APP-006939

LAND RECLAMATION AND BERTH 9 MODIFICATION PROJECT IN THE PORT OF WALVIS BAY, ERONGO REGION

ENVIRONMENTAL SCOPING ASSESSMENT REPORT

Assessed by:

Assessed for:

March 2026

Project:	**LAND RECLAMATION AND BERTH 9 MODIFICATION PROJECT IN THE PORT OF WALVIS BAY, ERONGO REGION: ENVIRONMENTAL SCOPING ASSESSMENT**	
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Report Approval:	 **André Faul** Conservation Ecologist	

I, _____, acting as the Proponent's representative (Namibian Ports Authority), 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 _____ on the _____ day of _____ 2026.

_____
Namibian Ports Authority

EXECUTIVE SUMMARY

Introduction

The Namibian Ports Authority, Namport, is mandated by the Namibian Ports Authority Act of 1994 to control and manage ports within Namibia. To meet the growing demand for port services at the Port of Walvis Bay, Namport proposes to modify Berth 9 through land reclamation to increase onshore operational space and improve the functionality of the existing berth area. This report focuses on the proposed Berth 9 land reclamation project. Geo Pollution Technologies (Pty) Ltd was appointed by Namport, as independent environmental consultant, to assist with the necessary studies to determine the potential environmental impacts and ultimately whether an environmental clearance certificate may be granted for this project. To achieve this, an environmental impact assessment was undertaken to determine the potential positive and negative impacts of the Proponent's proposed construction and operational activities on the environment. The assessment also guided the development of an environmental management plan aimed at preventing or limiting negative impacts while enhancing the positive benefits of the project.

Scope and Methodology

The environmental assessment is conducted to determine all environmental, safety, health and socio-economic impacts associated with the project. Relevant environmental data was compiled by using secondary data, primary data and during a reconnaissance site visit. Potential environmental impacts and associated social impacts were identified and are addressed in this report.

Project Description

The main construction component of the proposed Berth 9 modification project will be the development of a new platform (approximately 4.2 ha of newly reclaimed land) and associated heavy-duty paved laydown area (approximately 6.6 ha in total), together with the modification of the existing Berth 9 jetty to form a continuous quay wall. Construction activities will involve the following: 1) sourcing and placement of fill material (preferably from existing onshore stockpiles originating from the North Port dredging, or alternatively from approved dredging areas); 2) marine construction works, including the modification of the existing Berth 9 jetty to form a continuous quay wall and the construction of new quay wall sections required between existing dolphins; 3) construction of two reinforced deck sections designed to accommodate large crawler cranes; 4) construction of new quay walls for Namport tugboats and other small craft / small platform supply vessels, including installation of a small boat launch davit; and 5) associated landside works, including the implementation of a new road intersection and a new road-over-rail level crossing (both inside the port area) to provide access to the reclaimed area.

The Port of Walvis Bay has an existing operational environmental management plan and environmental clearance certificate that covers various port related activities. Ultimately, the operations and maintenance activities on the Berth 9 expanded port area will also be included in the general port operations as covered by the existing environmental management plan and environmental clearance certificate.

Environment

Development of the port is planned offshore within port limits, in an area which is under jurisdiction of Namport. Nearby sensitivities include, on the west to southwest of the proposed area, the Walvis Bay waterfront and marina precinct, accommodation establishments, and the Walvis Bay Lagoon and Kuiseb River mouth (including the salt ponds) which are important for avifauna, To the north are mariculture ventures (including oyster and mussel farming) and northeast in the harbour basin seawater abstraction for fish processing relies on clean, quality water. South and east are various industries and businesses, many depending on the port to sustain their business activities. Walvis Bay includes residential and commercial areas adjacent to the port, with sensitive receptors such as guesthouses and restaurants raising concerns regarding nuisance impacts (e.g. noise) during previous port-related construction. The broader marine environment forms part of a designated Ramsar site and Important Bird Area, supporting large numbers of resident and migratory bird species. The benthic communities in the proposed port development area are not particularly unique and the seafloor mostly has a fine silt/mud layer, typical of the disturbed commercial harbour environment.

Public Participation

As part of the environmental assessment process, public consultation was performed. This entailed compilation of a stakeholder database; compilation of a background information document, press notices, notification letters, and site notice. Environmental assessment announcements were made in two nationally distributed newspapers, once a week for two consecutive weeks (Republikein and Namibian Sun on 15 and 22 December 2025). Notification letters were hand delivered to available neighbours as well as the Municipality of Walvis Bay and site notices were placed on the public notice boards at Woermann and Brock Supermarket and SuperSpar in Walvis Bay. All comments and concerns were compiled in a comments and responses table as part of this report.

Impacts

Positive impacts arising from the land reclamation and quay wall modification project include increased availability of onshore operational port space; employment, training and development of the Namibian workforce; increased economic resilience of employees and contractors; and economic injection into the Namibian economy through the sourcing of goods and services, often with funds obtained from foreign investors.

Negative environmental impacts resulting from construction and operations of the port are expected unless suitable preventative and mitigating measures are implemented. The most important of the impacts are water quality (including turbidity and potential contaminant mobilisation), marine ecology (including avifauna and mariculture receptors), traffic, visual, noise, waste, pollution and health and safety. The Walvis Bay Lagoon and adjacent coastal wetland systems neighbouring the port area have significant ecological sensitivity due to their importance for resident and migratory birds and mariculture and seawater users rely on clean, quality water. As such, these sensitive receptors must be protected. Port expansion activities and operations, if proceeding without due consideration of the lagoon, mariculture areas and nearby residential/tourism receptors, could result in deterioration of the environment on which the abovementioned receptors rely, and this will be further aggravated by nuisance impacts (e.g. elevated noise and traffic), with associated knock-on effects on ecological functioning and adjacent land uses.

Management of Impacts

To minimise impacts on sensitive receptors within and adjacent to the Port of Walvis Bay, construction and operational activities must be planned and implemented in a manner that protects water quality, marine ecology (including avifauna and mariculture), and port-adjacent residential and tourism receptors. Particular attention must be given to controlling turbidity and pollution risks associated with dredging (where required) and reclamation filling, including the use of appropriate methods when placing filling material spill prevention measures, and real-time monitoring where necessary to avoid plume movement towards sensitive areas such as the Walvis Bay Lagoon and mariculture operations. Construction activities should be restricted to day time where feasible to limit nuisance impacts, and good housekeeping must be performed at all times. Equipment must be available on site to deal with emergencies such as spills, fire and injuries. Future port tenants must operate in accordance with the existing operational environmental management plan of Namport and, where applicable, must obtain their own environmental clearance and implement an environmental management plan aligned with Namport's requirements.

The environmental management plan accompanying this document should be used as an on-site reference document during planning and construction activities for the project. All monitoring and records kept should be included in a report to demonstrate compliance with the environmental management plan and environmental clearance certificate conditions. Namport's health, safety, environment and quality policy, or similar, should be used in conjunction with the environmental management plan. Contractors and responsible personnel must be taught the contents of these documents. National regulations and guidelines must be adhered to and compliance monitored regularly as outlined in the environmental management plan.

Conclusion

The Port of Walvis Bay is a national asset that must be operated and developed for the benefit of Namibia. This said, it should be operated in an environmentally responsible manner, with due regard for ecological and social sensitivities and in line with the existing operational requirements of the port. Based on the environmental assessment, the proposed Berth 9 land reclamation and quay wall modification should be allowed, provided that the recommended preventative and mitigation measures are implemented. The environmental management plan must form part of the contracts of all parties involved with the construction and associated activities. Future port tenants must, where applicable, conduct their own environmental assessments and implement their environmental management plans which must draw upon, and align with, the operational environmental management plan of Namport. Parties responsible for transgression of the environmental management plan should be held responsible for any corrective action and rehabilitation that may be required.

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LIST OF ABBREVIATIONS

AIDS	Acquired immunodeficiency syndrome
BCLME	Benguela Current Large Marine Ecosystem
CHIRPS-2	Climate Hazards Group InfraRed Precipitation with Station data (version 2)
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DEA	Directorate of Environmental Affairs
DMA	Directorate of Maritime Affairs
ECC	Environmental Clearance Certificate
ECMWF	European Centre for Medium-Range Weather Forecasts
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
EMS	Environmental Management System
ERA	ECMWF reanalysis dataset
GPT	Geo Pollution Technologies
HAT	Highest Astronomical Tide
HIV	Human Immunodeficiency Virus
HMV	Heavy Motor Vehichle
I&APs	Interested and Affected Parties
IBA	Important Bird Area
ISO	International Standards Organisation
ISPS	International Ship and Port Facility Security
IUCN	International Union for the Conservation for Nature
LAT	Lowest Astronomical Tide
Ma	Megaannum
MAFWLR	Ministry of Agriculture, Fisheries, Water and Land Reform
mamsl	Metres above mean sea level
MBL	Marine Atmospheric Boundary Layer
mCD	Metres Relative to Chart Datum
MEFT	Ministry of Environment, Forestry and Tourism
MHWN	Mean High Water Neaps
MHWS	Mean High Water Springs
MLWN	Mean Low Water Neaps
MLWS	Mean Low Water Springs
MSDS	Material Safety Data Sheet
MUCH	Maritime Underwater Cultural Heritage
Namport	Namibian Ports Authority
NASA	National Aeronautics and Space Administration
NDP	National Development Plan
NHC	National Heritage Council of Namibia
NSI	Namibian Standards Institution
NTU	Nephelometric Turbidity Units
OHSAS	Occupational health and safety information, guidance and resources
OPRC	International Convention on Oil Pollution Preparedness, Response and Co-operation
PAH	Poly Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PPE	Personal Protective Equipment
PPM	Parts Per Million
SADC	Southern African Development Community
SAH	South Atlantic High
spp	Species
TBT	Tributyltin

TEU	Twenty-foot Equivalent Unit
TPH	Total Petroleum Hydrocarbons
TSHD	Trailing Suction Hopper Dredger
TSS	Total Suspended Solids
UNFCCC	United Nations Framework Convention on Climate Change
WHO	World Health Organisation

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.

Mariculture - The farming and ranching of aquatic organisms.

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

Biota - The animal and plant life of a specific region, habitat, or geological period.

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.

Dredged Material – refers to substrate on the ocean floor consisting of sediments, soils, clays, silt, rock, sand and debris removed from the seafloor during dredging.

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.

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.

Mariculture - The farming and ranching of specifically marine organisms.

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

Non-native – a plant or animal introduced to an environment that is not the location of its natural occurrence

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 & 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.

Reclamation - the process of creating new land or restoring degraded land for productive use. This can involve creating new land from bodies of water by pumping water out or filling in the seabed.

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 INTRODUCTION

The Namibian Ports Authority (Namport) is tasked with the management and development of ports in Namibia. As part of their mandate, they are planning for the expansion of the Port of Walvis Bay South Port in the Erongo Region (Figure 1-1). To achieve this, Namport proposes to modify Berth 9, by reclaiming the land between the container terminal and Berth 9 (Figure 1-2). The South Port is currently operating at near full capacity, and the full development of North Port is still years away, therefore interim measures to expand cargo-handling capacity in the South Port have become necessary. Berth 9 is currently dedicated to cruise-liner berthing, and reclaiming the proposed area will add a further 4.2 hectares to the commercial harbour area, providing additional operational space and enhancing the port's short- to medium-term capacity.

Geo Pollution Technologies (Pty) Ltd (GPT) was appointed by Namport to prepare an environmental scoping assessment (EIA) and environmental management plan (EMP) for the modification and reclamation of land at Berth 9 in the Port of Walvis Bay. A risk assessment was undertaken to determine the potential impacts 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 (ECC) in compliance with Namibia's Environmental Management Act (Act No 7 of 2007) (EMA).

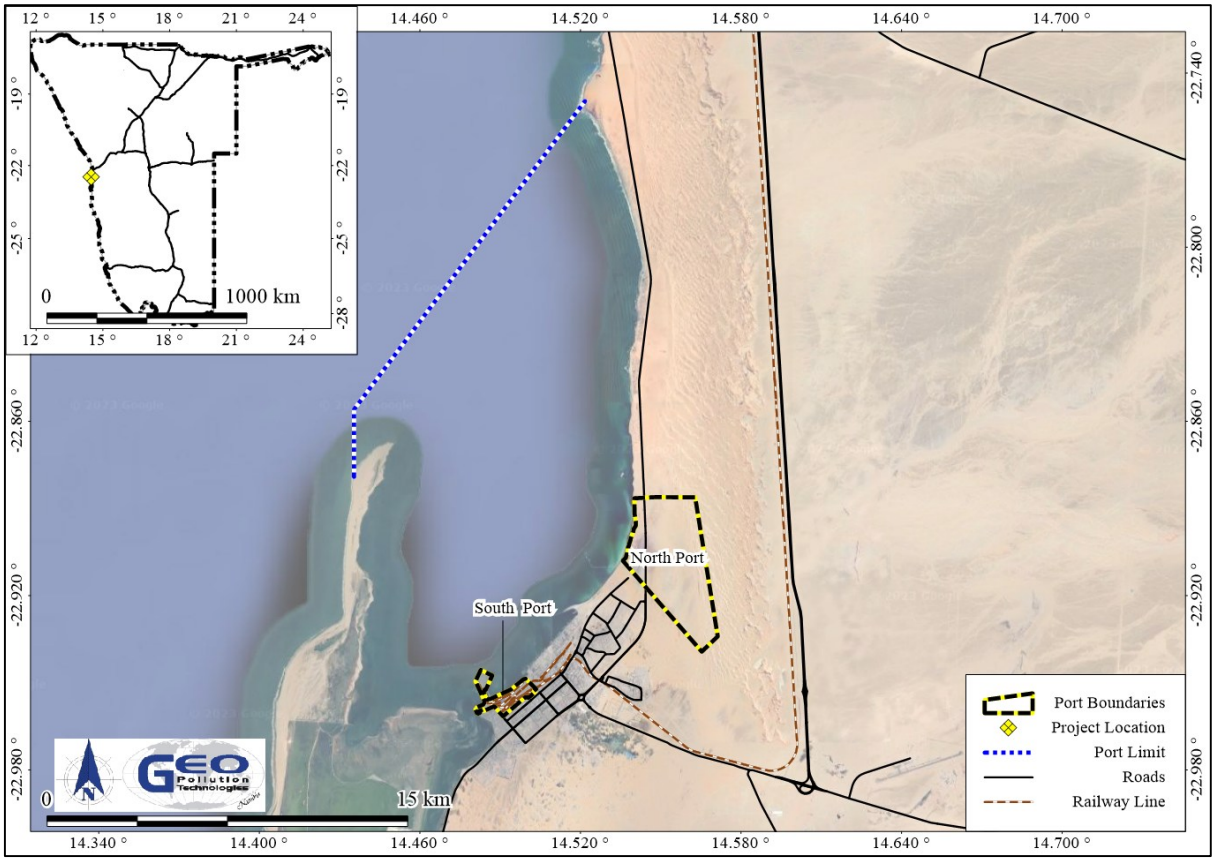

Figure 1-1 Existing commercial harbour

Figure 1-2 Proposed land reclamation area at Berth 9

2 BACKGROUND

The Namibian Ports Authority Act, Act Number 2 of 1994, as proclaimed in Government Gazette No. 810, made provision for "*the establishment of the Namibian Ports Authority to undertake the management and control of ports and lighthouses in Namibia and the provision of facilities and services related thereto; and to provide for matters incidental thereto.*" Under this act, Namport, a state owned enterprise, was established as the port authority and under their control is the Port of Walvis Bay on the central coast and the Port of Lüderitz on the southern coast of Namibia.

Namport's key roles are to (www.namport.com.na):

- Manage the port facilities to cater for current trade needs.
- Develop the ports for future demands.
- Contribute to the competitiveness of the Southern African Development Community (SADC) region's trade through the efficient, reliable and cost-effective supply of port services.
- Facilitate economic growth in Namibia by enabling regional development and cross-border trade.
- Promote the Ports of Walvis Bay and Lüderitz as preferred routes for sea-borne trade between SADC, Europe and the Americas.
- As the founding architects of the Walvis Bay Corridor Group, assist with developing cross-border trade.
- Minimise the impact of port operations on the natural environment by applying International Organisation for Standardisation (ISO) 14001 standards.
- Uplift and support the communities in which Namport operates.

Namport strives to be a world-class ports authority and thus works according to international standards, namely ISO 9001, ISO 14001 and Occupational Health and Safety Assessment Series (OHSAS) 18001, to uphold quality as well as environment and occupational health and safety standards.

Historically, the Port of Walvis Bay has functioned as Namibia's principal deep-water port, first established in 1793 and later reintegrated into Namibia in 1994, supporting national and regional trade

through container, break-bulk and bulk cargo handling, as well as fishing-related activities. Through the years the port has undergone sustained growth and seen increasing demand from mining, logistics and offshore sectors, reflecting its expanding role as a gateway for cargo moving into and out of Namibia and the wider SADC region via the Walvis Bay Corridor network. This evolving reliance underscores Walvis Bay's established role as a strategic logistics hub. The port is increasingly positioned to support a broader range of mineral and petroleum activities, with key industrial and commercial functions centred in the South Port, while the North Port continues to develop, including petroleum-related facilities and associated port services. The port functions with Namport as the port operator and landlord, with various tenants conducting business in and from the port.

3 PROJECT JUSTIFICATION

The Port of Walvis Bay is Namibia's principal commercial port and has undergone steady expansion over time to support national and regional trade. The port was established in 1793 and, during the period 1910 to 1994, it was administered by South Africa, before being reintegrated into Namibia in 1994. In recent years, operational demand within the Port of Walvis Bay has increased significantly, driven by growth in maritime traffic, containerised trade and changing industry requirements. The newly built container terminal, constructed on approximately 40 hectares of reclaimed land, has increased port capacity and contributed to increased vessel calls and landside activity.

At the same time, the port's role as a service hub has expanded, with growing offshore support requirements and an associated increase in demand for ship, equipment and instrumentation maintenance services. The port also continues to accommodate specialised offshore support tenants related to the oil and gas industry, which has reduced the availability of operational real estate in the South Port and created the need for additional, well-located working space.

The South Port is operating near full capacity, while the ongoing development of the North Port remains years away from full completion. The North Port also supports strategic activities, including serving as a supply base for offshore oil and gas exploration, while the South Port provides key infrastructure such as ship repair facilities. In this context, Namport has identified the need to create additional operational area within the existing port footprint to relieve spatial constraints and support efficient port operations.

The proposed land reclamation between Berth 9 and the new container terminal will create approximately 4.2 hectares of additional port space directly adjacent to existing operational infrastructure. This enables functional expansion in a strategically appropriate location, without the need for establishing a new port footprint elsewhere along the bay.

From an EIA perspective, this approach offers several advantages:

- Reduced environmental footprint: Expanding within the existing port footprint minimises disturbance to undisturbed marine and coastal ecosystems compared to greenfield development elsewhere along the coastline.
- Optimised use of existing infrastructure: Locating additional operational area adjacent to existing berths and port services reduces the need for extensive new supporting infrastructure and associated disturbance.
- Accelerated implementation: Development within the existing port area can proceed within shorter timeframes.
- Alignment with strategic policy: The proposed development supports Namibia's Vision 2030 and National Development Plans (NDPs), which prioritise safe, reliable and sustainable transport networks and the strengthening of Namibia's logistics hub function within the SADC region.

The proposed Berth 9 land reclamation is a technically practical and strategically aligned response to the growing space constraints within the Port of Walvis Bay. It creates additional operational area by reclaiming the water area between Berth 9 and the container terminal, thereby supporting increased port activity and changing operational requirements, while optimising the use of existing infrastructure and minimising incremental environmental disturbance.

4 SCOPE

The scope of the environmental assessment is to, in compliance with Namibia's Environmental Management Act (2007):

- Provide a detailed description of the project components.
- Present the legal setting within which the project must be planned and executed.
- Provide a description of all environmental components that may be impacted by the project.
- Present and rate the environmental impacts that may emanate from the proposed project.
- List management actions which could prevent or mitigate the potential adverse impacts to acceptable levels.
- Conduct the required public participation processes and present and address all communication received from interested and affected parties (I&AP).
- Provide sufficient information to the Ministry of Environment, Forestry and Tourism (MEFT) and other relevant authorities to make an informed decision regarding the issuing of an ECC for the proposed project.

5 METHODOLOGY

The following methods were used to execute and complete the environmental assessment process:

1. Preliminary designs and construction activities were received from the client and are presented in this report.
2. Baseline information about the area and surroundings was obtained from existing literature and previous environmental assessment reports of the port and surroundings.
3. Primary information was obtained from specialist studies commissioned in response to the requests made by I&APs.
4. I&APs were consulted about their views, comments and opinions and these are put forward in this report.
5. As per the findings of this environmental assessment, an EIA report and EMP were prepared and these will be submitted to the MEFT.

6 PROJECT DETAILS

The Port of Walvis Bay is under jurisdiction of Namport, who acts as landlord and port operator, with a number of tenants operating in the port. It is the principal commercial port in Namibia. Namport reports that vessel calls to the ports of Walvis Bay and Lüderitz increased from 1,636 in 2022/23 to 2,115 in 2023/24, largely attributed to increased oil and gas exploration activity off Namibia's coast and wider shipping disruptions affecting vessel routing (Namport Annual Report, 2024). The Port of Walvis Bay handles about 6.6 million tonnes of cargo per year, while total cargo handled across the Authority increased from 7.7 million tonnes to 8.0 million tonnes in 2023/24 (Namport Annual Report, 2024). The following subsections, categorised by activity, provide brief descriptions of the current activities and facilities in the port.

6.1 CONTAINERISED, BULK AND BREAK-BULK IMPORTS AND EXPORTS

Sea ports are typically the main avenue for containerised, bulk and break-bulk imports and exports for a country. The main types of bulk, break-bulk and containerised cargo moving through the Port of Walvis Bay include salt, copper, coal, sulphuric acid, wheat, sulphur, petroleum products, manganese, ammonium nitrate, vehicles, frozen products (fish, beef and poultry), foodstuffs (including rice, maize and sugar), project cargo, charcoal, timber, uranium, mining chemicals and mineral ores. Salt is the biggest commodity that is handled and exported by the Port of Walvis Bay.

Loading and offloading of dry bulk cargo are typically performed in two ways: 1) by means of an auger conveyor (screw conveyor) or 2) by means of grabs. During offloading, product is emptied into trucks, hoppers or onto conveyors. Hoppers are used to fill bulk bags and containers, or are emptied directly into trucks for transport. Conveyors transport products to dedicated storage areas from where trucks, bulk bags or containers can be filled for further transport.

Break-bulk cargo is typically handled and transported as bulk bags, crates or drums and is loaded and offloaded by means of cranes. Offloading can be directly to trucks for immediate transport out of the port or to temporary storage areas within the port. Temporary storage areas include various dry ports, warehouses and rub halls. From these facilities the break-bulk cargo can be loaded and transported to clients in its current break-bulk form, or it can be re-packed into smaller volumes, as per client requirements.

Containerised cargo is temporarily stored, loaded to, and offloaded from, container vessels at the New Container Terminal, established in 2019, which includes an additional 600 m long quay wall with a maximum water depth of approximately 16 m. The port has a container throughput capacity of 750,000 Twenty-foot Equivalent Units (TEUs) per annum. Namport reports that TEUs handled increased by 6% year-on-year, from 160,883 TEUs in 2022/23 to 171,151 TEUs in 2023/24 (Namport Annual Report, 2024). Containers are also stored and handled at the different dry ports. These include reefers for cold storage and associated transport purposes.

Hazardous substances such as caustic soda, sulphuric acid and explosive materials that are imported in bulk through the Port of Walvis Bay are mainly destined for the mining industries in Namibia and neighbouring SADC countries. Namport has various procedures in place for the safe handling and storage of these products. These include dedicated temporary storage areas, specific routes through the port and town and the necessary permits and permissions from various authorities.

Transport of bulk, break-bulk and containerised cargo to and from the port is by means of trucks or trains. Trucks and trains include flatbed, side tipper and tanker trucks / rail cars.

6.2 FUEL IMPORTS

Petroleum imports (diesel, unleaded petrol, Jet-A1 and heavy fuel oil) constitute the largest share of commodities landed at the Port of Walvis Bay (Namport Annual Report, 2024). The fuel terminal constructed in the North Port consists of a 1,600 m long concrete jetty with two dolphin berths. To service the fuel terminal, new pipelines to the bulk fuel storage facilities in the industrial area of Walvis Bay were constructed.

6.3 VEHICLE IMPORTS

Vehicle imports remain an important component of the services provided by the Port of Walvis Bay. Vehicles are imported either containerised or in roll-on/roll-off (Ro-Ro) vessels, with Ro-Ro vessels allowing vehicles to be driven onto, and off from, the vessel under their own power or onto other self-propelled platforms. In 2023/24, there was a 53% year-on-year increase in vehicle imports, largely following the Namibian Government's decision to extend the permissible year of manufacture for imported vehicles from 8 to 12 years, which encouraged both existing and new importers to increase volumes. Vehicles are also reflected as a notable import commodity through Walvis Bay (5% share), with a positive movement in volume during the year under review.

6.4 PASSENGER TRAFFIC

The growth in the tourism industry has supported continued cruise liner activity at the Port of Walvis Bay. With the introduction of the New Container Terminal, Berth 9 was created as the first dedicated passenger liner berth at the port, allowing passenger operations to be managed separately from the central cargo hub on berths 1 to 8. The berth can accommodate large cruise vessels (up to 350 m length overall).

6.5 SUPPORT AND LOGISTICS SERVICES

In addition to the import and export of goods and raw materials, a number of support services are also provided by Namport and its tenants. The following section provides an overview of the most important of these services.

6.5.1 Ship Repair and Maintenance

Ship repair and maintenance is undertaken at dedicated ship repair facilities within the Port of Walvis Bay, as well as alongside repair areas, depending on the size of the vessel and the nature of the work required. Major repairs and maintenance are undertaken at the Syncrolift and floating dry dock facilities, while minor repairs and maintenance can be performed alongside, where dry docking and land-based repairs are not required.

The port's Syncrolift has a lifting capacity of 2,000 tonnes displacement and is designed to accommodate vessels of up to approximately 80 m length overall and 12 m width. Namport provides docking and undocking services, while private local ship repair and engineering companies typically undertake dry-docking, repair work and repainting of vessels, with vessels utilising repair bay space for preparation and land-based works as required.

Larger vessels are accommodated at the floating dock facility managed and operated by Namibia Drydock & Ship Repair (Pty) Ltd (Namdock), a subsidiary of Namport. Three floating docks provide lifting capacities of 8,000 tonnes, 6,500 tonnes and 15,000 tonnes for dry-docking and repair, and Namdock has dedicated ship repair workshops and associated facilities.

Alongside repair and maintenance is also undertaken within port limits, including along dedicated repair jetties and other approved lay-up areas for floating repairs. Namport provides jetty space for vessels to lay up for floating repairs alongside multiple jetties and for vessels awaiting Syncrolift docking, enabling preparatory work to be undertaken prior to dry-docking.

6.5.2 Transhipments

The Port of Walvis Bay acts as an intermediate destination for transhipments. This can be in the form of sea cargo temporarily stored in the port before being re-loaded onto another vessel for further transport, or shipments via for example dry ports.

6.5.3 Dry Ports and Storage Facilities

The Port of Walvis Bay hosts dry ports for SADC countries. Dry ports are inland terminals directly connected to a seaport by rail or road. It acts as a hub for transhipments of sea cargo to and from inland destinations. At the Port of Walvis Bay dry ports serves the neighbouring land-locked countries Zambia, Zimbabwe and Botswana. Cargo stored and handled at the dry ports can include anything from mineral ores, chemicals, vehicles and general goods mainly in break-bulk and containerised form.

Various privately operated storage facilities are present within the commercial harbour. These range from bulk storage of mineral ores in the open to storage of goods in warehouses and rub halls. Many of these are operated under their own EIAs and EMPs which will have to be in accordance with Namport's EMP and operating procedures.

6.5.4 Fuel Bunkering

Namport as well as its tenants need to refuel vessels docked, anchored or underway within the port. For this purpose various smaller bulk fuel installations are present at different locations within the port. Fuel bunkering methods include: 1) underground pipelines from bulk tanks to the quay areas and concrete jetties, where hose trolleys are used for bunkering purposes; 2) by road tankers where bunker points are not available; or 3) by offshore tanker vessels where vessels cannot be fuelled from land. Permission for the latter ship-to-ship transfer method of fuel supply is obtained from the Directorate of Maritime Affairs (DMA), Ministry of Works and Transport. Within port limits, the pollution combating officer of Namport monitors and oversees ship-to-ship transfers.

6.5.5 Cold Storage Facilities

A commercial cold storage facility is present within the commercial harbour and is operated by a private company. The facility provides temporary cold storage space (refrigeration and

freezing) for the import and export of perishable goods (e.g. fruit, vegetables, meat and fish) via the port.

6.5.6 Small Craft Harbour, Yacht Club and Waterfront

A small craft harbour is situated in the port and serves to provide a launch site for small motorised craft. This serves among others the tourism and mariculture industries. The yacht club and waterfront further contribute to nautical recreation and maritime tourism activities. Numerous private sightseeing cruises operate from the waterfront area.

6.5.7 Dredging

Sedimentation and seabed scouring decreases water depth in the entrance channels and alongside jetties and quays. Maintenance dredging is therefore occasionally required to deepen these areas to allow for the safe navigation of vessels. Capital dredging is performed when new channels, turning areas or berthing space are required or existing ones are deepened. Dredging is covered by its own EIA and EMP which was amended in 2024 and is performed under its own environmental clearance certificate (Botha et al. 2024).

6.5.8 Fishing Operations and Mariculture

Fishing and fish processing is a very important industry in Walvis Bay and Namibia as a whole. The land-based infrastructure of the fishing industry is outside of the commercial harbour and is located in the industrial area of Walvis Bay. Offshore infrastructure like jetties and all related offshore activities within port limits performed by fishing companies are under Namport's jurisdiction. This includes any jetty construction and modification, dredging, docked ships' repair and maintenance activities, anchoring and navigation.

