and land-use, causes a local deflection of wind flow over the Walvis Bay area, from south to southwest in Walvis Bay (Figure 7-4), to more southwest to westerly further inland, as well as reduced wind speeds. The more low speed, westerly winds are for example experienced at the Walvis Bay Airport (Rooikop).

The winds are strongest in early to mid-summer (September to January) when the SAH is at its strongest and most persistent, and the temperature difference between the sea and the desert plains are at its greatest. Wind speeds then occasionally exceed 32 km/hr and usually peaks late morning to early afternoon. In winter, the SAH loses strength and the southerly to south-westerly winds are at their weakest. Winter winds do not have enough strength to reach far inland. Autumn to winter conditions do however promote the formation of east wind conditions (berg winds) that can reach speeds of more than 50 km/hr and transport a lot of sand. East winds occur when the inland plateau is cold with a localised high pressure cell, while a low pressure system is present at the coast. The high pressure cell forces air off the escarpment and as the air descends, it warms adiabatically as well as create a low pressure system due to the vertical expansion of the air column. The warm air flows toward the coastal low and as it passes over the Namib plains, it heats up even further. The wind manifests itself as very strong, warm and dry wind during the mornings to early afternoon, but dissipate in the late afternoon.

Throughout the year the prevailing night time regional wind is a weak easterly wind. This results when the mainland cools to below the temperature of the coastal water. This results in a coastal low versus an onshore high pressure system with first no wind in the early evening, when

temperatures between water and land is similar, and then weak easterly winds as the temperature difference increase. Wind within the MBL remains dominated by the Benguela Low-Level Coastal Jet, causing a localised southerly wind over Walvis Bay, see Figure 7-4.

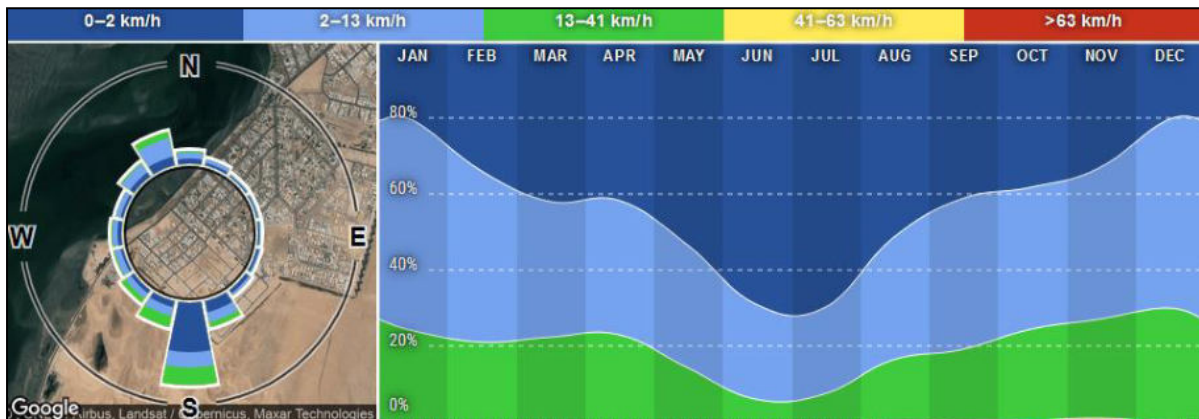


Figure 7-4 Wind direction and strength at the Walvis Bay Lagoon as measured between 2013 and 2020 (from: www.windfinder.com/windstatistics/walvis_bay_airport)

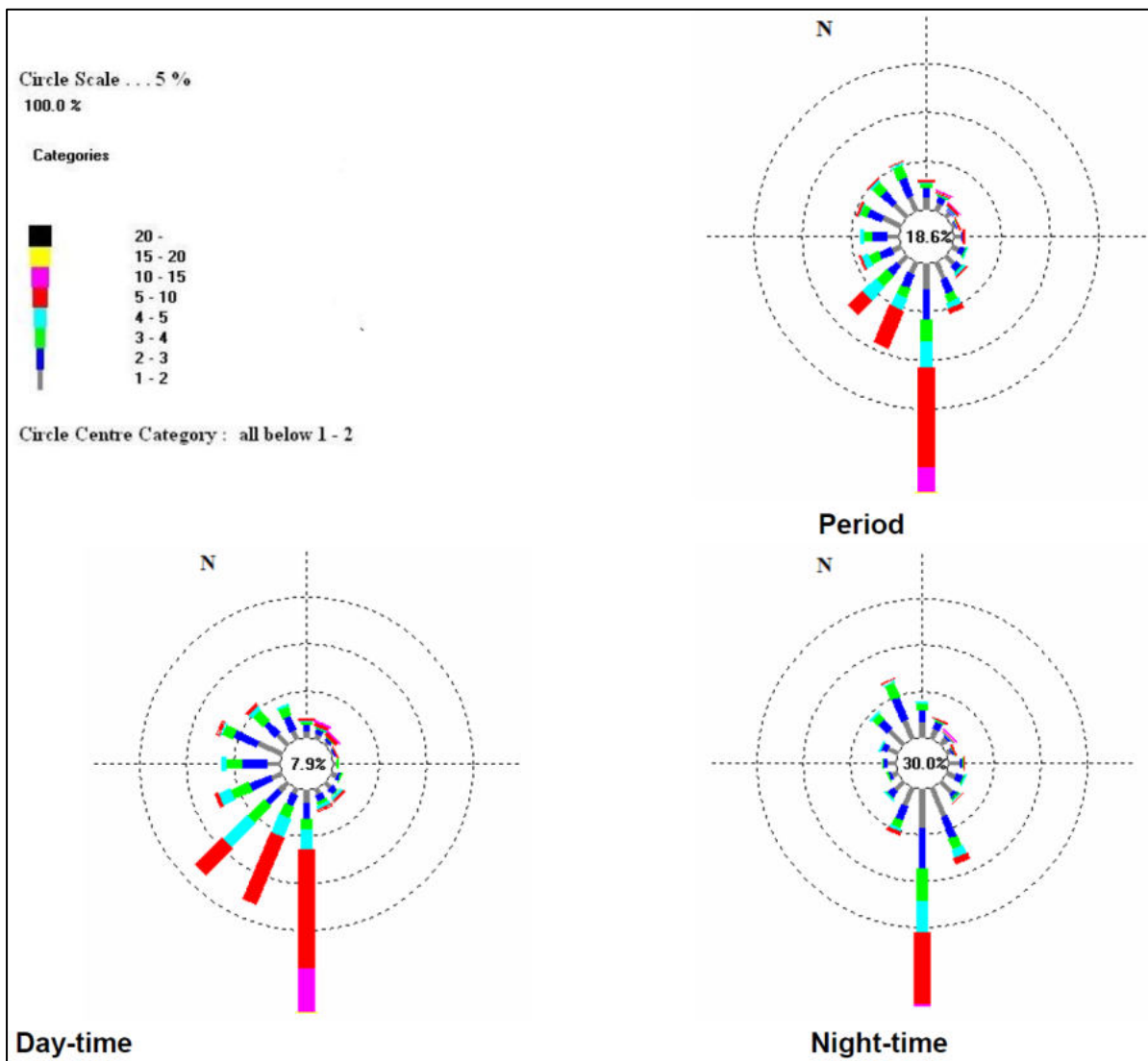


Figure 7-5 Period, daytime and night-time wind roses for Walvis Bay town for the period 2006 (Petzer, G. & von Gruenewaldt, R., 2008)

Temperature at Walvis Bay is strongly regulated by the cold Benguela current. As a result, there is typically limited variation between diurnal and seasonal temperatures. Average annual temperatures are approximately 18 °C to 19 °C with the maximum temperature seldom above 30 °C and minimums rarely below 5 °C (Figure 7-6). The only real temperature extremes are experienced during east wind conditions in the autumn to early winter months when temperatures can reach the upper thirties or even low forties. This results in these months having an average maximum temperature ranging from 30 °C to 35 °C. As one moves inland from Walvis Bay, daytime temperatures increase rather quickly while night time temperatures can get significantly colder in the desert environment.

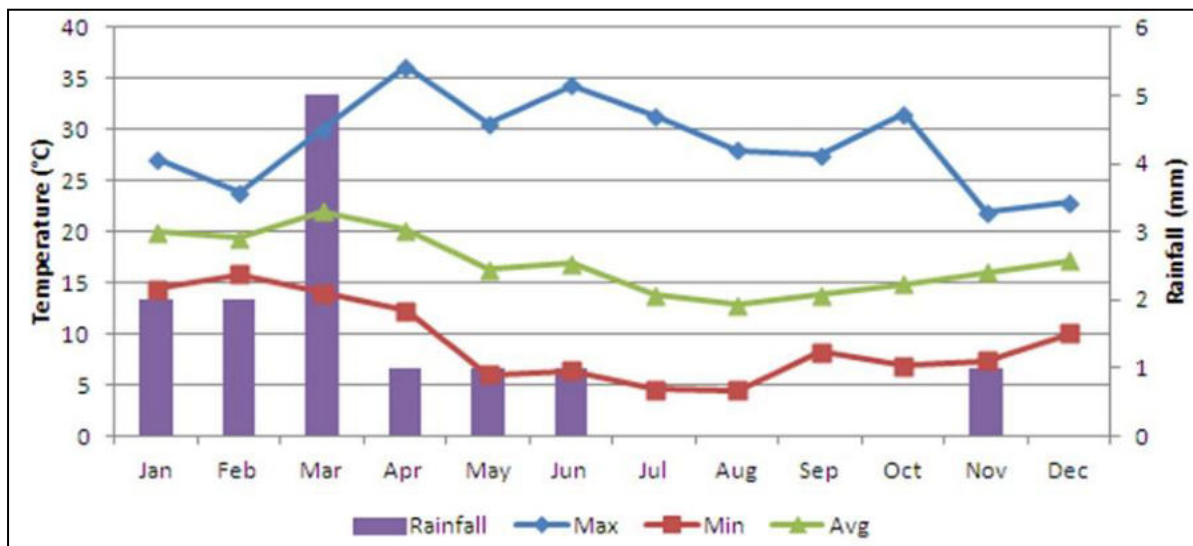


Figure 7-6 Temperature and rainfall at Walvis Bay (from: uMoya-NILU, 2020)

As explained above, the SAH severely limits the amount of rainfall over Namibia and especially at the coast and over the Namib Desert. As such, the average annual rainfall in Walvis Bay is below 50 mm (Figure 7-6), with 100% variation in annual rainfall. Infrequent, heavy rainfall does occur and typically results in rather chaotic conditions as Walvis Bay, and other coastal towns, has not been developed to cater for large volumes of storm water. Fog plays a very significant role as source of water for many plants and animals along Namibia's coast and the Namib Desert. Walvis Bay has up to 900 hours of fog per year and it results from the cold Benguela water cooling the humid air above it to such a temperature that the water vapour condenses to form fog and low level clouds (Mendelsohn et al., 2002).

Implications and Impacts

The strong westerly to south-westerly winds in Walvis Bay will carry any dust on site for great distances. Dust plumes may have potential health impacts (humans and animals) as well as cause damage to infrastructure and create a negative visual impact. Prevailing winds are away from any residential areas.

Heavy rainfall does not occur frequently but in such an event, metal ore dusts and other potential pollutants such as spilled hydrocarbons, may be washed off site and enter the environment. Infrastructure damage can also occur.

Strong winds on site can cause damage to infrastructure not constructed or anchored to withstand them.

7.3 CORROSIVE ENVIRONMENT

Walvis Bay is located in a very corrosive environment, which may be attributed to the frequent salt-laden fog, periodic winds and abundance of aggressive salts (dominantly NaCl and sulphates) in the soil. The periodic release of hydrogen sulphide (H₂S) from the ocean is expected to contribute to corrosion. See Figure 7-7 for corrosion comparison data with other centres.

The combination of high moisture and salt content of the surface soil can lead to rapid deterioration of subsurface metal (e.g. pipelines) and concrete structures. Chemical weathering of concrete structures due to the abundant salts in the soil is a concern.

