

APP-002821

**CONSTRUCTION AND OPERATIONS OF A CONSUMER FUEL
INSTALLATION IN KUISEBMUND, WALVIS BAY**

ENVIRONMENTAL ASSESSMENT SCOPING REPORT




Assessed by:



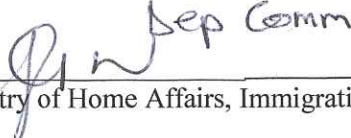
Assessed for:

**Ministry of Home Affairs,
Immigration, Safety and
Security**

Project:	CONSTRUCTION AND OPERATIONS OF A CONSUMER FUEL INSTALLATION IN KUISEBMUND, WALVIS BAY: ENVIRONMENTAL ASSESSMENT SCOPING REPORT	
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Report Approval	 André Faul Conservation Ecologist	

I S.R. GROENEVUUD acting as a representative of Ministry of Home Affairs, Immigration, Safety and Security hereby confirm that the project description contained in this report is a true reflection of the information which the Proponent 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 and the report is hereby approved.

Signed at WINDHOEK on the 20 day of July 2021.


Ministry of Home Affairs, Immigration, Safety and Security Business Registration/ID Number

EXECUTIVE SUMMARY

The Ministry of Home Affairs, Immigration, Safety and Security commissioned the construction of a new police station in Kuisebmond. The facility will be developed on erf 8631 in Kuisebmond, Walvis Bay. A consumer fuel installation is proposed to form part of the police station in order to support operations of the Namibian Police Force (NAMPOL) by supplying fuel to the NAMPOL fleet operational in the area. Diesel and unleaded petrol will be supplied from two 23 m³ belowground storage tanks. General operations will involve the receipt of fuel from road tankers, dispensing fuel to fleet vehicles, operations of related infrastructure and day to day administrative tasks.

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

Due to the nature of the proposed facility, limited impacts can be expected on the surrounding environment, see summary impacts table below. The facility is surrounded by mostly residential and institutional activities. It is however recommended that environmental performance be monitored regularly to ensure regulatory compliance and that corrective measures be taken if necessary. The operations of the consumer fuel installation will play an important role in contributing to a reliable supply of fuel to the NAMPOL fleet vehicles operational in the area.

The major concerns related to the construction and operations of the facility are that of potential groundwater, surface water and soil contamination and the possibility of fire. This will however be limited by adherence to South African National Standards and Material Safety Data Sheet instructions. Furthermore, noise pollution should meet the minimum requirements of the World Health Organisation standards. By appointing local contractors and employees and implementing educational programs the positive socio-economic impacts can be maximised while mitigating any negative impacts.

The environmental management plan included in Section 9 of this document should be used as an on-site reference document during all phases (planning, construction (care and maintenance), operations and decommissioning) of the facility. All monitoring and records kept should be included in a report to ensure compliance with the environmental management plan. Parties responsible for transgression of the environmental management plan should be held responsible for any rehabilitation that may need to be undertaken. A Health, Safety, Environment and Quality policy as well as Environmental Policy could be used in conjunction with the environmental management plan. Operators and responsible personnel must be taught the contents of these documents. Municipal or national regulations and guidelines must be adhered to and monitored regularly as outlined in the environmental management plan.

Impact Summary Class Values

Impact Category	Impact Type	Construction		Operations	
		Positive Rating Scale: Maximum Value	Negative Rating Scale: Maximum Value	Positive Rating Scale: Maximum Value	Negative Rating Scale: Maximum Value
		5	-5	5	-5
EO	10.1.2 Skills Transfer, Employment and Income	2		2	
SC	Demographic Profile and Community Health		-1		-1
EO	Fuel Supply			2	
SC	Traffic		-2		-2
SC	Health, Safety and Security		-2		-2
PC	Fire		-2		-2
PC	Air Quality		-1		-1
PC	Noise		-1		-1
PC	Waste Production		-2		-2
BE	Ecosystem and Biodiversity Impact		-1		-1
PC/BE	Groundwater, Surface Water and Soil Contamination		-2		-2
SC	Visual Impact		-1		-1
PC/SC	Impacts on Utilities, Infrastructure and Seabed Scouring		-3		-2
PC	Cumulative Impact		-3		-3