Mariculture of oysters and mussels occur within port limits. It is a growing industry regarded as an important industry by the various Namibian development plans. Mariculture activities also fall outside the scope of Namport's EMP.

Although the fisheries and mariculture activities are not included in the EMP, operations of the commercial harbour may impact on the fishing and mariculture industry and vice versa. This will mostly be related to deterioration of seawater quality as a result of activities of the respective parties. For example, ship repair activities, dredging and accidental spills may decrease the quality of the seawater abstracted for fish processing, while effluent discharge from fish factories can in turn increase the biological and chemical oxygen demand of water in the harbour. Water which is essentially Namport's responsibility to protect.

6.6 TRAFFIC

Vehicle traffic into and out of the port is regulated at security controlled gates. Access is permit controlled and regular alcohol testing is conducted. The main access gate is off 3rd Street East and limited off-street parking space for light vehicles is provided outside the access gate. A truck staging area is located near the gate in 4th Street East.

The Port of Walvis Bay is serviced by three gates. Container traffic is handled through the container gate, situated in Gertrude Rikumba Kandanga Hilukilwa Road. General traffic, bulk and break bulk cargo, after hour container traffic and container traffic to private container depots inside the port are handled through the main gate. The third gate, situated at the northern end of 5th Road (South Gate), is used for abnormal loads which include the trucks transporting salt and explosives as well as construction vehicles as for example during the construction of the new container terminal.

With the commissioning of the new container terminal, and to manage the current and expected increase in traffic, Namport proposed a design for a new entrance gate with access gained from 4th Street east. Construction of the new gate is at an advanced staged. The design includes the following main components: 1) the closure of the existing container gate; 2) the conversion of the existing main gate into an exit gate only; 3) construction of a multi-lane entrance gate; and 4)

construction of a truck staging/queuing area. See Figure 6-1 and Faul A and Botha P, 2017 for more details.

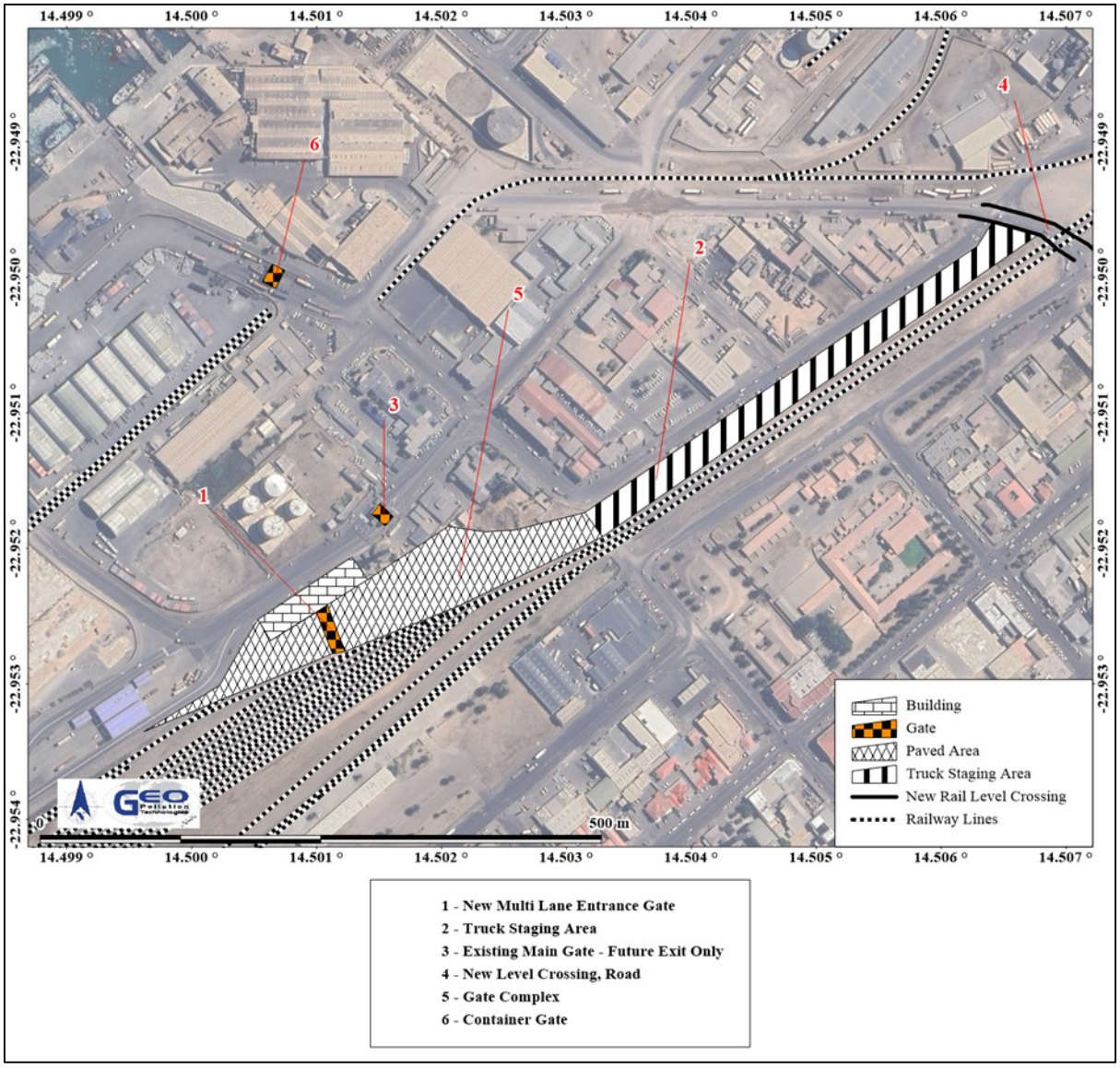

Figure 6-1 Proposed layout of the new Port entry area

Dangerous cargo which may have the added danger of being explosive is carefully managed in terms of transport. Various predetermined transport routes and management methods are implemented for dangerous cargo.

The railways and sidings in the Port are actively used, mainly for the transport of cargo to the mining sector within Namibia.

6.7 SECURITY

The entire landside of the port area is fenced off and security personnel man all entrance gates. No unauthorised access is allowed in the port area and all visitors must obtain an entrance permit from Namport security. Access to all dry port storage and handling areas are via port security and the internal roads, except the administrative building of the Botswana Dry Port which can be accessed directly from the street.

6.8 PLANNED MODIFICATION

The aim of the planned modification of the port is to increase the on land capacity of the South Port to increase operational area. The following is a summary of the proposed project of the port.

6.8.1 Additional Footprint

The entire footprint of the planned modification project is offshore between the Berth 9 jetty and the new Container terminal (Figure 6-2). The modification project will provide an additional 6.6 ha operational area of which 4.2 ha will consist of reclaimed land.

Figure 6-2 Additional planned port area and proposed components

6.8.2 Construction Activities

The proposed works comprise the development of a new land reclamation platform and associated marine and landside infrastructure. A heavy-duty pavement laydown area of approximately 6.6 ha will be constructed, of which about 4.2 ha will comprise newly reclaimed land. Fill material will be sourced from an existing sand stockpile at the Port of Walvis Bay North Port (approximately 7 km from the site) (Figure 6-3) or, alternatively, from dredged material located north of the existing container terminal.

Marine works will include the construction of new quay walls for Namport tugboats and other small craft / small platform supply vehicles, as well as the modification of the existing Berth 9 jetty to form a continuous quay wall, including new quay wall sections required between existing dolphins. Two reinforced deck sections will be constructed to accommodate large crawler cranes. A small boat launch davit (crane-like mechanical system) will be installed at the new quay wall, with a minimum 6 m hook radius and a 3-tonne safe work load.

Associated landside works will include the implementation of a new road intersection and the construction of a new road-over-rail crossing, all within the existing port, to provide access to the proposed operational area (Figure 6-2). Construction activities will involve the following:

6.8.2.1 Quay Wall Construction

Construction will begin with the installation of either a steel sheet-pile or a combi-wall system to establish a retaining wall structure.

Sheet pile option: Interlocking steel sheet piles are driven vertically into the ground using vibratory hammers, impact hammers or by using jet assisted piling.

Combi-wall option: Large-diameter tubular piles and sheet piles are installed together, combining high bending resistance with watertightness.

The purpose of the sheet pile or combi-wall is to form a retaining wall to hold back soil and water. This defines the perimeter of the reclamation area and provides lateral stability during subsequent filling operations. To stabilise the steel sheet pile/combi-wall, tie-back anchors or struts may also be added. These structures will resist lateral pressure from the reclaimed fill and ensure the integrity of the quay wall during and after construction.

After installing the sheet piles or combi-wall system, large steel tubular piles will be driven into the foundation of the area to be reclaimed. Heavy-duty cranes and pile-driving rigs align tubular piles at designated grid points. Piles are driven deep into the foundation strata using hydraulic hammers, ensuring penetration into load-bearing soil or bedrock, or installed using water jet-assisted piling (pile jetting) to reduce friction and allow the pile to be advanced with lower noise and vibration compared to conventional impact driving. Once installed, piles are inspected and cleaned internally to remove debris or groundwater.. Steel reinforcement cages may be lowered into the hollow pile to enhance structural capacity. High-strength concrete is pumped into the pile, filling it from the base upward to avoid voids. Concrete is allowed to set, forming a composite pile with both steel and reinforced concrete properties. These piles become the primary load-bearing supports, transferring structural loads to the foundation.

6.8.2.2 Land Reclamation between Quay Wall and the Container Terminal

After installation of the sheet pile, land reclamation will be carried out in the area between the newly constructed quay wall and the Container terminal. Fill material is placed within the enclosed sheet-pile wall to raise ground levels. Fill is compacted in layers to achieve required density and stability.

6.8.2.3 Sourcing and Placement of Fill Material

Fill material for land reclamation can be sourced from two primary locations:

Onshore Material: The preferred option is to utilise stockpiled material that was previously dredged and pumped ashore during the construction of the North Port fuel terminal. The chemical (Figure 9-12 and Table 9-5) and physical properties of this material are known and, by re-handling and re-using it for the proposed reclamation, the project can reduce the requirement for additional borrow material. Sand and fines will be loaded onto heavy motor vehicles (HMV) and transported by road to the project area for placement and compaction. The filling material will be loaded at the designated North Port loading area and transported along the B2 into Walvis Bay. On entering Walvis Bay, two transport routes will be used from the Dias Circle: Route A proceeds along 18th Street East, turns into 5th Road and enters the Port via the South Gate; Route B diverts at the Dias Circle by turning right onto 18th Road, then continues via either 5th Street East or 6th Street East towards the Port, entering through the main entrance and proceeding to the project area (Figure 6-3). The tray of the HMV will be closed with a tarpaulin after the filling material is loaded to prevent any windblown dust during transport.

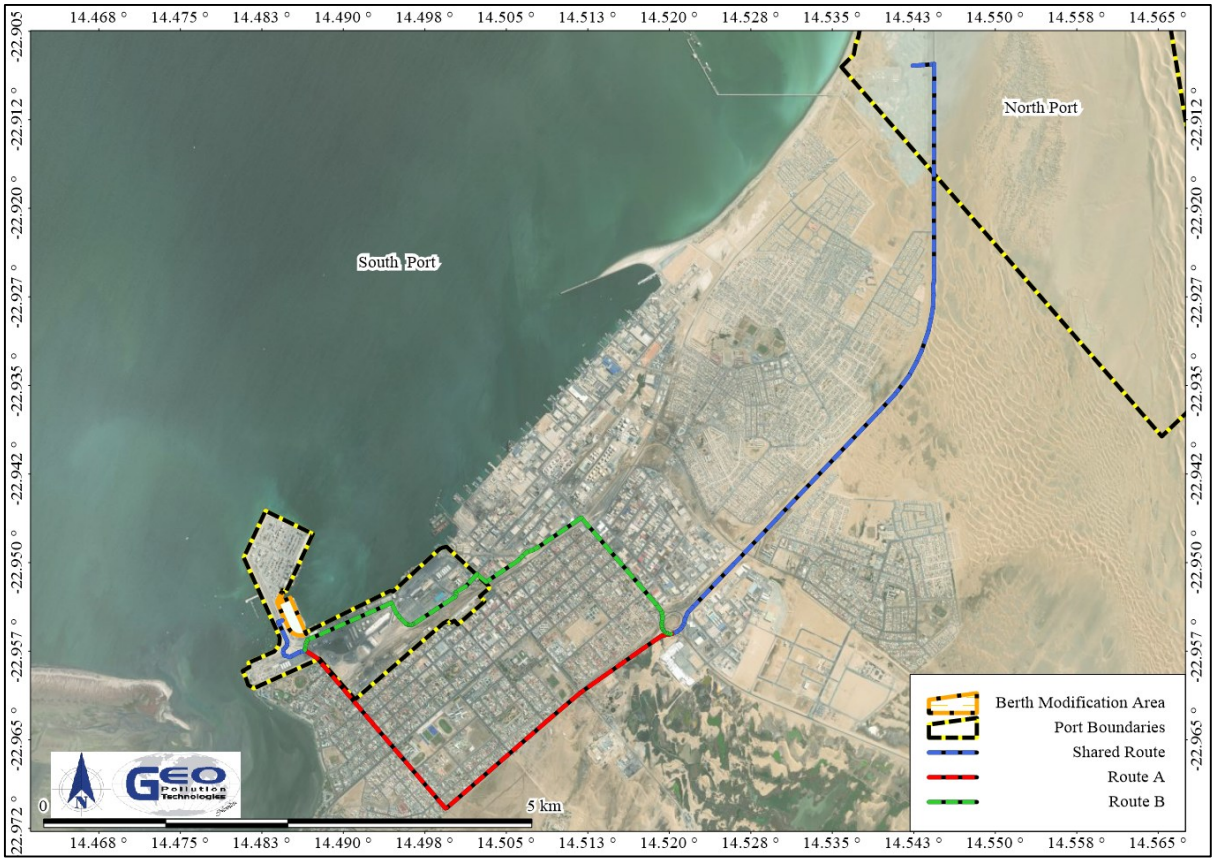

Figure 6-3 Proposed transport route from the fill material to the project site

Offshore Dredged Material: Where additional fill is required, suitable material may be sourced from marine sediments through approved dredging activities within port limits. The suitability of any marine-sourced material will be confirmed prior to use, and sourcing, handling and placement will be undertaken in accordance with applicable approvals and environmental controls to prevent unnecessary turbidity, spillage and contamination.

Registered Quarries: Should additional material, possibly with other specifications, be required for reclamation, it will be sourced from registered quarries in the area.

6.8.2.4 Superstructure

Construction of the superstructure will start with caps, pile caps, or slab construction atop the piles to distribute loads. Surface works involve preparing and finishing the reclaimed ground so it can function effectively as operational port infrastructure. This includes final grading, compaction, and stabilisation of the reclaimed area, followed by the construction of pavements, hardstanding zones, and access roads designed to accommodate heavy equipment and cargo handling. Integrated drainage systems, utility lines, and service ducts are installed to ensure proper water management and reliable connections for power, communication, and other essential services.

Once the functional layers are in place, protective surfacing such as concrete aprons, asphalt, or paving blocks is applied to withstand high loads and marine conditions. Additional works may include erosion protection along exposed edges, installation of lighting, signage, and safety features, and landscaping or environmental buffers to enhance site resilience. Together, these surface works transform the reclaimed foundation into a durable, accessible, and fully operational harbour platform ready for cargo handling, vessel servicing, and associated port activities.

6.8.2.5 Extension of Onshore Services

To ensure seamless integration with existing port infrastructure, the following onshore services will be extended into the newly reclaimed area:

- Internal access roads and pedestrian pavements
- Water supply and sewerage networks
- Electrical and lighting systems
- Storm water drainage and fire protection infrastructure

These installations will follow existing design standards and environmental safeguards to maintain operational continuity and minimize terrestrial impact.

6.8.3 Operations

Operations within the Berth 9 modification area will form part of the Port of Walvis Bay's existing operational footprint and will be managed in accordance with Namport's existing operational EMP. The port operates on a landlord-and-tenant principle, where Namport is responsible for key aspects of port operations and infrastructure management, while tenants are required to comply with Namport's regulations, policies and management procedures. Port tenants conducting activities which are also listed in the EMA as requiring environmental clearance, will be subject to their own environmental assessment, with an EMP which must align with that of Namport.

Operational activities on the expanded port area will initially focus on servicing the offshore oil and gas exploration industry as a main supply base, as well as functioning as a base for Namport's tugboat fleet. Over the longer term, and once the supply-base function reduces, the area will be utilised as a multi-purpose terminal for the Port of Walvis Bay. Typical port-related activities are expected to include vessel navigation within port limits, loading and offloading of bulk, break-bulk and containerised cargo, and the storage and handling of cargo. Passenger vessel operations will also continue at Berth 9.

Port infrastructure under direct control of Namport will require periodic maintenance, replacement or upgrade in order to ensure continued functionality. Construction of completely new infrastructure as the demand for various port services and facilities change, may also be required. Some aspects of such construction activities may require their own environmental assessment or amendment of the port's EMP, depending on the type and scale of the proposed construction activity.

7 ALTERNATIVES

Various alternatives are considered. These mainly relate to location, construction methods and type of infrastructure, and the no go alternative. These are discussed below.

7.1 LOCATION

The water body to the east of the Berth 9 jetty, where the proposed land reclamation is to take place, as well as the jetty itself, is currently underutilised and does not serve a defined operational purpose. Marine access to this area is limited due to the narrow opening, and the area is mainly used for the temporary docking of smaller vessels while they wait for cargo or operational equipment to be loaded and the storage of equipment such as oil booms. The chosen location is expected to result in the least additional environmental disturbance, as the works will be confined to the existing port footprint and is intended to avoid disruption to day-to-day port operations during construction, improving the functionality of the Berth 9 area and creating additional operational space within the Port of Walvis Bay. Therefore, no alternative locations are proposed.

7.2 CONSTRUCTION METHODS

Table 7-1 presents the comparison of the retaining wall construction alternatives under consideration for the port modification project. Table 7-2 provides some alternatives regarding resource use for construction.

Table 7-1 Construction method alternatives

Feature	Sheet-Pile Wall	Combi-Wall
Strength and Load Capacity	♦ Moderate; suitable for earth retention and lighter marine works	♦ Very high; designed for heavy loads, deep water, and large harbour structures
Installation Speed	♦ Fast; sections are prefabricated and easily driven	♦ Slower; requires alternating tubular king piles and sheet piles, more complex alignment
Cost	♦ Generally lower; economical for temporary or small-scale works	♦ Higher; steel consumption and complexity increase costs
Flexibility	♦ Can tolerate deformation; useful in varied soil conditions	♦ Rigid and robust; less flexible but ensures long-term stability
Durability	♦ Good, but prone to corrosion without protection	♦ Excellent; thicker steel sections and concrete filling improve lifespan
Water Tightness	♦ Provides good cut-off for groundwater and seawater	♦ Superior sealing when combined with interlocking sheet piles
Applications	♦ Cofferdams, temporary retaining walls, shallow quay walls	♦ Major harbour quays, deep-water berths, heavy-duty marine infrastructure
Environmental Impact	♦ Less intrusive, smaller footprint	♦ Larger footprint, more steel and concrete use

Table 7-2 Resource use

Alternative	Advantages	Disadvantages	Preferred Option
Quay Wall Construction			
Fill Material for Reclamation			
Onshore stockpiled dredged material	♦ Beneficial re-use of existing dredged material, reducing the need for new dredging or new terrestrial borrow material. ♦ Known source material and already available on land for loading and transport. ♦ May reduce future re-handling requirements for North Port development by utilising stockpiled material now.	♦ Requires HMV haulage between the North Port and Berth 9, with potential traffic and nuisance effects along the. ♦ Placement must be managed to limit mobilisation of fines and any contaminant-bound sediments into the harbour basin.	♦ Re-uses existing dredged material that's already available on land (and previously assessed), which reduces the need for new dredging or quarrying.
Dredged Sediments	♦ Dual purpose – deepening of port and reclamation ♦ Cheaper ♦ Reduced heavy vehicle traffic through town to the port	♦ Sediments may not be of suitable quality	
Onshore Quarry Material	♦ Suitable material can easily be identified	♦ High traffic volumes through town	

		♦ Expensive ♦ Terrestrial impacts at quarry	
Water Supply			
NamWater Kuiseb Water Supply Scheme	♦ Already available and reticulated to the existing port	♦ Could create water supply disruptions to Walvis Bay if supply is not sustainable	♦ NamWater Kuiseb Water Supply Scheme if sustainable supply is confirmed
Desalinated Water (Mobile Unit)	♦ Being a mobile unit it can quickly be commissioned ♦ No additional pressure on NamWater supply	♦ Additional localised impacts on marine environment through brine return ♦ More expensive	

7.3 NO-GO ALTERNATIVE

The "No-Go" alternative is the option of not proceeding with the project and it typically means the current status quo of the site and surrounds will remain. Should the proposed development not commence, none of the potential impacts (positive and negative) identified would occur. Importantly, the benefits of employment creation, revenue generation, increased operational area in the port as well as Namibia's national development goals, would not occur or be delayed. Since the area is earmarked for port use and the demand for real estate in the port is greater than the current availability, the No-Go option is not recommended.

8 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 in Table 8-1 to Table 8-3 govern the environmental assessment process in Namibia and/or are relevant to the project.

Table 8-1 Namibian law applicable of specific interest

Law	Key Aspects
The Namibian Constitution	♦ 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**	♦ 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**	♦ Commencement of the Environmental Management Act. ♦ List activities that requires an environmental clearance certificate. ♦ Provide Environmental Impact Assessment Regulations.
Namibian Ports Authority Act **Act No. 2 of 1994, Government Notice No. 30**	♦ Provides for the establishment of the Namibian Ports Authority to undertake the management and control of ports.
Territorial Sea and Exclusive Economic Zone of Namibia Act **Act No. 3 of 1990, Government Notice No. 28**	♦ Determine and define the territorial sea, internal waters, contiguous zone, exclusive economic zone and continental shelf of Namibia.
Marine Resources Act **Act No. 27 of 2000, Government Notice No. 292**	♦ Provide for the conservation of the marine ecosystem and the responsible administration, conservation, protection and promotion of marine resources on a sustainable basis. o Declaration of the Namibian Islands' Marine Protected Area: Marine Resources Act (2009). o Regulations relating to Namibian Islands' Marine Protected Area: Marine Resources Act, 2000 (2012).
Water Resources Management Act **Act No. 11 of 2013, Government Notice No. 332 of 2013**	♦ Provide for management, protection, development, use and conservation of water resources. ♦ Prevention of water pollution and assignment of liability. ♦ Licensing for abstraction of water and disposal of wastewater.
Dumping At Sea Control Act **Act No. 73 of 1980, Government Notice No. 1149**	♦ Provide for the control of dumping of substances in the sea.

Law	Key Aspects
Marine Traffic Act **Act No. 2 of 1981, Government Notice No. 282**	♦ Regulate marine traffic in Namibia.
Prevention and Combating of Pollution of the Sea by Oil Act **Act No. 6 of 1981, Government Notice No. 342**	♦ Provides for the prevention of pollution of the sea where oil is being or is likely to be discharged.
Prevention and Combating of Pollution of the Sea by Oil Amendment Act **Act No. 24 of 1991, Government Notice No. 150**	♦ Amends the Prevention and Combating of Pollution of the Sea by Oil Act of 1981 to be more relevant to Namibia after independence.
Aquaculture Act **Act No. 18 of 2002**	♦ Regulates aquaculture activities to ensure sustainable development. ♦ Provides for water quality monitoring to protect aquaculture activities.
Local Authorities Act **Act No. 23 of 1992, Government Notice No. 116 of 1992**	♦ Define the powers, duties and functions of local authority councils. ♦ Regulates discharges into sewers.
Regional Councils Act **Act No. 22 of 1992; Government Notice No. 115**	♦ Sets out the powers, duties, functions, rights and obligations of Regional Councils. ♦ Provides the legal basis for the drawing up of Regional Development Plans.
Public and Environmental Health Act **Act No. 1 of 2015, Government Notice No. 86 of 2015**	♦ 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.
Labour Act **Act No 11 of 2007, Government Notice No. 236 of 2007**	♦ 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).
National Heritage Act of Namibia **Act No. 27 of 2004**	♦ Provides for the protection and conservation of places and objects of heritage significance and the registration of such places and objects. ♦ Provides for reporting of heritage finds, issuing of permits, and archaeological impact assessments.
Namibia's Draft Wetland Policy (2004 Draft)	♦ Aims to protect and conserve wetland diversity and ecosystem functioning without compromising human needs. ♦ Promote the integration of wetland management into other sector policies. ♦ Recognise and fulfil Namibia's international and regional obligations concerning wetlands, including those laid down in the Ramsar Convention and the SADC Protocol on Shared Water Systems.
Integrated Coastal Zone Management Bill of 2014	♦ Aims at coastal management and give effect to Namibia's obligations in terms of international law regulating coastal management. ♦ Not adopted yet.

Law	Key Aspects
Hazardous Substances Ordinance **Ordinance No. 14 of 1974**	♦ The ordinance's primary purpose is to prevent hazardous substances from causing injury, ill-health or the death of human beings.
National Marine Pollution Contingency Plan of 2017	♦ Coordinated and integrated national system for dealing with oil spills in Namibian waters.

Table 8-2 Relevant multilateral environmental agreements for Namibia

Agreement	Key Aspects
Stockholm Declaration on the Human Environment, Stockholm 1972	♦ 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.
United Nations Framework Convention on Climate Change (UNFCCC)	♦ The Convention recognises that developing countries should be accorded appropriate assistance to enable them to fulfil the terms of the Convention.
Convention on Biological Diversity, Rio de Janeiro, 1992	♦ Under article 14 of The Convention, EIAs must be conducted for projects that may negatively affect biological diversity.
Benguela Current Convention of 2013	♦ The Convention is a formal treaty between the governments of Angola, Namibia and South Africa that sets out the countries' intention "to promote a coordinated regional approach to the long-term conservation, protection, rehabilitation, enhancement and sustainable use of the Benguela Current Large Marine Ecosystem, to provide economic, environmental and social benefits.
Abidjan Convention of 1981	♦ The Convention for Cooperation in the Protection, Management and Development of the Marine and Coastal Environment of the Atlantic Coast of the West, Central and Southern Africa Region. ♦ Provides an overarching legal framework for all marine-related programmes in West, Central and Southern Africa.
International Convention on Oil Pollution Preparedness, Response and Cooperation (OPRC 1990)	♦ International maritime convention establishing measures for dealing with marine oil pollution incidents nationally and in co-operation with other countries.

Table 8-3 Standards or codes of practise

Standard or Code	Key Aspects
Namport Specifications and Legislation	♦ Enforced standards and codes which governs construction and operations relating to the port. ♦ Includes the EMP of the Port of Walvis Bay.

Table 8-4 Municipal by-laws, guidelines and regulations

Municipal By-laws, Guidelines or Regulations	Key Aspects
Integrated Urban Spatial Development Framework for Walvis Bay	♦ Overall vision to transform Walvis Bay to being the primary industrial city in Namibia ♦ 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)	♦ 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
Drainage and Plumbing By-Law of 1958 (updated in 1982)	♦	Regulations regarding discharges into sewers

8.1 THE ENVIRONMENTAL MANAGEMENT ACT

The project is listed as an activity requiring an environmental clearance certificate as per the following points from Section 8 and 10 of Government Notice No. 29 of 2012 of the Environmental Management Act:

Water Resource Developments

8.1 The abstraction of ground or surface water for industrial or commercial purposes – only applicable if desalinated water will be used during the construction or operational phase.

8.10 Reclamation of land from below or above the high-water mark of the sea or associated inland waters – Reclamation of land constitutes a major activity during the modification of the port.

8.12 The release of brine back into the ocean by desalination plants - only applicable if desalinated water will be used during the construction or operational phase.

Infrastructure

10.1 The construction of-

(c) railways and harbours – a new area is developed as a harbour.

9 ENVIRONMENTAL CHARACTERISTICS

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

9.1 LOCALITY AND SURROUNDING LAND USE

The project site (22.9545607°S; 14.485237°E) is located in the Port of Walvis Bay at the Berth 9 terminal (Figure 9-1), within an area zoned for port use (Figure 9-2). To the north of the project location is the new container terminal, to the east is the harbour basin, to the south lies different port users as well as the town and to the west lies the Walvis Bay waterfront and the entrance channel to the Walvis Bay Lagoon.