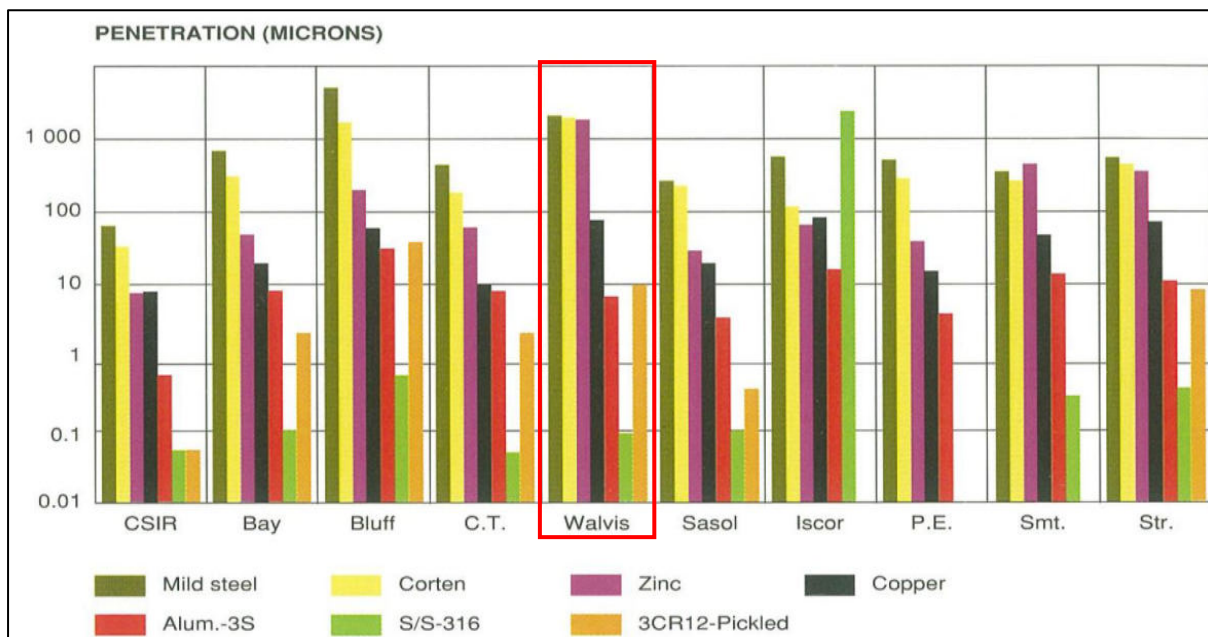


Figure 7-7 Twenty year corrosion exposure results in southern African towns (Callaghan 1991)

Implications and Impacts

Corrosion levels may be high and must be kept in mind when planning the construction and maintenance of the facility and related infrastructure. Goods will not remain on site for prolonged periods of time or in the open, thereby reducing their risk to corrode on site.

7.4 TOPOGRAPHY AND DRAINAGE

Walvis Bay is located in the Central Western Plain of Namibia. The Kuiseb River forms the southern boundary of this landscape group, with the Namib Dune Field being present south of the Kuiseb River. A bay is formed by a peninsula commonly known as Pelican Point. On the southern part of the bay is a lagoon which used to be the mouth of the Kuiseb River. Dune migration however forced the flow of the Kuiseb River to the north. This flow was stopped through the construction of a flood control wall to prevent flooding of the town of Walvis Bay, thus forcing the flood waters to move through the dune area to the lagoon. The Kuiseb River now rarely reaches the lagoon.

The topography on site and surroundings have been levelled in order to support development. Surface flow is thus highly influenced by anthropogenic activity. See Figure 7-8 for the surface drainage of the area. In general, drainage in the Walvis Bay area is poorly developed due to the lack of rainfall <50 mm/annum received. A dune field is present southeast of Walvis Bay and also further to the northeast. These dunes generally migrate in a northerly direction. Further inland is the gravel plains of the central areas of the Namib Naukluft Park. Surface water around Walvis Bay is limited to the marine salt pans, lagoon and ocean as well as a man-made wetland formed as a result of the sewage treatment works.

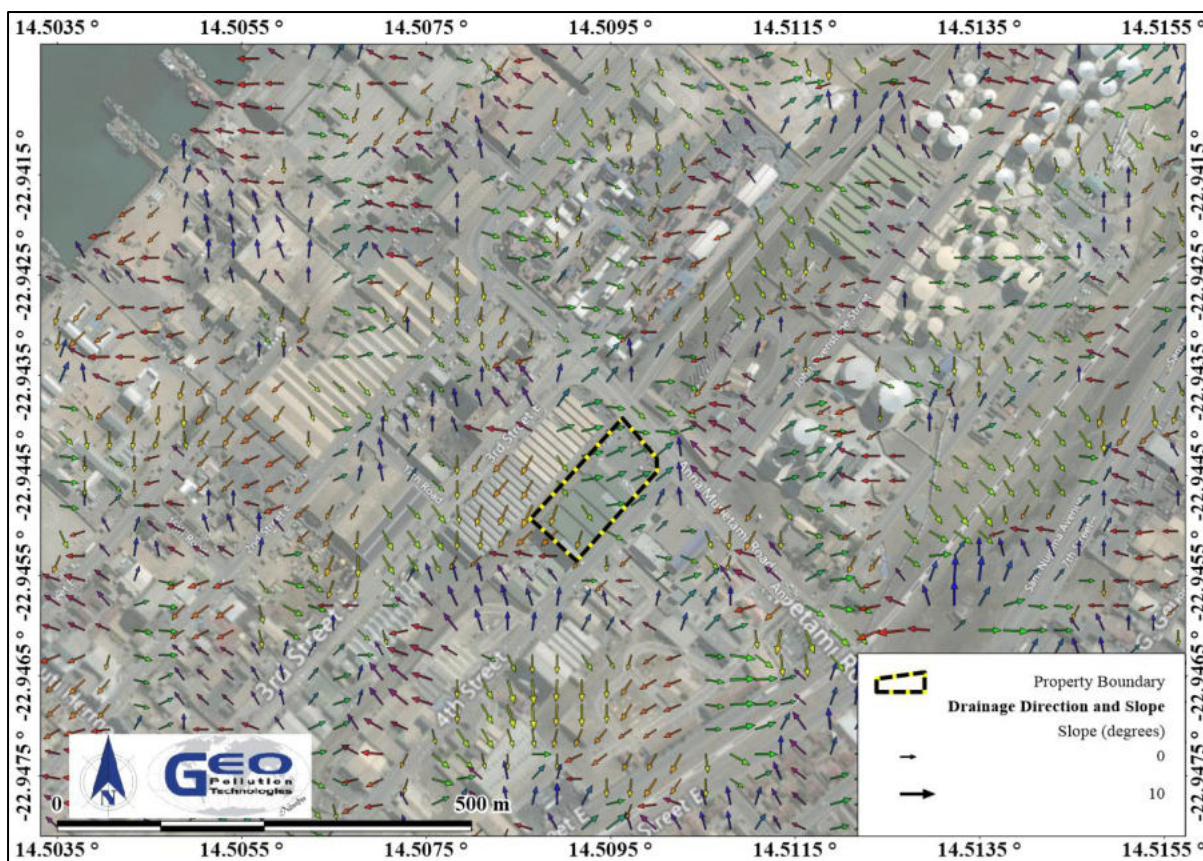


Figure 7-8 Drainage direction and slope

Implications and Impacts

Any pollutants that are not contained and are transported via surface water flow may be transported out of the site to the surrounding environment. Therefore, the storage of hazardous substances must be strictly controlled according to industry best practise requirements.

7.5 GEOLOGY AND HYDROGEOLOGY

Walvis Bay is located in the Central Western Plain of Namibia. The Kuiseb River forms the southern boundary of this landscape group, with the Namib Dune Field being present south of the Kuiseb River. Northerly dune migration is forcing the Kuiseb River in a northerly direction, with Kuiseb River paleochannels being present as far south as Sandwich Harbour.

Following the breakup of West-Gondwana during the early Cretaceous (130 – 135 Ma ago), continental uplift took place, enhancing erosional cutback and the formation of the Namibian Escarpment. A narrow pediplain formed, mainly over Damara Age rocks. The South Central started filling in over the pediplain, with marine conditions established around 80 Ma ago. Towards the end of the Cretaceous (70 – 65 Ma ago) a relative level surface was created, on which later deposition of sediments took place. Marine deposition took place in the parts covered by the newly formed South Central Ocean, while terrestrial deposits took place on land. Further continental uplift moved the shoreline to its present position.

Northwards migration of sand covered parts of the exposed marine deposits, with Kuiseb floods also depositing material over the marine sediments. Depth to bedrock in Walvis Bay is expected to be deeper than 40 m below surface. Based on previous work conducted in the area, it is expected that the sediments under the project area would consist of medium to coarse grain sand with thin lenses of more clayey material and layers of shell material.

Groundwater in the area is expected less than 2 m below surface and most probably related to seawater intrusion. Shallow freshwater lenses might be present. The origin of these freshwater

lenses would mostly be freshwater leakages from the water supply reticulation as well as from the semi purified ponds present near the effluent treatment works.

Implications and Impacts

Groundwater is not utilised in the area. Pollution of the groundwater is however still prohibited. Adherence to Namibian law or better in relation to correct handling and storage of hazardous substances, and spill control structures installed and maintained where hazardous substances are stored and handled will successfully prevent pollution of groundwater, surface water or soil. Shallow groundwater may lead to rapid lateral spreading of contaminants. This may further have potential impact on underground utilities and may cause impacts on neighbouring properties.

7.6 PUBLIC WATER SUPPLY

Public water supply to Walvis Bay and the surrounding developments is provided by NamWater from the NamWater Kuiseb Water Supply Scheme.

Implications and Impacts

Groundwater is saline and not used as potable water source. No potential contamination impact on water supply is thus expected. Water usage by the facility will be mainly for domestic use and possibly for dust suppression, but is not expected to have a negative impact on public water supply.

7.7 FAUNA AND FLORA

The site is located within an industrial area which has previously been cleared of all vegetation. Of note nearby (3.5 km southwest) is the Walvis Bay Lagoon, the salt works and the southern part of the bay west of the lagoon, which are the key components of the 12,600 ha Ramsar site (Wetland of International Importance). It is important both as an over-wintering area for Palaearctic migrant wader species as well as for African species such as Greater and Lesser Flamingos, Great White Pelican and Chestnut-Banded Plovers.

The sewerage ponds, situated about 2.4 km south-southeast of the facility, are regarded as sensitive manmade wetlands. Although a manmade fresh water source, they are an attraction for pelicans and flamingos. These wetlands also support 53% of the duck and geese population in the area. The wetland is formed by the constant inflow of semi-purified water and supports extensive stands of reeds. There is also a flight path for birds between the sewerage ponds, the lagoon and the offshore bird breeding platform (Ghwano Island) 7.9 km northeast of the site. The site is near the flight paths for the three major habitats (lagoon, sewage ponds and Ghwano Island).

Implications and Impacts

The facility is located within an already disturbed industrial area. Thus no immediate threat to biodiversity in the area is expected, however, uncontrolled pollution may and can cause damage to any biodiversity surrounding the site. Bright lighting may also negatively affect birds flying at night and may cause disorientation and collisions.

7.8 DEMOGRAPHIC AND ECONOMIC CHARACTERISTICS

At local level Walvis Bay has an urban population size of 62,096 (Namibia Statistics Agency, 2014) although the current estimate is around 90,000 to 100,000. Walvis Bay is the principal port of Namibia, and is an import/export facility for processed fish, mining products and beef. The area is linked to Namibia's air, rail and road network, making its port well situated to service Zambia, Zimbabwe, Botswana, Southern Angola and South Africa. The fishing industry is the major employer of low skilled workers on a permanent and seasonal basis. The total employment of this sector is estimated at 2% of the total Namibian workforce.

Table 7-1 Demographic characteristics of Walvis Bay, the Erongo Region and Nationally (Namibia Statistics Agency, 2011)

	Walvis Bay	Erongo Region	Namibia
Population (Males)	30,500*	79,823	1,021,912
Population (Females)	29,000*	70,986	1,091,165
Population (Total)	62,096	150,809	2,113,077
Unemployment (15+ years)	30%	22.6%	33.8%
Literacy (15+ years)	99%	96.7%	87.7%
Education at secondary level (15+ years)	86%	71.8%	51.2%
Households considered poor	Not available	5.1%	19.5%

Implications and Impacts

The facility will provide additional employment to people from the area. Some skills development and training will benefit employees during the operational phase. Operations may have further stimulate economic growth of the area and region which may result in more job opportunities.

7.9 HERITAGE, CULTURAL AND ARCHAEOLOGICAL ASPECTS

There are no church, mosques or related buildings in close proximity to the site. No known archaeological resources have been noted in the vicinity since the urbanisation of the area. No other structures, sites or spheres of heritage of cultural significance was determined to be in close proximity to the site.

8 PUBLIC CONSULTATION

Consultation with the public forms an integral component of an environmental assessment investigation and enables interested and affected parties (IAPs) e.g. neighbouring landowners, local authorities, environmental groups, civic associations and communities, to comment on the potential environmental impacts associated with projects and to identify additional issues which they feel should be addressed in the environmental assessment.

Public participation notices were advertised twice for two weeks in the national papers: Republikein and Namibian Sun on 18 and 25 April 2023. A site notice was placed at erf 4409. Interested and affected parties were identified and notified of the project. Notification letters were hand delivered to available neighbours as well as the Municipality of Walvis Bay. See Appendix A for proof of the public participation processes. No one registered as IAP for the project and no concerns regarding the project were raised during the public consultation phase.

9 MAJOR IDENTIFIED IMPACTS

During the scoping exercise a number of potential environmental impacts have been identified. The following section provides a brief description of the most important of these impacts.

9.1 SOCIO-ECONOMIC IMPACTS

Operations of the Proponent will sustain and provide employment opportunities to residents of Walvis Bay. The operational phase will create additional permanent employment opportunities and some training and skills development will take place. Successful implementation of the project is hinged on continued employment of labourers. Continued employment of individuals increases their economic stability which in turn increases their economic resilience.

Additional revenue will be generated by the proposed operations and contributions will be made to the local, regional and national economy. The optimisation in the use of the land will change the revenue produced and paid to the national treasury. Additional revenue will be generated though employment, exporting of goods and use of services.

9.2 ENVIRONMENTAL CONTAMINATION

During the storage and handling of metal ores and industrial cargo at the site, as well as during transportation thereof, contamination of the environment may occur if product containment fails or as a result of windblown dust. For major spills, or as a result of long term contamination by windblown dust, the environment can negatively be impacted. Discoloration of soil and infrastructure can also occur. The risk of this impact occurring is mainly associated with aspects such as bulk bag failure, bulk bag damage during handling (e.g. by the forklift), trucks overturning, transporting bulk cargo uncovered (e.g. bulk ore transport in side tipper trucks and skips), or if the wind carry dust from the stockpiles to the outside of the warehouse when the doors are open. These risks could however be mitigated and prevented by strict adherence to all international best practise standards or guidelines.

9.3 NOISE IMPACTS

Noise pollution will exist due to heavy vehicles accessing the site to deliver and collect product, as well as the use of forklifts, frontend loaders, reach stackers and related machinery that may make use of audible warning sounds. However, the majority of operations will be within the warehouse which will act as a noise barrier. The facility is also situated in an industrial area which, within reasonable limits, allows for noisy activities.

9.4 AIR QUALITY RELATED HEALTH IMPACTS

Hazard and health impact information of pure or near pure elements and compounds are relatively freely available. On the other hand, determining the potential dangers of metal ores to health and the environment is difficult as the ore is a mixture of the main metal of interest and a variety of gangue material. Ultimately, there will be a number of factors that will determine the level of exposure. These include:

- ◆ Workers vs. neighbours/passers-by: Workers within the warehouse may potentially be exposed to dust at all times of offloading and loading. Neighbours and passers-by will only be exposed to dust should dust containment not be sufficient, or if accidental product loss occur outside the warehouse (e.g. torn bag during lifting with forklift).
- ◆ The volume and particle size of the wind dispersible dust present in the product.
- ◆ The concentration of actual hazardous/dangerous material in the dust.
- ◆ The strength and direction of the wind.
- ◆ The effectiveness of dust control measures (i.e. dust suppression, use of tarpaulins, wind breaks, etc.).

Table 9-1 provides an overview of the key characteristics of the different cargo types planned to be handled on site. It should be noted that the table is not meant to be an exhaustive list of all the potential hazards, incompatibilities, etc., but only to act as a rough guide. Some major hazards or incompatibilities are however highlighted. For all products, their respective MSDS documentation should at minimum be adhered to. Where a MSDS is not available for specifically the metal ores, the mine from where the ore originates should be able to provide guidance on handling and storage of the ore according to their standard operating procedures and EMP. Although the Health and Safety Regulations of the Namibia Labour Act provides exposure limits, based on the Occupational Safety and Health Administration (OSHA) permissible exposure limits (PEL), for some of the chemicals/elements, they are likely outdated and above accepted or recommended international levels. Therefore the National Institute for Occupational Safety & Health (NIOSH) recommended exposure limits (REL) are instead provided.

Table 9-1 Cargo to be stored and handled on erf 4409

Cargo Type	Health Impacts	Environmental Hazard	Incompatibility	Flammability	Exposure Limits*
Import					
Sulphur	Irritant When hydrogen sulphide is produced (upon combustion) the gas can be lethal.	Toxic in aquatic environments and as hydrogen sulphide gas.	Chlorates, Nitrates, Oxidisers, carbides, halogens, phosphorus and heavy metals.	Flammable and explosive if significant quantities of dust is airborne.	NIOSH REL for hydrogen sulphide is 15 mg/m ³ (for 10 minutes)
Sodium Metabisulphite	Irritant and toxic if ingested. Produce dangerous gases if heated.	Harmful to aquatic life.	Keep away from heat sources.	Not flammable.	NIOSH REL 5 mg/m ³
Magnesium oxide	Irritant. Very fine magnesium oxide dispersed in air (known as magnesium oxide fume) can cause metal fume fever if inhaled at concentrations of more than 15 mg/m ³ (TWA).	Not considered toxic, but should not enter aquatic habitats.	Chlorine trifluoride and phosphorus pentachloride. Keep away from heat sources.	Not flammable.	Namibian 10 mg/m ³ (as a fume)
Export					
Manganese ore	Most metals in its elemental form can become toxic if ingested in too high quantities. Reaching of levels detrimental to health, for any of the metals in the ores proposed to be handled on erf 4409, is limited to workers inside the warehouse, if suitable personal protective equipment such as respirators, overalls, etc. is not worn at all times. Since the ores	The ores are not considered toxic to the terrestrial environment per se, but spillages of ore may negatively impact habitats at site of the spill. Aquatic environments are more vulnerable as elements and compounds contained in the ore can become dissolved in the	The ore will at all times be segregated by the Proponent since cross-contamination of ores are not desired by their clients.	Very fine dusts, if dispersed in air as fine particles and in high quantities can become flammable.	NIOSH REL 1 mg/m ³
Copper ore, concentrates and cathodes					NIOSH REL 1 mg/m ³
Nickel ore					NIOSH REL 0.015 mg/m ³
Lithium ore					OSHA 5 mg/m ³

Cargo Type	Health Impacts	Environmental Hazard	Incompatibility	Flammability	Exposure Limits*
Chrome ore	also contain gangue materials, the specific types not necessarily known, dust generated from the ores per can cause health effects. Some examples include the inhalation of silicates or asbestos which are carcinogenic. Nickel as an element is considered a potential carcinogen.	water column and can accumulate or magnify in the food chain.			NIOSH REL 0.5 mg/m ³
Zinc ore					As Zinc Oxide - NIOSH REL 5 mg/m ³
Cobalt hydroxide	A very toxic substance, especially if inhaled (among others carcinogenic).	Very toxic to aquatic life.	Keep dry, sealed and away from heat sources.	Fine dusts may ignite spontaneously.	NIOSH REL 0.05 mg/m ³

*For metal ores and cobalt hydroxide, the NIOSH REL for the elemental form of the metal are provided as no REL (or other exposure limits) for the ores are available. All values are time weighted averages (TWA) which is exposure over an eight hour period, except where stated otherwise. Where no NIOSH REL is available, the Namibian limit or OSHA permissible exposure limit (PEL) for respirable particulates (dust) are provided.

In addition to possible ore dust impacts, exhaust gases of trucks may also deteriorate air quality in town. Exhaust gases typically contain nitrogen (67%), carbon dioxide (12%), water (11%), oxygen (9%) and pollutant emissions (1%) that include carbon monoxide, hydrocarbons, nitrogen oxides, sulphur dioxide and particulate matter (Resitoglu and Altinisik 2015). While carbon dioxide contributes to the greenhouse effect and climate change, it is the 1% pollutant emissions that are typically a health concern. Due to the frequent winds of Walvis Bay, these gases and particulate matter are expected to disperse quickly, but may accumulate during periods of no or very calm winds.

Apart from the metals in the ore dusts, the dust itself in respirable size (PM10) and thoracic size (PM2.5), as well as potential silicates and asbestos in the dust, can also impact on the health of workers and residents, should it not be successfully contained. Both silicates and asbestos are very carcinogenic, thus, even more so the need for zero dust emissions and compulsory wearing of respirators by employees working in close proximity to potential dust prone environments (e.g. inside warehouse).

9.5 TRAFFIC IMPACTS

The site is located within the industrial area of Walvis Bay. During existing operations cargo is transported to and from the warehouse with trucks. Proposed future operations are expected to result in increased traffic along 4th Street East and 18th Road which is already a high traffic area. Impacts relate to increased accidents, damaged road surfaces and pavements, congestion, and obstruction of entrances and exits of nearby properties. The nearby rail level crossing also presents potential traffic related impacts and increases the chances of accidents. The transport of goods throughout the country leads to additional traffic impacts in the town, the region and nationally.

9.6 FIRE

Potentially flammable substances are stored on site. By adhering to municipal and MSDS requirement and ensuring sufficient firefighting and preventative measures are in place, these impacts can be prevented. Metal ore dust is not flammable per se, but significant concentrations of very fine airborne dust can ignite. The likelihood of this occurring is low. Sulphur is however flammable and even explosive if fine dust is present. It reacts violently if exposed to an oxidiser. Dry sulphur is a static electricity accumulator which can cause ignition. Extinguishing a sulphur fire is difficult and it produces toxic hydrogen sulphide gas.

10 ASSESSMENT AND MANAGEMENT OF IMPACTS

The purpose of this section is to assess and identify the most pertinent environmental impacts that are expected from the operational, construction (also upgrades, maintenance, etc. – see glossary for “construction”) and potential decommissioning activities of the facility. An EMP based on these identified impacts are also incorporated into this section.

For each impact an Environmental Classification was determined based on an adapted version of the Rapid Impact Assessment Method (Pastakia, 1998). Impacts are assessed according to the following categories: Importance of condition (A1); Magnitude of Change (A2); Permanence (B1); Reversibility (B2); and Cumulative Nature (B3) (see Table 10-1).

Ranking formulas are then calculated as follow:

Environmental Classification = A1 x A2 x (B1 + B2 + B3).

The environmental classification of impacts is provided in Table 10-2.

The probability ranking refers to the probability that a specific impact will happen following a risk event. These can be improbable (low likelihood); probable (distinct possibility); highly probable (most likely); and definite (impact will occur regardless of prevention measures).

Table 10-1 Assessment criteria

Criteria	Score
Importance of condition (A1) – assessed against the spatial boundaries of human interest it will affect	
Importance to national/international interest	4
Important to regional/national interest	3
Important to areas immediately outside the local condition	2
Important only to the local condition	1
No importance	0
Magnitude of change/effect (A2) – measure of scale in terms of benefit / disbenefit of an impact or condition	
Major positive benefit	3
Significant improvement in status quo	2
Improvement in status quo	1
No change in status quo	0
Negative change in status quo	-1
Significant negative disbenefit or change	-2
Major disbenefit or change	-3
Permanence (B1) – defines whether the condition is permanent or temporary	
No change/Not applicable	1
Temporary	2
Permanent	3
Reversibility (B2) – defines whether the condition can be changed and is a measure of the control over the condition	
No change/Not applicable	1
Reversible	2
Irreversible	3
Cumulative (B3) – reflects whether the effect will be a single direct impact or will include cumulative impacts over time, or synergistic effect with other conditions. It is a means of judging the sustainability of the condition – not to be confused with the permanence criterion.	
Light or No Cumulative Character/Not applicable	1
Moderate Cumulative Character	2
Strong Cumulative Character	3

Table 10-2 Environmental classification (Pastakia 1998)

Environmental Classification	Class Value	Description of Class
72 to 108	5	Extremely positive impact
36 to 71	4	Significantly positive impact
19 to 35	3	Moderately positive impact
10 to 18	2	Less positive impact
1 to 9	1	Reduced positive impact
0	-0	No alteration
-1 to -9	-1	Reduced negative impact
-10 to -18	-2	Less negative impact
-19 to -35	-3	Moderately negative impact
-36 to -71	-4	Significantly negative impact
-72 to -108	-5	Extremely Negative Impact

10.1 RISK ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN

The EMP provides management options to ensure impacts of the facility is minimised. An EMP is a tool used to take pro-active action by addressing potential problems before they occur. This should limit the corrective measures needed, although additional mitigation measures might be included if necessary. The environmental management measures are provided in the tables and descriptions below. These management measures should be adhered to during the various phases of the operation of the facility. This section of the report can act as a stand-alone document. All personnel taking part in the operations of the facility should be made aware of the contents in this section, so as to plan the operations accordingly and in an environmentally sound manner.