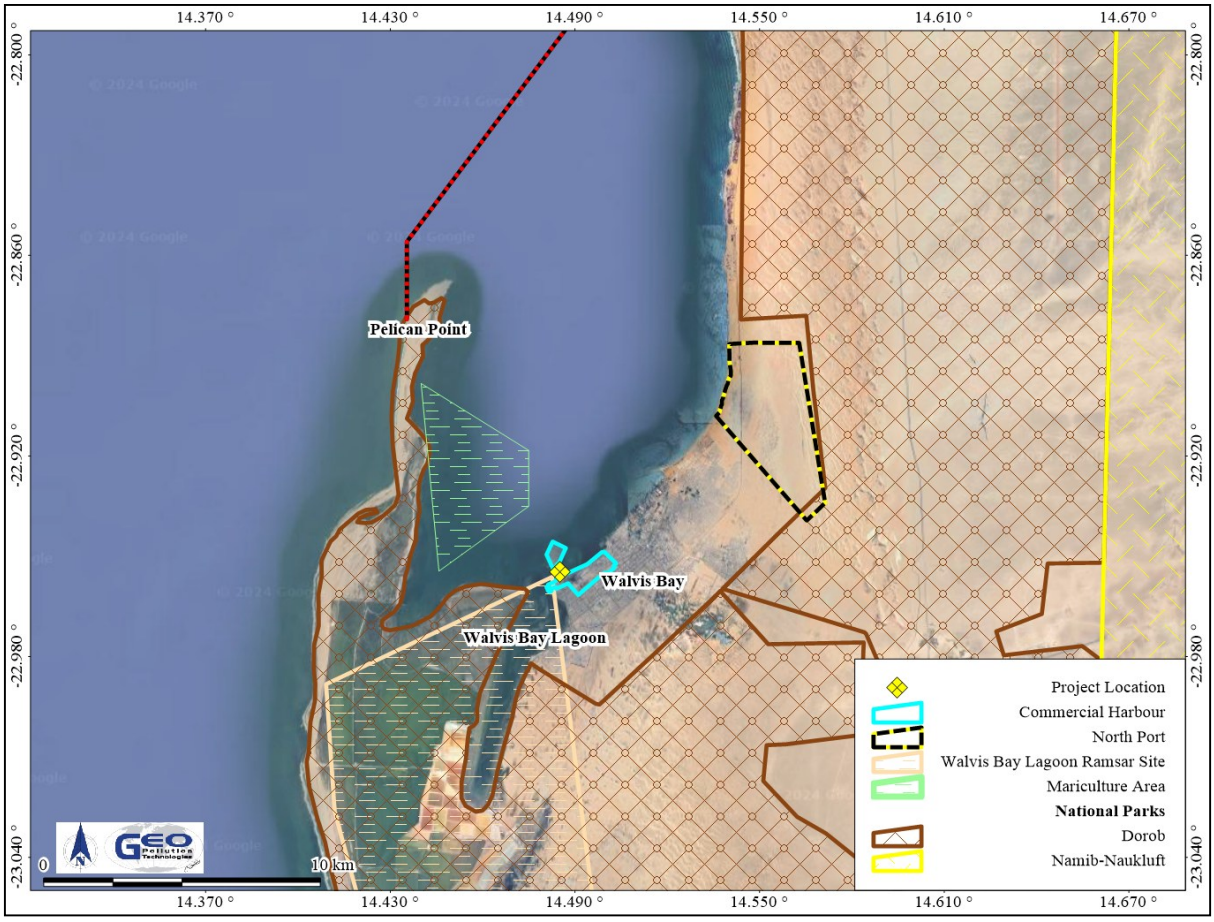

Figure 9-1 Project location in relation to the larger setting

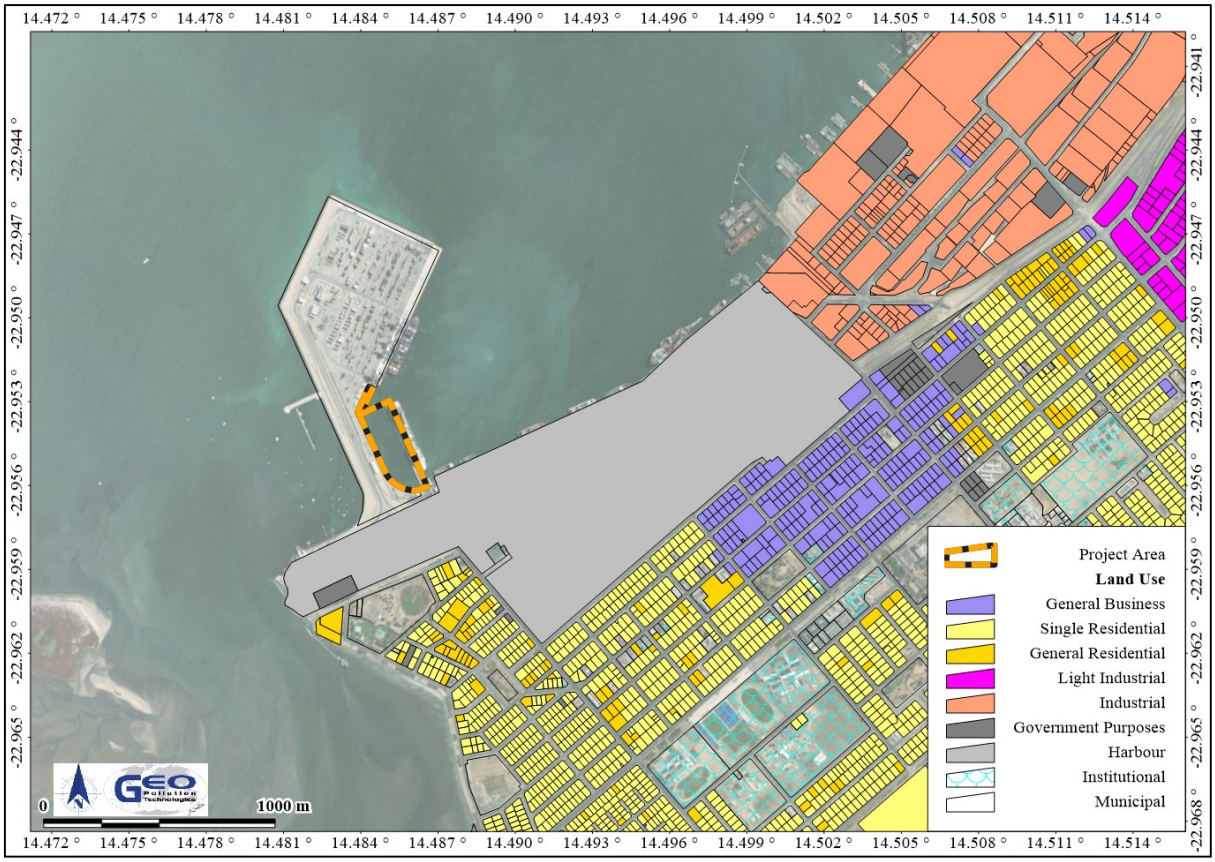

Figure 9-2 Land use at the project location

Implications and Impacts

The land reclamation, construction of a new operating platform and future operations of the area is in line with the current land use and expansion plans of the Port of Walvis Bay. The reclamation of land will provide additional on shore operational area. If pollutants from the transport of filling material or from dredging activities are released to nearby receptors, there could be negative effects on the surrounding area.

9.2 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, 2022; Bryant, 2010), see Figure 9-3.

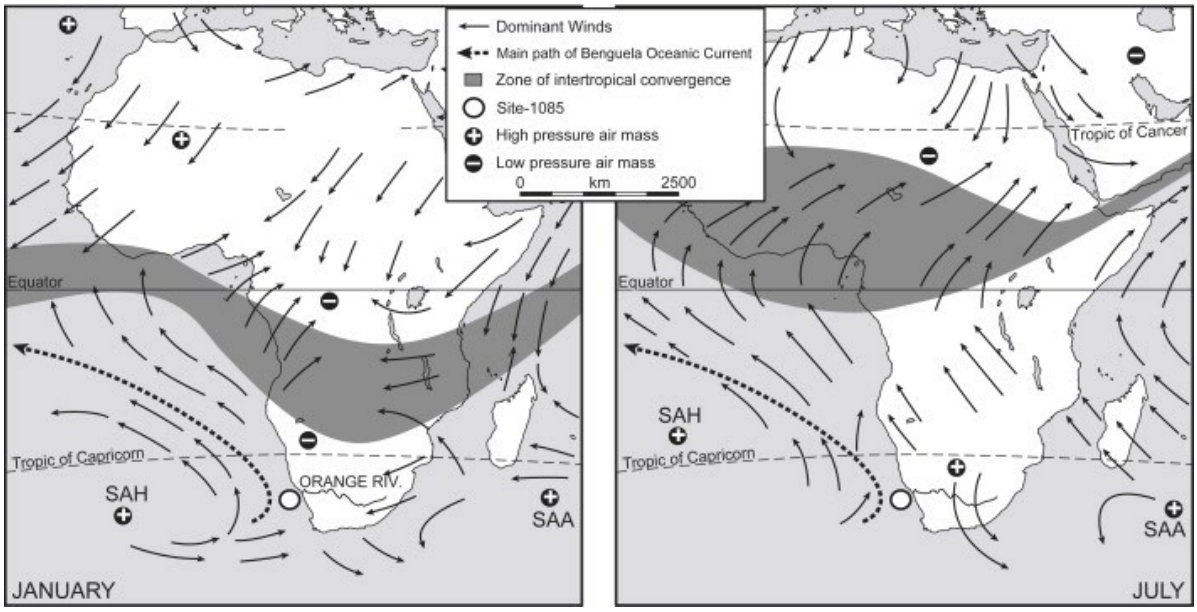

Figure 9-3 Map indicating the Intertropical Convergence Zone, Subtropical High Pressure Zone (SAH), Benguela Current and Temperate Zone south of Tropic of Capricorn (not indicated) (from: http://www.meteoweb.eu)

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.

Long term precipitation data was obtained from the CHIRPS-2 database (Funk et al., 2015). The CHIRPS-2 dataset (Climate Hazards Group Infra-Red Precipitation with Station data version 2) consist of long term precipitation data (1981 to near-present) obtained from satellite imagery and in-situ station data and therefore represents more recent data. Data is averaged over an area of roughly 5 km by 5 km. This averaging effect should be kept in mind during data analyses as high precipitation from single thunder storm cells would be averaged out, thereby providing a reduced daily maximum precipitation value.

The average annual precipitation for the last 43 years was calculated as 78 mm/a, with a coefficient of variance of 29%. Heavier precipitation (single day events) occur between November and February, with a single event of 30 mm in April (last 43 years data) being the highest. Fog plays a very significant role as source of precipitation and 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).

Daily and seasonal precipitation data (Funk et al., 2015) is presented in Table 9-1 and in Figure 9-4. Seasonal (July to June) total precipitation, centred on the average line for the last 43 years, is presented, with the daily total precipitation and the seasonal cumulative precipitation. From the figure it is clear that 9 of the last 10 seasons were below the average.

As explained above, the SAH severely limits the amount of rainfall over Namibia and especially at the coast and over the Namib Desert. 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.

Table 9-1 Precipitation statistics based on CHIRPS-2 data (Funk et al., 2015)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Minimum (mm)	0	5	0	5	0	0	0	0	0	0	6	0
Maximum (mm)	22	29	39	37	10	2	1	1	1	9	28	19
Average (mm)	9	14	12	12	1	0	0	0	0	6	13	10
Variability (%)	50	42	60	59	245	262	323	334	283	40	35	47
Daily maximum (mm)	13	19	25	30	6	1	1	1	1	8	12	18
Average rain days	2	2	2	2	0	0	0	0	0	2	3	2

Season July - June average: 78 mm | Season coefficient of variation: 29 %

Date range: 1981-July-1 to 2025-June-30 | Lat: 22.93830°S; Long: 14.54850°E

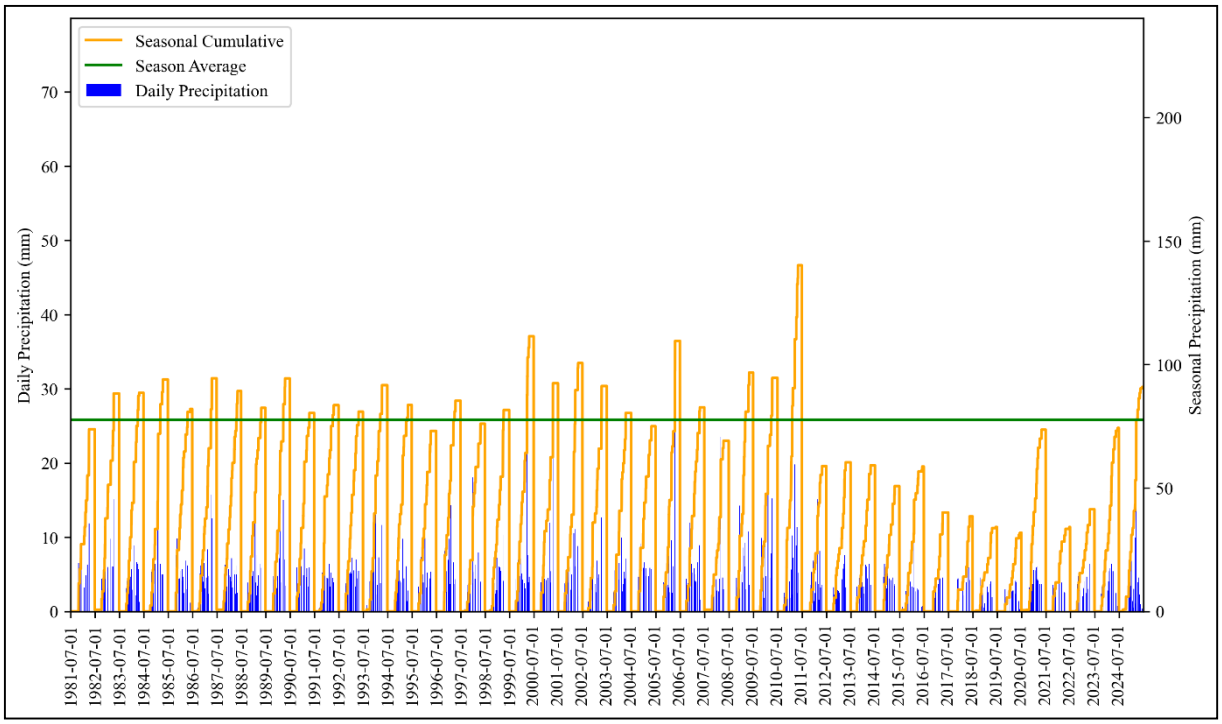

Figure 9-4 Daily and seasonal precipitation from CHIRPS-2 data (Funk et al., 2015)

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 9-5). 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 9-5). 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.

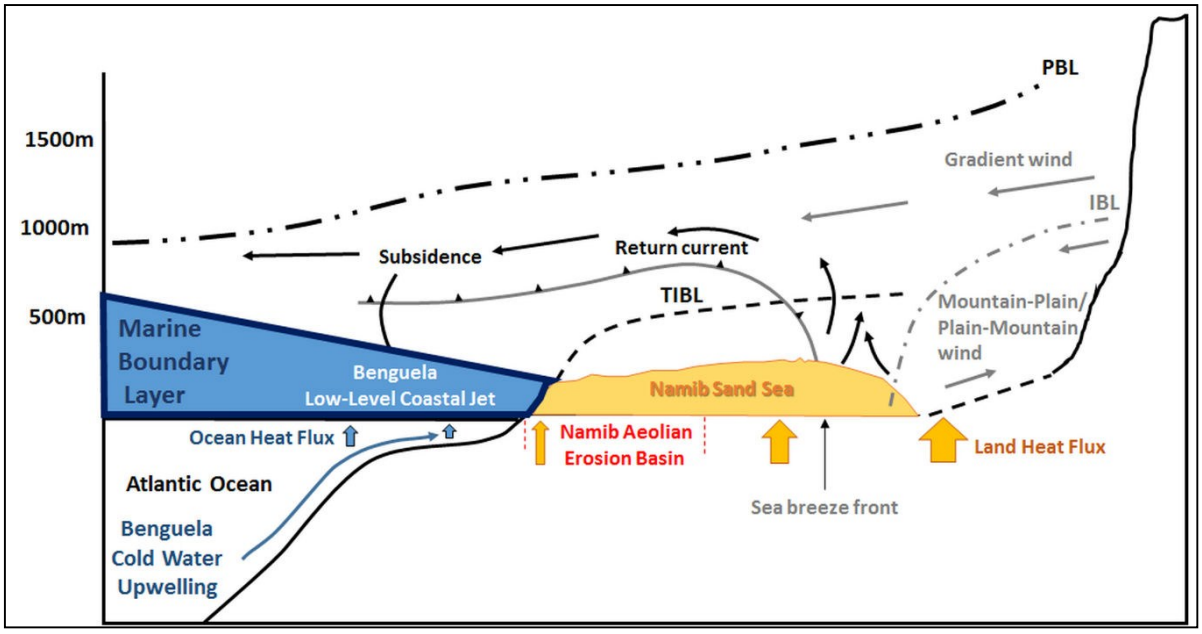

Figure 9-5 Marine atmospheric boundary layer (from: Corbett, 2018)

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 southwesterly to southwesterly 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 9-5), 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 (Figure 9-6). Wind speeds then occasionally exceed 32 km/hr (8.9 m/s) and usually peaks late morning (Figure 9-7) to early afternoon. In winter, the SAH loses strength and the southerly to southwesterly 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 (13.9 m/s) 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 descents, 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.

Outside the MBL, 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, resulting 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 during the night, slowly loosing speed and dominant wind direction during the morning (Figure 9-7). In the afternoon the wind becomes stronger and the direction more from the southwest, with the windspeed decreasing and the direction shifting to wind blowing more from a southerly direction.

Wind data presented in Figure 9-6 and in Figure 9-7 was sourced from the ERA5 data set from 1980 to 2025 (Hersbach, 2020). ERA5 is a fifth generation European Centre for Medium-Range Weather Forecasts (ECMWF) atmospheric reanalysis of the global climate. ERA5 provides hourly estimates of atmospheric, land and oceanic climate variables on a 0.25° grid. ERA5 data is produced by the Copernicus Climate Change Service (C3S) at ECMWF and wind data at a height of 10 m above surface was downloaded from this facility.

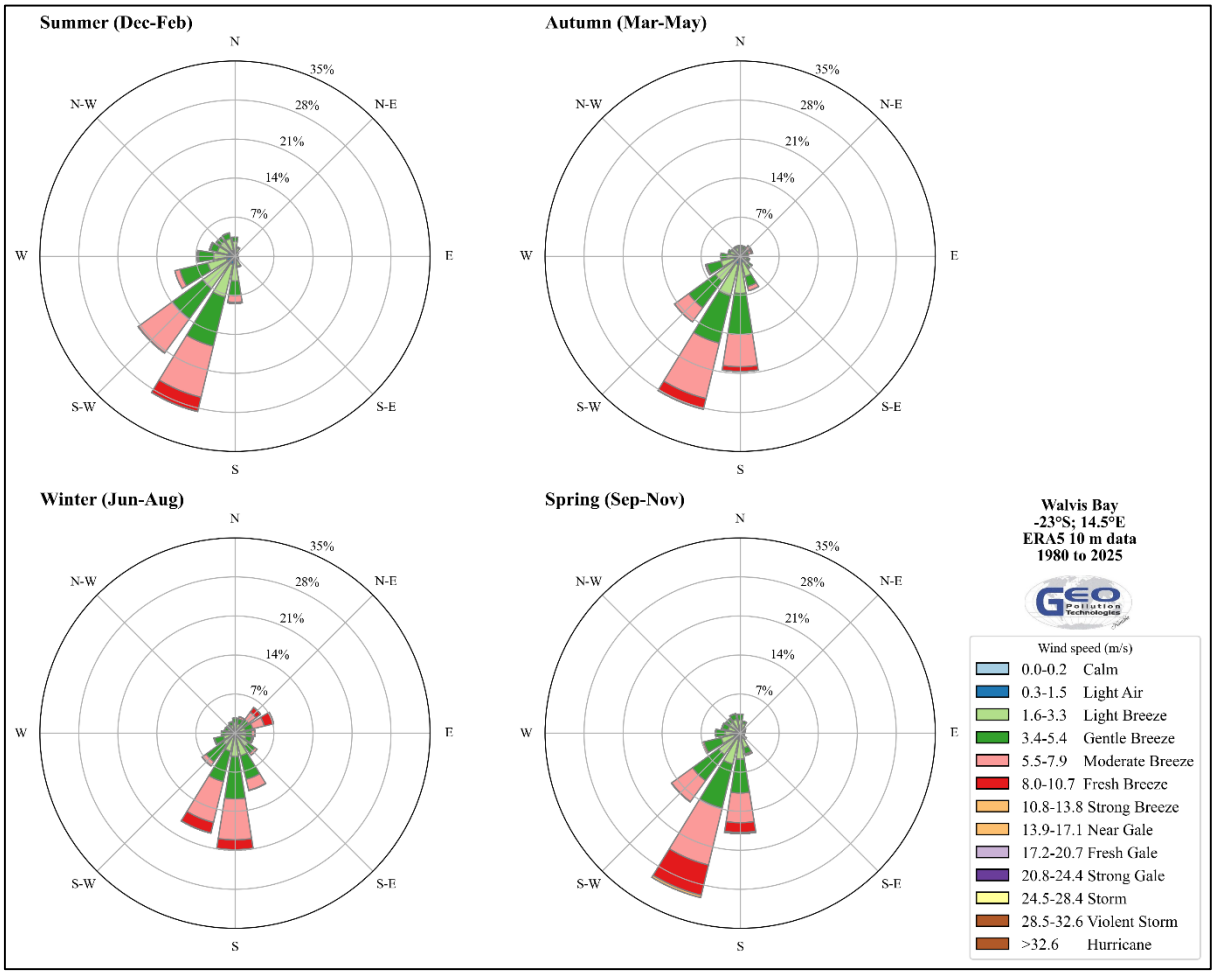

Figure 9-6 Seasonal wind rose - 1980 to 2025 (ERA4 10m data)

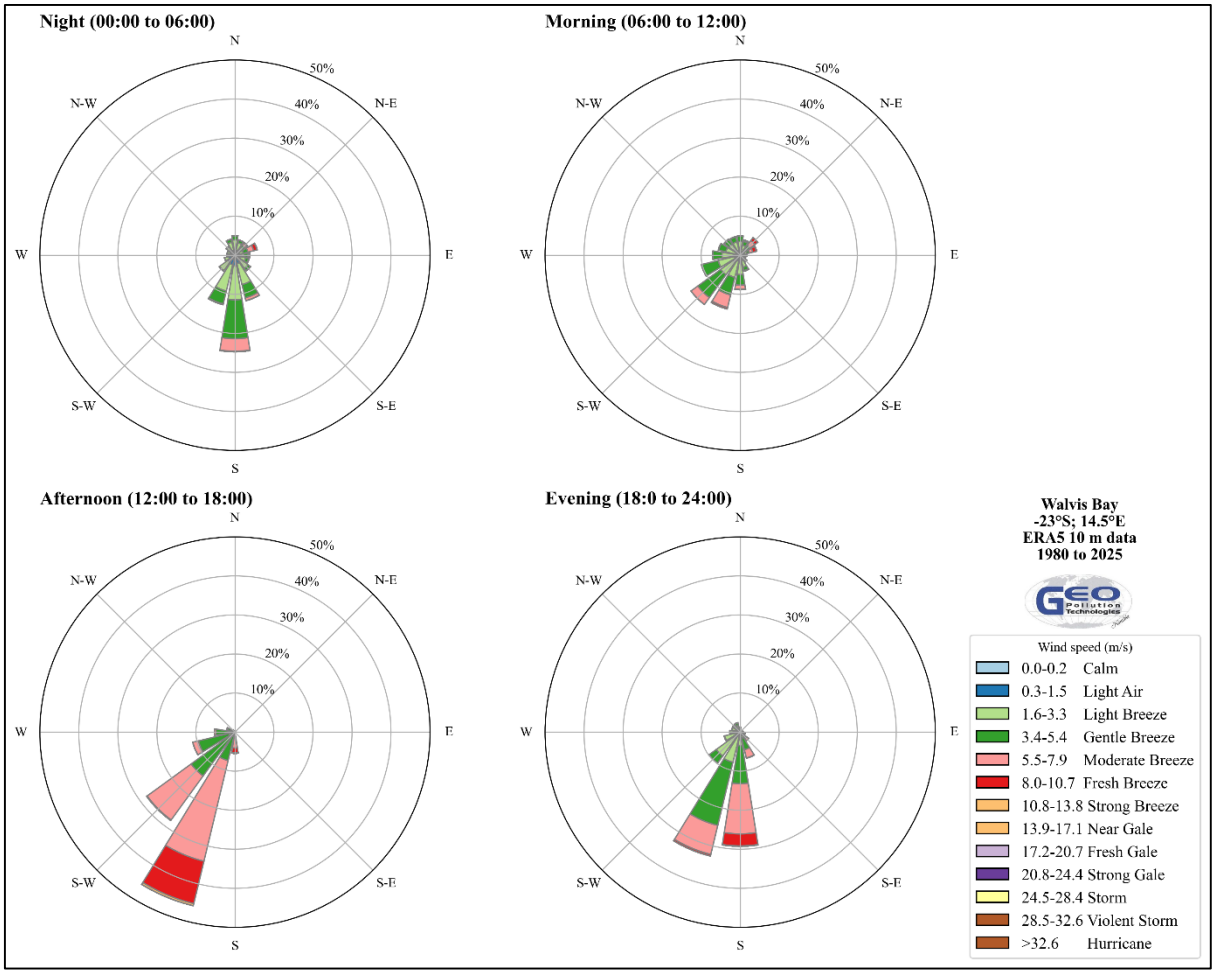

Figure 9-7 Quarter day wind rose

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 (Table 9-2). As one moves inland from Walvis Bay, daytime temperatures increases rather quickly while night time temperatures can get significantly colder in the desert environment.

Temperature data was retrieved from the Modern-Era Retrospective analysis for Research and Applications version 2 (MERRA-2) data set for a height of 2 m above surface (Gelaro et al., 2017). This data set is a NASA atmospheric reanalysis, incorporating satellite data integration and aims at historical climate analyses at 0.5 ° x 0.625 ° spatial resolution. Table 9-2 presents statistics of daily data abstracted from the data set for the last 43 years. Lowest temperature (8.92 °C) over the data period was recorded in July, with on average no days in the year being below freezing point. A maximum temperature of the data period of 35.18 °C, was measured in September.

Table 9-2 Temperature statistics based on Merra-2 data (Gelaro et al., 2017)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Minimum (°C)	14	14	13	11	11	9	9	9	9	10	12	13
Maximum (°C)	33	34	35	35	34	32	31	33	35	35	35	31
Average (°C)	19	20	19	19	19	18	17	16	16	16	17	18
Diurnal (°C)	4	5	5	6	7	7	8	7	6	6	5	5
Average days < 0°C	0	0	0	0	0	0	0	0	0	0	0	0

Implications and Impacts

Prevailing winds are from the south to southwest and strong winds are a regular occurrence, mainly during the afternoons. Under these dominant conditions, dust from the transportation and stockpiling of filling material during the construction activities is likely to be carried north wards and north-eastwards, dispersing over the harbour basin. During periods of northerly or westerly winds, dust may be blown towards receptors located to the southeast and east of the site, this includes the Walvis Bay lagoon and the Walvis Bay waterfront. In the absence of effective containment and housekeeping, this could result in nuisance dust, localised air quality impacts and deposition on buildings, loading areas and sensitive food-handling environments.

9.3 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 (H_2S) from the ocean is expected to contribute to corrosion. See Figure 9-8 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.

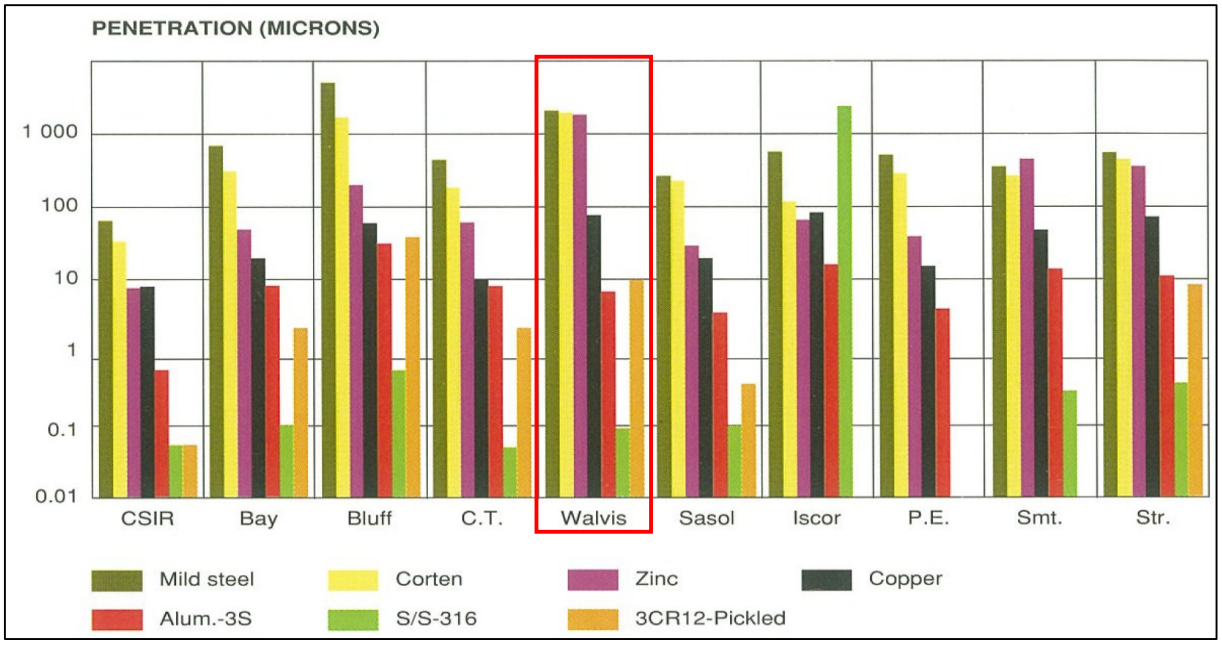

Figure 9-8 Twenty year corrosion exposure results in southern African towns (Callaghan 1991)

Implications and Impacts

Corrosion levels may be high and must be kept in mind when planning the material for the new infrastructure.

9.4 TOPOGRAPHY

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 is generally flat with a local gentle downward slope in a westerly direction. Drainage is poorly developed due to the lack of rainfall (<50 mm/annum). 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.

The area that will be reclaimed is generally shallow close to the harbour walls and deepens towards the Berth 9 jetty and the greater basin area Figure 9-9. Within the basin various areas have been modified by dredging in order to create sufficient water depth for vessel manoeuvring and anchoring.