The objectives of the EMP are:

- ◆ to include all components of construction activities (upgrades, maintenance, etc.) and operations of the facility;
- ◆ to prescribe the best practicable control methods to lessen the environmental impacts associated with the project;
- ◆ to monitor and audit the performance of operational personnel in applying such controls; and
- ◆ to ensure that appropriate environmental training is provided to responsible operational personnel.

Various potential and definite impacts will emanate from the operations, construction and decommissioning phases. The majority of these impacts can be mitigated or prevented. The impacts, risk rating of impacts as well as prevention and mitigation measures are listed below.

As depicted in the tables below, impacts related to the operational phase are expected to mostly be of low to medium significance and can mostly be mitigated to have a low significance. The extent of impacts are mostly site specific to local and are not of a permanent nature. Due to the nature of the surrounding areas, cumulative impacts are possible and include noise pollution and traffic impacts.

10.1.1 Planning

During the phases of planning for construction, operations and decommissioning of the facility, it is the responsibility of Proponent to ensure they are and remain compliant with all legal requirements. The Proponent must also ensure that all required management measures are in place prior to and during all phases, to ensure potential impacts and risks are minimised. The following actions are recommended for the planning phase and should continue during various other phases of the project:

- ◆ Ensure that all necessary permits from the various ministries, local authorities and any other bodies that governs the construction (maintenance) and operations of the facility are in place and valid.
- ◆ Ensure all appointed contractors and employees enter into an agreement which includes the EMP. Ensure that the contents of the EMP are understood by the contractors, sub-contractors, employees and all personnel present or who will be present on site.
- ◆ Make provisions to have a Health, Safety and Environmental Coordinator to implement the EMP and oversee occupational health and safety as well as general environmental related compliance at the site.
- ◆ Make provisions to have a community liaison officer on site who will handle complaints and community input, and through whom, where reasonable, monitoring data can be requested. Communicate the contact details of the community liaison officer to interested and affected parties when the project is initiated.
- ◆ Have the following emergency plans, equipment and personnel on site where reasonable to deal with all potential emergencies:
 - Risk management / mitigation / EMP/ Emergency Response Plan and HSE Manuals;
 - Adequate protection and indemnity insurance cover for incidents;
 - Comply with the provisions of all relevant safety standards;
 - Procedures, equipment and materials required for emergencies.

- ◆ If one has not already been established, establish and maintain a fund for future ecological restoration of the project site should project activities cease and the site is decommissioned and environmental restoration or pollution remediation is required.
- ◆ Establish and / or maintain a reporting system to report on aspects of construction activities, operations and decommissioning as outlined in the EMP.
- ◆ Prepare and submit environmental monitoring reports as per the conditions of the environmental clearance certificate.
- ◆ Appoint a specialist environmental consultant to update the EIA and EMP and apply for renewal of the environmental clearance certificate prior to expiry.

10.1.2 Skills, Technology and Development

During various phases of construction and operations, training will be provided to a portion of the workforce. Skills are transferred to an unskilled workforce for general tasks. The technology required for the development of the facility is often new to the local industry, aiding in operational efficiency. Development of people and technology are key to economic development.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Technological development and transfer of skills	2	1	2	3	1	12	2	Probable
Daily Operations	Technological development and transfer of skills	3	1	3	2	2	21	3	Definite
Indirect Impacts	Economic development	3	1	3	2	2	21	3	Definite

Desired Outcome: To see an increase in skills of local Namibians, as well as development and technology advancements in associated industries.

Actions

Enhancement:

- ◆ If the skills exist locally, contractors must first be sourced from the town, then the region and then nationally. Deviations from this practise must be justified.
- ◆ Skills development and improvement programs to be made available as identified during performance assessments.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Record should be kept of training provided.
- ◆ Ensure that all training is certified or managerial reference provided (proof provided to the employees) inclusive of training attendance, completion and implementation.
- ◆ Bi-annual summary report based on records kept.

10.1.3 Revenue Generation

The project will change the way revenue is generated and paid to the national treasury. An increase of skilled and professional labour will result from the operations of the project and related wages and salaries will be paid. Employment at the warehouse will be sourced locally as far as practically possible while transport companies / drivers may be contracted from other regions in order to transport cargo to and from Walvis Bay. Revenue will be generated through the provision of port and related services such as stevedore operations.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Contribution to local economy	2	1	2	2	2	12	2	Probable
Daily Operations	Contribution to local and national economy	3	2	3	2	2	42	4	Definite
Indirect Impacts	Increase in revenue generated	3	1	3	2	2	21	3	Definite

Desired Outcome: Contribution to the local and national economy. Contribution to national treasury.

Actions

Enhancement:

- ◆ The Proponent must employ local Namibians and source Namibian contractors, goods and services as far as is practically possible. Deviations from this practise must be justified.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ Bi-annual summary report based on employee records.

10.1.4 Employment

An increase of skilled and professional labour will result from the operations of the project. Employment will be sourced locally as far as practically possible while ore transport companies / drivers may be contracted from other regions. Development of the existing facility into the proposed operations will increase the sustainability of the current employment.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Employment and contribution to local economy	2	1	2	2	2	12	2	Probable
Daily Operations	Employment contribution to local economy; project revenue generation	3	1	3	2	2	21	3	Definite
Indirect Impacts	Decrease in unemployment, increase in revenue generated	3	2	3	2	2	42	4	Definite

Desired Outcome: Provision of employment to local Namibians.

Actions

Mitigation:

- ◆ 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.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ Bi-annual summary report based on employee records.

10.1.5 Demographic Profile and Community Health

The project is reliant on labour during the construction and operational phases. Local construction teams in Walvis Bay will be used for all general maintenance and upgrade activities. The scale of the construction portion of the project is limited and it is not expected to create a change in the demographic profile of the local community. Where possible, existing labour, already employed by the Proponent will be used or new labourers will be sourced from the town. Community health may be exposed to factors such as communicable disease like HIV/AIDS and alcoholism/drug abuse, associated with the trucking industry (transport of goods to and from Walvis Bay) and increased spending power of the labour force. Trucks delivering products to the warehouse will not stay for extended periods of time at the site, however, may reside over-night in Walvis Bay. Foreign persons in the area may increase the cumulative risk of communicable disease (such as HIV/ AIDS) in Walvis Bay.

Positive impacts will related to employees and contractors' increased economic resilience and improved livelihoods.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Daily Operations	Social ills related to unemployment and cross country transport	2	-1	3	2	2	-14	-2	Probable
Daily Operations and Construction	Increased economic resilience and improved livelihoods	2	2	3	2	2	28	3	Probable
Indirect Impacts	The spread of diseases	3	-1	3	2	2	-21	-3	Probable

Desired Outcome: To prevent the in-migration and growth in informal settlements, prevent the spread of communicable disease and prevent / discourage socially deviant behaviour.

Actions:

Prevention:

- ◆ Employ local people from the area where possible, deviations from this practise should be justified appropriately.
- ◆ Adhere to all municipal by-laws relating to environmental health which includes, but is not limited to, sanitation requirements for workers on site.
- ◆ Appointment of reputable contractors.

Mitigation:

- ◆ Educational programmes for employees (especially truck drivers) on HIV/AIDS and general upliftment of employees' social status.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ Facility inspection sheet for all areas which may present environmental health risks, kept on file.
- ◆ Bi-annual summary report based on educational programmes and training conducted.
- ◆ Bi-annual report and review of employee demographics.

10.1.6 Health, Safety and Security

Activities associated with the construction and operational phases are reliant on human labour and therefore exposes them to health and safety risks. Activities such as the operation of machinery, unsafe stacking, falling from heights and handling of hazardous chemicals (inhalation of dust and potential health effects chemicals), poses the main risks to employees. If not contained, windblown ore dust may further pose health risk to nearby receptors. Security risks are related to unauthorized entry, theft and sabotage. Security risks are increased as a result of high value commodities, e.g. copper cathodes, stored and handled at the site.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Physical injuries, exposure to chemicals and criminal activities	1	-2	2	2	1	-10	-2	Improbable
Daily Operations	Physical injuries, exposure to chemicals and criminal activities	2	-2	3	2	2	-28	-3	Improbable

Desired Outcome: To prevent injury, health impacts and theft.

Actions

Prevention:

- ◆ All Health and Safety standards specified in the Labour Act, or better, should be followed.
- ◆ Clearly label dangerous and restricted areas as well as dangerous equipment and products.
- ◆ Provide all employees with required and adequate personal protective equipment (PPE) including dust masks and protective clothing for workers in close proximity to, or working with, the dust producing cargo. Accidental inhalation, ingestion, dermal or eye contact with ore dust must be prevented at all times.
- ◆ Ensure that all personnel receive adequate training on operations of equipment / handling of hazardous substances.
- ◆ Equipment on site must be stored in a way that does not encourage criminal activities (e.g. locked away to prevent theft).
- ◆ Appoint reputable contractors for transporting of cargo who prioritise the safety and well-being of the truck drivers and the community.
- ◆ Security procedures and proper security measures must be in place to protect workers and clients.
- ◆ Strict security that prevents unauthorised entry.

Mitigation:

- ◆ Selected personnel should be trained in first aid and a first aid kit must be available on site. The contact details of all emergency services must be readily available.
- ◆ Implement and maintain an integrated health and safety management system, to act as a monitoring and mitigating tool, which includes operational, safe work and medical procedures, permits to work, emergency response plans, housekeeping rules, MSDS's and signage requirements (PPE, flammable etc.).
- ◆ Dust suppression when required.
- ◆ Emergency wash stations in case of accidental exposure to chemicals or dust.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Receive chemical composition analysis results of various ores to be handled from the mines and scrutinize the results for any carcinogenic (or other hazardous) gangue material like asbestos. Should any such material be present, additional safety measures must be implemented to ensure that no workers or nearby receptors are exposed to dust.
- ◆ If regular complaints are received regarding dust, air quality monitoring must be conducted on and around the site to monitor ore dust fallout. Monitoring to be conducted by an independent specialist who must advise on the monitoring protocol to be followed.
- ◆ Any incidents must be recorded with action taken to prevent future occurrences.
- ◆ A bi-annual report should be compiled of all incidents reported. The report should contain dates when training were conducted and when safety equipment and structures were inspected and maintained.

10.1.7 Traffic

The volume of trucks on the national road networks will increase. The warehouse is within an area zoned for industrial use and operations will result in an increase in traffic along 18th Road and 4th Street East. Heavy motor vehicles turning in these roads may result in an increased, cumulative impact on the road surface of the area. Trucks may block neighbouring business' entrances and increase the likelihood of accidents and incidents. Development of existing operations will not see a significant increase in traffic, however an altered flow pattern with a dedicated entrance and exit will decrease possible collision risk at the access points.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Delivery of equipment and building supplies	1	-1	2	2	2	-6	-1	Probable
Daily Operations	Increase traffic, road wear and tear and accidents	2	-2	3	2	2	-14	-2	Definite

Desired Outcome: Minimum impact on traffic and no transport or traffic related incidents.

Actions

Mitigation:

- ◆ Trucks delivering or collecting goods should not be allowed to obstruct any traffic in surrounding areas and the town.
- ◆ Trucks associated with the facility should not be allowed to park or overnight in 18th Road or 4th Street East, and may only overnight at areas designated for this purpose.
- ◆ Adhere to The Road Traffic and Transport Regulations, 2001 and all other applicable legislation related to road transport and maximum axle loads.
- ◆ If any traffic impacts are expected, traffic management should be performed to prevent these.
- ◆ The placement of signs to warn and direct traffic will mitigate traffic impacts.
- ◆ Identify vehicles on which hazardous substances are to be transported and handle all dangerous or hazardous goods according to MSDS instructions and under supervision of trained staff. Ensure the correct documentation (e.g. dangerous goods declaration, TREM card, etc.) is provided in the vehicle. Verify that the driver of the vehicle has undergone appropriate training.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ The Road Traffic and Transport Regulations, 2001.
- ◆ Any complaints received regarding traffic issues should be recorded together with action taken to prevent impacts from repeating itself.
- ◆ A bi-annual report should be compiled of all incidents reported, complaints received, and action taken.

10.1.8 Air Quality Related Impacts

Reduced air quality as a result of exhaust gases (greenhouse gases) of trucks visiting the property and the port during construction and operations. This may have localised health impacts, but are expected to disperse relatively quickly due to the prevailing south-westerly winds in Walvis Bay. It will however still contribute to greenhouse gas emissions that in turn contribute to climate change. In terms of greenhouse gas emissions from trucks, it is the project in its entirety that should be considered. It is thus the responsibility of all stakeholders to implement strategies and measures to curb the release of greenhouse gases. The Proponent's contribution to greenhouse gas emissions will be minimal.

Air quality as a result of windblown ore dust can cause health effects, especially through chronic inhalation of such dust, in the nearby communities. The risk is not only related to the metals in the ores per se, but also to the potentially harmful gangue materials that comprise the bulk of the ore, as well as respirable fractions (PM10) and thoracic fraction (PM2.5) of the dust. Since the gangue materials present are not necessarily known, but could potentially include for example asbestos, it is crucial that the inhalation / ingestion of dust is prevented at all times. Sources of such dust can be from trucks not suitably covered, dust originating from the warehouse when the doors are opened and dust carried onto paved surfaces outside the warehouse by truck wheels.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Daily Operations	Exposure to metal ore dust and its subsequent inhalation and/or ingestion and inhalation of exhaust gases. Damage to buildings as a result of exhaust gases resulting in acid deposition, ozone and soot build-up.	2	-3	3	2	2	-42	-4	Probable

Desired Outcome: To prevent health impacts and to reduce greenhouse gas emissions.

Actions

Prevention:

- ◆ All truckloads of bulk ore must be suitably covered to prevent the escape of dust from the load bin. This include empty trucks that may still contain some dust.
- ◆ All bulk bags must be checked prior to filling to ensure they are not damaged. Forklift operators to be suitably trained.
- ◆ Appoint reputable contractors for transporting of ore who prioritise a “zero dust policy”.

Mitigation:

- ◆ Dust suppression in the warehouse when required.
- ◆ Cease any operations with immediate effect once dust plumes that cannot be contained becomes visible. Operations can commence once sufficient mitigation measures have been implemented or when the cause of dust disseminates. This includes operational processes such as handling and loading / offloading of ore at the bulk storage yard, transport through town, offloading in the port, etc.
- ◆ All trucks transporting ore must be service regularly and make use of technology to reduce emissions. This include selective catalytic reduction, diesel particulate filters and diesel oxidation catalysts.

Responsible Body:

- ◆ Proponent

◆ Contractors

Data Sources and Monitoring:

- ◆ Receive chemical composition analysis results of various ores to be handled from the mines and scrutinize the results for any carcinogenic (or other hazardous) gangue material like asbestos. Should any such material be present, additional safety measures must be implemented to ensure that no workers or nearby receptors are exposed to dust.
- ◆ If regular complaints are received regarding dust, air quality monitoring must be conducted on and around the site to monitor ore dust fallout. Monitoring to be conducted by an independent specialist who must advise on the monitoring protocol to be followed.
- ◆ 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 bi-annual report should be compiled of all incidents reported and monitoring performed. The report should contain dates when safety equipment and structures were inspected and maintained.

10.1.10 Fire

Construction and operational activities may increase the risk of the occurrence of fires if proper maintenance and housekeeping are not conducted. Of the cargo to be handled, specifically, sulphur is flammable and should be segregated from any oxidisers or heat or ignition sources. Ore dust (fines) suspended in the air can become flammable in excessive quantities.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Fire and explosion risk	2	-2	2	2	1	-20	-3	Improbable
Daily Operations	Fire and explosion risk	2	-2	3	2	2	-28	-3	Improbable

Desired Outcome: To prevent property damage, possible injury and impacts caused by uncontrolled fires.

Actions:

Prevention:

- ◆ Ensure all materials are stored strictly according to MSDS instructions. This include segregation of incompatible products, if any.
- ◆ Maintain regular site, mechanical and electrical inspections and maintenance.
- ◆ Clean all spills / leaks.
- ◆ Ensure sufficient firefighting and fire prevention measure are in place for the specific products being stored and handled in the warehouse. This includes specific fire suppressants compatible with the materials stored.
- ◆ Regularly update the firefighting and prevention plan and equipment according to the materials stored on site, keeping in mind the activities on neighbouring properties.
- ◆ Proper dust suppression to be conducted in the warehouse to prevent airborne dust (fines) that can become flammable if present in excessive quantities.

Mitigation:

- ◆ A holistic fire protection and prevention plan is needed for flammable products. This plan must include an emergency response plan, firefighting plan and spill recovery plan, and should include specific substances handled at the site. The plan should consider risks posed to and by neighbouring properties.
- ◆ Maintain dust suppression systems, firefighting equipment, good housekeeping and personnel training (firefighting, fire prevention and responsible housekeeping practises).

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ A register of all incidents must be maintained on a daily basis. This should include measures taken to ensure that such incidents do not repeat themselves.
- ◆ A bi-annual report should be compiled of all incidents reported. The report should contain dates when fire drills were conducted and when fire equipment was tested and training given.

10.1.11 Noise

Noise pollution will exist due to heavy motor vehicles accessing the site to load and offload cargo as well as from the stacking and moving of bags and containers and other large equipment. As the site is situated in an industrial area, noise impacts on surrounding properties will be minimal. Construction (maintenance and upgrade) may generate excessive noise for short periods of time.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Excessive noise generated from construction activities – nuisance and hearing loss	2	-1	2	2	1	-10	-2	Probable
Daily Operations	Noise generated from the operational activities – nuisance and hearing loss	2	-1	3	2	2	-14	-2	Probable

Desired Outcome: To prevent any nuisance and hearing loss due to noise generated.

Actions

Prevention:

- ◆ The Health and Safety Regulations of the Labour Act and World Health Organization (WHO) guideline on maximum noise levels (Guidelines for Community Noise, 1999) to prevent hearing impairment for workers on site should be followed during the construction and operational phases.
- ◆ Confine noise generating operational activities to daytime hours as far as possible.
- ◆ At night, the nuisance created by audible warning signals on trucks and forklifts can be prevented by switching to a flashing light or ‘broadband white noise’ system.

Mitigation:

- ◆ Hearing protectors as standard PPE for workers in situations with elevated noise levels.
- ◆ Maintain noise generating activities to within the warehouse as far as possible.
- ◆ All machinery must be regularly serviced to ensure minimal noise production.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Health and Safety Regulations of the Labour Act and WHO Guidelines.
- ◆ Maintain a complaints register.
- ◆ Bi-annual report on complaints and actions taken to address complaints and prevent future occurrences.

10.1.12 Waste production

Various waste streams will result from the operational phase and development of the facility. Waste may include hazardous waste associated with the handling of hazardous products and contaminated packaging material. Domestic waste will be generated by the facility and related operations. Waste presents a contamination risk and when not removed regularly may become a fire hazard. Construction waste may include building rubble and discarded equipment. Contaminated soil and water is considered as a hazardous waste.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Excessive waste production, littering, illegal dumping, contaminated materials	1	-2	2	2	2	-12	-2	Definite
Daily Operations	Excessive waste production, littering, contaminated materials	1	-2	3	2	2	-14	-2	Definite

Desired Outcome: To reduce the amount of waste produced, and prevent pollution and littering.

Actions

Prevention:

- ◆ Waste reduction measures should be implemented and all waste that can be re-used / recycled must be kept separate.
- ◆ Ensure adequate temporary waste storage facilities are available.
- ◆ Ensure waste cannot be blown away by wind.
- ◆ Prevent scavenging (human and non-human) of waste.
- ◆ All drains leading directly into sewers must be closed off, and locked where possible, to prevent any unwanted products from entering sewers should an accidental spill occur. Where drains are present to drain wash water, these should only be opened during times of washing.

Mitigation:

- ◆ Waste should be disposed of regularly and at appropriately classified disposal facilities, this includes hazardous material (empty chemical containers, contaminated rugs, paper water and soil).
- ◆ See the material safety data sheets available from suppliers for disposal of contaminated products and empty containers.
- ◆ Liaise with the municipality regarding waste and handling of hazardous waste.
- ◆ Due to the nature of some hazardous materials they, or the containers they are packed in, should be disposed of in an appropriate way at an appropriately classified waste disposal facility. See the material safety data sheets available from suppliers for disposal methods.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ A register of hazardous waste disposal should be kept. This should include type of waste, volume as well as disposal method/facility.
- ◆ Any complaints received regarding waste should be recorded with notes on action taken.
- ◆ All information and reporting to be included in a bi-annual report.

10.1.13 Ecosystem and Biodiversity Impact

The nature of the operational activities is such that the probability of creating a habitat for flora and fauna to establish is low. No significant impact on the biodiversity of the area is predicted as this is an existing operation and the site is void of natural fauna and flora. Excessive lighting used at night and especially those that are directed upwards may blind birds like flamingos that fly at night. This may result in disorientation of birds and collisions with structures. Further impacts will mostly be related to pollution of the environment.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Impact on fauna and flora. Loss of biodiversity	1	-1	2	2	2	-6	-1	Improbable
Daily Operations	Impact on fauna and flora. Loss of biodiversity	2	-1	3	2	2	-14	-2	Improbable

Desired Outcome: To avoid pollution of and impacts on the ecological environment.

Actions.

Mitigation:

- ◆ Report any extraordinary ecological sightings to the Ministry of Environment, Forestry and Tourism.
- ◆ Mitigation measures related to waste handling and the prevention of groundwater, surface water and soil contamination should limit ecosystem and biodiversity impacts.
- ◆ Avoid scavenging of waste by fauna.
- ◆ The establishment of habitats and nesting sites at the facility should be prevented where possible.
- ◆ Lights used at night should be kept to a minimum and should be directed downwards to the working surfaces.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ All information of extraordinary ecological sightings to be included in a bi-annual report.

10.1.14 Groundwater, Surface Water and Soil Contamination

Ore dust or chemicals that are not contained in the warehouse or trucks can contaminate the environment. The entire property is paved and pollution of soil and groundwater is not expected. There is no surface water present nearby. Dust that is not contained can however reach sensitive receptors during times of strong wind. Oil, hydraulic fluid and fuel leaks from vehicles may also present a pollution risk.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Contamination from hazardous material spillages and hydrocarbon leakages	2	-1	2	2	1	-10	-2	Probable
Daily Operations	Contamination from hazardous material spillages	2	-1	3	2	1	-12	-2	Probable

Desired Outcome: To prevent the contamination of water and soil.

Actions

Prevention:

- ◆ Dust suppression in the warehouse to prevent dust blown into the surrounding environment when warehouse doors are opened.
- ◆ Proper training of operators must be conducted on a regular basis (e.g. forklift operators).
- ◆ Install a rumble grid at the warehouse exit to dislodge and contain any ore nuggets trapped in tyres. Also conduct visual inspection of the tyres.
- ◆ Channel water from the roofs out of the yard to minimize runoff on the paving which may potentially be contaminated by some metal ore and chemical dust.

Mitigation:

- ◆ Clean-up action must be taken immediately for all instances where ore dust is not contained (e.g. spillages and torn bags).

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ The procedures followed to prevent environmental damage during service and maintenance, and compliance with these procedures, must be audited and corrections made where necessary.
- ◆ A report should be compiled bi-annually of all spills. The report should contain the following information: date and duration of spill, product spilled, volume of spill, remedial action taken, etc.

10.1.15 Visual Impact

This is an impact that not only affects the aesthetic appearance, but also the integrity of the facility. The site is within an area zoned for industrial use. The development of the site is in line with the urban character.

Operations will be kept tidy and neat which will promote effectiveness and pollution prevention while being aesthetically pleasing.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Aesthetic appearance and integrity of the site	1	-1	2	2	2	-6	-1	Probable
Daily Operations	Aesthetic appearance and integrity of the site	1	1	3	2	2	7	1	Definite

Desired Outcome: To minimise aesthetic impacts associated with the facility.

Actions

Mitigation:

- ◆ Regular waste disposal, good housekeeping and routine maintenance on infrastructure will ensure that the longevity of structures are maximised and a low visual impact is maintained.
- ◆ All structures and infrastructures constructed on site should be in line with the visual character of the landscape as far as practically possible.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ A bi-annual report should be compiled of all complaints received and actions taken.

10.1.16 Cumulative Impact

The main cumulative impact associated with the operational phase is an increase in traffic frequenting the site. This will have a cumulative impact on traffic flow on surrounding streets.

The increase of traffic and other noise generating activities in the area may further increase the noise impacts on nearby receptors, the facility is however situated in an industrial area. The cumulative effect of lighting on birds due to various industrial related developments may also increase the risk of collisions and interference with bird flight paths at night.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Daily Operations	The build-up of minor impacts to become more significant	2	-1	3	2	2	-14	-2	Definite

Desired Outcome: To minimise all cumulative impacts associated with the facility.

Actions

Mitigation:

- ◆ Addressing each of the individual impacts as discussed and recommended in the EMP would reduce the cumulative impact.
- ◆ Reviewing biannual and annual reports for any new or re-occurring impacts or problems would aid in identifying cumulative impacts and help in planning if the existing mitigations are insufficient.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ Review bi-annual summary reports based on all other impacts to gain an overall assessment of the impact of the operational phase.