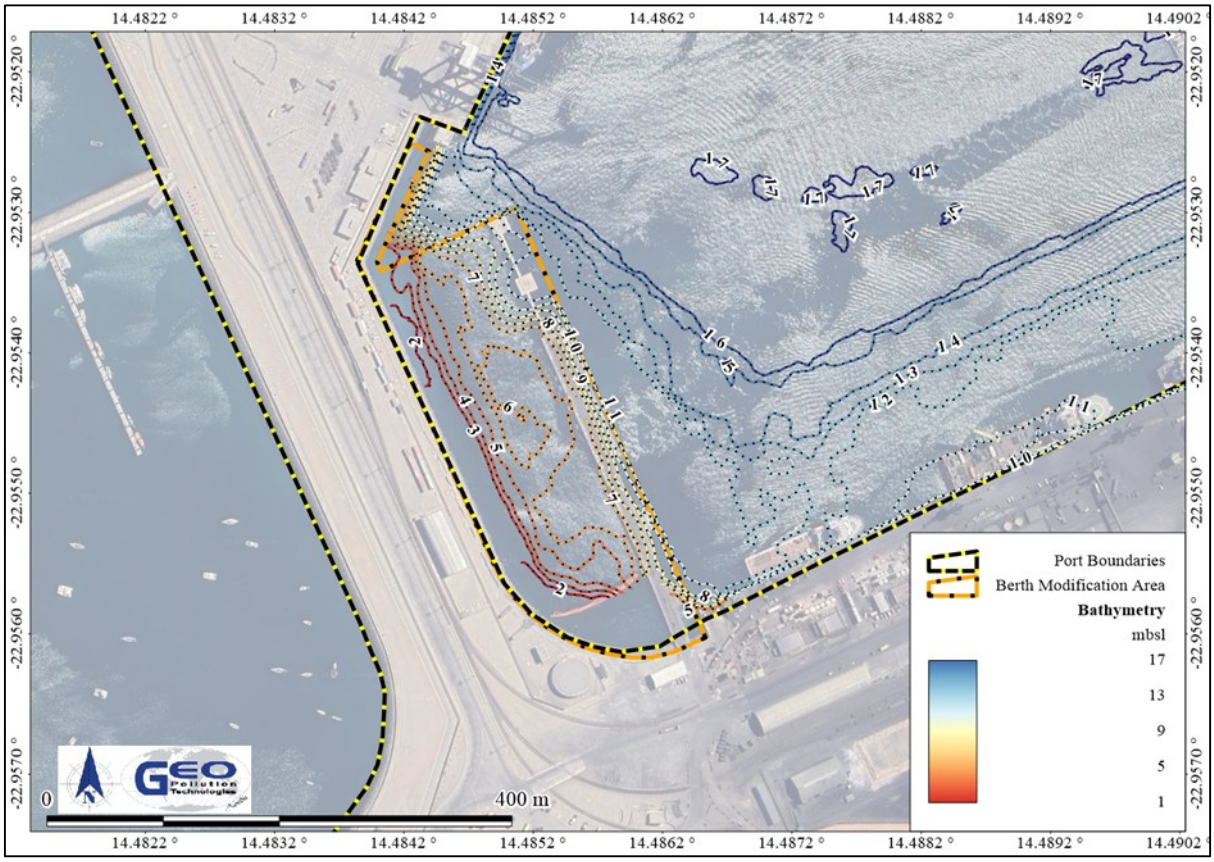

Figure 9-9 Bathymetry

Implications and Impacts

The presence of Pelican Point allows for the presence of a function harbour. It shelters the bay from open ocean wave action. The proposed reclamation area occurs in relatively shallow water, which reduces the volume of fill material required to create additional backup land. Dredging may need to be conducted to achieve the required depths to construct the new quay wall and operational areas.

9.5 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 Atlantic 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 Atlantic Ocean, while terrestrial deposits took place on land. Further continental uplift moved the shoreline to its present position, from approximately just east of Dune 7.

Northwards migration of sand covered parts of the exposed marine deposits, with Kuiseb floods also depositing material over the marine sediments. Unconsolidated Tertiary to recent age sediments under lie the Walvis Bay area. Depth to bedrock in Walvis Bay is estimated to occur at depths of between 40 – 60 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.

The hydraulic conductivity of the sediments is expected to be moderate to high and groundwater flow would be mainly through primary porosity. No potable groundwater source is known of in the vicinity of the Walvis Bay. Groundwater is expected to be saline and originating from the Atlantic Ocean. This area does not fall within a Water Control Area.

Implications and Impacts

The depth to bedrock in the bay simplifies dredging operations. Sediment is generally soft and can easily be dredged with TSHD and grab dredgers. No drilling and blasting is thus necessary to deepen the harbour.

9.6 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 at the site is not a source of potable water and as such public water supply should not be at risk as a result of activities at the project.

9.7 THE MARINE ENVIRONMENT

This section deals with various aspects, including physical processes and conditions, of the marine environment that may potential affect, or be affected by, dredging operations.

9.7.1 Hydrodynamic Conditions

The Namibian coastline is characterised by the cold, northward flowing Benguela Current. Accounts of current speed varies between different literature sources, but in general estimates range between 0.10 m/s to 0.35 m/s, with a mean speed estimated at around 17 m/s (Shannon, 1985; O'Toole, 1997; Wedepohl et al., 2000; NSI, 2012).

Water enters and exits the bay at the northern tip of Pelican Point (DMC-CSIR 2010). Water entering is below the exiting water. Current velocities are on average 0.12 m/s with sporadic maximums up to 0.25 m/s.

A study in 1965 indicated a pre-dominant clockwise circulation of currents in the bay (Tractebel, 1998). This was later confirmed in the COWI (2003b) and DMC-CSIR (2010) studies. Circulation occurs mostly in the upper layer and it depends on the wind direction. The current pattern is clockwise in the morning, towards the south. At Pelican Point, the current moves mostly northward for the whole day. A general northward current is found along the east side (vicinity of the project location) of the bay very close to the coast.

Water currents in the bay are depicted in Figure 9-10 below. From this figure it is clear that a stronger north flowing current can be expected in the project area, after the container terminal is constructed. The most important hydraulic conditions are shown in Table 9-3 (Tractebel, 1998; COWI, 2003b; DMR-CSIR, 2010).

Table 9-3 Tide and sea-level data for Walvis Bay

Hydrological conditions	Description
Land Levelling Datum (Mean Sea Level)	+0.966 mCD
Mean Level (Mean of MHWS, MLWS, MHWN, MLWN)	+0.980 mCD
Tidal Pattern	Semidiurnal
Tidal Range	1.42 m on a spring tide and 0.62 m on a neap tide
Lowest Astronomical Tide (LAT)	-0.0 mCD
Highest Astronomical Tide (HAT)	+1.97 mCD
Mean High Water Springs (MHWS)	+1.69 mCD
Mean Low Water Springs (MLWS)	+0.27 mCD
Mean High Water Neaps (MHWN)	+1.29 mCD
Mean Low Water Neaps (MLWN)	+0.67 mCD

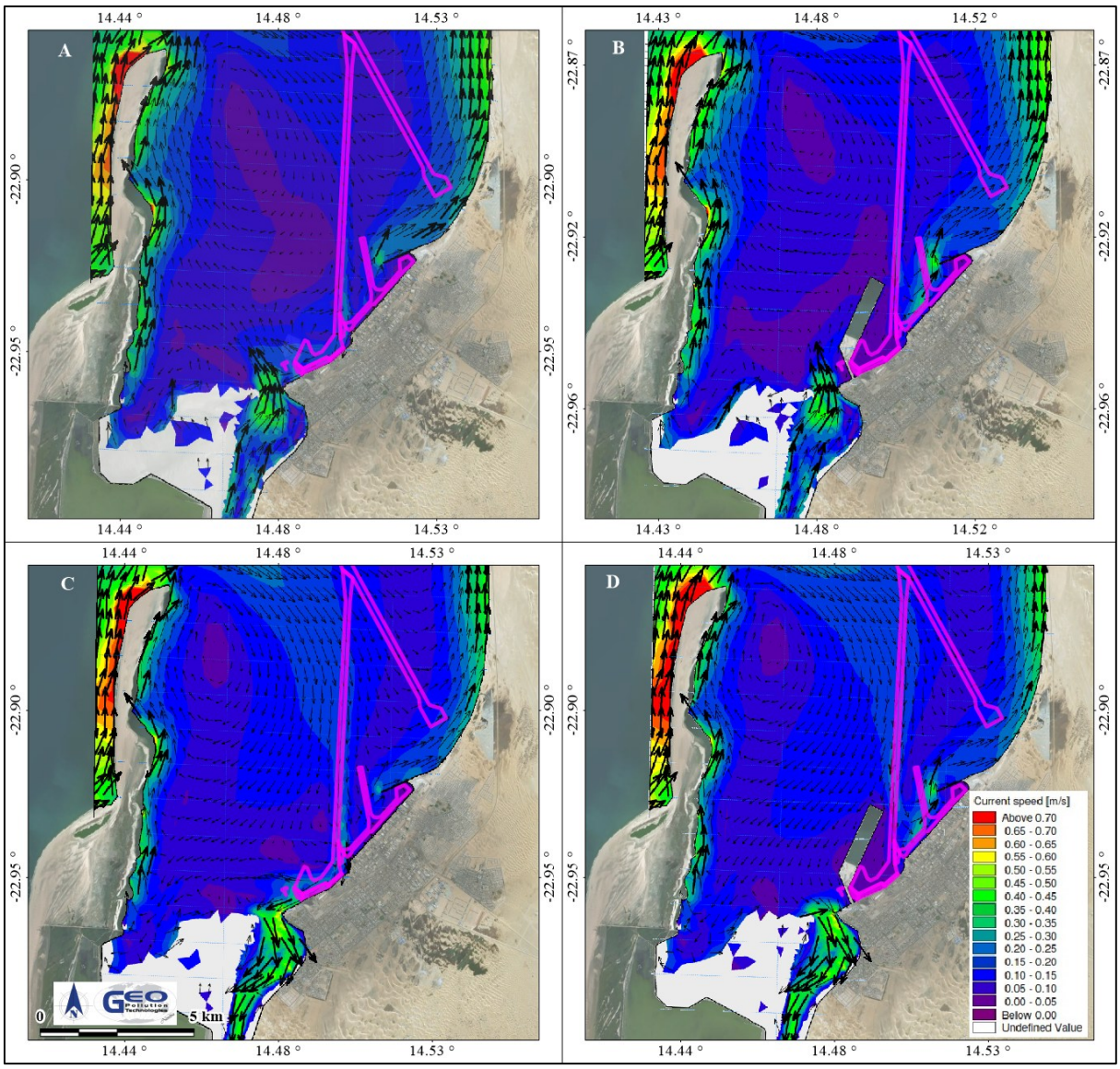

Figure 9-10 Comparison of modelled ebb (A and B) and flood (C and D) tide scenarios for before and after the construction of the new container terminal (Source: Hydrodynamic Modelling Report of DMC-CSIR 2010)

Implications and Impacts

Current velocity and direction are important for predicting where resultant sediment plumes will go and how quickly they will disperse. Sensitive receptors most likely to be influenced by such plumes are seawater intakes (water quality and particulate matter), mariculture areas (water quality) and the Walvis Bay lagoon Ramsar site (water quality and sedimentation). Currents within the reclamation area are relatively weak, which may limit dispersion and result in the localised accumulation of suspended particulates within and immediately adjacent to the works area.

9.7.2 Upwelling, Sediments, Algal Blooms and Sulphur Eruptions

Strong upwelling of cold, nutrient rich water along the Namibian coast is one of the key environmental characteristics of the Benguela Current. The magnitude of upwelling is strongly influenced by wind and it leads to high biological productivity supporting significant fish populations (O'Toole, 1997). An abundance of nutrients are brought from the sediments on the sea floor by this upwelling system to the photic zone. Large amounts of dead phyto- and zoo-plankton, which bloom as a result of this nutrient flux, settle and decay on the seafloor together with silt. The result is that the ocean floor at Walvis Bay consists of a thick dark green mud layer with a very high organic content, at some places, that overlay fine to medium sand (COWI, 2006). This typically contributes to anoxic conditions and result in occasional hydrogen sulphide eruptions. The mud layer or "mud belt" on the sea floor can be between three and four meters thick (COWI, 2006). A geotechnical survey of the proposed area for the North Port was conducted during 2013/2014 (WSP, 2014). This survey consisted of 33 offshore boreholes of a depth of about 35 m. Based on the results of the survey, the offshore substrate can be divided into four layers. These are:

- Upper layer with a thickness of 1 m to 4 m consisting of very soft, diatomaceous oozes, clayey silts and silty clays.
- The upper layer is followed by a medium dense to very dense, fine grained sand with shell fragments layer with a varying thickness of 2 m to 20 m.
- The third layer has a thickness between 4 m and 32 m of soft to medium hard rock, lithic arenites and pebbly conglomerates.
- Below the third layer is bedrock, weathered soft rock to hard rock, granites, gneisses and migmatites.

Low oxygen levels related to the mud belt develop in two ways. Firstly, localised, small scale nutrient remineralisation, resulting in oxygen deficient conditions, occur in the bottom waters of the Benguela system. This process is dependent on the organic material build-up in the sediments. Low oxygen conditions affect marine biota and can have sub-lethal effects, such as reduced growth and feeding, on marine populations. The second natural cause of low oxygen levels in the ocean can be attributed to harmful algal blooms. These larger scale events can create low oxygen events having catastrophic effects on the marine communities leading to large-scale stranding of rock lobsters, and mass mortalities of white mussels, rocky shore biota and fish.

Hydrogen sulphide accumulates in the sediments as a result of anaerobic bacteria reducing sulphates in the absence of oxygen to obtain energy. This produces hydrogen sulphide and when sufficient pressure is reached a hydrogen sulphide (or sulphur) eruption occur. The abundance of hydrogen sulphide in the water kills or drives away many marine organisms and reduces air quality at the surface. During dredging the risk of releasing hydrogen sulphide gas is present. Such eruptions are accompanied by a characteristic pungent smell along the coast and the sea takes on a lime green colour. These eruptions have been known to occur off the Namibian coast for centuries and the biota in the area are likely to be naturally adapted to such pulsed events, and to subsequent hypoxia.

Harbour sediments often contain elevated concentrations of toxic compounds, most typically heavy metals, poly aromatic hydrocarbons (PAH) and/or tributyltin (TBT). TBT originates

from marine paints which typically contain an agent to prevent fouling of the ship with barnacles and other organisms, which eventually will slow the ship and impede its movements (COWI, 2003a).

Prior to previous dredging exercises, sediment samples at various locations throughout the South and North Port were analysed for a wide range of organic contaminants and heavy metals. The analyses were performed to determine suitability of sediment for disposal at the offshore disposal site. The sediment samples were analysed for more than 200 different elements and compounds including heavy metals, mono aromatic compounds, phenols, polycyclic aromatic hydrocarbons, polychlorinated biphenyls and pesticides. Summaries of the results of only those elements measurable in the sediment samples are presented. The results of the sediment analysis of the most recent dredging campaigns, namely: 1) the capital dredging of the widening and deepening of the main channel (2024), 2) capital dredging of the new fuel terminal; and 3) maintenance dredging of the fishing harbour, are presented below. Although a number of heavy metals exceeded the Benguela Current Large Marine Ecosystem (BCLME) guideline values as well as the BCLME probable effect concentrations, they were not elevated to such an extent that alternative disposal sites had to be investigated.

Sixty-eight sediment (dredge material), of which 16 was in the harbour basin, samples were collected with a Van Veen grab sampler from the dredge area prior to dredging. The samples were collected from the areas indicated in Figure 9-11. Samples comprised of homogenised composite samples. The results of the analysis for the samples are presented in

Table 9-4. Copper and nickel were among the more elevated metals. In some instances, the BCLME probable effect concentrations were exceeded (notably for nickel and, to a lesser extent, copper), while arsenic was generally elevated but remained below the probable effect concentrations.

Figure 9-11 Sediment sampling locations prior to dredging at main channel (Botha, 2024)

Table 9-4 Sediment sampling results prior to dredging at of the main channel: Samples 1-15 (Botha, 2024)

Map Number				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Sample Number		BCLME Sediment (Recommended Guideline Value)	BCLME Sediment (Probable Effect Concentration)	CPTN 4012	CPTN 4013	CPTN 4014	CPTN 4015	CPTN 4016	CPTN 4017	CPTN 4018	CPTN 4019	CPTN 4020	CPTN 4021	CPTN 4022	CPTN 4023	CPTN 4024	CPTN 4025	CPTN 4026
Matrix				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Units	Units			mg/kg [dm]	mg/kg [dm]	mg/kg [dm]	mg/kg [dm]	mg/kg [dm]	mg/kg [dm]	mg/kg [dm]	mg/kg [dm]	mg/kg [dm]	mg/kg [dm]	mg/kg [dm]	mg/kg [dm]	mg/kg [dm]	mg/kg [dm]	mg/kg [dm]
Inorganic Metals																		
As	mg/kg	7.24	41.6	17.21	17.03	17.53	31.71	14.68	23.31	8.89	8.24	15.45	12.66	5.55	26.68	23.03	5.36	3.66
Cd	mg/kg	0.68	4.21	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Cr	mg/kg	52.3	160	6.91	5.68	6.85	9.87	7.68	15.46	4.47	6.56	6.06	6.54	5.36	28.19	6.24	4.32	7.83
Cu	mg/kg	18.7	108	71.78	72.87	71.72	152.9	61.63	103.8	40.8	36.36	62.53	63.54	29.74	120.5	107.1	28.21	22.85
Ni	mg/kg	15.9	42.8	5.95	4.14	4.96	3.59	5.51	80.46	4.51	3.99	3.43	3.81	3.13	249.2	4.51	<3	4.75
Pb	mg/kg	30.2	112	4.15	9.72	4.77	11.47	4.62	7.15	3.49	<3	4.52	7.66	<3	6.78	6.14	<3	<3
Zn	mg/kg	124	271	14.46	30.01	15.6	28.64	17.35	17.81	13.82	10.12	16.46	18.7	10.08	21.12	26.12	9.44	10.14
Hg	mg/kg	0.13	0.7	0.73	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.3	<0.3	<0.3	0.81	0.55	<0.3	0.7
Polycyclic Aromatic Hydrocarbons																		
Dilution Factor				10 (Dilution due to matrix interference)	10 (Dilution due to matrix interference)	10 (Dilution due to matrix interference)	10 (Dilution due to matrix interference)	10 (Dilution due to matrix interference)	10 (Dilution due to matrix interference)	10 (Dilution due to matrix interference)	10 (Dilution due to matrix interference)	10 (Dilution due to matrix interference)	10 (Dilution due to matrix interference)	10 (Dilution due to matrix interference)	10 (Dilution due to matrix interference)	10 (Dilution due to matrix interference)	10 (Dilution due to matrix interference)	10 (Dilution due to matrix interference)
Naphthalene	mg/kg	34.6	391	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Acenaphthene	mg/kg	6.71	89	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Acenaphthylene	mg/kg	5.87	128	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Fluorene	mg/kg	21.2	144	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Phenanthrene	mg/kg	86.7	544	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Anthracene	mg/kg	46.9	245	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Fluoranthene	mg/kg	113	1494	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Pyrene	mg/kg	153	1398	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Benzo(a)anthracene	mg/kg	74.8	693	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Chrysene	mg/kg	108	846	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Benzo(b+j)fluoranthene		No Value	No Value	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
Benzo(k)pyrene	mg/kg	82.8	763	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Benzo(g,h,i)perylene		No Value	No Value	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
Dibenz(a,h)anthracene		No Value	No Value	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
Indeno(123-cd)pyrene		No Value	No Value	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
Total Petroleum Hydrocarbons																		
TPH Dilution				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
TPHC10-C14		No Value	No Value	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
TPHC14-C15		No Value	No Value	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
TPHC15-C16		No Value	No Value	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
TPHC16-C21		No Value	No Value	24	11	18	22	7	8	30	6	33	20	32	20	17	12	8
TPHC21-C28		No Value	No Value	28	<10	15	26	<20	<10	26	<10	28	<10	34	25	<20	27	<20
TPHC28-C36		No Value	No Value	41	33	46	52	14	20	26	15	100	36	59	57	35	54	20
TPHC36-C40		No Value	No Value	<4	<4	<4	<4	<4	<4	<4	<4	4	<4	4	<4	<4	<4	<4
Polychlorinated Biphenyl (PCB)																		
Dilution Factor				7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
PCB28		No Value	No Value	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007
PCB52		No Value	No Value	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007
PCB101		No Value	No Value	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007
PCB138		No Value	No Value	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007
PCB153		No Value	No Value	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007
PCB180		No Value	No Value	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007
Miscellaneous Organic compounds																		
Tributyltin (TBT)	mg/kg dm	No Value	No Value	<0.0098	0.13	<0.0098	0.15	0.014	<0.0098	<0.0098	0.013	<0.0098	<0.0098	<0.0098	<0.0098	<0.0098	<0.0098	<0.0098
Tributyltin (TBT) Sn	mg Sn/kg dm	0.005	0.07	<0.0040	0.052	<0.0040	0.061	0.0058	<0.0040	<0.0040	0.0053	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040

Notes:
Only parameters detected are reported on
Not Detected / No Guideline Value
< BCLME Sediment (Recommended Guideline Value)
> BCLME Sediment (Recommended Guideline Value) < BCLME Sediment (Probable Effect
> BCLME Sediment (Probable Effect Concentration)
> BCLME Sediment (Probable Effect Concentration) x 100

The preferred fill source for the Berth 9 land reclamation is stockpiled dredged material originating from the North Port works. The sediment sampling exercise undertaken for the fuel terminal in 2016 was conducted to characterise sediment quality closer to shore and to confirm suitability for beneficial use as landfilling material for future North Port development. As the material is of the same origin as the proposed fill for this project, the findings provide a useful indicative overview of likely sediment quality.

The sediment sampling locations are presented in Figure 9-12 (Botha, 2016). Five composite samples (each comprising three sub-samples) were collected across a wide area and analysed, with results presented in Table 9-5. Cadmium, lead, copper, arsenic, chromium and nickel were among the more elevated metals. In some instances, the BCLME probable effect concentrations were exceeded;

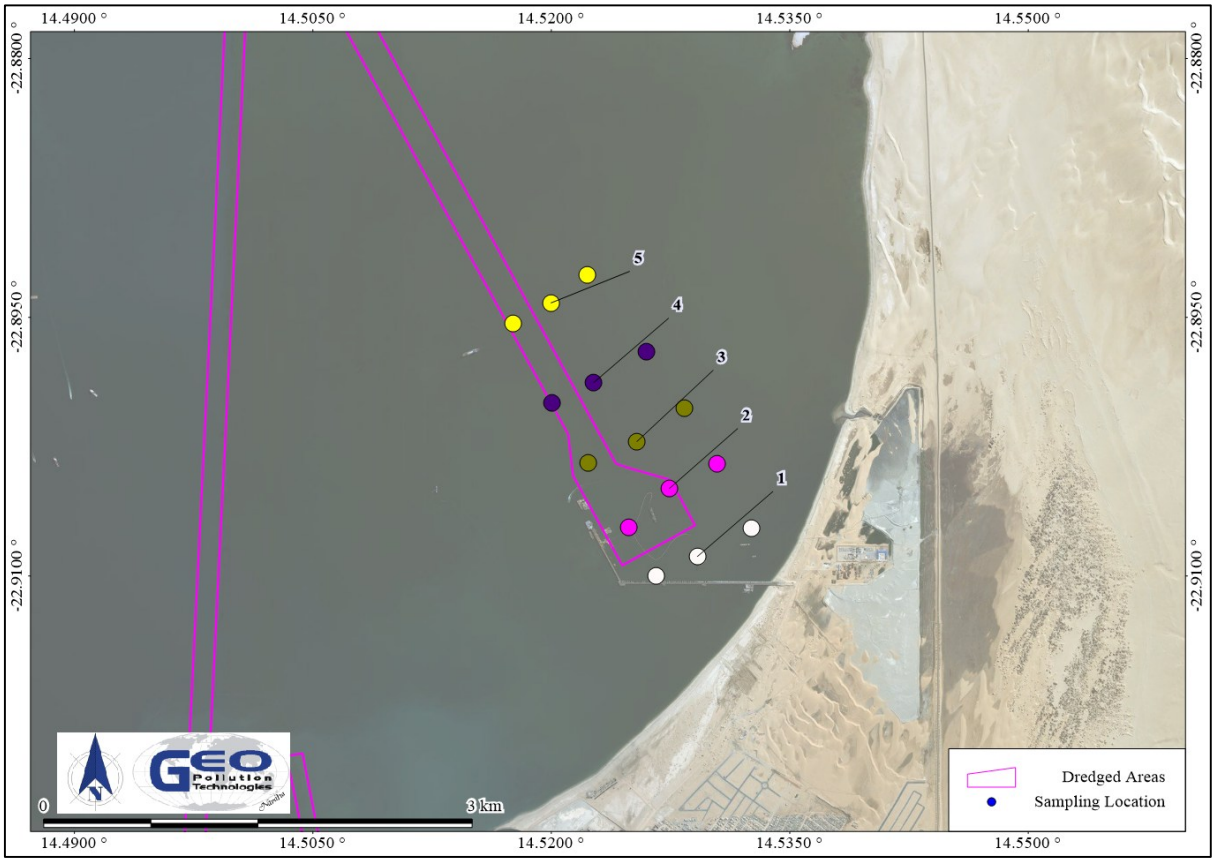

Figure 9-12 Sediment sampling locations for capital dredging of the North Port entrance channel with onshore disposal (Botha, 2016)

Table 9-5 Sediment sampling results for capital dredging of the North Port entrance channel with onshore disposal (Botha, 2016)

Fuel Tanker Jetty Project - Sediment Baseline Sampling

Your project number	G139-17
Certificate number	2016101849
Certificate number	2016101849
Start date	2016/09/07
Report date	2016/09/12
Date sampling	2016/08/24
Sampler	S. Short / A. Faul

				Map Number	1	2	3	4	5
Analysis	**Unit**	**BCLME Sediment (Recommended Guideline Value)**	**BCLME Sediment (Probable Effect Concentration)**						
TerrAttesT									
Version number					7.23	7.23	7.23	7.23	7.23
Characteristics									
Dry matter	% (w/w)				52.5	39.2	28.1	40	34.3
Organic matter	% (w/w) dm				4	5.1	7.2	5.3	6.2
Fraction < 2 µm (Clay)	% (w/w) dm				8.5	9.1	8.5	7.7	10.4
Metals									
Arsenic (As)	mg/kg dm	7.24	41.6		13	17	16	12	11
Barium (Ba)	mg/kg dm	No Value	No Value		61	57	52	41	43
Beryllium (Be)	mg/kg dm	No Value	No Value		1.8				
Cadmium (Cd)	mg/kg dm	0.68	4.21		3.7	5.9	8	5.8	5.9
Chromium (Cr)	mg/kg dm	52.3	160		41	47	49	40	37
Cobalt (Co)	mg/kg dm	No Value	No Value		5.8	6	5	4	3.3
Copper (Cu)	mg/kg dm	18.7	108		20	22	21	20	20
Lead (Pb)	mg/kg dm	30.2	112		7.4	9.2	8.1	7	6.2
Molybdenum (Mo)	mg/kg dm	No Value	No Value		3.4	4.9	4.8	3.5	4
Nickel (Ni)	mg/kg dm	15.9	42.8		17	19	18	14	13
Vanadium (V)	mg/kg dm	No Value	No Value		34	35	32	28	24
Zinc (Zn)	mg/kg dm	No Value	No Value		46	45	41	33	30
Selenium (Se)	mg/kg dm	No Value	No Value			5.1			
Total Petroleum Hydrocarbons									
TPH (C10-C12)	mg/kg dm	No Value	No Value						6.2
TPH (C12-C16)	mg/kg dm	No Value	No Value				36		20
TPH (C16-C21)	mg/kg dm	No Value	No Value		10				
TPH (C21-C30)	mg/kg dm	No Value	No Value				42		
TPH (sum C10-C40)	mg/kg dm	No Value	No Value				82		

Notes:

Only parameters detected are reported on

Not Detected / No Guideline Value
< BCLME Sediment (Recommended Guideline Value)
> BCLME Sediment (Recommended Guideline Value) < BCLME Sediment (Probable Effect Concentration)
> BCLME Sediment (Probable Effect Concentration)
> BCLME Sediment (Recommended Guideline Value) x 100

The Berth 9 land reclamation will utilise the same stockpiled dredged material as the preferred fill source. During placement, water displaced from the reclamation footprint may decant/ seep back into the harbour basin, potentially carrying fine suspended solids and contaminant-bound particles. Fill placement should therefore be managed to limit re-suspension of fines (e.g. controlled placement rates and methods, avoiding unnecessary agitation in standing water), and monitoring/controls should be implemented where required to prevent deterioration of water quality within the basin.

Implications and Impacts

The re-suspension of sediments associated with dredging and/or in-water construction works will contribute to the nutrient load of the water column and may result in the mobilisation of contaminants bound to fine sediments (e.g. heavy metals). The timing of dredging within the year, and thus prevailing current velocities and directions, will influence the extent to which this artificial introduction of nutrients and contaminants disperses within the harbour basin and potentially beyond.

The preferred reclamation fill is stockpiled dredged material originating from the North Port works. Previous sediment sampling indicated that certain metals (including arsenic, cadmium, chromium and nickel) were elevated and during reclamation, displaced water may decant/seep back into the basin and may carry fine suspended solids and contaminant-bound particles.

The metal content and overall quality of any material proposed for dredging and/or use as reclamation fill must therefore be assessed prior to dredging/placement to ensure adherence to safe handling and disposal requirements. In addition, dredging and fill placement methods should be managed to minimise sediment re-suspension and to prevent deterioration of harbour water quality.

9.7.3 Turbidity

Turbidity is a measure of the optical clarity of water and presents an indication of the amount of light scattering particles in water. Its unit of measure is nephelometric turbidity units (NTU). When calibrated, turbidity is a representation of the concentration (or weight) of suspended particles in water or total suspended solids (TSS), which is measured as milligram of solids per millilitre of water (mg/ml). The water within Walvis Bay is characterised by relatively high turbidity in comparison to the open ocean. This mainly results from a combination of shallow water, coupled with wind induced waves and currents, which continuously bring sediment into suspension.