10.2 DECOMMISSIONING AND REHABILITATION

Decommissioning is not foreseen during the validity of the environmental clearance certificate. Decommissioning was however assessed as construction activities include modification and decommissioning. Should decommissioning occur at any stage, rehabilitation of the area may be required. Decommissioning will entail the complete removal of all infrastructure including buildings and underground infrastructure not forming part of post decommissioning use. Any pollution present on the site must be remediated. The impacts associated with this phase include noise and waste production as structures are dismantled. Noise must be kept within Health and Safety Regulations of the Labour Act and WHO standards and waste should be contained and disposed of at an appropriately classified and approved waste facility and not dumped in the surrounding areas. Future land use after decommissioning should be assessed prior to decommissioning and rehabilitation initiated if the land would not be used for future purposes. The EMP for the facility will have to be reviewed at the time of decommissioning to cater for changes made to the site and implement guidelines and mitigation measures.

10.3 ENVIRONMENTAL MANAGEMENT SYSTEM

The Proponent could implement an Environmental Management System (EMS) for their operations. An EMS is an internationally recognized and certified management system that will ensure ongoing incorporation of environmental constraints. At the heart of an EMS is the concept of continual improvement of environmental performance with resulting increases in operational efficiency, financial savings and reduction in environmental, health and safety risks. An effective EMS would need to include the following elements:

- ◆ A stated environmental policy which sets the desired level of environmental performance;
- ◆ An environmental legal register;
- ◆ An institutional structure which sets out the responsibility, authority, lines of communication and resources needed to implement the EMS;
- ◆ Identification of environmental, safety and health training needs;
- ◆ An environmental program(s) stipulating environmental objectives and targets to be met, and work instructions and controls to be applied in order to achieve compliance with the environmental policy;
- ◆ Periodic (internal and external) audits and reviews of environmental performance and the effectiveness of the EMS; and
- ◆ The EMP.

11 CONCLUSION

The operations of the Proponent will see the import and export of metal ores and industrial cargo through the port of Walvis Bay. This will have a positive impact on the economy of Walvis Bay and Namibia as a whole. Employment will be created and sustained at the warehouse and in the transport sector. Training and skills transfer will take place. Various business will be supported along the different transport routes and within Walvis Bay. The Port of Walvis Bay and stevedores will render port services. The entire project will contribute to the national treasury through payment of taxes, levies and permitting fees.

Regulations related to the handling and transport of goods as prescribed by Namibian law, or according to international best practice standards where Namibian law is lacking, must be followed during the planning and operations of the project. The necessary permits and approvals must be obtained from the relevant authorities. Dust suppression must be adequate to protect both workers and nearby receptors (business and residential areas). All hazardous substances should be handled and stored according to MSDS requirements which include storage on impenetrable surfaces and segregation of incompatible products. Noise pollution should at all times meet the prescribed Health and Safety Regulations of the Labour Act and WHO requirements to prevent hearing loss and minimise nuisance. Fire prevention should be adequate, and health and safety regulations should be adhered to in accordance with the regulations pertaining to relevant laws and internationally accepted standards of operation. Any waste

produced must be removed from site and disposed of at an appropriate facility or re-used or recycled where possible. Hazardous waste must be disposed of at an approved hazardous waste disposal site.

The EMP (Section 10) should be used as an on-site reference document for the operations of the facility. Parties responsible for transgressing of the EMP should be held responsible for any rehabilitation that may need to be undertaken. The Proponent could use an in-house Health, Safety, Security and environment management system in conjunction with the EMP. All operational personnel must be taught the contents of these documents.

Should the Directorate of Environmental Affairs (DEA) find that the impacts and related mitigation measures, which have been proposed in this report are acceptable, an environmental clearance certificate may be granted to the Proponent. The environmental clearance certificate issued, based on this document, will render it a legally binding document which should be adhered to. Focus could be placed on Section 10, which includes an EMP for this project. It should be noted that the assessment process's aim is not to stop the activity, or any of its components, but to rather determine its impact and guide sustainable and responsible development as per the spirit of the EMA.

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Appendix A: Proof of Public Consultation

Notified IAPs

Name	Position	Organisation
David Uushona	Manager: Solid Waste and Environmental Management	Municipality of Walvis Bay
Nangula Amutenya	Environmental Coordinator	Municipality of Walvis Bay
Lovisa Hailaula	Environmental Officer	Municipality of Walvis Bay
Ephraim Nambahu	Town Planning Officer	Municipality of Walvis Bay
Deville Dreyer	Environmental Health Practitioner	Municipality of Walvis Bay

Municipal Notification



TEL.: (+264-61) 257411 ♦ FAX.: (+264) 88626368
 CELL.: (+264-81) 1220082
 PO BOX 11073 ♦ WINDHOEK ♦ NAMIBIA
 E-MAIL: gpt@thenamib.com

To: Interested and / or Affected Party / Neighbour 14 April 2023
 Re: ENVIRONMENTAL SCOPING ASSESSMENT AND ENVIRONMENTAL
 MANAGEMENT PLAN FOR THE STORAGE AND HANDLING OF METAL ORES
 AND INDUSTRIAL CARGO ON ERF 4409 IN THE INDUSTRIAL AREA OF WALVIS
 BAY

Dear Sir/Madam

Geo Pollution Technologies (Pty) Ltd was appointed by Wesbank Transport, a Division of FP du Toit (Pty) Ltd, to undertake an environmental assessment for the storage and handling of metal ores and industrial cargo on erf 4409 in the industrial area of Walvis Bay (see location map on page 2). The assessment will be conducted according to the Environmental Management Act of 2007 and its regulations as published in 2012.

Project: Storage and Handling of Metal Ores and Industrial Cargo on Erf 4409 in the Industrial Area of Walvis Bay

Proponent: Wesbank Transport, a Division of FP du Toit (Pty) Ltd

Environmental Assessment Practitioner: Geo Pollution Technologies (Pty) Ltd

The Proponent operates an existing warehouse on erf 4409 which is located in Walvis Bay's industrial area, at the corner of 18th Road and 4th Street East. The facility will be used to receive and temporarily store metal ores to be exported via the Port of Walvis Bay. It will also receive industrial cargo imported via the Port and destined for African countries like Zambia and the Democratic Republic of Congo. Export cargo will be the ores of copper, manganese, nickel, lithium, chrome and zinc as well as cobalt hydroxide. Copper can also include copper concentrates and cathodes. Imported cargo will be the industrial chemicals sulphur (S), sodium metabisulphite (SMBS) and magnesium oxide (MgO). Dust suppression will be conducted inside the warehouse. Fire detection and firefighting equipment and procedures will be in place according to accepted standards. Administrative tasks, site security and cleaning of the premises will continue on a daily basis to ensure the effective and clean operations of the facility. Environmental compliance monitoring and public liaison will continue throughout operations.

Interested and affected parties or neighbours are invited to register with the environmental consultant to receive further documentation and communication regarding the project. Please register at:

Fax: 088-62-6368 or **E-Mail:** wesbank@thenamib.com.

Should you require any additional information please contact Geo Pollution Technologies at telephone 061-257411.

Sincerely,

Geo Pollution Technologies

André Faul
 Environmental Practitioner



Page 1 of 2

Directors:

P. Botha (B.Sc. Hons. Hydrogeology) (Managing)

NEWS IN SHORT

Toddler drowns in oshikundu

A one-year-old boy drowned in a 20-litre bucket of traditional brew on Sunday afternoon in the Oshana Region's Onampinda village. Police spokesperson Thomas Aiyambo said Festus Severinus Tsalu Linus was at home with his aunt - whose age has not been disclosed - and two other children, aged four and five. "It is further reported that the aunt queried from the other two were Linus was and upon searching, she discovered the deceased had drowned in a bucket of oshikundu," he said. The family has been informed and the toddler's body has been transported to the Oshakati police mortuary for a postmortem examination, he added.

- TUYEIMO HAIDULA

High cattle slaughter points to drought

With cattle slaughter increasing by more than 102% at export abattoirs, it is clear farmers are preparing for a drought. Live cattle exports increased by 49.43% from 8 337 heads in February to 12 458 in March.

In January, 3 910 cattle were exported. This is according to Meat Board's monthly market watch for March.

It said weaner auction prices remain on a rapid decline from N\$38.17/kg in January to N\$25.81/kg in March. "This decline is due to low rainfall experienced throughout the country, causing high export supply at auctions and, in return, lower prices for farmers."

According to the Meat Board, due to unfavourable rainfall conditions expected during the year, many farmers have started to sell cattle to prevent loss.

- ELLANIE SMIT



PANIC: Cattle slaughter has increased by more than 100% at export abattoirs. PHOTO: FILE

COMMUNITIES BUILD OWN TOILETS, HAND-WASHING FACILITIES

Over 1 000 households reach ODF status

The Community-Led Total Sanitation initiative targets 1 302 households in the two constituencies with a cumulative population of 3 448 people.

ELIZABETH JOSEPH WINDHOEK



BETTER SANITATION: Stakeholders celebrated over 1 000 households that reached an ODF status. Pictured is Dr Elijah Ngunare, Unicef country representative Rachel Odede and other stakeholders. PHOTO: ELIZABETH JOSEPH

Over the weekend, Windhoek's Samora Machel and Moses //Garoeb constituencies celebrated 1 052 households which achieved open defecation-free (ODF) status.

The project, Community-Led Total Sanitation - a collaboration between the City of Windhoek, Development Workshop Namibia, the Namibia Chamber of Environment and the United Nations Children's Fund (Unicef) - aims to create ODF communities while empowering residents to assess, analyse and take collective action by building their own toilets and hand-washing facilities with minimal external assistance.

The initiative targets 1 302 households in the two constituencies with a cumulative population of 3 448 people.

To date, four blocks - Nalitungwe, Brendan Simbwaye, Max Mutongolome and Hadino Hishongwa

- have been declared as ODF in line with the national protocol.

"This means households have constructed and use toilets, built in line with local authority standards, while there is no human faeces in the environment, and proper hand-washing is practiced," Unicef said in a statement.

Unicef country representative Rachel Odede added: "Today is the start of many opportunities to grow as a community and flourish, where your children can develop and grow without suffering from preventable diseases and reach their full potential."

'It's possible'

On behalf of agriculture minister of agriculture Calle Schlettwein, Dr Elijah Ngunare congratulated the communities of the two constitu-

encies on their achievement, saying the ministry salutes their hard work and dedication.

"It's also an opportunity to show that elimination of open defecation is possible with communities taking a leading role.

"To achieve this commitment, Cabinet approved the National Sanitation and Hygiene Strategy 2022-2027 to scale up sanitation in the country," he said. He added that among other initiatives, the ministry has scaled up support on urban sanitation through collaborations with local authorities.

"The water and sanitation sectors have been prioritised through sound government frameworks," Ngunare said.

Long way to go

Data - collected under a joint mon-

itoring programme by the World Health Organisation and Unicef - shows that Namibia has a long way to go and is not on track to eliminate open defecation by 2030, with a 0.4% reduction of ODF areas recorded between 2000 and 2017.

According to Ngunare, ensuring that every Namibian has access to sanitation is a collective responsibility because it is "a dignity and it is a human right, just like access to water".

"The challenges are known, and we must therefore summon our resolve to find solutions to the country's sanitation challenge where 43% of the population are practicing open defecation," he said.

Ngunare added that 23% of this population is urban and 65% resides in rural areas.

LONG LINES FOR EGYPTIAN MEDICAL OUTREACH

IFEMIMA BELUKES WINDHOEK

Hordes of afflicted Namibians queued up at the Katutura hospital to access free healthcare - including surgeries and much-needed medicine - brought by a convoy of Egyptian health specialists.

The group of medical professionals arrived in the country over the weekend, and the initiative is led by the Egyptian Orthodox Church in Namibia in collaboration with the Coptic Medi-

cal Association of North America (CMANA).

During a welcoming ceremony on Sunday, Egyptian ambassador to Namibia Wael Lotfy Batea emphasised their commitment to supporting Namibia in bringing healthcare closer to the people.

"Egypt takes pride in its role to provide African sister countries with all sorts of technical assistance in the spirit of south-to-south cooperation to enforce sustainable development. "When it comes to Namibia, it is not the Egyptian government that is contributing to this role, but rather Egyptian entities - including our religious institutions," he said.

Critical surgeries

"This is building on seven successful visits by our Egyptian medical convoy

of over 40 persons," Batea said.

During the convoy's last visit in May 2022, Egyptian doctors performed dozens of critical surgeries including neurological surgeries, he added.

"Our convoy brought along prosthetic limbs and medicines worth over N\$10 million."

Health minister Dr Kalumbi Shangula said the outreach helps the ministry redistribute the significant burden of healthcare and cuts down on the time some patients have to wait for services such as surgeries.

"They are doing specific types of surgeries that are carried out in collaboration with our local doctors. It really reduces the time tremendously because now you have more hands that can help when patients arrive at the hospital for services."

jemima@namibiansun.com

PUBLIC PARTICIPATION NOTICE

ENVIRONMENTAL ASSESSMENT, STORAGE AND HANDLING OF ORES, INDUSTRIAL CARGO AND CHEMICALS IN THE INDUSTRIAL AREA OF WALVIS BAY

Geo Pollution Technologies (Pty) Ltd was appointed by Wesbank Transport, a Division of PP da Toit (Pty) Ltd (the Proponent), to undertake environmental assessments (EAs) for the storage and handling of metal ores, industrial cargo and chemicals in the industrial area of Walvis Bay.

The Proponent plans to use their existing facilities on erven 4409, 1754, 2894 and 5044 in Walvis Bay, as follows. Metal ores from southern Africa will be stored in warehouses, containers or bags, until it is exported via the Port of Walvis Bay. Industrial cargo will be imported via the port, stored in warehouses and then dispatched to clients. Hazardous chemicals (new and used vehicle oil, paints and solvents) will be handled and stored, either for own use or for distribution to clients. Additional warehouses and infrastructure will be constructed to ensure sufficient storage space. Additional and location information pertaining to specific areas can be obtained at: <http://www.thenamib.com/projects/projects.html>

The environmental assessment will be conducted according to the Environmental Management Act of 2007 and its regulations as published in 2012.

Interested and affected parties are invited to register with the environmental consultant to be provided with the opportunity to share comments, issues or concerns related to the project, for consideration in the EAs.

Requests for additional information and comments and concerns should be submitted to Geo Pollution Technologies by 3 May 2023.

André Faal
Geo Pollution Technologies
Tel: +264-61-257411
Fax: +264-88626368
E-Mail: wesbank@thenamib.com



COMMERCIAL PROPERTY TO RENT

Type of Property: Commercial Property | Description: Office Building Block
Occupation Date: Immediately | Office: Floor Area 470 m²
Office include: Ablution facility Parking bays Kitchen facility

Contact Uweilyn Kruger | Location: 118 Beni Murtala Muhammed
at +264 61 285 7686 | Ave Eroo, Windhoek, Namibia



NEWS IN SHORT

Appeal to locate missing persons

Police in the Erongo Region are appealing for public assistance in locating two missing persons. Enota Kalilo (13), a grade three learner at Swakopmund Primary School, went missing from his home in Mondesa last Thursday evening.

According to Inspector Ileni Shapumba, the unit commander for community affairs in the region, Kalilo went missing after being sent to buy sweets from a local tuck shop by his grandmother.

"Since then, he was nowhere to be found and all efforts to trace him have been unsuccessful," he said.

Anyone with information on Kalilo's whereabouts is urged to urgently contact detective warrant officer Cletus Kabuku at 081 391 0671 or report to the nearest police station.

Meanwhile, Walvis Bay resident Johannes Shilongo Iita has also been reported missing. Iita reportedly left his residence on Thursday, 6 April, and never returned home. He is of average height, dark in complexion and speaks Oshiwambo.

Anyone with information regarding Iita's whereabouts is urged to contact detective warrant officer Dennis Skrywer at 081 443 3377, Sergeant Ashipala at 0814377517 or any police station.

- NIKANOR NANGOLO

Two arrested for murder after fight

Two male suspects were arrested after a fight reportedly turned deadly on Saturday in Karibib. Inspector Ileni Shapumba, the unit commander for community affairs in the Erongo Region, confirmed the incident, which took place between 04:00 and 06:00 in the Harambee location.

It is alleged that a fight, which resulted in the death of Werner Tjipanga (44), broke out between the suspects and Tjipanga at one of the suspects' homes. "It was not clear what caused the fight. Both suspects as well as the deceased person have been employees of a security company at Karibib."

Tjipanga's next of kin have been informed. His body was taken to the Karibib clinic for further an autopsy. The suspects, aged 29 and 39, were arrested and were due to appear in court yesterday. Police investigations continue.

- NIKANOR NANGOLO

• FAMILY SURVIVES ON N\$1 400 A MONTH

'My pension doesn't see the next day'

"My pension grant only lasts one day because when it comes, you already spent weeks budgeting it. It does not live to see the next day because I have to use it to survive," the 74-year-old said.

KENYA KAMBOWE
SITENDA

A 74-year-old pensioner, who is her family's sole breadwinner, says her monthly pension of N\$1 400 only lasts a single day.

Perpetua Nangura Mbuga from Sitenda village in the Kavango West Region said the money is not enough to take care of her household needs and pay off her debts, while her family survives on one meal a day.

Things are so dire for Mbuga's family that they have not been able to work their land for the past five years because they cannot afford to hire cattle or donkeys to plough their field. They only own three chickens.

Mbuga lives with her son Frans Haingura (38) and three children.

"We last worked our land some five years ago but ever since life become difficult for us, we did not do anything on our land, it has just become a bush now. We don't have the money to pay those with cattle or donkeys to plough our field," Mbuga said.

A mother of seven, Mbuga said six of her children have left home in search of better opportunities, but it has been years since she's heard from some of them, or received any support.

Haingura narrated that he has never been formally employed, adding that he only does odd jobs that don't pay much.

At the moment, he is unemployed, but eager to work if the opportunity presents itself, he said.

"I went to school but I was never employed for a long period of time. It's just those jobs of someone coming to get you to go either chop wood, for example."

'I use it to survive'

Regarding her pension grant, Mbuga said although it is not enough, it does ease their woes.

She said once she receives the money, it is immediately used to buy maize meal and relish and cater for the needs of her grandchildren, while she also has to pay the debts she accumulated during the month to sustain her household.

"My pension grant only lasts one day because when it comes, you already spent weeks budgeting it. It does not live to see the next day because I have to use it to survive," she said.

With Haingura eager to work, he urged Good Samaritans who needs a farmworker or helper to employ him, adding he is willing to work in order to contribute to his family's livelihood.

The family further asked to be assisted with food and basic necessities such as clothes, mattresses, blankets and cosmetics. Livestock such as cattle and donkeys would be greatly appreciated, they added.

"We really need help and if there are Good Samaritans out there to help us, please help us."

kenyanambiansun.com



POVERTY STRICKEN: Perpetua Nangura Mbuga (74) and her son Frans Haingura (38). PHOTO: KENYA KAMBOWE

Another bad month of rain

ELLANIE SMIT
WINDHOEK

Despite forecasts for a good seasonal rainfall for this year, March was yet another disappointing month.

Rainfall performance showed a general decrease throughout the country, with very few exceptions.

The highest amount of rain recorded was 129.4mm in Omafo, which is 32% above its normal rainfall of 98mm.

This according to the rainfall bulletin issued by the Namibia Meteorological Services.

"Very low rain was observed over the western and southern parts of the country. High amounts of rainfall were only observed over the eastern parts of the country," it said.

According to the bulletin, after a long dry spell experienced during February, the seasonal rainfall performance was below-normal over southern Omusati, Oshana and Kunene, as well as much of the Hardap and //Karas regions.

"The bulk of the west and the south of the country experienced below-normal rainfall with respect

to the departure from its normal for the month of March; however, normal rainfall was experienced over Ohangwena, Kavango West and East, Zambezi, east of Otjozondjupa and Omaheke."

Dam levels

Meanwhile, the latest dam bulletin indicates that Namibia's dam levels have declined to an average of 69.3%, compared to last year's 83.9%.

The National Oceanic and Atmospheric Administration Climate Prediction Centre has issued an El Niño watch as part of its April El Niño-Southern Oscillation (ENSO) outlook.

El Niño is commonly linked to droughts in southern Africa.

A watch is issued when conditions are favourable for the development of El Niño within the next six months.

"While it is still an ENSO-neutral phase – when no El Niño or La Niña is present – there is a 62% chance El Niño will develop some time between May and July," it said.

This comes after nearly two continuous years of La Niña.



DISAPPOINTING: Namibians have been left wondering: "Where is the rain?" PHOTO: FEEN IN NAMIBIA

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The environmental assessment will be conducted according to the Environmental Management Act of 2007 and its regulations as published in 2012.

Interested and affected parties are invited to register with the environmental consultant to be provided with the opportunity to share comments, issues or concerns related to the project, for consideration in the EAs.

Requests for additional information and comments and concerns should be submitted to Geo Pollution Technologies by 3 May 2023.

André Faul

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» 'Dié regering ondersteun ons nie'



Opperhoof Mutjinda Katjua van die Ovaherero Tradisionele Owerheid, sê koloniale standbeelde behoort met geweld verwyder te word. FOTO: FREDDY WEBER

OTA eis verwydering van koloniale standbeelde

Die opperhoof van die Ovaherero Tradisionele Owerheid sê dit is nou aan die betrokke gemeenskappe oorgelaat om formeel versoeke te rig vir die verwydering van koloniale standbeelde.

» Ogone Tihage

Met die Ovaherero Tradisionele Owerheid (OTA) wat opnuut aandring op die verwydering van koloniale standbeelde wat steeds in verskeie dorpe oraloer Namibië staan, stamp dié tradisionele beheerliggaam koppe met sekere plaaslike owerhede.

Die OTA-opperhoof, Mutjinda Katjua, sê lede van die Nama- en Ovaherero-gemeenskappe moet standbeelde wat die Nama-Ovaherero-volksmoord vier met geweld verwyder as diegene in wie se dorpe en stede hierdie standbeelde oppgerig, versuim om dit te doen.

Katjua het dié opmerkings die afgelope naweek by 'n volksmoord-gedenkdag op Lüderitz gemaak.

Volgens hom is die regering se versuim om die kwessie van voorvaderlike grond op 'n voldoende wyse te hanteer, genoegrede om tot die gevolgtrekking te kom dat die staat geen bedoeling gehad het om die belange van die Nama- en Ovaherero-mense op te hef nie.

SPERDATUM NODIG

Katjua het na 'n voorbeeld verwys waarin die wyle OTA-opperhoof, adv. Vekuii Rukoro, en wyle hoofman Simon Petrus Kooper van die Kai-//Khaun, die Swakopmund-munisipaliteit gevra het om standbeelde wat die volksmoord

herdenk, te verwyder.

"In 2016 het wyle opperhoof Rukoro en wyle Kooper 'n duidelike versoek aan die Swakopmund-munisipaliteit gerig om daardie standbeelde van Duitse soldate te verwyder. Dis nou seker al agt jaar... niks het gebeur nie. Dis hoog tyd dat ons 'n sperdatum stel vir sommige van hierdie goed; as dit nie verwyder word nie, behoort ons dit te kan plattrrek," het Katjua gesê.

"Jy sal nie tronk toe gaan omdat jy 'n koloniale standbeeld verwyder het nie; dit gebeur in Duitsland," het hy bygevoeg.

IN EIE HANDE

Volgens Katjua word dit nou aan die betrokke gemeenskappe oorgelaat om formeel versoeke te rig vir die verwydering van koloniale standbeelde en dit self te verwyder as die versoek nie

oorweeg word nie.

"Dis hoog tyd dat ons van hierdie goed identifiseer en 'n sperdatum stel en dit verwyder," het hy gesê.

Katjua het ook die regering daarvan beskuldig dat hulle lede van die Nama- en Ovaherero-gemeenskappe opsetlik op die kantlyn gestoot het.

"Ons weet ons het 'n regering wat ons nie ondersteun nie. Ons weet ons het 'n regering wat Herero's en Namas verarmd wil sien, 'n regering wat die twee gemeenskappe suig aan die agterspeen wanneer dit by die voordele van Namibië se hulpbronne kom, het hy bygevoeg.

"Vandag word die Namas en die Herero's gemarginaliseer; ons het geen politieke stem nie. Daarom, wanneer die nasionale koek gesny word, is ons die laaste wat krummels ontvang.

"Ons het die Suide, die Erongostreek, onder die rykste streke in die land, maar as jy na die burgers van daardie streke toe gaan, is hulle van die mees gemarginaliseerdes met geen toegang tot hierdie hulpbronne nie," het hy gesê.

Regter maak kapsie teen uitrek van saak

» Irène-Mari van der Walt

"Met alle respek, jy het die indruk geskep dat ons die einde van die staat se saak nader. Ek dink ons moet ons gedra asof ons die einde van die staat se saak nader."

So het regter Christie Liebenberg Donderdag tydens die verhoor van Marcus Thomas en Kevan Townsend aan die staatsaanklaer, Antonia Verhoef, gesê nadat sy versoek het dat die verhoor reeds dié middag vir die week sal afsluit voor dit vroeg in Mei sal hervat.

"Die res van die getuies is klaarblyklik minder belangrik tot die staat se saak. Ek wil nie die staat onder druk plaas om getuies agterweë te laat (to abandon witnesses) in die belang van tyd nie," het hy gesê.