By using onshore stockpiled material as backfill, turbidity effects are expected to differ from a dredging-dominated reclamation. The reclamation footprint will be progressively isolated from the wider basin as perimeter works and the reclamation boundary are established, after which fill will be placed into a contained area. During filling, water within the enclosed footprint will be displaced and decant (seep/overflow) back into the adjacent basin. In principle, this decant water should carry relatively low suspended solids, because the disturbance is largely confined within the reclamation cell and suspended particles have time to settle out before water escapes. Some short-term increases in turbidity may still occur, where fine fractions are present in the fill or where filling is undertaken too rapidly, causing turbulence and entrainment of fines. The placement rate and method should be managed (e.g. controlled placement, limiting drop heights and avoiding “end tipping” into standing water) and any decanting should be routed/managed to promote settlement (e.g. defined low-energy overflow points), supported by real-time turbidity monitoring at the boundary with immediate response, should trigger levels be exceeded.

During dredging, sands and fine particulate matter (silts and clays) are released into the sea in the form of dredger overspill. Whereas the sand fraction settles rapidly, fine particles form turbid plumes which may under certain wind and wave conditions persist for a few days before dispersing. This may negatively impact on marine ecology and especially filter feeders. At Walvis Bay, concerns specifically exist regarding the siltation of the Walvis Bay Lagoon.

Prior to dredging at the new container terminal, a baseline TSS / turbidity monitoring survey was carried out for Namport. Turbidity baseline data was collected from November 2012 to March 2013 at the strategic locations around the dredge area as indicated in Figure 9-13 (Botha et al., 2014). Turbidity readings were converted to TSS with a laboratory based determined turbidity to TSS conversion equation. The baseline TSS data is presented in Table 9-6. The locations chosen were specifically monitored to observe and prevent possible impacts on the Walvis Bay Lagoon and the mariculture industry.

Baseline TSS / turbidity determinations for the dredging associated with the new fuel terminal construction were determined in 2015 (Botha et al., 2015). The same baselines were later used for the maintenance dredging of the fishing harbour. The locations of probes were chosen to specifically monitor the spread of dredging plumes to rocky shores north of the fuel terminal and is presented in Figure 9-14. The baseline TSS data is presented in Table 9-7.

It should be noted that baseline TSS at Buoy 6, for the dredging at the new container terminal during 2012 to 2013 (Table 9-6), is lower than the baseline determined for the dredging associated with the new fuel terminal construction in 2015 (Table 9-7). When the baseline was determined for the latter, dredging was already in progress at the container terminal, and this may have resulted in the slightly elevated TSS levels at Buoy 6. Also, TSS conditions will change over time as various components of harbour development are finalised. Thus, new baselines should be determined prior to all future dredging events, in order to determine the status quo.

Figure 9-13 Locations for determining baseline turbidity conditions prior to the dredging at the new container terminal (Botha et al., 2014)

Table 9-6 Baseline turbidity and total suspended solids as reported on during the new container terminal dredging baseline conditions determining exercise (Botha et al., 2014)

Day*	80th Percentile TSS (mg/ml)			Average TSS (mg/ml)			Maximum TSS (mg/ml)		
	Lagoon Entrance	Boat	Buoy 6	Lagoon Entrance	Boat	Buoy 6	Lagoon Entrance	Boat	Buoy 6
1	9	9	14	3	6	7	94	227	47
2	8	8	7	3	7	5	71	1407	47
3	9	7	4	3	5	4	205	310	32
4	9	7	3	3	5	3	988	126	17
5	8	9	3	3	6	3	108	170	24

Day*	80th Percentile TSS (mg/ml)			Average TSS (mg/ml)			Maximum TSS (mg/ml)		
	Lagoon Entrance	Boat	Buoy 6	Lagoon Entrance	Boat	Buoy 6	Lagoon Entrance	Boat	Buoy 6
6	8	7	3	3	5	3	176	203	15
7	10	10	3	3	7	3	795	308	23
8	11	11	3	2	7	3	18,238	56	17

* Number of days after cleaning of the turbidity sensor on the permanently deployed probe

Figure 9-14 Locations for determining baseline turbidity and total suspended solids conditions prior to the dredging at the new fuel terminal (Botha et al., 2015)

Table 9-7 Baseline total suspended solids as reported on during the new fuel terminal dredging baseline conditions determining exercise (Botha et al., 2015)

Day*	80th Percentile TSS (mg/ml)			Average TSS (mg/ml)			Maximum TSS (mg/ml)		
	Buoy 6	T6	T7	Buoy 6	T6	T7	Buoy 6	T6	T7
1	17	23	31	14	17	21	171	92	73
2	18	30	35	14	21	22	222	53	69
3	19	26	33	14	18	25	35	53	313
4	24	35	41	16	23	42	49	86	889
5	21	41	35	17	29	31	106	92	391
6	18	35	32	15	23	24	40	86	51
7	16	32	34	14	22	25	28	44	55
8	22	38	31	15	33	27	26	45	44

* Number of days after cleaning of the turbidity sensor on the permanently deployed probe

Implications and Impacts

Increased TSS in the marine environment may result from dredging and other in-water works and can affect marine organisms through reduced light penetration (lower photosynthetic rates) and smothering of sensitive biota, particularly filter feeders. By prioritising the use of existing onshore dredged material as reclamation fill, the project reduces the potential for dredging-related turbidity plumes compared to a scenario where fill is predominantly obtained through active dredging.

If dredging is required, turbidity monitoring remains a practical and rapid (albeit indirect) method for managing TSS and for determining when dredging activities should be halted to prevent unacceptable plume dispersion. To reduce the impact of re-suspended particulate matter on natural and cultured marine organisms, the measurement of turbidity is useful for determining when to halt dredging activities. Turbidity probes must be calibrated for local water and substrate conditions and a device specific turbidity to TSS factor must be determined.

9.7.4 Water Quality

Water quality is typically affected by natural and anthropogenic factors. Natural contributors typically relate to sand influx due to wind, sediment transport via rivers and leaching of naturally occurring elements from sediments. Namibian coastal waters for example seem to have naturally higher cadmium concentrations (Faul and Botha, 2015). In ports, water quality can be compromised due to the presence of nearby onshore industrial activities and port operations resulting in the release of contaminants into the ocean (effluent discharge, windblown dust, ship repair, etc.) and spills from vessels (e.g. oil or fuel). Previously, ships were painted with antifouling paints containing harmful chemicals such as tributyltin (TBT). Although now banned, traces of TBT can still be detected in sediment and thus sometimes also in water samples taken from harbours.

Prior to dredging at the new fuel terminal water quality samples were collected at three sites to determine the baseline water quality of the bay (Botha et al., 2015). The locations where the samples were collected are presented in Figure 9-15. The water samples were analysed for more than 200 different elements and compounds including heavy metals, mono aromatic compounds, phenols, polycyclic aromatic hydrocarbons, polychlorinated biphenyls and pesticides. A summary of the results of only those elements measurable in the water samples is presented in Table 9-8. Copper were elevated above the BCLME recommended guideline value at one location, while zinc exceeded it at two locations. Some metals like barium and arsenic, as well as various hydrocarbons, were also detected, but at levels below the BCLME recommended guideline values. Long term water quality monitoring data is not available to confirm the persistence of these chemicals in the water column within the bay.

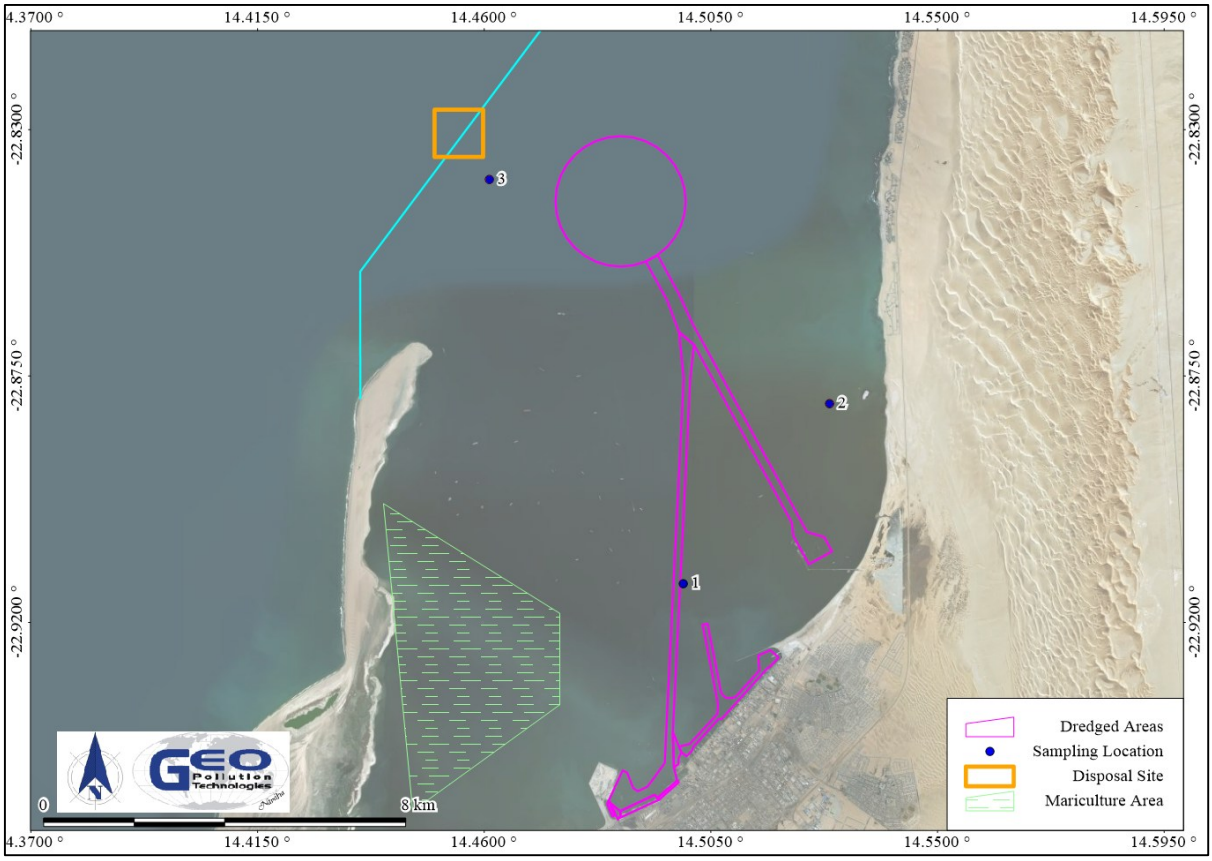

Figure 9-15 Water sampling sites for the water quality monitoring prior to dredging at the new fuel terminal (Botha et al., 2015)

Table 9-8 Water sampling results for the water quality monitoring prior to dredging at the new fuel terminal (Botha et al., 2015)

Fuel Tanker Jetty Project - Water Baseline Sampling	
Your project number	G139-17
Certificate number	2015101455
Certificate number	2015101461
Start date	15-09-2015
Report date	**28-09-2015**
Date sampling	09-09-2015
Sampler	P. Botha

Map Number			1	2	3
Analysis	Unit	BCLME Water (Recommended Guideline Value)			
TerrAttesT					
Version number			7.23	7.23	7.23
Characteristics					
EC-temp. corr. factor (mathematical)			1.177	1.169	1.174
Electric conductivity 25 °C	µS/cm		53000	53000	53000
Electric conductivity 25 °C	mS/m		5300	5300	5300
Electric conductivity 20°C	mS/m		4800	4800	4800
Measuring temperature (EC)	°C		17.7	18	17.8
Measuring temperature (pH)	°C		19.1	19.2	19.1
pH			7.5	7.7	7
Metals					
Arsenic (As)	ppm	No Value	0.0043	0.0038	0.0037
Barium (Ba)	ppm	No Value	0.0091	0.0079	0.0093
Copper (Cu)	ppm	0.0013	0.0031		
Mercury (Hg)	ppm	0.0004	0.00022	0.00015	0.00021
Molybdenum (Mo)	ppm	No Value	0.0094	0.0072	0.01
Vanadium (V)	ppm	0.1	0.0033	0.0027	0.0042
Zinc (Zn)	ppm	0.015	0.018	0.025	0.013
Volatile Organic Hydrocarbons					
Benzene		0.5		0.0002	
Toluene		0.18	0.0002	0.00035	0.00018
Total Petroleum Hydrocarbons					
TPH (C10-C12)	ppm	No Value			0.056
TPH (C12-C16)	ppm	No Value	0.066		0.098
TPH (C16-C21)	ppm	No Value	0.18		0.15
TPH (C21-C30)	ppm	No Value	0.1		0.18
TPH (C30-C35)	ppm	No Value	0.023		0.041
TPH (sum C10-C40)	ppm	No Value	0.39		0.54
Volatile halogenated Hydrocarbons					
Chloromethane	ppm	No Value			0.0018

Notes:

Only parameters detected are reported on

Not Detected / No Guideline Value
< BCLME Water (Recommended Guideline Value)
> BCLME Water (Recommended Guideline Value)

Implications and Impacts

Utilising the existing onshore stockpiled dredged material from the North Port lowers the likelihood of widespread turbidity plumes associated with dredging. During filling, water within the reclaimed footprint will be displaced and will decant/ seep back into the adjacent basin. This is expected to be more localised than open-water dredging plumes, the return water may contain fine suspended solids and, depending on the quality of the fill material, may also carry contaminants.

Where dredging is required (e.g. trimming, levelling, or to obtain supplementary fill), the re-suspension of sediments may temporarily change water quality by increasing turbidity and releasing nutrients and/or contaminants from harbour sediments into the water column. The analysis of water samples before, during and after dredging activities confirms the possible impacts that dredging could have on receptors like marine organisms, mariculture areas, Ramsar site and seawater users, e.g. fish factory seawater intakes. The results from analyses can be used to determine whether dredging should continue or halt temporarily so that receptors can experience a reprieve from poor water quality.

9.8 ECOLOGY OF THE BAY

Walvis Bay is well known for the presence of thousands of birds, mostly associated with the Walvis Bay Lagoon. In the immediate vicinity of Walvis Bay there are three main wetland systems of importance to avifauna. They are the Lagoon and Kuiseb River mouth (including the salt ponds), the Walvis Bay sewage ponds and the mixed sandy and rocky coast north of Walvis Bay (Scott & Scott, 2013). The old guano platform, or Bird Island, also contributes to the number of birds in the area.

The Walvis Bay Lagoon is the most important coastal wetland for migratory birds in southern Africa and one of the top three most important wetlands for migratory birds in Africa. It is 7 km long with over 10 km^2 of wetland conditions that provides a home to a large population of flamingos and is a migration point for thousands of wading, resident and migratory birds. An area of approximately 12,600 ha, mainly covering the lagoon and salt works, have been declared a Ramsar site in 1995 (Figure 9-1). The largest extent of the Ramsar site also falls into one of two Important Bird Areas, IBA NO13 (BirdLife International 2021a) and IBA NO14 (BirdLife International 2021b). The Walvis Bay IBA NO14 is regarded as the most important coastal wetland in the Sub-region and is probably one of the most important coastal wetlands in Africa. It supports on average 91,000 birds of 94 different species with peak numbers reaching 150,000 (Robertson et al., 2012). These are mostly intra-African and Palearctic migrants.

Bird counts on the coastline area of IBA NO13 exceed 13,000 shorebirds of approximately 31 species, most of which are Palearctic migrants. IBA NO13 is not only the richest shoreline in terms of shorebird density anywhere in southern Africa, but also supports the densest colony of breeding Damara Terns known. Important in this area is the guano platform, or bird island, that provides a roosting and breeding site to large numbers of birds.

In the greater study area, 19 birds have been identified which are International Union for Conservation of Nature (IUCN) Red listed. Some important species that are considered endangered, vulnerable or near threatened, and occurring within the Walvis Bay area, are presented in Table 9-9 with some notes on their status and threats (https://www.iucnredlist.org/).

In 2013, as part of the environmental assessments for the new fuel terminal, a specialised cetacean study was conducted by the Namibian Dolphin Project (Gridley and Elwen 2013). The following is a brief summary of some important aspects highlighted by the report.

The marine mammals, occurring at various times in the Walvis Bay area, are the cetaceans which are the Common Bottlenose Dolphins, the Namibian endemic Heaviside's Dolphins, Dusky Dolphins, Humpback Whales, Southern Right Whales and Pigmy Right Whales as well as the Cape Fur Seals. The Common Bottlenose Dolphin and Heaviside's Dolphin and Cape Fur Seal is seen most frequently (daily), the Pigmy Right Whale less frequently (monthly) and the rest

infrequently as they are seasonal or infrequent visitors. The Common Bottle Nose Dolphin population of less than a 100 individuals is quite unique in being one of the smallest mammal populations in Africa.

Apart from the intrinsic value of these mammals as well as their role in the ecosystem, their role in the marine tourism industry of Walvis Bay is indispensable. The daily presence of dolphins and seals, and the chance of sighting whales, attracts a steady flow of tourists for various marine excursions. This alone is a multimillion dollar industry which creates a number of direct and indirect employment opportunities.

The Namibian benthic and seashore communities are characterised by relatively low species diversity with high abundance. It is also a dynamic ecosystem with relatively high resilience against impacts when compared with the more tropical waters of for example the east coast of southern Africa.

The South Port is significantly degraded by anthropogenic activities associated with harbours and periodic dredging activities. Towards the north of the newly constructed fuel terminal the first rocky shores are present from Bird Island northwards. From here on the shoreline is a mixed sand and rocky shoreline with the rocky shores typically exposed during low tide. Rocky shores usually have increased plant and animal biodiversity due to niche differentiation. Furthermore, the low eulittoral zone are characterized by higher species diversity due to the agitation of water maintaining high oxygen concentrations and thus promotes algal growth which in turn attract intertidal grazers. The high eulittoral zone however undergo periods of desiccation and temperature stress as tides change and low species diversity is present (Nashima, 2013). At Langstrand it has thus been found that the most dominant high eulittoral zone species was barnacles while the low eulittoral zone is dominated by algae.

Large parts the marine environment of Walvis Bay is characterized by low diversity of benthic species. The major limiting factor being low oxygen concentrations in the sediment even though high nutritional levels may be present (COWI 2006). Low oxygen conditions gave rise to a diverse mix of anaerobic bacteria including sulphide oxidizing taxa like *Beg giatoa*, *Thiomargarita namibiensis* and *Thioploca* spp.. A marine ecosystem specialist study (Botha et al., 2013c) indicated that there is a decrease in diversity and abundance of species as one move into deeper water. The macrofauna of the benthos was dominated by the crustacean order Cumacea (mainly *Iphinoe africana*) and polychaetes (mainly *Prionospio sexucolata*). Meiofaunal diversity was rich in nematodes. Few bivalves were present and echinoderms (ophiuroids and at one station an asteroid) were least common.

Four main species of sharks occur in the surfzone in the proximity of the development and along the coastal area northwards to Swakopmund. These are the Spotted Gullyshark, Bronze Whaler, Smooth-Hound and Broadnose Seven Gill sharks (EnviroSolutions 2005).

The Namibian coastal waters are home to five species of turtles and all five species are listed as threatened under the IUCN and is controlled through the Convention on International Trade in Endangered Species of Fauna and Flora (CITES). The most commonly occurring turtles near the proposed development are the Leatherback Turtle and Green Sea Turtle with the Hawksbill Sea Turtle occurring occasionally.

Table 9-9. Key bird species found around Walvis Bay (list not exhaustive)

Common Name (Scientific Name)	Range	Status (Last Assessed)	Comments	Current Threats
Bank Cormorant (*Phalacrocorax neglectus*)	Native to Namibia and South Africa	Endangered (2018)	Very rapid decline in small population	Human disturbance, displacement by seals, food shortages and low quality food

Common Name (Scientific Name)	Range	Status (Last Assessed)	Comments	Current Threats
Cape Cormorant (*Phalacrocorax capensis*)	Native resident to Namibia, South Africa and Angola	Endangered (2018)	Decreasing population	Commercial fishing causing food shortage, pollution, predation, climate change, etc.
Curlew Sandpiper (*Calidris ferruginea)*	Namibian resident with wide global distribution	Vulnerable (2024)	Decreasing population	Habitat loss and degradation, human disturbance
Eurasian Curlew (*Numenius arquata*)	Non-breeding native	Near Threatened (2017)	Decreasing population	Habitat loss and degradation, human disturbance
Grey Plover (*Pluvialis squatarola*)	Namibian breeding resident	Vulnerable (2024)	Decreasing population	Habitat loss and degradation, human disturbance
Lesser Flamingo (*Phoeniconaias minor*)	Namibian native with relatively wide global distribution	Near Threatened (2018)	Decreasing population	Mining, power generation and transmission
Maccoa Duck (*Oxyura maccoa*)	Namibian resident and endemic to south and east Africa	Endangered (2021)	Decreasing population	Habitat loss and disturbance, pollution, etc.
Red Knot (*Calidris canutus)*	Namibian native with wide global distribution	Near Threatened (2024)	Decreasing population	Habitat loss and human disturbance
Ruddy Turnstone (*Arenaria interpres*)	Namibian breeding resident	Near Threatened (2024	Decreasing population	Habitat loss and degradation, human disturbance

Source: The IUCN Red List of Threatened Species Website https://www.iucnredlist.org/

Implications and Impacts

Suspended particulate matter generated during dredging (where required) and in-water construction activities may affect sessile filter feeders through smothering and reduced light penetration. Under prevailing south-westerly wind conditions, any turbidity plumes that escape the working area may disperse northwards towards the larger basin area. Siltation of the Walvis Bay Lagoon remains a key concern where fine sediments are mobilised, given its status as a sensitive wetland system supporting large numbers of resident and migratory birds.

Turbidity effects are expected to be largely localised where filling is undertaken within a progressively enclosed reclamation footprint. As the area is isolated and filled, displaced water may decant/seep back into the basin; while this decant water is expected to carry relatively lower suspended solids than open-water dredging plumes, it may still contain fine particulates and contaminant-bound material depending on the quality and handling of the fill. The re-suspension of sediments may also contribute to the nutrient load of the water column and may mobilise contaminants such as heavy metals, which could affect sensitive receptors (including wetlands and mariculture operations) if dispersion is not adequately controlled. Hydrocarbon spills from dredging/support vessels and construction plant remain a risk and, depending on wind and tidal conditions, could reach sensitive areas such as the lagoon.

Monitoring during previous dredging exercises has indicated that, given that appropriate preventative and mitigating measures are implemented, very little impact as a result of dredging plumes can be expected. Mitigating measures include real time turbidity monitoring to allow for cessation of dredging when suspension of particulate matter is severe and persistent, especially as it approach sensitive receptors.

Habitat loss within the reclamation footprint is unavoidable, and any dredging will cause localised disturbance and removal of benthic habitat at the dredge location(s). However, the affected areas are within an active port environment that is already disturbed by historical development and periodic dredging.

Pollution of the environment, and specifically large hydrocarbon spills, would have much more severe and longer lasting impacts on the local ecology.

9.9 DEMOGRAPHIC AND ECONOMIC CHARACTERISTICS

At local level, Walvis Bay has an urban population of 51,618 (Namibia Statistics Agency, 2024). Walvis Bay is the principal port of Namibia and serves as an import/export hub for processed fish, mining products, general and hazardous cargo, and fuel. The port also plays a growing role in supporting the offshore oil and gas industry, with increasing vessel traffic related to exploration, rig maintenance and associated logistics.

The area is strategically linked to Namibia's air, rail and road network, making the port well positioned to service Zambia, Zimbabwe, Botswana, southern Angola and South Africa. The fishing industry remains the major employer of low-skilled workers on both a permanent and seasonal basis, contributing approximately 2% of total national employment. In addition to these industrial sectors, Walvis Bay is an emerging tourism gateway, providing access to attractions such as Sandwich Harbour, the Namib Desert and the wider Erongo coastline. This combination of industrial activity, logistics functions and tourism makes Walvis Bay a key economic centre for Namibia.

Implications and Impacts

The project will provide employment to people from the area. Skills development and training would also be a benefit to employees. The modification of the port may have an influence on further stimulating economic growth of the town and region which may result in more job opportunities.

Table 9-10 Demographic characteristics of Walvis Bay, the Erongo region and nationally (Namibia Statistics Agency, 2023; Namibia Statistics Agency, 2023)

	Walvis Bay Urban	Erongo Region	Namibia
Population (Males)	26,212	122,322	1,474,224
Population (Females)	25,406	117,884	1,548,177
Population (Total)	51,618	240,206	3,022,401
Population Density (persons/km^2)	2,730.8	3.8	3.7

9.10 CULTURAL, HERITAGE AND ARCHAEOLOGICAL ASPECTS

Walvis Bay does not have particularly rich heritage features or archaeologically significant aspects. Within the marine environment, there is a potential for submerged cultural heritage such as wrecks (typically small fishing vessels) to occur within the broader bay area. However, the Berth 9 footprint and surrounding seabed have been substantially modified and previously disturbed through dredging undertaken during the construction of the new container terminal. As a result, the likelihood of intact cultural or archaeological artefacts still being present within the seabed sediments is considered low.

Implications and Impacts

Reclamation activities is not expected to impact on any of the cultural or historically significant areas or buildings.

10 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 15 and 22 December 2025. Due to the location of the project, site notices were placed on the public notice boards at Woermann and Brock Supermarket and SuperSpar in Walvis Bay. These are high-traffic public areas that increases visibility and help ensure the wider community has an opportunity to be aware of, and comment on, the proposed project. 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.

Registered IAPs for the project consist mainly of surrounding neighbours and businesses, as well as the relevant local authorities. During site visits and neighbour notification, general concerns were raised regarding the pace and extent of development in Walvis Bay and the surrounding area. In this context, aspects of the EIA process were questioned, specifically in relation to perceived limitations in regulation, compliance monitoring and policing of conditions contained in existing ECCs and EMPs for developments in and around the port. A nearby guesthouse also raised concerns regarding excessive noise experienced during previous port-related construction activities and requested that the EIA include clear mitigation measures to manage noise generation during the construction phase. Two IAPs provided input during the public review period of the EIA and EMP. These are presented in Appendix B, with comments from GPT / Namport.

11 ASSESSMENT AND MANAGEMENT OF IMPACTS

The purpose of this section is to identify, describe and assess environmental impacts that are expected from a project.

For each impact, an environmental classification is 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 11-1).

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 11-2.

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 11-1 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 11-2 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

Preventative and mitigatory measures are also provided for impacts and an EMP based on these identified impacts are produced. The EMP provides management options to ensure impacts of the proposed project are minimised. An EMP is a tool used to take pro-active action by addressing potential problems before they occur. This should limit corrective measures needed, although additional mitigation measures may require implementation for some impacts.

The impacts, descriptions and environmental management measures are provided in the tables and descriptions below. The management measures should be adhered to during the various phases of construction. Ultimately the operations of the new expanded port will be incorporated into the existing operational EMP of the Port of Walvis Bay.

This section of the report can act as a stand-alone document. All contractors and personnel taking part in the construction of the expanded port should be made aware of the contents of this section, so as to plan the construction process accordingly and in an environmentally sound manner.

The objectives of the EMP are:

- to include all components of construction and related activities;
- to prescribe the best practicable control methods to lessen the environmental impacts associated with the project;
- to monitor and audit the performance of contractors and personnel in applying such controls; and
- to ensure that appropriate environmental training is provided to responsible contractors and personnel.

Various potential and definite impacts will emanate from the project. 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 are expected to mostly be of medium-high significance and can mostly be mitigated to have a medium to low significance. The spatial extent of impacts are mostly limited to the proposed land reclamation area and the immediate surroundings. Some impacts are of a permanent nature. Due to the nature of the surrounding areas, some cumulative impacts are possible.

11.1 ENVIRONMENTAL MANAGEMENT PLAN

11.1.1 Planning

During the planning phase it is the responsibility of the Proponent to ensure they, and all contractors, sub-contractors, consultants and other personnel who will be involved with the construction of the new port area comply with all legal and industry specific requirements. Management measures must be put in place prior to, and during construction, to ensure

potential environmental impacts and risks are minimised. The following actions are recommended during the planning phase and should continue for the duration of the project:

Namport

- Ensure that all necessary permits from the various ministries, local authorities and any other bodies that govern or authorise port construction are in place and remains valid.
- Ensure that reputable contractors and sub-contractors are appointed and enter into an agreement, which includes adherence to the EMP, with Namport.
- Assign a Health, Safety and Environmental Coordinator to oversee implementation of and compliance to the EMP, by all responsible parties.
- Appoint a community liaison officer who can receive and deal with complaints and suggestions and share the contact details with the community.
- Communicate Namport's various emergency response procedures and operational procedures which are relevant to construction, to the relevant contractors involved in the land reclamation project.
- For any dredging, comply with the existing EIA and EMP for dredging of the Port of Walvis Bay.
- Ensure sufficient insurance cover is available for aspects of environmental damage, pollution clean-up or restoration, if ever needed.
- Establish and maintain a reporting system to report on aspects of construction as outlined in the EMP in accordance with ECC conditions.
- Update the EIA and EMP if required and apply for renewal of the environmental clearance certificate prior to expiry.

Contractor

- Enter into an agreement with Namport which includes the EMP and environmental compliance, monitoring and reporting as required by Namport and the ECC.
- Where applicable, ensure that all requirements of the Ministry of Home Affairs, Immigration, Safety and Security are met with respect to work permits and entry into Namibia.
- Where relevant, include the EMP as part of all contracts for the procurement of services.
- Assign a Health, Safety and Environmental Coordinator to oversee the implementation of, and compliance to the EMP.
- Obtain and implement all Namport's emergency response and operational procedures.
- Ensure sufficient insurance cover is available for aspects of environmental damage, pollution clean-up or restoration, if ever needed.
- Establish and maintain a reporting system to report on aspects of construction as outlined in the ECC and as in agreement with Namport.

11.1.2 Employment

The construction of the expanded port area will require various contractors, sub-contractors, building materials, equipment and infrastructure. Employment within goods and services suppliers' businesses will thus be sustained and new job opportunities may be created. Once operational, the new expanded port will require Namport to appoint new employees to be able to manage the larger footprint. However, more importantly, the additional space will be available to various new port tenants who will through both construction and operations sustain and create employment.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Sustaining or creating employment opportunities by appointing a contractor(s) and through support services offered to the contractor(s)	3	2	2	2	2	36	4	Definite
Operations	Enlarged Namport employee base. New businesses operating in the port requiring a new employee base.	3	2	3	2	2	42	4	Definite
Indirect Impacts	Port services sustain the majority of business relying on imports and exports of goods. Port operations will thus indirectly sustain and create new employment within those business.	4	3	3	2	3	96	5	Definite

Desired outcome: Provision of employment to local Namibians and adhering to Namibian legal requirements with respect to work permits.