Thomas en Townsend is reeds 12 jaar gelede in Januarie 2011 in hegtenis geneem vir die moord op André Heckmair. Beide het in 2014, bykans nege jaar gelede, vir die eerste keer in die hoërhof verskyn. Buiten 'n lys van

bykans 200 staatsgetuies, is die verhoor ook vertraag deur twee aansoeke vir Liebenberg om homself aan die saak te onttrek en Thomas en Townsend wat verskeie prokureurs laat gaan het. Verhoef het op Liebenberg se instruksie nog 'n staatsgetuie, hoof-inspekteur Barry de Klerk, geroep.

NOTABOEK 'GESTEEL'

De Klerk het dae ná die beskuldigdes se arrestasie saam met inspekteur Felix Ndikoma gegaan om hul besittings uit die gastehuis-kamer waar hulle gebly het, te verwyder. Hiertydens het die

polisie op 'n knaldemper afgekom, wat volgens die getuiesse van ballistiese kenners nooit afgevuur is nie. Thomas en Townsend staan ook tereg op die onwettige besit van 'n vuurwapen. De Klerk het getuig oor die ontdekking van die knaldemper asook Thomas se beweerde regsverryding toe hy glo 'n notaboek in die besit van die polisiegesteel, blaie uitgeskeur en verbrand het. Hy het ook getuig oor die inhoud van die vermiste blaie waarvan daar afskrifte gemaak is voor Thomas na bewering die boek gesteel het. Verhoef het Vrydag aangedui sy wil nog drie staatsgetuies roep wanneer die verhoor op 8 Mei hervat.

- Irène-Mari Jerongo.com.na



Marcus Thomas (links) en Kevan Townsend saam met hul regsvertegenwoordigers Salomon Kanyemba (regs voor) en Mbanga Siyomunji. FOTO: IRÈNE-MARI VAN DER WALT

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Madelein Beukes 081 811 2218
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Tel: 061 330 504

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VOORUITSIGTE

WINDHOEK	15°	30°
RUNDU	18°	33°
OSHAKATI	20°	33°
GOBABIS	17°	33°
MARIENTAL	20°	35°
KEETMANSHOOP	18°	33°
WALVISBAAI	16°	27°
LUANDA	23°	31°
JOHANNESBURG	9°	24°
KAAPSTAD	11°	25°



Jessé Liula Schiceya FOTO VERSKAF

Namibiese toep vir suidelike Afrika

VAN BL. 1

Volgens Jessé fokus dit op twee doelwitte; eerstens om vroue en die jeug te bemagtig met hulpmiddels om hul eie geld te maak en hul gemeenskappe te ondersteun. Hierbernevens bevorder dit ook finansiële geleentheid en die opleiding van eienaars van ondernemings oor onder meer die belangrikheid om belasting te betaal, te spaar, sake-etiek en toegang tot krediet.

BEKROONDE ENTREPRENEUR

Hy is reeds die afgelope 11 jaar 'n entrepreneur en werk as 'n konsultant vir klein- en entrepreneursondernemings en het deur die jare baie geleer oor sagware-ingenieurswese, sakebestuur en kubersekeriteit. Tussendeur het Jessé ook 'n paar waardevolle vaardighede in onderhandelinge en spanbestuur aangeleer. Hy was reeds die ontvanger van 'n lang lys gesogte toekennings, insluitend mees innoverende idee in Namibië 2020 (UNDP

& MTC), mees kreatiewe besigheid in Namibië (Nes Namibia), mees belowende entrepreneur vir suidelike Afrika 2022 (Africa-Arena), stigter van die jaar 2022 (Namibië), beste diensverskaffer 2022 (Namibië), groentjie-besigheid wat die winnigste groei 2022, sowel as Forbes 30u30-finaal 2022.

Op die koop toe is Jessé ook Amazon Web Services se ambassadeur vir groentjie-besighede in Afrika.

Wanneer hy nie werk nie, lees hy graag literatuur oor persoonlike groei, speel aanlyn skaak met sy vriende, gaan stap saam met sy hushikes of soos dit 'n goeie sakeman en entrepreneur betam, sluit hy ook gereeld by netwerksessies aan.

VOLGENDE

Sy toekomsdroom is om krediet aan sy toekopliënte te verskaf, sê Jessé. "Om vir krediet te kwalifiseer, moet 'n kliënt vir minstens 12 maande 'n opbetaalde Premium-gebruiker wees, deel van die Nikke-gemeenskap, in die belastingowerheid se goeie boekies wees en moet deursigtigheid in sy besigheid hê. "As ons dié doelwit bereik het, wag daar groter doelwitte!"

Uitstekende grondregte

VAN BL. 1

Afrikalande wat beter as Namibië gevaar het sluit in Burkina Faso, Ethiopië en Rwanda, terwyl Tanzanië, Uganda en Kenia dieselfde punte as Namibië ontvang het. Namibië oortref egter Europese lande soos Switserland, Italië en selfs Duitsland in terme van die punttoekenning.

MAATSTAWWE

Ses maatstawwe is vir dié verslag gebruik. Dit sluit in vroue se regte tot gesamentlike registrasie van grond, egeenwese toestemming vir grondtransaksies, gelyke erfenisregte vir vroue in boedels asook die toekenning van geldelike hulpbronne om vroue se grondeienaarskapregte te versterk.

Ander maatstawwe behels die beskerming van vroue se regte tot grond binne gewoontereg en kwotas vir vroue se deelname in grondbestuur.

Namibië, Malawi, die Comoreilande en Lesotho is die enigste lande waar die balans van eienaarskap van grond of regte tot grond na vroue se kant toe leun – met mans wat sowat 25% van die regte besit, terwyl Namibiese vroue s'n net kort voor 30% staan.

Dit maak van Namibië 'n ware uitsondering, want uit die 46 lande wat by die verslag ingesluit is, is daar net ses waar vroue toegang tot die meeste grond het. In 40 van die lande behoort die meerderheid grond aan mans, of het hulle die meeste regte tot die benutting van grond.

Luidens die verslag is die meeste Namibiers – net minder as 90% – ten gunste daarvan dat vroue grond besit of regte tot die benutting daarvan het.

Volgens die FAO is landbouvoedselstelsels wêreldwyd een van die sektore waarin die meeste vroue werksaam is. Hulle maak dus in verskeie lande 'n lewensbestaan hieruit – in 'n groter mate as mans.

Die verslag getiteld "The status of women in agro-food systems" is die eerste van sy soort sedert 2010. Dit kyk na meer as net landbou om 'n groter geheelbeeld te kan skep van die status van vroue wat binne dié stelsel werksaam is – van produksie tot verbruik.

Hiervolgens werk tot 36% van vroue wêreldwyd binne die sektor, terwyl 38% van mans daarin werksaam is. Tog is vroue in die sektor meer gemarginaliseer en is hul werks-toestande dikwels slegter. Hulle werksure is dikwels ongereguleerd en hulle werk informeel en deeltyd, terwyl dié arbeidsintensiteit is en nie veel vaardighede vereis nie.

Vroue in die sektor verdien ook net sowat 82% vir elke US\$1 wat mans verdien.

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Boulter sê Imalwa tree irrasioneel op

VAN BL. 1

Hy verwys ook in sy verklaring na die inhoud van die dossier wat daarop dui dat Van Wyk se familie hom na die Outjo-kliniek geneem het, wat glo sowat 200 km vanaf die plaas geleë is, terwyl die Kamanjab-staats-hospitaal nader was. Die familie het na bewering nie 'n ambulans of paramedikus van Kamanjab gebel nie, wat 35 km van die plaas af is.

"Hierdie onverskillige dade kon ook onnodig die lewensverlies van Van Wyk veroorsaak het," beweer Boulter in sy verklaring.

Partye het gister voor regter Herman Oosthuizen in die hoër hof in Windhoek verskyn. Imalwa het reeds kennisgewing gegee van haar voorneme om die saak teen te staan, maar het nog nie 'n verklaring by die hof ingedien nie.

GEBEURE

Boulter verwoerd ook die betrokke dag se gebeure in sy verklaring. Die voorval het glo tydens 'n sosiale geleentheid op sy plaas gebeur nadat 'n woordewisseling tussen hom en Gerhard van Wyk jr. omstreeks 19:30 ontstaan het. Van Wyk sr. het glo by die woordes-



Die moordbeskuldigde, Harvey Boulter.

FOTO ARGIEF

wisseling betrokke geraak.

"Ek het die 9 mm-pistool byna horisontaal oor my bors en plat voor my lyf in 'n voorverdedigingsposisie gehou terwyl ek die voorste deel van die loop met my linkerhand bedek het. Ek het geweet dit is 'n veiliger manier om 'n vuurwapen in 'n verdedigende posisie te hou wat daarop gemik

is om 'n aanvaller af te weer. Hierdie fisieke postuur en verdedigingsmaneuver het my natuurlik blootgestel aan 'n aanval deur Van Wyk jr. en senior aangesien albei my hande op die vuurwapen was."

Boulter beweer sy vinger was nie toe op die sneller nie.

"Hoewel ek nie die presiese besonderhede kan onthou nie, onthou ek dat Van Wyk sr. die pistool gegryp het waarna 'n skoot afgestaan het. Tot op hede weet ek nie presies hoe en hoekom die skoot afgestaan het nie."

Boulter sê in sy verklaring hy het nie dié skoot afgestaan nie besef dit het deur sy linkerhand se palm gegaan. Hy was glo in skok en uiterste pyn.

"Iemand het genoem Van Wyk sr. is ook beser. Ek het nie die presiese aard van sy besering geweet nie, aangesien ek myself van die grond af moes optel terwyl hy, sover ek kan onthou, saam met ander familieleden van die toneel weggehoop het."

"Om die waarheid te sê, dit sou vir my bisar wees as ek van plan was om Van Wyk sr. te vermoor met wie ek 'n jarelange goeie verhouding gehad het en aangesien hy nie die aanval teen my begin het nie."

Wyle Van Wyk se vrou, Alta, sy seun Gerhard, skoondogter Liani en dogter Michelle het ook na die voorval 'n siviele saak teen Boulter aanhangig gemaak waarin hulle skadevergoeding eis.

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Appendix B: Consultant's Curriculum Vitae

ENVIRONMENTAL SCIENTIST**André Faul**

André entered the environmental assessment profession at the beginning of 2013 and since then has worked on more than 180 Environmental Impact Assessments including assessments of the petroleum industry, harbour expansions, irrigation schemes, township establishment and power generation and transmission. André's post graduate studies focussed on zoological and ecological sciences and he holds a M.Sc. in Conservation Ecology and a Ph.D. in Medical Bioscience. His expertise is in ecotoxicological related studies focussing specifically on endocrine disrupting chemicals. His Ph.D. thesis title was The Assessment of Namibian Water Resources for Endocrine Disruptors. Before joining the environmental assessment profession he worked for 12 years in the Environmental Section of the Department of Biological Sciences at the University of Namibia, first as laboratory technician and then as lecturer in biological and ecological sciences.

CURRICULUM VITAE ANDRÉ FAUL

Name of Firm	:	Geo Pollution Technologies CC.
Name of Staff	:	ANDRÉ FAUL
Profession	:	Environmental Scientist
Years' Experience	:	22
Nationality	:	Namibian
Position	:	Environmental Scientist
Specialisation	:	Environmental Toxicology
Languages	:	Afrikaans – speaking, reading, writing – excellent English – speaking, reading, writing – excellent

EDUCATION AND PROFESSIONAL STATUS:

B.Sc. Zoology/Biochemistry	:	University of Stellenbosch, 1999
B.Sc. (Hons.) Zoology	:	University of Stellenbosch, 2000
M.Sc. (Conservation Ecology)	:	University of Stellenbosch, 2005
Ph.D. (Medical Bioscience)	:	University of the Western Cape, 2018

First Aid Class A	EMTSS, 2017, OSH-Med 2022
Basic Fire Fighting	EMTSS, 2017, OSH-Med 2022

PROFESSIONAL SOCIETY AFFILIATION:

Environmental Assessment Professionals of Namibia (Practitioner)

AREAS OF EXPERTISE:

Knowledge and expertise in:

- ◆ Water Sampling, Extractions and Analysis
- ◆ Biomonitoring and Bioassays
- ◆ Biodiversity Assessment
- ◆ Toxicology
- ◆ Restoration Ecology

EMPLOYMENT:

2013-Date	:	Geo Pollution Technologies – Environmental Scientist
2005-2012	:	Lecturer, University of Namibia
2001-2004	:	Laboratory Technician, University of Namibia

PUBLICATIONS:

Publications:	5
Contract Reports	+180
Research Reports & Manuals:	5
Conference Presentations:	1