Actions:

Enhancement:

- If the skills exist locally, contractors and employees must first be sourced from the town, then the region and then nationally. Deviations from this practise must be justified.
- Work permits for foreign employees and contractors.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Immigration Control Act 7 of 1993.
- Work permits and employee contracts on file.
- Bi-annual reporting based on employee records that provides details on number of employees and demographic profile such as male vs. female, local vs. foreign, and disabled employees).

11.1.3 Revenue Generation

During construction, contractors, resources and services will be procured locally where available and feasible, contributing to the economy of the town, region and Namibia. Through the efficient functioning of the expanded Port of Walvis Bay, additional operational opportunities will be available in the port, also contributing to revenue generation. Payment of employees' salaries and wages contribute to the overall economy of the town, region, Namibia and SADC countries exporting and importing goods via Walvis Bay.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Local procurement of resources and support services by the resulting in revenue generation	3	2	2	2	2	36	3	Definite
Operations	Additional employment and port operations continuously require resources and services resulting in revenue generation	3	2	3	2	2	42	3	Definite
Indirect Impacts	Port services sustain the majority of business relying on imports and exports of goods. Port operations will thus indirectly result in the livelihoods of employees of such businesses.	4	3	3	2	3	96	5	Definite

Desired outcome: Revenue generation and contribution to the local, regional, Namibian and SADC economy.

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.
- Resources and services must be procured locally, if available. Deviations from this must be justified.
- Payment of taxes and remuneration in accordance with Namibian legislation.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Where requested, proof must be provided to show that goods and services are procured locally, and if this is not the case, justification for foreign acquisition of such goods and services must be provided.
- Bi-annual reporting based on employee records that provides details on number of employees and demographic profile such as male vs. female, local vs. foreign, and disabled employees).

11.1.4 Skills, Technology and Development

Through employment and contracting of local companies and employees for certain aspects of construction, some skills will be transferred to an unskilled workforce and technologies that are new to Namibia may be introduced. Development of people and technology are key to economic development.

Overall operations of the Port of Walvis Bay may promote the port as a reliable location to conduct port related business ventures. This may further stimulate technological development in the port with associated benefits of training of employees and acquiring of new skills.

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 to the local population	2	1	2	2	1	10	2	Probable
Operations	Growth in port services and operations and associated technological development and transfer of skills	3	2	3	2	2	42	4	Probable

Desired outcome: To see an increase in skills of local Namibians, as well as development and technology advancements in the port.

Actions:

Enhancement:

- If the skills exist locally, contractors and employees 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.
- Training and skills development must be focussed on Namibians.
- Employees to be informed about parameters and requirements for references upon employment.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Record should be kept of all training or development programmes provided to Namibians.
- Ensure that all training is certified or managerial references provided (proof provided to the employees) inclusive of training attendance, completion and implementation.
- Bi-annual reporting summarising any training or skills development programmes provided to Namibians.

11.1.5 Demographic Profile and Community Health

Impacts related to the demographic profile and community health relate to the influx of people (foreigners and Namibians) to the town, and the potential social ills and deviant behaviour that often accompany such events. This includes the spread of communicable diseases such as HIV/AIDS and increased criminal activities. Additional employment opportunities also mean more spending power which can lead to increased misuse of alcohol and drugs.

For the duration of construction there will be an influx of foreign people in Walvis Bay. Contractors, employees or consultants may be sourced in Namibia and may require temporary accommodation and offices in town. Due to the scale and duration of construction it is foreseen that the influx of people will create a significant or permanent change in the demographic profile of the local community, and may result in significant instances of socially deviant behaviour.

The prospects of more operators in the port may entice jobseekers to migrate to the town. The probability of negative impacts occurring, as discussed above, thus increases. More pressure will be placed on goods and services supply and housing.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Before Mitigation/Prevention									
Construction	Social ills and deviant behaviour resulting from the temporary presence of foreign contractors	2	-2	2	2	2	-24	-3	Probable
Operations	Social ills and deviant behaviour resulting from an influx of jobseekers into the town and related unemployment	2	-3	3	2	2	-42	-4	Probable
After Mitigation/Prevention									
Construction	Social ills and deviant behaviour resulting from the temporary presence of foreign contractors	2	-1	2	2	2	-12	-2	Probable
Operations	Social ills and deviant behaviour resulting from an influx of jobseekers into the town and related unemployment	2	-2	3	2	2	-28	-3	Probable

Desired Outcome: To prevent growth in informal settlements and an increase in social ills, the spread of communicable diseases, and prevent / discourage socially deviant behaviour and criminal activities.

Actions:

Enhancement

- Timely information sharing with local, regional and national authorities as well as the suppliers of services to ensure timely development of the town and services to meet growing demands.
- As far as is practically possible, Namibian contractors and support services must be sourced from the town, region or nationally (if available). Deviations from this practice should be justified appropriately.
- Appoint reputable contractors with a proven track record of social responsibility.

- Maintain a comprehensive employee wellness program, ensuring that relevant support are provided to employees with information sessions on aspects such as dangers and prevention of communicable diseases such as HIV/AIDS, alcohol and drug abuse, and sound financial planning.
- No intoxicating substances, or persons under the influence of such substances, may be allowed in the port and construction areas.
- Adhere to all applicable laws and regulations relating to public and environmental health (e.g. sanitation requirements, work conditions, etc.).
- Disciplinary steps, within the legal parameters of Namibia, to be taken for socially deviant behaviour during working hours, should be clearly stipulated in employment contracts.

Mitigation

- Take disciplinary action against employees not adhering to contractual agreements with regard to socially deviant behaviour (e.g. alcohol or drug abuse during working hours).

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Bi-annual reporting summarising employee demographics, educational programmes provided, information session attendance and training conducted.

11.1.6 Health, Safety and Security

Construction and operations rely on human labour who are exposed to health and safety risks. Working at heights and in confined spaces, diving, handling of hazardous chemicals, working with machinery all pose risks.

During operations, working with machinery, unsafe stacking, falling from heights and handling of hazardous chemicals (inhalation of dust and potential health effects chemicals), poses risks to employees. If not contained, windblown dust may further pose health risk to nearby receptors.

The Namibian coast is characterised by very cold water and rough conditions. Falling in the water and being exposed to cold water, will quickly result in hypothermia which may rapidly become fatal.

Security risks are related to unauthorised entry, theft and sabotage.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Before Mitigation/Prevention									
Construction	Physical injuries, chemical exposure, hypothermia or drowning, etc.	1	-3	3	3	1	-21	-3	Probable
Operations	Physical injuries, exposure to chemicals, dust and emissions, and criminal activities.	2	-2	3	3	1	-28	-3	Highly Probable
After Mitigation/Prevention									
Construction	Physical injuries, chemical exposure, hypothermia or drowning, etc.	1	-3	3	3	1	-21	-3	Improbable
Operations	Physical injuries, exposure to chemicals, dust and emissions, and criminal activities.	2	-2	3	3	1	-28	-3	Probable

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

Actions

Prevention

- 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, material safety data sheets (MSDS) and signage requirements (personal protective equipment (PPE), flammable etc.).
- Appointment of reputable contractors with a known history of responsible and safe construction practices.
- 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. This includes strict security to prevent unauthorised entry.
- Provide all employees with required and adequate PPE.
- Ensure that all personnel receive adequate training on operations of equipment / handling of harmful materials.

- Equipment on site must be stored in a way that does not encourage criminal activities (e.g. locked away to prevent theft).
- Security procedures and proper security measures must be in place to protect workers.
- Dredging, if any, to adhere to the approved dredging EMP of the Port of Walvis Bay.

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 emergency response procedures in case of incidents.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Industry standards and protocols, etc.
- An up-to-date health and safety file to be maintained.
- Any incidents or complaints 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, incidents or complaints received, including action taken to prevent future occurrences, must be included.

11.1.7 Traffic: South Gate Route

Construction activities will increase traffic thorough the town to deliver constructing material, equipment, infrastructure, as well as filling material for land reclamation (if sourced from land). Should the latter be required, it will result in a significant temporary increase in traffic. Routes through town and into the port are limited. For this route, construction traffic is expected to increase along the D1986 from Swakopmund and along 5th Road leading towards the South Gate of the Port of Walvis Bay. The increase in construction vehicles along the South Gate route moves through an area that consists mostly of residential neighbourhoods, as well as several guesthouses and/or restaurants. The route is commonly used by residents to travel to and from work, to drop off and pick up children from school, and by tourists visiting the marina, the salt pans and the Walvis Bay Lagoon. In addition, heavy motor vehicle (HMV) movements along the B2 (Walvis Bay–Swakopmund road) are expected to increase due to the loading and transport of fill material from the North Port area, with HMVs turning onto the B2 from the North Port loading area. This will increase the likelihood of traffic delays and congestion (particularly at turning points and intersections), traffic incidents, and road surface damage along affected routes.

Future operations of the new port area will increase traffic on the roads through town, to and from the port. This will however mainly be via the Main Gate. HMV may result in an increased, cumulative impact on the road surface of the area, especially when turning on these roads. Trucks parking in town may block business' entrances and increase the likelihood of accidents and incidents.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Before Mitigation/Prevention									
Construction	Traffic congestion, accidents, and road wear and tear.	2	-3	2	2	3	-42	-4	Highly Probable
Operations	Traffic congestion, accidents, and road wear and tear.	3	-2	3	3	2	-48	-4	Improbable
After Mitigation/Prevention									
Construction	Traffic congestion, accidents, and road wear and tear.	2	-2	2	2	3	-28	-3	Highly Probable
Operations	Traffic congestion, accidents, and road wear and tear.	3	-1	3	3	2	-24	-3	Improbable

Desired Outcome: Minimum impact on traffic, no transport or traffic related incidents, good quality roads.

Actions

Mitigation

- Continuous consultation with the Walvis Bay Town Council, Roads Authority and port users to find feasible measures and alternative to alleviate traffic congestion in town (for both construction and operational phases. This could include investigation and implementation of truck staging areas outside town, alternative access roads, bridges, etc.
- Trucks should not be allowed to park, overnight or obstruct any traffic in areas surrounding the port and the town.
- HMVs associated with construction activities (including the hauling of fill material) should be granted pre-arranged, quick access to the Port via the Southern gate, to avoid HMVs queuing on public roads and contributing to congestion in and around Walvis Bay.

- HMVs hauling fill material should be restricted to approved operating hours to reduce traffic congestion and disturbance along residential sections of the route: 07:30–18:00 only. Along 5th Road no hauling should occur between 12:30 and 14:00, to reduce peak congestion and increase safety associated with lunchtime traffic, school-related movements and access to the Walvis Bay marina and neighbouring facilities
- Adhere to The Road Traffic and Transport Regulations and all other applicable legislation related to road transport and maximum axle loads.
- If any traffic impacts are expected, such as during delivery of abnormal loads, traffic management should be performed.
- The placement of signs to warn and direct traffic or placement of marshals at potentially high incident areas (close too schools, at four way stops and at the North Port access intersection) will aid in mitigation of traffic impacts.

Responsible Body:

- Proponent
- Contractor

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.

11.1.8 Traffic: Main Gate Route

Construction activities will increase traffic thorough the town to deliver constructing material, equipment, infrastructure, as well as filling material for land reclamation (if sourced from land). Should the latter be required, it will result in a significant temporary increase in traffic. Routes through town and into the port are limited. For this route, construction traffic is expected to increase along the D1986 from Swakopmund as well as along 18th Road and other routes leading towards Main Gate of the Port of Walvis Bay. This route is situated within a business and industrial area and already carries high volumes of traffic. The majority of vehicle movements consists HMVs accessing and servicing businesses in the area, including logistics companies, oil and gas operations, storage warehouses and fishing factories. The route also accommodates much of the cargo-related traffic travelling to and from the Port via the Main Gate and the Container Gate located on Gertrude Rikumba Kandanga Hilukilwa Road. In addition, HMV movements along the B2 (Walvis Bay–Swakopmund road) are expected to increase due to the loading and transport of fill material from the North Port area, with HMVs turning onto the B2 from the North Port loading area. This will increase the likelihood of traffic delays and congestion (particularly at turning points and intersections), traffic incidents, and road surface damage along affected routes.

Future operations of the new port area will increase traffic on the roads through town, to and from the port. Heavy motor vehicles (HMV) may result in an increased, cumulative impact on the road surface of the area, especially when turning on these roads. Trucks parking in town may block business' entrances and increase the likelihood of accidents and incidents.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Before Mitigation/Prevention									
Construction	Traffic congestion, accidents, and road wear and tear.	3	-3	2	2	4	-72	-5	Highly Probable
Operations	Traffic congestion, accidents, and road wear and tear.	2	-2	3	3	2	-32	-3	Highly Probable
After Mitigation/Prevention									
Construction	Traffic congestion, accidents, and road wear and tear.	3	-2	2	2	3	-42	-4	Highly Probable
Operations	Traffic congestion, accidents, and road wear and tear.	3	-1	3	3	2	-24	-3	Highly Probable

Desired Outcome: Minimum impact on traffic, no transport or traffic related incidents, good quality roads.

Actions

Mitigation

- Continuous consultation with the Walvis Bay Town Council, Roads Authority and port users to find feasible measures and alternative to alleviate traffic congestion in town (for both construction and operational phases. This could include investigation and implementation of truck staging areas outside town, alternative access roads, bridges, etc.
- Trucks should not be allowed to park, overnight or obstruct any traffic in areas surrounding the port and the town.
- HMVs associated with construction activities (including the hauling of fill material) should be granted pre-arranged, quick access to the Port via the Main gate, to avoid additional

HMVs queuing on public roads and contributing to the congestion in and around Walvis Bay.

- Adhere to The Road Traffic and Transport Regulations and all other applicable legislation related to road transport and maximum axle loads.
- If any traffic impacts are expected, such as during delivery of abnormal loads, traffic management should be performed.
- The placement of signs to warn and direct traffic or placement of marshals at potentially high incident areas (at four way stops and at the North Port access intersection) will aid in mitigation of traffic impacts.

Responsible Body:

- Proponent
- Contractor

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.

11.1.9 Seafaring Traffic

Seafaring traffic may experience delays or in extreme instances be involved in collisions or allisions due to the construction activities in the port area. Delays in ship arrivals or departures at the port can disrupt the timely delivery of goods, interfere with cruise liner schedules, affecting the tourism industry, and lead to a build-up of export-bound cargo within the port. The possibility for such events occurring increases when the proper navigational warnings are not issued, or vessels that are not seaworthy, and without proper communications systems, operate within the area.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Before Mitigation/Prevention									
Construction	Delays in calling to port and potential collisions and allisions.	2	-2	2	2	1	-10	-2	Probable
After Mitigation/Prevention									
Construction	Delays in calling to port and potential collisions and allisions.	2	-2	2	2	1	-10	-2	Improbable

Desired Outcome: Minimum impact on seafaring traffic and no accidents.

Actions

Prevention

- Proper communication, management and planning will largely prevent seafaring vessel delays and accidents.
- Timely issuing of navigational warnings (Namport).
- Planning and communication with regular provision of construction updates to the Port Captain.
- All communications, navigational and warning systems on the vessel in working order and regularly tested and maintained.

Mitigation

- Should an incident occur, it must immediately be reported to the Port Captain, followed by a detailed report within 24 hours, and corrective action should be taken to prevent any future occurrences of such events.

Responsible Body:

- Proponent
- Contractor

Data Sources and Monitoring:

- Part III of the regulations proclaimed under the Namibian Ports Authority Act; Merchant Shipping Act; Marine Traffic Act.; Convention on the International Regulations for Preventing Collisions at Sea; International Convention on Standards of Training, Certification and Watchkeeping for Seafarers
- Ships' logs to be duly maintained.
- Any complaints or incident reports received from seafaring traffic, with regard to port construction, should be recorded together with corrective action taken and measures implemented to prevent impacts from repeating itself.
- Bi-annual reporting on all seafaring traffic related incidents reported, complaints received, and action taken.

11.1.10 Fire and Explosion Risk

Products used during construction, e.g. fuel, solvents, lubricants, etc., may be flammable to varying degrees. Whilst unlikely, these may become explosive under very specific conditions and in confined spaces. The primary causes of such accidents may include human error, technical failures and inadequate maintenance. Dredging also pose fire risks on board the dredging vessel.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Before Mitigation/Prevention									
Construction	A fire that may lead to an explosion and infrastructure damage, injury or loss of life	2	-2	3	3	1	-28	-3	Probable
Operations	A fire that may lead to an explosion and infrastructure damage, injury or loss of life	2	-2	3	3	2	-32	-3	Probable
After Mitigation/Prevention									
Construction	A fire that may lead to an explosion and infrastructure damage, injury or loss of life	2	-2	3	3	1	-28	-3	Improbable
Operations	A fire that may lead to an explosion and infrastructure damage, injury or loss of life	2	-2	3	3	1	-28	-3	Improbable

Desired Outcome: To prevent injury or physical damage as a result of fire or explosions.

Actions

Prevention

- A holistic fire protection and prevention plan is needed. 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.
- Appointment of reputable contractors with known histories of responsible and safe construction practices.
- Share the requirements for firefighting based on the products kept on site with Namport.
- Ensure all materials are stored strictly according to MSDS instructions. This include segregation of incompatible products.
- Maintain firefighting equipment, implement good housekeeping and conduct personnel training (firefighting, fire prevention and responsible housekeeping practises).
- Operations of the dredger must be according to the approved EMP for dredging.

Mitigation

- Implement the emergency and firefighting plan immediately if a fire is detected.

Responsible Body:

- Proponent
- Contractor

Data Sources and Monitoring:

- Record should be kept of all inspections and maintenance performed on firefighting equipment (date of last service, date of next service, replacement date, etc.).

- Record should be kept of all training related to firefighting, fire drills and evacuation procedures.
- Record should be kept of all inspections and maintenance performed on equipment whose failure may result in a fire and/or explosion. This include electrical installations, fuel storage and reticulation, etc.
- Any incidents must be recorded with action taken to prevent future occurrences.
- Bi-annual report on all record keeping and incidents, including corrective action taken.

11.1.11 Noise and Vibration

Noise and vibrations are closely linked. The main noise-generating activities that will result from port construction activities are related to the installation of the steel sheet piles, pile driving (if conducted), compaction of fill material, and HMV movements through town. In addition, increased HMV movements associated with hauling fill material may result in intermittent elevated noise levels along the transport routes and at access control points, particularly at the South Gate entrance, where vehicle queuing, braking, accelerating and idling may increase noise levels in the immediate residential area.

Operational noise will vary depending on the activities of tenants, but will likely include vehicle and train noise, audible warning signals, cranes, the picking up and putting down of skips and containers, vessel engine noise, and the opening and closing of doors and hatches. Noise can cause permanent hearing loss if continued exposure to loud noises occurs, or can be a nuisance to nearby community members such as at residences and accommodation establishments. Whole body vibration is common in vehicle and heavy machinery operators. It can cause lower back pain, motion sickness, bone damage and digestive issues. Long-term exposure may lead to fatigue, drowsiness and reduced concentration. Hand-arm vibration affects workers using power tools. It can result in nerve damage, vascular disorders and musculoskeletal problems.

Not only living organisms are affected by vibrations. Machinery and structures also undergo wear and tear, as vibration leads to accelerated mechanical fatigue and component degradation, loosened joints, cracks, and structural instability.

Noise impacts are expected to be most pronounced during the construction phase and during periods of peak operational activity. Appropriate mitigation (e.g. limiting unnecessary idling, maintaining equipment and vehicles, implementing traffic management at the South Gate, and restricting high-noise activities to daytime where feasible) will assist in reducing nuisance effects and worker exposure.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Before Mitigation/Prevention									
Construction	Noise and vibrations causing health impacts and a nuisance	2	-2	2	2	3	-28	-3	Definite
Operations	Noise and vibrations causing health impacts and a nuisance	2	-2	3	2	2	-28	-3	Definite
After Mitigation/Prevention									
Construction	Noise and vibrations causing health impacts and a nuisance	2	-2	2	2	3	-28	-3	Definite
Operations	Noise and vibrations causing health impacts and a nuisance	2	-1	3	2	2	-21	-3	Definite

Desired Outcome: To ultimately reduce noise and vibration levels in order to prevent hearing loss and other health impacts on workers, side-effects of vibration, a nuisance to nearby receptors, and impacts on animals. Where noise and vibration levels cannot be lowered, the potential impacts thereof must be minimised.

Actions

Mitigation

- The potential noise levels and construction schedule should be discussed with all noise sensitive receptors staying within 500 m from the construction and future operational site. Measures that will be used to reduce noise levels should be highlighted
- 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 and not to be a nuisance to communities should be considered during the construction and operational phases.
- Confine noise generating operational activities to daytime hours as far as possible.
- Should piles be installed, water jet-assisted piling (pile jetting) and/or press-in (static jacking) should be used where geotechnically feasible to minimise noise and vibration.
- Shrouds, noise barriers and acoustic enclosures must be used to limit noise.
- Contractors that use newer, quieter equipment should be appointed. Equipment should be well maintained as per manufacturers requirements, with the engine compartments closed.
- Induction training should include an environmental noise component, which should be given to all employees and contractors, highlighting the sensitivity of the area to noise. Sources of noise should be highlighted, especially the potential impact of material handling noises.
- Use white noise alarms (squawkers) instead of tonal reverse alarms on heavy vehicles and fork-lifts operating within the port area and consider changes to policies and guidelines for contractors and port users.
- Hearing protectors must be issued as part of PPE when working in noisy environments.
- Mechanisms to reduce vibration impact must be employed. This includes frequently rotating operators and wearing of PPE such as vibration absorbing gloves.
- Any machinery and vehicles that cause excessive vibrations should be given defect notices and taken off site immediately. Machinery and/or vehicles may only be used again on site once they have been serviced and approval has been granted by the site supervisor.
- Unnecessary vibrations can be minimised by ensuring that no machinery or vehicles are left idling when not in use.
- The appropriate and correct placement of specific work activities can ensure the reduction of handling of machinery that cause heavy vibrations. Careful placement of infrastructure and transport routes to, from and within the modification area can optimise the noise-reduction effectiveness of walls and buildings. This could include locating loading and unloading activities to allow buildings to act as noise barriers.
- Namport could install a real-time noise monitoring system to provide immediate and accurate noise levels to the contractors and Namport.
- Conduct annual noise auditing to assist in classify noise sources, defining the associated noise levels (magnitude of the noise emission levels) and identify the specific measures that could reduce noise levels.
- Investigate reasonable and valid noise complaints and implementing viable noise management measures

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Health and Safety Regulations of the Labour Act and WHO Guidelines on Community Noise
- Maintain a register to record complaints received from workers and the general public. Complaints should be investigated and if required, a noise and vibration survey should be conducted.
- Bi-annual reporting of all record keeping, including corrective action taken.

11.1.12 Waste

Various types of waste will be produced during the construction phase and the volume of waste originating from the port will increase during the operational phase. Where waste is not securely stored, it may be blown into the sea or town during strong winds and may wash up on the coastline or blow into the desert. This form of pollution will not only have a visual impact, but may also negatively impact on marine and terrestrial animals like dolphins, seals and birds (e.g. entanglement, accidental ingestion, etc.).

Some wastes are hazardous and may deteriorate the quality of the environment, especially the waters in the bay (see section 11.1.13).

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Before Mitigation/Prevention									
Construction	Waste entering the environment	2	-2	2	2	2	-24	-3	Definite
Operations	An increase in waste requiring disposal	2	-2	3	2	2	-28	-3	Definite
After Mitigation/Prevention									
Construction	Waste entering the environment	2	-1	2	2	2	-12	-2	Probable
Operations	An increase in waste requiring disposal	2	-1	3	2	2	-14	-2	Probable

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

Actions

Prevention

- Appointment of reputable contractors with a known history of environmental responsibility.
- Communicate proper waste disposal procedures to the contractor and employees.
- 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 within the confines of the port and ensure waste cannot be blown away by wind.
- Prevent scavenging (human and non-human) of waste.
- For hazardous substances, see the material safety data sheets available from suppliers for disposal of contaminated products and empty containers.

Mitigation

- Waste should regular be disposed of at appropriately classified disposal facilities, this includes hazardous materials (empty chemical containers and contaminated rugs, paper, water and soil), if any.
- To prevent people from using potentially contaminated containers for transport or holding of drinking water, all containers that will be discarded must be crushed or punctured prior to disposal.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- A record should be kept of any disposal of hazardous waste.
- Any complaints received regarding waste should be recorded with notes on action taken.
- Bi-annual reporting on all record keeping, including corrective action taken.

11.1.13 Water Quality

Impacts on water quality may negatively affect various receptors such as aquatic organisms, mariculture farms and seawater intakes (fish processing). Water quality can deteriorate during construction as a result of mixing of sediment in the water column (during dredging or filling of the reclaimed area), spilled or leaked hydrocarbons and chemicals directly entering the water or being blown/washed into the water from nearby surfaces.

The preferred filling material is stockpiled dredged material originating from the North Port dredging operations. Previous sediment sampling indicated that certain metals, including arsenic, cadmium, chromium and nickel, were elevated. During filling, displaced water may decant/seep back into the harbour basin and may carry fine suspended solids and contaminant-bound particles. If not adequately managed, this may contribute to localised reductions in water quality.

Where piling is required, pile installation (including any water jet-assisted piling/jetting, if used) may disturb seabed sediments and temporarily increase turbidity and suspended sediment concentrations in the immediate vicinity of the works area.

With the modified Berth 9 quay wall, the berth will be able to accommodate a broader range of vessels and operational uses, while remaining the primary berth for passenger cruise liners. Where cargo handling and associated loading/offloading activities occur, there is an increased potential for dust to be generated and, under windy conditions, for dust to be blown into the harbour water.

Many pollutants that can enter the water may result in reproductive abnormalities and reduced fertility, which may put the local food web at risk. It may also accumulate in aquatic organisms, especially filter feeders like mussels and oysters and magnify in higher trophic levels where physiological stress and abnormalities can realise. For the mariculture industry, it may prevent the export of mariculture products and causes financial losses if pollution plumes reach mariculture areas.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Before Mitigation/Prevention									
Construction	Suspension of sediments during dredging and reclamation and hazardous substances and waste entering the water	2	-3	3	2	1	-36	-3	Probable
Operations	Hazardous substances and waste entering the water	2	-3	3	2	2	-42	-4	Probable
After Mitigation/Prevention									
Construction	Suspension of sediments during dredging and reclamation and hazardous substances and waste entering the water	2	-2	3	2	1	-20	-3	Probable
Operations	Hazardous substances and waste entering the water	2	-2	3	2	2	-28	-3	Probable

Desired Outcome: To protect sensitive receptors against impacts of reduced water quality as a result of construction activities and pollution

Actions

Prevention

- Appointment of reputable contractors with a known history of environmental responsibility.
- Regularly inspect and maintain all vehicles and infrastructure, to minimise the chances of infrastructure failure. Regular training and refresher courses for operators of machinery and infrastructure that can cause pollution.
- Vehicles and heavy machinery should not be serviced on site.
- Dredger operators must adhere to the approved EMP for dredging.
- Fill placement must be controlled to minimise decanting of turbid water into the harbour basin (e.g. controlled placement rates).
- Port tenants must, where applicable, conduct their own EIA and operate according to their EMP which must be in line with the port's EMP.

Mitigation

- Use drip trays to contain leaks and repair such leaks before continuing to use the equipment/vehicle.
- Clean-up action must be taken immediately for all instances where any hazardous (and non-hazardous product is spilled or leaked.
- Where relevant a conditions survey should be conducted post-clean-up to confirm successful clean-up.
- For large spills containment equipment must be available such as absorbents and booms for oil spills in the ocean.
- Adjust jetting pressure and flow rate (and limit jetting duration) to the minimum required to achieve penetration, in order to reduce sediment mobilisation and plume formation.
- Implement turbidity and/or visual plume monitoring during dredging and fill placement with trigger levels and immediate corrective action where elevated turbidity persists or approaches sensitive receptors.
- Regular inspection and reporting on non-compliance to EMP requirements. Issue non-compliance order and follow up to confirm corrective action taken.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Inspection registers, logging of incidents, reporting of incidents, corrective action taken and inclusion in bi-annual report.

11.1.14 Ecological

Construction activities will impact the marine ecosystem in a localised small footprint. The area earmarked for land reclamation has already been disturbed through previous dredging undertaken during the construction of the new container terminal and Berth 9; however, any remaining ecological features within the reclamation footprint will be permanently lost as the area is filled. No range restricted endemic or unique species are expected or known of in the area.

Marine mammals do not frequent the area earmarked for construction and they will likely avoid the area during construction as a result of noise and activity.

During operations, various structures can act as suitable areas for birds to roost or nest. Bright lights used at night may impact birds like flamingos that fly at night. They may become blinded and disorientated, causing collisions with structures or veering off course.

Operational impacts will mostly be the same as that of the existing port, although at a larger scale.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Before Mitigation/Prevention									
Construction	Habitat destruction and displacement, injury or mortality of marine organisms, pollution	2	-2	3	3	2	-32	-3	Definite
Operations	Reduced water quality, impact of bright lights on birds, pollution	2	-1	3	2	2	-21	-3	Probable
After Mitigation/Prevention									
Construction	Habitat destruction and displacement, injury or mortality of marine organisms, pollution	2	-1	3	3	2	-16	-2	Definite
Operations	Reduced water quality, impact of bright lights on birds, pollution	2	-2	3	2	2	-28	-3	Probable

Desired Outcome: To prevent or minimise destruction, degradation and disturbance of the ecological environment.

Actions:

Prevention

- Appointment of reputable contractors with a known history of environmental responsibility.
- Clearly define the footprint of the project area and work within this footprint at all times.
- Follow the EMP sections on noise, water quality and waste in order to minimise impacts on marine and terrestrial organisms and the environment.
- Dredger operators must adhere to the approved EMP for dredging.
- Port tenants must, where applicable, conduct their own EIA and operate according to their EMP which must be in line with the port's EMP.
- If any mortalities in marine fauna are observed at or around the construction site, it should be reported to the Directorate of Fisheries and the cause investigated and corrective action implemented if applicable.

Mitigation

- All lighting should be directed downwards to construction and operational areas to not blind birds flying at night.
- Use the minimum lighting required for safe operations and use auto dimming lights when no activity is ongoing.
- Record any bird strikes and take corrective action if needed.

Responsible Body:

- Proponent
- Contractor

Data Sources and Monitoring:

- Record any marine mammal sightings and any other significant encounters or observations of animals and birds (including sick or dead animals) and report these to the local offices of the MEFT and MAFWLR.
- Bi-annual reporting of all record keeping, including corrective action taken.

11.1.15 Visual

The modification project will increase the footprint of the commercial harbour, while the industrial nature and visual character of the area will remain largely unchanged. The main noticeable visual change associated with the project is expected to be during the construction phase, particularly due to the use of large crawler cranes, construction plant and temporary works within the Berth 9 area. Once operational, the reclaimed area will form part of the existing port environment and is expected to read as a continuation of the established industrial harbour landscape. Overall, visual impacts are therefore expected to be low to moderate, given that the project is located within an existing developed port footprint and will not introduce land uses that are visually inconsistent with the surrounding port environment.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Before Mitigation/Prevention									
Construction	The presence of construction teams and equipment	2	-2	2	2	2	-24	-3	Highly Probable
Operations	The presence of new port facilities and infrastructure changing the landscape character	1	-1	3	2	2	-7	-1	Definite
After Mitigation/Prevention									
Construction	The presence of construction teams and equipment	2	-1	2	2	2	-12	-2	Highly Probable
Operations	The presence of new port facilities and infrastructure changing the landscape character	1	-1	3	2	2	-7	-1	Definite

Desired Outcome: To minimise the negative visual impact of the project.

Actions

Mitigation

- Confine construction to day time only.
- Contain construction and establishment activities within specifically demarcated areas with the smallest footprint possible.
- Regular waste disposal at an approved landfill site.
- "Housekeeping" procedures should be developed for the Project to ensure that the Project sites and lands adjacent to the Project sites are kept clean of debris, garbage, graffiti, fugitive trash, or waste generated onsite; procedures should extend to control of "track out" of dirt on vehicles leaving the port area.
- Install light fixtures that provide precisely directed illumination to reduce light "spillage" beyond the immediate surroundings of the site.
- Minimise the number of light fixtures to the bare minimum, including security lighting, and utilise motion-activated/security-triggered lighting where feasible.
- Minimise the number of light fixtures to the bare minimum, including security lighting.

Responsible Body

- Proponent
- Contractors

Data Sources and Monitoring:

- Record all complaints received and investigate the validity of such complaints. Record all corrective measures taken.
- A bi-annual report should be compiled of all complaints received and actions taken.

11.1.16 Infrastructure

Damage can be caused to the existing port infrastructure during the construction phase. This may temporarily disrupt port services or create unsafe working conditions.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Before Mitigation/Prevention									
Construction	Damage to existing infrastructure	2	-2	2	2	1	-20	-3	Probable
After Mitigation/Prevention									
Construction	Damage to existing infrastructure	2	-2	2	2	1	-20	-3	Improbable

Desired Outcome: To prevent the damage to existing port infrastructure.

Action:

Prevention

- Appointment of reputable contractors with a known history of safe and responsible work practices.
- Trained operators of equipment.
- Emergency response plan with contact details of emergency personnel.
- Inform relevant stakeholders of the intention to work close to their facilities.
- Ensure the proper and correct functioning of all operational equipment and warning systems.

Mitigation

- Implement emergency response plan if any incident occurs.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Record and report to Namport any incidents with the corrective actions taken.
- Bi-annual report of all record keeping and the proof of reporting of any incidents to Namport.

11.2 DECOMMISSIONING

Closure and decommissioning of the modified Berth 9 as a whole is highly unlikely. However, it is possible that certain components of the project—such as auxiliary structures or civil infrastructure—may be decommissioned, upgraded or replaced at a later stage. Decommissioning is therefore included for this purpose, as well as to account for any construction activities that may involve the modification or removal of infrastructure.

Future land use after decommissioning should be assessed prior to the initiation of works, particularly if the affected land will not be used for similar purposes. Should decommissioning occur at any stage, rehabilitation of the area may be required to return the site to an acceptable condition. Decommissioning will entail the complete removal of infrastructure, including buildings, foundations, marine structures and associated support systems that are not required for the future use of the area. Any pollution present on-site must be identified, documented, and remediated in accordance with applicable environmental standards.

The impacts associated with the decommissioning phase include increased noise, dust, and waste production as structures are dismantled. These impacts are typically short-term and localised, but they must be managed effectively to avoid nuisance or environmental degradation. Noise levels must be maintained within the limits stipulated in the Health and Safety Regulations of the Labour Act and/or World Health Organization guidelines. Implementation of a waste management plan, especially for the identification and disposal of hazardous or contaminated materials, will be paramount. Waste must be securely contained and transported to licensed waste disposal sites; dumping or stockpiling in surrounding areas is not permitted. The EMP and associated waste management plan will need to be reviewed and updated at the time of full decommissioning to reflect any site changes, updated legislation, and improved mitigation approaches.

11.3 ENVIRONMENTAL MANAGEMENT SYSTEM

Namport subscribes to an environmental management system (ISO14001) that 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 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.

To ensure Namport continues to adhere to ISO14001, the contractor must also adhere to the parameters prescribed by this EMS. It remains Namport's responsibility to ensure that all contractors operating on behalf of Namport adhere to all environmental compliance requirements.

12 CONCLUSION

Namport proposes to modify Berth 9 at the Port of Walvis Bay through a process of land reclamation. The project is aimed at meeting the growing demand for additional operational space within the South Port while North Port development progresses. Reclamation will entail the development of additional backup land and associated marine and landside infrastructure, including modification of the existing

Berth 9 jetty to form a continuous quay wall, construction of new quay walls for tugboats and small craft, and backfilling of the reclamation footprint to create heavy-duty paved operational space. The development is intended to improve port functionality and provide additional space to support port services, including offshore support requirements, while maintaining Berth 9 as the primary berth for passenger cruise liners.

Negative environmental impacts resulting from construction and operations of the port are expected, unless suitable preventative and mitigating measures are implemented. The most important of the impacts are water quality (including turbidity and potential contaminant mobilisation), marine ecology, traffic, noise, waste, pollution and health and safety.

The EMP accompanying this report specifies enhancement measures aimed at increasing the positive impacts. This includes maximising the appointment of local Namibian companies as contractors and for support services. To minimise impacts on sensitive receptors, the EMP includes measures to control dredging (where required) and filling activities, manage HMV movements and traffic, prevent pollution incidents, and reduce nuisance effects (including noise, particularly along transport routes and at the Main and South Gate). Good housekeeping must be performed at all times and equipment must be on site to deal with any emergencies such as spills, fire and injuries. Where any potentially significant heritage finds are encountered during works, the chance find procedure must be implemented.

The EMP also describes a monitoring programme to be carried out by Namport and contractor(s). This is a typical condition linked to ECCs and aims to show compliance to the EMP and environmental responsibility.

Should the DEA find that the impacts and related mitigation measures, which have been proposed in this report, are acceptable, an ECC may be granted to Namport. The ECC, based on this document, will render it a legally binding document which should be adhered to. Focus should be placed on section 11, 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 Public Participation Process

Notified Interested and Affected Parties

Name	Organisation/Representative
Mr. Hull	Neighbour – Atlantic Street
Olivie Tobias	Godenfang Restaurant
Valerie	Annas Inn
Y Seibes	No.9 5th Road
Eben Wessels	IAdventure - Waterfront
Helena Shaahamange	Kaizzy Tours
J. Dueuloge	Dockside Restaurant
T.N van der Merwe	Catamaran Charters
Lara Stiege	The Jetty Shoppe
Paulo Martins	Anchors Restaurant
Lieschen Pretorius	Mola Mola Safaris
Helga Kapitako	Sandwich Dune Tours and Car Rentals
David Uushona	Municipality of Walvis Bay
Nangula Amutenya	Municipality of Walvis Bay
Lovisa Hailaula	Municipality of Walvis Bay
Ephraim Nambahu	Municipality of Walvis Bay
Efraim Kathindi	Municipality of Walvis Bay
Environmental Management	Municipality of Walvis Bay
Town Planning Department	Municipality of Walvis Bay
Environmental Health Practitioner	Municipality of Walvis Bay
Walvis Bay Environmental Management Advisory Forum	
All port users (e-mailed via Namport distribution list)	

Hand Delivered Notification to the Municipality of Walvis Bay

GEO Pollution Technologies

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

15 December 2025

To: **Authority/ Interested and / or Affected Party / Neighbour**

MUNICIPALITY WALVIS BAY
General Manager
1 [illegible] 2025
Waste & Environ. MGMT.

Dear Sir/Madam

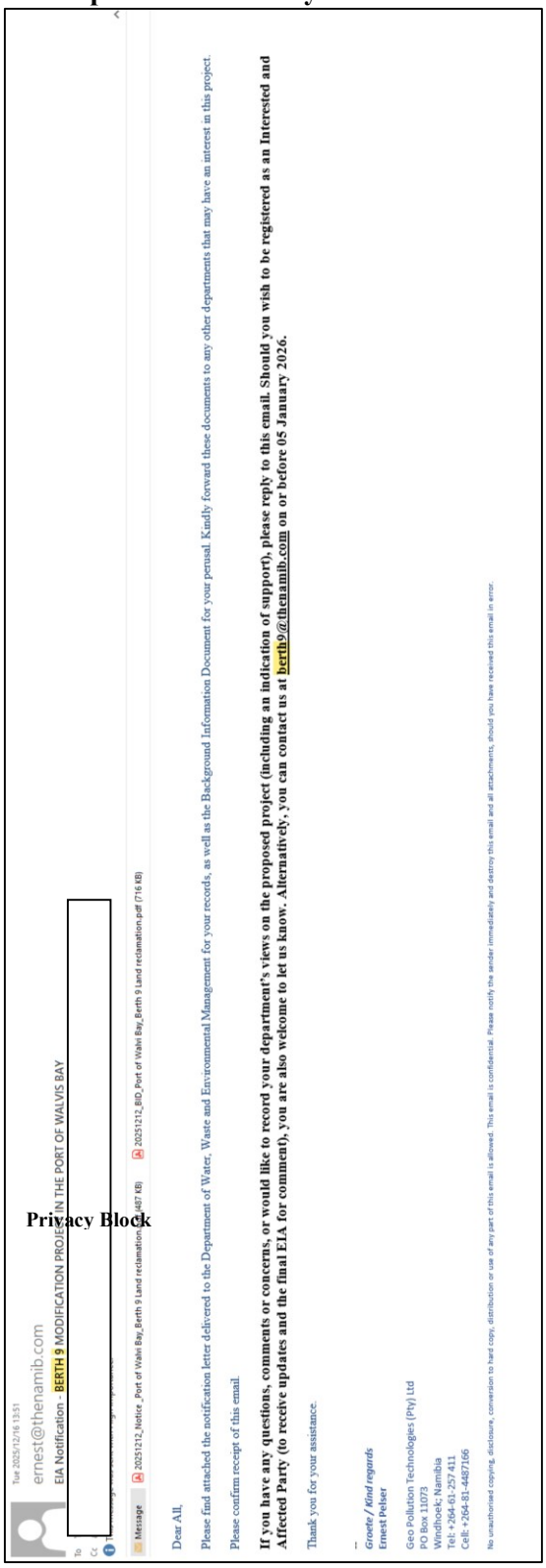
Re: **Berth 9 Modification Project in the Port of Walvis Bay, Erongo Region**

The Port of Walvis Bay is Namibia's principal deep-water port and a strategic gateway to global markets (Figure 1). The port is one of two ports in Namibia and is located in Walvis Bay, Erongo Region. First established in 1793, it remained under South African administration from 1910 until its reintegration into Namibia in 1994. Since then, the port has become central to the national economy and plays a vital role in facilitating trade for Namibia and several landlocked countries in southern Africa, including Botswana, Zambia, and Zimbabwe, via the Walvis Bay Corridor network. The main industrial and commercial activities are currently concentrated in the South Port, which hosts key infrastructure for container handling, break-bulk cargo, fishing, ship repair and logistics services, while the North Port remains in an early development phase with only the new petroleum storage and handling terminal completed to date. With the South Port operating near full capacity and the North Port still years away from full development, interim measures to expand cargo-handling capacity in the South Port have become necessary. The first major intervention was the construction of the new container terminal on 40 hectares of reclaimed land, improving container throughput. Building on this expansion, the Namibian Ports Authority (Namport) now proposes to modify Berth 9 (Figure 2), currently dedicated to cruise-liner berthing, to add a further 4.7 hectares to the commercial harbour area, providing much-needed operational space and enhancing the port's short- to medium-term capacity.

Namport proposes to extend and reconfigure the existing Berth 9 interface through land reclamation and associated marine and landside infrastructure. Modification of Berth 9, a dolphin-type jetty, will entail reclamation of the water area between the berth and the container terminal to create new backup land directly adjacent to the existing quay infrastructure. Typically, construction will begin with the installation of a steel sheet-pile or combi-wall system to establish a retaining wall structure. This will be followed by driving large steel tubular piles into the foundation of the area to be reclaimed and filling them with concrete to create the primary load-bearing supports. The area will then be reclaimed by filling it with suitable material from onshore sources and/or from sediment obtained by dredging in the port area. Once the piling works and reclamation are completed, formwork and reinforcement will be placed and a reinforced concrete deck will be cast to create the final operational platform. The design will include service tunnels to house all the quayside services required by ships. Onshore services will also be installed, i.e. roads, pavements, water, sewer, lighting and electricity distribution, so that all services in the existing port can simply continue into the extended section. It should be noted that some deviations from the design and construction of the modified Berth 9 area may ultimately realise based on final designs.

Geo Pollution Technologies (Pty) Ltd, an independent environmental consultant, was appointed by Namport to conduct an environmental assessment for the proposed Berth 9 modification project. The purpose of the environmental assessment is to identify and address the potential impacts of the project on the environment, where the environment includes biophysical, social and economic impacts. The environmental assessment will be accompanied by an environmental management plan (EMP) and will ultimately, depending on the conclusion of the assessment, be submitted to the Ministry of Environment, Forestry and Tourism to apply for an environmental clearance certificate (ECC). The environmental

Municipal Notification by e-mail



Tue 2025/12/16 13:51

ernest@thenamib.com

EIA Notification - BERTH 9 MODIFICATION PROJECT IN THE PORT OF WALVIS BAY

To [redacted]

Cc

Message 20251212_Notice_Port of Walvi Bay_Berth 9 Land reclamation (...487 KB) 20251212_BID_Port of Walvi Bay_Berth 9 Land reclamation.pdf (716 KB)

Dear All,

Please find attached the notification letter delivered to the Department of Water, Waste and Environmental Management for your records, as well as the Background Information Document for your perusal. Kindly forward these documents to any other departments that may have an interest in this project.

Please confirm receipt of this email.

If you have any questions, comments or concerns, or would like to record your department's views on the proposed project (including an indication of support), please reply to this email. Should you wish to be registered as an Interested and Affected Party (to receive updates and the final EIA for comment), you are also welcome to let us know. Alternatively, you can contact us at berth9@thenamib.com on or before 05 January 2026.

Thank you for your assistance.

--

Groete / Kind regards

Ernest Pelser

Geo Pollution Technologies (Pty) Ltd
PO Box 11073
Windhoek; Namibia
Tel: +264-61-257 411
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Notifications Hand Delivered to Identified IAP

Public Participation Notification: Environmental Assessment

Namport: Berth 9 Modification Project in the Port of Walvis Bay

Name & Surname	Organisation/Address	Tel / Mobile	Email	Signature
Hall	[illegible]			
OLIVIE TOBIAS	Goldenpeng Ltd.			
Valerie	Ana's Inn			
Seibes	9 5th Road W/Bay			
Eben Wessels.	Iventure - Waterfront			
Helena Shoohamange	Kaizzy Tours			
J Duenlaye.	Dockside.			
T.N. VAN DER MERWE	CATAMARAN CHARTERS			
Lara Stiege	The Jettyshoppe			
PAULO MARTINS	ANCHORS REST.			
LIESCHEN SMITH (PRETORIUS)	MOLA MOLA SAF			
Helga Kapitako	Sandwich Dune Tours & Car Rentals			

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Geo Pollution Technologies December 2025
Environmental Scoping Assessment and Environmental Management Plan Berth 9 Modification Project in the Port of Walvis Bay

Newspaper Advertisement Namibian Sun 15 and 22 December 2025

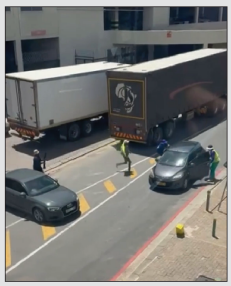
NEWS IN SHORT

Robbers snatch N$380 000 in broad daylight

City Police spokesperson Superintendent Marcelline Murapo yesterday confirmed that a cash-in-transit robbery occurred in Windhoek on Saturday afternoon at Wernhill shopping centre, during which an estimated N$380 000 was stolen, although the final amount may be higher.

Murapo also confirmed that footage that had circulated on social media was authentic and showed the five suspects fleeing the scene of the crime. She said investigations are ongoing, and police are appealing to members of the public to assist with information that could help trace the suspects.

- ELIOT IPINGE



UNHCR Osire employee arrested for alleged cash fraud

A United Nations High Commissioner for Refugees (UNHCR) employee in Namibia, aged 38, employed as a community-based protection associate, has been arrested in connection with alleged fraud linked to the agency's cash-based initiative, which provides financial assistance to families at the Osire refugee camp.

Police sources have confirmed the arrest. The suspect is expected to appear in the Windhoek Magistrate's Court today.

In October, Namibian Sun reported that more than 100 refugees at Osire had not received payments under the cash-based initiative. The report cited alleged irregularities in the system, including cases where beneficiaries were recorded as having received funds despite having relocated from the camp.

At the time, UNHCR acknowledged a funding shortfall, stating that assistance is prioritised for families "most in need."

- ELIOT IPINGE

MAN SUSTAINED 14 STAB WOUNDS

Autopsy casts doubt on initial police account of Rehoboth stabbing, suicide

The family of the late George Haubab (26) say the police account of his death lacks credibility, citing post-mortem findings they claim indicate he was possibly assaulted and murdered.

ELIZABETH KHEIBES
WINDHOEK

DOUBT CAST: The late George Haubab. PHOTO: CONTRIBUTED

A Rehoboth family is strongly disputing an initial police account of a fatal stabbing earlier this month after a forensic post-mortem report appeared to contradict claims that their relative died from self-inflicted stab wounds.

The police's initial report, issued shortly after the 5 December incident, said that 26-year-old George Haubab had allegedly stabbed his former girlfriend and her companion before turning the knife on himself.

The alleged victims survived the incident, police said, and were reported to be in critical condition.

However, the Haubab family have since released the post-mortem findings on social media, saying the report suggests their relative was assaulted and murdered.

The report raises questions about whether the 14 stab wounds sustained by Haubab were self-inflicted and appears to indicate Haubab suffered several defensive wounds.

This has triggered a public outcry.

The incident occurred on 2nd Street, Block E, Rehoboth, left Haubab dead.

"It is alleged that the deceased arrived at his then girlfriend's home, found her with another man, and immediately launched a violent attack," the initial police report had stated. "The male victim managed to escape but sustained serious injuries. The woman was also stabbed multiple times. Both remain in critical condition in a Windhoek hospital."

Neighbours at the time told police they fled after Haubab allegedly threatened them with an okapi knife. He reportedly collapsed nearby and died before paramedics arrived.

Initial findings not final

On Friday, amid growing public outcry, police spokesperson Deputy Commissioner Kauna Shikwambi urged restraint, stressing that initial police reports are not conclusive while investigations are ongoing.

She also criticised the circulation of the confidential autopsy report on social media.

"First and foremost, I strongly condemn the circulation of sensitive and confidential autopsy results on social media. While the distress and outcry are noted, the dissemination of such information, especially that forming part of an ongoing investigation, is not encouraged."

The deputy commissioner explained that crime reports are based on real-time information available at the time, often provided quickly to respond to media queries.

"These are preliminary reports. Such information is subject to change. This is why we often state: 'Police investigation continues,' indicating that the situation may evolve as new evidence is gathered."

Shikwambi stressed that investigations are gradual processes, involving evidence collection and witness statements.

"Suggesting that our updates are contradictory somehow undermines our diligent efforts to respond, share, update and keep the public informed," she noted. "In the end, the truth will always be known."

Forensic findings

The autopsy report issued by the Namibian Police Force's Forensic Pathology Division and seen by Namibian Sun confirmed that Haubab sustained 14 stab wounds, including four fatal injuries to the heart, chest and neck.

The medical certificate concluded that Haubab died from a major laceration of the heart accompanied by haemopericardium, as well as a lacerated internal jugular vein and significant bleeding in the chest cavity. These injuries were described as the result of an assault involving a knife.

A detailed medico-legal examination conducted by forensic pathologist Dr Soraya Cher Podewiltz documented deep chest wounds penetrating the thoracic cavity, including two that pierced the right ventricle of the heart and another that entered the upper lobe of the right lung. Sharp-force injuries to the neck were also confirmed.

Suicide disputed, petition launched

The Haubab family has since submitted a petition to the acting police commissioner in Marienthal, arguing that the initial police report "lacked credibility" and failed to reflect the true circumstances of Haubab's death.

They further argued that law enforcement failed to collect statements from all relevant parties before releasing the initial report, undermining confidence in the early investigative process.

Responding to the family's concerns, Shikwambi said once an investigation is launched, the facts surrounding a matter may change. She said added that the police will continue to investigate the incident thoroughly.The two surviving victims remain in critical condition in a Windhoek hospital, while the probe into Haubab's death, now under heightened scrutiny, continues.

NEWS IN SHORT

Police set record straight on fake news bakkie claims

Police have dismissed social media claims that officers used an official police bakkie to tow a private trailer for a wedding in the Oshikango area and fuelled it with so-called 'Ngungula' - illegal fuel. Police Inspector Joseph Shikongo said the allegations are false and misrepresent an incident that occurred more than a year ago.

He said the matter referred to in the circulating audio clips took place in May 2024 in Fransfontein, not Oshikango, and was connected to an active stock theft investigation.

He said a Toyota Hilux, registration number POL 9451, was deployed to recover three stolen donkeys following a report to the police. The complainant provided a private trailer to assist with transporting the animals, which were recovered during the operation.

Two suspects were arrested. Shikongo stressed that the police vehicle was not used for any private purpose and that the operation was unrelated to a wedding.

He urged the public to avoid sharing misleading or defamatory content on social media and encouraged people to verify information with the police or other relevant authorities before circulating it. - ELIOT IPINGE

Namport signs MoU with Suez Canal Authority

Namport signed an MoU with the Suez Canal Authority last week to strengthen Namibia's position within the global maritime and logistics network. The agreement focuses on cooperation in key strategic areas, including capacity building, port infrastructure development, marine asset management, dredging expertise and the exchange of technical and operational information.

Namport said the partnership supports its broader ambition to position Namibia as a leading regional logistics hub and transhipment centre on Africa's western seaboard, leveraging the country's ports to improve connectivity between southern Africa and international shipping routes.

The collaboration also builds on the longstanding bilateral relationship between Namibia and Egypt. Namport noted that cooperation with the Suez Canal Authority, one of the world's most strategically important maritime institutions, is expected to contribute to improved port operations, skills development and long-term infrastructure planning in Namibia. - STAFF REPORTER

Geingob's top economic team exits – did they deliver?

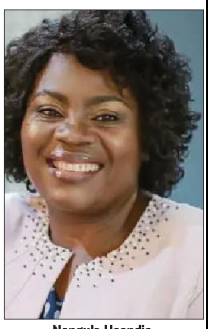
• REFLECTIONS

As Geingob's dream team departs, Namibia faces a pressing question: did those empowered **to wield real influence generate tangible improvements for ordinary citizens?**

STAFF REPORTER
WINDHOEK


Johannes !Gawaxab. PHOTOS: FILE


James Mnyupe.


Nangula Uaandja.

Johannes !Gawaxab and Nangula Uaandja will both leave office at the end of the month, drawing the curtain on a quiet but powerful chapter in Namibia's recent economic history.

Their departures signal more than routine leadership changes. They mark the fading presence of the technocratic core that once formed the intellectual backbone of the late former president Hage Geingob's economic recovery agenda.

Both !Gawaxab and Uaandja were central figures on the high-level economic panel appointed by Geingob in 2019 – a panel born from his 2018 pledge to establish a presidential economic advisory council to help steer the country out of stagnation.

As the figures Geingob once entrusted to conceive, design and implement economic recovery now depart, Namibia confronts an unavoidable question: did the team empowered by the country's top leader to wield economic influence deliver real changes that improved the lives of ordinary Namibians?

!Gawaxab chaired the high-level panel and quickly emerged as one of Geingob's most influential economic thinkers.

In June 2020, he officially assumed office as governor of the Bank of Namibia, initially on an 18-month term. His mandate was later extended, and he was reappointed for a full five-year term from 1 January 2022 – a term that was supposed to run until January 2027.

Instead, he is stepping down earlier, bringing to a close a tenure that coincided with some of Namibia's most difficult economic moments.

Similar path

Serving as !Gawaxab's deputy on the panel was Nangula Uaandja. Her rise followed a similar trajectory from adviser to executive authority.

Uaandja subsequently became the founding chief executive officer of the Namibia Investment Promotion and Development Board (NIPDB), an institution created directly on the panel's recommendation.

Under Geingob, the NIPDB reported directly to State House and operated as an autonomous body, reflecting the former president's belief that investment promotion needs insulation from bureaucratic inertia.

That changed under the new administration, when the NIPDB was placed under the trade ministry.

On Thursday, the board announced that Uaandja would also bow out at the end of December.

Another prominent panel member, James Mnyupe, exited earlier than his counterparts.

After about a year on the panel, he was appointed Geingob's presidential economic adviser, a role that placed him at the centre of financial decision-making.

He later became Namibia's green hydrogen commissioner, again reporting directly to Geingob. Like Uaandja, his authority flowed from the Presidency rather than a line ministry.

Mnyupe has since also left that role.

Viewed together, these departures tell a coherent story. Geingob did not simply convene a panel to advise him. He elevated its members into positions of real power, expecting ideas to move swiftly from institutions into outcomes.

The former head of state gave these technocrats proximity to power, political cover and the authority to act.

A more complex question

That is why the focus should not rest on Geingob himself. He kept his promise. He created the panel. He trusted and empowered its members. The more complex question – the one that now hangs in the air – is whether those given the jobs delivered what the country needed.

Under !Gawaxab, the Bank of Namibia remained stable through the Covid-19 shock, global inflation and tightening monetary conditions. Institutional credibility was preserved, and the financial system was held. But for many Namibians, stability did not translate into opportunity.

Unemployment, particularly among the youth, remained stubbornly high. Living costs rose faster than incomes. Poverty and informality deepened.

Uaandja's NIPDB was billed as a game-changer: a one-stop investment body designed to unlock capital, cut red tape and drive industrialisation.

Yet investment outcomes remained uneven and the promised wave of transformative projects has been slow to materialise.

Mnyupe's green hydrogen drive positioned Namibia boldly on the global energy map, but its benefits remain largely in the future, still far removed from households struggling to meet daily needs.

None of this ignores the context in which they served. Covid-19 disrupted economies everywhere. Fiscal space was tight.

Structural problems were inherited. But leadership is ultimately measured by translation – by whether ideas move beyond policy boardrooms and into people's lives.

As Geingob's economic chosen thinkers now leave the stage, Namibia is left with reflection rather than accusation.

Did the country feel the work of its brightest technocrats? Did economic expertise translate into dignity, jobs and opportunity for the majority? Or did too much remain confined to strategy documents, institutions and elite conversations?

Geingob believed deeply in expertise. He believed Namibia could think its way out of a crisis. The people he appointed were given the platform to prove that belief right.

Their departure now shifts the burden of judgement to the only place it truly belongs: the lived experience of ordinary Namibians.

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» Vrou ly onder jare van pyn en ongemak

Chirurgiese naald 20 jaar later 'ontdek'

Dit is na bewering in 2002 in die vrou agter gelaat ná die geboorte van haar kind.

Rita Kakelo

'n Vrou van Windhoek eis meer as 'n miljoen in skadevergoeding, nadat 'n chirurgiese naald meer as twee dekades later in haar ontdek en verwyder is.

Die chirurgiese naald is na bewering in 2002 tydens die geboorte van haar kind agtergelos, met N$1,5 miljoen wat van die ministerie van gesondheid en maatskaplike dienste geëis word.

Die vrou wie se identiteit weerhou word om haar privaatheid te beskerm, het die eis ingedien 'n jaar nadat 'n ginekoloog by die Katutura-staatshospitaal die naald tydens opvolgondersoeke ontdek het.

Volgens hofdokumente het mediese personeel by die staatshospitaal op Otjiwarongo versuim om die chirurgiese naald na die uitvoer van 'n keisersnee en die herstel van 'n perineale skeur op 1 Junie 2002 te verwyder.

"Op 1 Junie 2002, terwyl die klaer kraampyne ervaar het, is sy in die Okakarara-staatskliniek opgeneem. Nadat sy ondersoek is, is sy na die bevallingskamer oorgeplaas. 'n Senior verpleegster het opgemerk dat sy nog nie voldoende ontsluit het nie en het vir haar gesê om te stap in 'n poging om die kraamproses te versnel," lui die hofdokumente.

Die vrou is gevolglik per ambulans na die staatshospitaal op Otjiwarongo vervoer, omdat die kliniek net een dokter beskikbaar gehad het wat op hierdie tydstip na ongelukslagoffers omgesien het.

Tydens die oordrag na die staatshospitaal het die vrou na bewering haar bewussyn verloor en eers met haar aankoms van haar omgewing bewus geword. Sy was toe 29 jaar oud.

Sedertdien het sy volgehoue pyn, ongemak en herhaalde infeksies oor die jare ervaar saam met 'n vrees vir seksuele intimiteit.

Sy het by verskeie staatsgeriewe vir behandeling gaan aanklop waaronder die Robert Mugabe-kliniek, asook die Khomasdal- en Katutura-gesondheidsentrums in Windhoek. Volgens die besonderhede van haar eis is sy herhaaldelik huis toe gestuur met pynmedikasie, antibiotika en verwysings – sonder voldoende ondersoek na die oorsaak van haar simptome.

Die chirurgiese naald is eers op 26 September verlede jaar in haar linkerlabia ontdek en is later in die Katutura-staatshospitaal verwyder.

Die ldaer voer aan dat die ministerie se mediese personeel versuim het om, ten spyte van haar voortdurende klagtes oor meer as 20 jaar, die verwagte standaard van sorg toe te pas of om haar na 'n spesialis te verwys.

Sy beweer die voortdurende lyding het emosionele trauma, vrees vir seksuele intimiteit, fisieke pyn en 'n beduidende verlies aan lewensgehalte veroorsaak. Haar skadevergoedingseis sluit in N$500 000 vir emosionele lyding, N$500 000 vir trauma en angs, N$250 000 vir fisiese beserings, N$250 000 ongemak en pyn en N$50 000 vir verwagte sielkundige berading in. Die ministerie wat deur die regering se regsverteenwoordiger verteenwoordig word, moet nog sy pleit indien.

Volgens die senior regsbeampte, Deon Ndana, sukkel die ministerie ten spyte van herhaalde versoeke om instruksies van die staatshospitaal op Otjiwarongo te kry. Die ministerie beplan om aansoek om uitstel te doen om sy pleit en teeneis in te dien.

Die saak is tot 4 Februarie aanstaande jaar vir 'n verwysing vir mediasieverhoor uitgestel.

- rita@nmh-hub.com.na

Botswana-terugkerendes trek na hervestigingsplase

Jacques du Toit

Honderde Namibiese afstammelinge wat vanaf Botswana na Gam in die Otjozondjupastreek vir hervestiging teruggekeer het, het begin verhuis na hul permanente nedersettings by Otjipaheua.

Dit is deur die minister van landbou, visserye, water en grondhervorming, Inge Zaamwani, tydens haar besoek aan Gam einde verlede week bevestig.

Zaamwani het die families opdrag gegee oor die hervestigingsproses: "Elke gesin wat op 20 September deur die regering ontvang is, sowel as diegene wat daarna aangekom het, moet voorbereі om na Otjipaheua te verhuis vir die toekenning van landbougrond. Julle samewerking om hierdie proses te begin, sal hoogs waardeer word en moet ideaal gesproke teen die einde van Januarie 2026 voltooi wees."

Terugkerendes van Botswana vergader by Gam en berei voor vir hul hervestiging na permanente by Otjipaheua. FOTO'S MAFWLR

Sy het bygevoeg dat "die regering vervoerbystand sal verskaf en alle kwalifiserende individue word aangemoedig om hierdie ondersteuning te gebruik". Zaamwani het bevestig sommige vragmotors wat aangewys is vir die reis na Otjipaheua het aangekom, terwyl ander op pad is.

Die minister het ook aangekondig dat die ministerie in samewerking met die Kambazembi tradisionele owerheid van hierdie gebied binnekort agt boerdery-eenhede van plase wat deur die regering gekoop is, aan agt families uit die groep sal toeken. Na aanleiding van hierdie aankondiging word verwag dat daardie families binne 30 dae na hul boerdery-eenhede sal trek."

Zaamwani het die regering se belegging in infrastruktuur by Gam vir die hervestiging uitgelig en gesê: "Tot op hede het die regering meer as N$115 miljoen in hierdie inisiatief belê." Dit is gebruik vir onder meer die bou van moderne waterinfrastruktuur sowel as 'n veeldoelige kraal.

Die regering se aankoop van ses plase van 23 000 hektaar ter waarde van N$60 miljoen sal in boerdery-eenhede in die streke van Otjozondjupa, Hardap en Omaheke vir kwalifiserende families onderverdeel word.

Sy het die gemeenskap aangespoor om saam te staan tydens die oorgangsfase en beklemtoon: "Die handhawing van samehorigheid sal julle in staat stel om interne en eksterne uitdagings wat tydens julle hervestiging mag ontstaan."

Zaamwani het inwoners ook herinner aan die regering se verbintenis tot integrasie en gesê: "Die regering is daartoe verbind om julle volle integrasie in die Namibiese samelewing te ondersteun."

Sy het 'n beroep gedoen op samewerking in die vestiging van produktiewe huishoudings: "Ek vra jul mede-Namibiërs om verenig te bly en met julle regering saam te werk om te verseker dat die hervestigingsproses lei tot die vestiging van produktiewe huishoudings wat uiteindelik sal bydra tot selfstandigheid en veerkragtigheid."

Die minister het afgesluit met die woorde: "Jul besluit om na jul land terug te keer is beide prysenswaardig en betekenisvol. Jul liefde vir jul land word met respek deur die huidige en toekomstige geslagte geag. Ons dank die Almagtige God wat dit vir ons moontlik gemaak het om vandag hier te wees, byna 15 maande sedert jul aankoms in jul Moederland vanuit Botswana."

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WEER

WEERWAAK: Swaar reënval met kitsvloede op plekke is heel waarskynlik in die streke van Omusati, Oshana, Kavango-Oos, Otjozondjupa en Khomas.
BINNELAND: Gedeeltelik bewolk en warm tot baie warm met geïsoleerde donderbuie in // Kharas, maar verspreid tot wydverspreid in die noordwestelike en sentrale gedeeltes.
KUS: Gedeeltelik bewolk en matig tot warm met miskolle.
GETYE BY WALVISBAAI: L: 10:33 H: 16:47 L: 22:45

VOORUITSIGTE

WINDHOEK	18°	28°
RUNDU	20°	28°
OSHAKATI	21°	29°
GOBABIS	20°	30°
MARIENTAL	20°	34°
KEETMANSHOOP	18°	33°
WALVISBAAI	16°	26°
LUANDA	22°	29°
JOHANNESBURG	13°	21°
KAAPSTAD	18°	26°

Donkies

VAN BL. 1

Meer as 10 000 eenhede sal versprei word oor Omusati, Oshana en Khomas, die streke wat geïdentifiseer is as die gebiede met die hoogste las van dierewerwante padsterftes.

Dierewelsynsorganisasies sê soortgelyke maatreëls is reeds as doeltreffend bewys. Janine van Rooyen van die Namibiese Vereniging vir Dierewelsyn (Nawa) het aan Network Media Hub (NMH) gesê haar organisasie gebruik reeds die afgelope drie jaar weerkaatsers op werkende donkies, perde en donkiekarretjies, eerder as op vrylopende diere.

Volgens Van Rooyen het die ministerie Nawa sowat agt maande gelede gekontak, nadat hulle die weerkaatsers gesien het wat in die organisasie se plasings op sosiale media was.

"Hulle het in ons foto's op sosiale media gesien waar ons weerkaatsers in klein dorpies gebruik waar motoriste teen 'n hoë spoed ry. Die ministerie het ons toe genader vir idees en ons het van ons voorbeelde vir hulle gegee. Ons gebruik wit elastiese weerkaatsers, wat hulle nie gebruik het nie," het Van Rooyen gesê.

Volgens haar het Nawa tot dusver weerkaatsers op meer as 350 donkies en perde aangebring. Sy het egter die omvang van die ministerie se benadering bevraagteken en voorgestel dat die loodsprojek op 'n kleiner skaal begin en op minder kategorieë diere fokus.

Sylvia Breitenstein, direkteur van bedrywighede van die Windhoek SPCA, het voorgestel dat die projek meer doeltreffend sou wees as weerkaatsers eerder as oorplaatjies aangebring word.

"Mense sorg nie vir hul diere nie, en as 'n dier met die nekweerkaatser vassit en dit word nie gevind nie, is dit iets anders," het sy gesê.

Ten spyte van verskillende sienings oor implementering, stem dierewelsynsgroepe en regeringsamptenare saam dat die vermindering van diereverwante ongelukke 'n dringende veiligheidskwessie op Namibiese paaie bly.

Namibië is nie die eerste land wat donkie-weerkaatsers as 'n padveiligheidsmaatreël gebruik nie. In Noord-Botswana het dierewelsynsorganisasies en liefdadigheidsorganisasies jare lank weerkaatsende oorplaatjies op vrylopende donkies aangebring om nagtelike ongelukke op swak beligte landelike paaie te verminder.

Soortgelyke reflektorkonsepte is ook in ander dele van Afrika ondersoek, insluitend Somalië, waar dit vir donkiekarre voorgestel is.

KRITIEK

Nekundi het die projek verdedig as 'n noodsaaklike, kostedoeltreffende ingryping vir padveiligheid.

"Dit is hartverskeurend om die verlies van soveel ekonomies aktiewe Namibiërs te aanskou, wat gesinne in hartseer en ontbering laat," het Nekundi gesê. "Padveiligheid is 'n persoonlike verantwoordelikheid, en hierdie reflektors is 'n belangrike stap in die vermindering van die voorkombare slagting op ons paaie."

Hy het aangevoer dat die uitgawes beskeie is in vergelyking met die koste van grootskaalse infrastruktuur soos uitgebreide heinings langs paaie en het beklemtoon dat padveiligheid politieke debat moet oorskry.

Statistieke wys dat beeste, donkies en honde verantwoordelik is vir die meerderheid van diereverwante ongelukke, met die drie proefgebiede wat verantwoordelik is vir meer as 40% van die verwante sterftes.

Terwyl die reflektors bedoel is om motoriste te help om gevare vroeër te identifiseer, het Nekundi gewaarsku dat tegnologie alleen nie die probleem sou oplos nie.

"Al wat julle hoef te doen, is om te bestuur terwyl julle nugter is sodat julle die weerkaatsers kan sien," het Nekundi gemaan. Hy het beklemtoon dat sy ministerie volle samewerking van verwante rolspelers insluitend die Nasionale Padveiligheidsraad verwag.

Low

VAN BL. 1

Sy het haar dank uitgespreek vir die konvooi, die gedenkdiens en die teenwoordigheid van die gemeenskap wat haar man gedien het. Low was 'n stigterslid van LifeLink Emergency Services in Hentiesbaai en het die dorp en omliggende streek vir ongeveer 19 jaar gedien. Sprekers het tydens die gedenkdiens ook talle reddingsaksies onthou waarby Low betrokke was onder meer 'n voorval waartydens vyf seuns amper verdrink het. "Vra enigiemand in Hentiesbaai," het die goewerneur gesê. "Hulle sal sê: Dit is ons Brian. Hy het my pa gered, hy het my broer gered, hy het ons ma gered." Low het verdrink nadat hy deur die see meegesleur is tydens die reddingspoging wat drie tienerseuns gered het. - adam@erongo.com.na

Hester

VAN BL. 1

Oor die titel van die boek, *Kreef & Kaiings*, vertel sy van die dag toe sy en haar boerman Johnnie, hul oudste dogter se vrieskas vir haar ontvries en reg gepak het. Twee sakkies was op die tafel oor: Een met twee kreefsterte, en een met kaiings. Die kreef het haar dogter by haar skoonouers gekry in die Oos-Kaap, die kaiings was van hul Namibiese plaas af. Dit gaan oor die lewe se beter en slegter dae, verduidelik Hester. Kreefdae is die uitskieterdae - wanneer jy jou lippe rooi maak, parfuum aansit en die luuksheid geniet wat soms oor jou pad kom. "Kaiingdae is daardie hartseer dae wanneer jy terug verlang na jou komvandaan," sê sy. Maar, aan die einde van die dag is beide nodig vir 'n gebalanseerde bestaan, beklemtoon Hester. Dit anker jou.

Sy woon tans as gevolg van die droogte in die Kaap.

"Ons moes 'n manier kry om die wolf van die deur weg te hou, en ek het die geleentheid gekry om daar te gaan werk."

Dis 'n tydelike reëling, beklemtoon Hester, totdat die reën kom. En sy en boerman Johnnie glo en vertrou dat dit kortstondig sal wees.

Sy is 5 Januarie 2025 weg van die plaas af, en het die 13 de Desember vir die eerste keer weer huis toe gekom en haar hart juig!

"Dit voel soms asof ek nooit weg was nie, en soms voel dit soos 'n ewigheid. Ek het darem my boerman in Maart en November gesien met ons kleinseuntjie se geboorte en doop in Suid-Afrika."

Die Kaap het haar egter wonderlike geleenthede gebied. Sy het mense ontmoet wat haar opgelig het, en die boek het net gebeur, vertel 'n dankbare Hester. 'n Wildvreemde vrou, Petro Swanepoel, het haar gekontak en gevra of sy kan kom koffie drink. Petro het gekom en sy en Hester het soos ou vriendinne gesels.

"Sy het gesê sy voel my stories moet in 'n boek vrygestel word sodat dit meer mense kan bereik, want dit het baie vir haar beteken. Ek het gesê ek sal daaroor dink."

Sy was heeltemal oorweldig en het nie geweet hoe om dit te hanteer nie, erken Hester, want Petro het aangebied om die geld voor te skiet.

"Ek was uit die veld geslaan toe 'n uitgewer my twee dae later kontak en sê dat Petro vir haar van my skrywes gewys het, en sy dink ons moet 'n boek maak. Toe gebeur dit!"

Hester het ook die wonderlike geleentheid gehad dat van haar gedigte in verskeie bundels opgeneem is. Sy was ook die wenner van die Ink in Afrikaans-kompetisie, verower die goue kategorie met haar gedig "Leonardville", asook die groot landwye kompetisie met die gedig "Weerkaatsings". Daarby stap Hester weg met twee ATKV Veertjies in Namibië. Een vir *Kreef & Kaiings*, asook 'n ongepubliseerde manuskrip, *Stof en Sterre*, 'n digbundel. Hester is ook met die Herman van Wyk Prosa- en die Oswald Rall Theart-prys beloon. "Hierdie was vir my 'n ongelooflike groot voorreg. Afrikaans is vir my die mooiste taal denkbaar, en ek voel bevoorreg dat ek my gedagtes en gevoelens kan uitdruk in die taal van my hart!"

Kreef & Kaiings kan per whatsapp by Hester bestel word - die sein is te swak op die plaas vir bel! Haar nommer is 081 124 5467 en die prys is N$280, plus N$70 posgeld.

"Ons laat lewer af. My dogter, Sandri Coetzer, sal die versendings hanteer." As jy Hester se hartsboek wil bestel, is haar rekeningbesonderhede soos volg:

Hester Steenkamp, FNB Mariental, tjekrekening 62085588576, takkode: 280471; verwysing: Jou naam en van.

Hester laat weet van die plaas die week hulle het reën gehad en by die huis en Kortpomp is 22 mm uitgegooi, by Sleepwapos 17 mm.

"Groot dele van die plaas is nog baie droog, ander het 'n mooi lewetjie. Ons is dankbaar. Vir Desember is dit wonderlik!"

Dis verstommend hoe gewillig die veld steeds is, al is dit deur groot trauma die laaste klompie jare, en al is die reën min en ver uit mekaar, skryf sy. Die liewe Vader het hulle bederf met veld wat veerkragtig is.

Die natuur sal nooit ophou om haar asem weg te slaan nie, erken sy.

"Dit het gisteraand laat gereën, en vanmiddag begroet nege rooibeenelsies ons in 'n klein pannetjie staande water. Wie hulle vertel het en waarvandaan hulle kom, kan ek nie sê nie. Maar hulle weet. En hulle kom. Daaroor is ons ook dankbaar."

Hester en haar boerman Johnnie bid vir opvolg, sodat elke plant en dier en mens vir 'n slag diep kan asemhaal.

"Ons glo," sê sy.

- henriette@republikein.com.na

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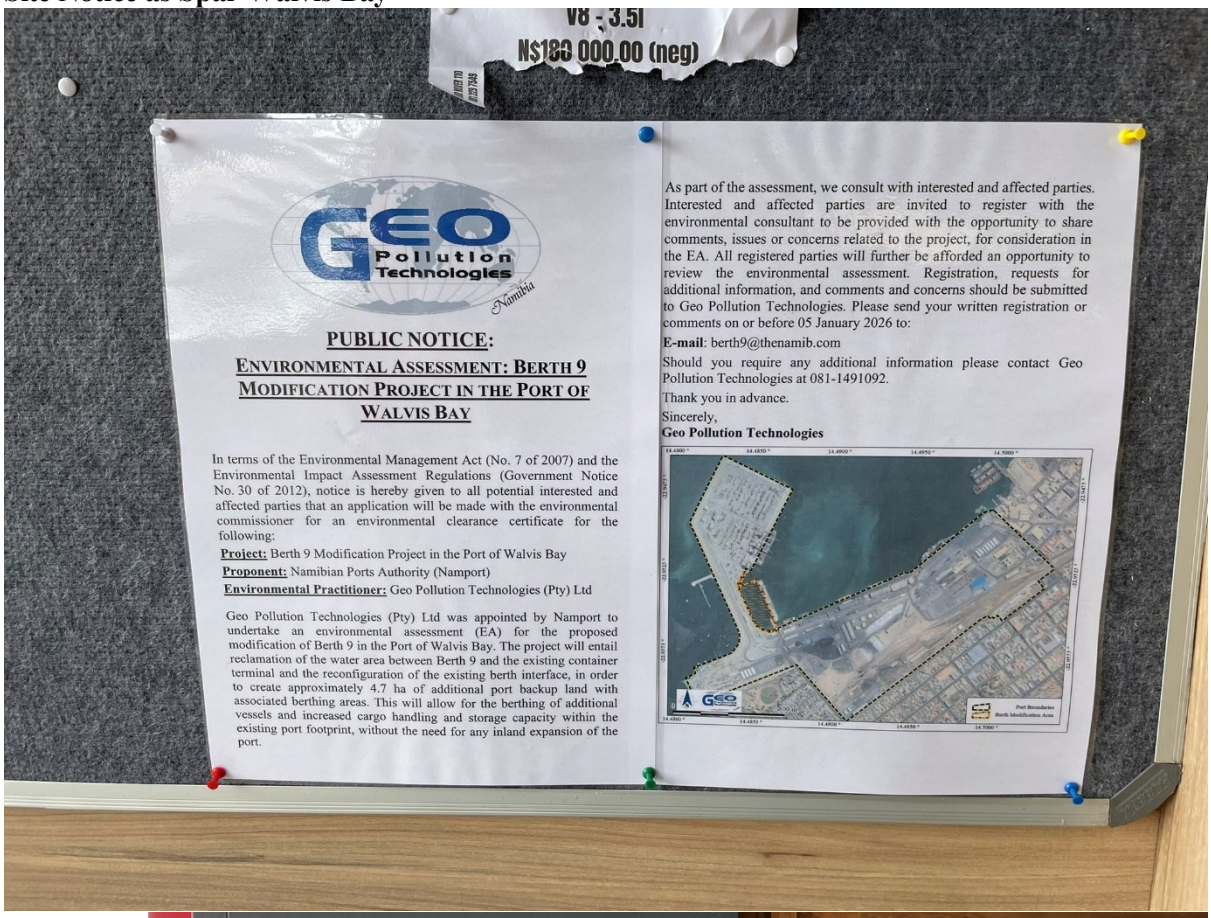

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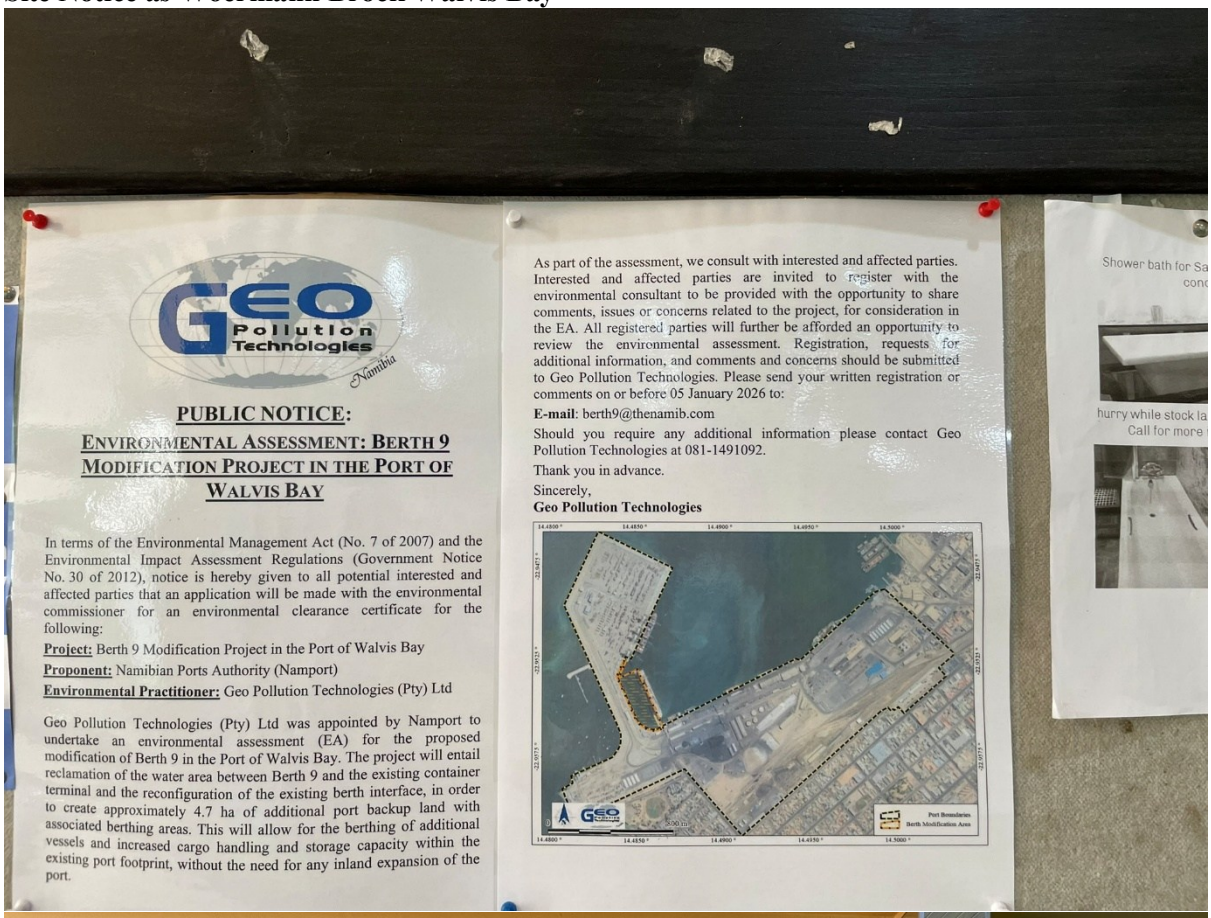

PUBLIC NOTICE:

ENVIRONMENTAL ASSESSMENT: BERTH 9 MODIFICATION PROJECT IN THE PORT OF WALVIS BAY

In terms of the Environmental Management Act (No. 7 of 2007) and the Environmental Impact Assessment Regulations (Government Notice No. 30 of 2012), notice is hereby given to all potential interested and affected parties that an application will be made with the environmental commissioner for an environmental clearance certificate for the following:

Project: Berth 9 Modification Project in the Port of Walvis Bay

Proponent: Namibian Ports Authority (Namport)

Environmental Practitioner: Geo Pollution Technologies (Pty) Ltd

Geo Pollution Technologies (Pty) Ltd was appointed by Namport to undertake an environmental assessment (EA) for the proposed modification of Berth 9 in the Port of Walvis Bay. The project will entail reclamation of the water area between Berth 9 and the existing container terminal and the reconfiguration of the existing berth interface, in order to create approximately 4.7 ha of additional port backup land with associated berthing areas. This will allow for the berthing of additional vessels and increased cargo handling and storage capacity within the existing port footprint, without the need for any inland expansion of the port.

As part of the assessment, we consult with interested and affected parties. 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 EA. All registered parties will further be afforded an opportunity to review the environmental assessment. Registration, requests for additional information, and comments and concerns should be submitted to Geo Pollution Technologies. Please send your written registration or comments on or before 05 January 2026 to:

E-mail: berth9@thenamib.com

Should you require any additional information please contact Geo Pollution Technologies at 081-1491092.

Thank you in advance.

Sincerely,

Geo Pollution Technologies

Appendix B Registered IAPs and Comments Received

Registered Interested and Affected Parties

Name	Organisation
Lieschen Pretorius	Mola Mola Safaris
Lara Stiege	Jetty Shopp / Dreyer Tours
Environmental Management	Municipality of Walvis Bay
Town Planning Department	Municipality of Walvis Bay
Environmental Health Practitioner	Municipality of Walvis Bay
David Uushona	Municipality of Walvis Bay
Nangula Amutenya	Municipality of Walvis Bay
Lovisa Hailaula	Municipality of Walvis Bay
Ephraim Nambahu	Municipality of Walvis Bay
André Burger	Ana's Inn
Lindi and Martina Dreyer	Godenfang
Patrick Kohlstaedt	Manica Group Namibia

Comments and Responses Table

E-Mail Correspondence Received – Public Notification Period

Note: E-mails received solely for the purpose of registration as an I&AP are not included in the comments and responses table. Comments are presented as received with no changes in typing or related errors. Contact details are redacted for privacy reasons.

Comments	Response
From: Andre Burger, Neighboiuring Resident **Date: 02 January 2026**	
As I and surrounding neighbours were affected by the previous port projects in the vicinity and as the nearest residential/business property (guest house Ana's Inn) I would like to register as an I&AP in order to be kept updated on the proposed project and especially how noise pollution as well as the potential impact of vibration on our properties from piling etc. will be handled and mitigated. Pse contact Lindie and Martina at GodenFang next to me for registration as well. Kind Regards Andre Burger	Your email is well received and you will be registered for the project. @ Lindie and Martina, do you wish to register for the project?
From: Patrick Kohlstaedt, Manica Group Namibia **Date: 06 March 2026**	
We would like to make a socioeconomic remark: We have seen other ports, where such infrastructure is developed and more specifically operated by single entities on an exclusive basis. That removes all competition and creates a high price and low performance environment for the users. In the Namibian and Walvis context, there are various operators who can perform this work, with or without Namport's operational involvement. That creates a sustainable environment for the port ecosystem and its users. We remain available for additional input at the appropriate time, based on your guidance.	Your email is well received and communicated to Namport.

E-Mail Correspondence Received – Public Review of EIA/EMP Period

Note: E-mails received solely for the purpose of registration as an I&AP are not included in the comments and responses table. Comments are presented as received with no changes in typing or related errors. Contact details are redacted for privacy reasons.

From: Alexandre Reali, Terminal Investments Namibia **Date: 11 March 2026**	
Reference is made to your correspondence concerning the proposed adaptations to a berth within the Port of Walvis Bay. TIN confirms receipt thereof and takes note of NAMPORT's plans in this respect. TIN wishes, however, to formally express its concerns regarding the potential impact of the proposed modifications on the hydrodynamic behaviour and operational conditions within the port basin, particularly considering the already known surge phenomenon affecting this area. TIN notes that the introduction of a change in quay wall (installation of a sheet pile retaining wall) or other hard boundary may alter the wave behaviour in the basin by increasing its closed and reflective character. This may result in increased wave reflection and constructive interference in the vicinity of Berths 10/11, the current revetment installed currently provides a certain degree of buffering. In addition, the proposed changes may affect the resonance characteristics of the basin and reduce the existing dampening effect of the open water area, with the risk of aggravating the present surge conditions. TIN is not in a position to quantify the extent of such impact based on the information currently available to it and therefore assumes that NAMPORT has duly assessed these effects through a dedicated hydraulic or numerical model. Without prejudice to the above, TIN would recommend that, should the project proceed, the new surface be designed with energy-absorbing capacity to the extent reasonably possible, to avoid worsening the prevailing conditions in this part of the port. TIN accordingly wishes to place on record its reservations regarding the proposed changes and their potential impact on berths 10 & 11, vessel motions, and terminal operations within its concession area.	The answer to this will not be known until such time that the engineering, procurement, and construction (EPC) contractor has been appointed, since the EPC contractor will have to design the works and do downtime assessment studies upfront. One of the criteria in the final tender document will be that the EPC contractor must come up with a solution that will minimize any downtime to the berth itself and surrounding berths. This can be achieved with various methods, even with a sheetpile, since the sheetpile in this project is behind the existing jetty and it might still have a rock revetment in front of it, which will serve to absorb some wave energy. Other contractors will not opt for a sheetpile at all, so it is something the EPC contractor must design and propose to us. The EPC contractor's detailed modelling might also show that downtime will not at all be affected by a solid sheetpile wall.
From: Andre Burger, Neighbouring Resident **Date: 18 March 2026**	
Thank you for a well compiled report. Although I did not manage to study it in detail, I'm satisfied to note that my/other residents' concerns have been noted and addressed and some mitigation measures proposed. As mentioned : 1. Trucks, hauling fill material and others, along 5th rd should be restricted to daylight hours (plus avoiding congestion at the WBay Primary school and one opposite during drop-offs and collection times). 2. Piling and other noise generating activities should also to be restricted to non-sleeping hours i.e not allowed after 21h00 to 07h00 : It was a big nuisance previously.	Comments noted and communicated to Namport.

3. I intend to measure my existing house and boundary wall cracks/deflections prior to construction in order to compare during/afterwards for possible claims in that regard from piling and other resultant vibrations. 4. The movement of passengers/travel operators during passenger liner season through the gate should be addressed/co-ordinated (perhaps I missed it?).	

Appendix C 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 260 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 (Pty) Ltd.
Name of Staff	:	ANDRÉ FAUL
Profession	:	Environmental Scientist
Years' Experience	:	24
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:	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 (Environmental Assessment Practitioner)

AREAS OF EXPERTISE:

Knowledge and expertise in:

- Environmental Impact Assessments
- Environmental Management Plans
- Public Participation
- 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:	+260
Research Reports & Manuals:	5
Conference Presentations:	1