BE = Biological/Ecological EO = Economical/Operational PC = Physical/Chemical SC = Sociological/Cultural

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LIST OF ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
BE	Biological/Ecological
DWA	Department of Water Affairs
DEA	Directorate of Environmental Affairs
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EMA	Environmental Management Act No 7 of 2007
EMP	Environmental Management Plan
EMS	Environmental Management System
EO	Economic/Operational
ES	Environmental Classification
GPT	Geo Pollution Technologies
HIV	Human Immunodeficiency Virus
IAPs	Interested and Affected Parties
IUCN	International Union for Conservation of Nature
LNAPL	Light Non-Aqueous Phase Liquids
m/s	Meter per second
mbs	Meters below surface
MEFT	Ministry of Environment, Forestry and Tourism
mm/a	Millimetres per annum
NAMPOL	Namibian Police Force
MHAISS	Ministry of Home Affairs, Immigration, Safety and Security
MSDS	Material Safety Data Sheet
NaCl	Sodium chloride
PC	Physical/Chemical
PPE	Personal Protective Equipment
ppm	Parts per million
SANS	South African National Standards
SC	Sociological/Cultural
SO₂	Sulphur dioxide
UNCCD	United Nations Convention to Combat Desertification
WHO	World Health Organization

GLOSSARY OF TERMS

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

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

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

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

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

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

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

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

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

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

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.

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

Proponent (Applicant) - Any person who has submitted or intends to submit an application for an authorisation, as legislated by the Environmental Management Act no. 7 of 2007, to undertake an

activity or activities identified as a listed activity or listed activities; or in any other notice published by the Minister or Ministry of Environment, Forestry & Tourism.

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

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

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

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

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

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

1 BACKGROUND AND INTRODUCTION

The Ministry of Home Affairs, Immigration, Safety and Security commissioned the construction of their new Kuisebmond Police Station in Walvis Bay. The facility will be developed on erf 5774 in Kuisebmond. A consumer installation forms part of the proposed development and its future operations and will supply fuel to the Namibian Police Force (NAMPOL) fleet vehicles operational in the area (Figure 2-1). Establishment of the consumer fuel installation will involve:

- ◆ Site clearing, preparation and earthworks;
- ◆ Civil works required for new infrastructure;
- ◆ Construction of infrastructure for the consumer installation, including driveway and refuelling area, underground tanks, pumps, reticulation and buildings;
- ◆ Installation of associated electrical and sewer utilities;
- ◆ Installation of spill control infrastructure.

Operations of the consumer fuel installation will include:

- ◆ Filling of the storage tanks with fuel from road transport tankers;
- ◆ Dispensing of fuel to customers;
- ◆ Tank dips and fuel volume reconciliation;
- ◆ General operational activities and maintenance procedures associated with the consumer installation.

A risk assessment was undertaken to determine the potential impact of the operational and possible decommissioning phases of the project on the environment. The environment being defined in the Environmental Assessment Policy and Environmental Management Act as “land, water and air; all organic and inorganic matter and living organisms as well as biological diversity; the interacting natural systems that include components referred to in sub-paragraphs, the human environment insofar as it represents archaeological, aesthetic, cultural, historic, economic, paleontological or social values”.

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

Project Justification – The Ministry of Home Affairs, Immigration, Safety and Security performs an important task by ensuring residents and operations throughout Walvis Bay are kept safe and the law is adhered to. This is achieved largely through NAMPOL, who in turn relies on a secure and reliable supply of fuel for fleet vehicles used to conduct day to day operations. The construction and operations of the consumer fuel installation will provide a safe and reliable supply of fuel to the NAMPOL fleet operating from the new police station planned in Kuisebmond.

Benefits of the consumer fuel installation include:

- ◆ Reliable supply of fuel to the NAMPOL fleet,
- ◆ Employment and skills development, especially during the construction phase,
- ◆ A well-functioning police force plays an important role in providing for a secure and safe environment. This indirectly supports growth in the town by creating a favourable environment for potential additional investments and development.

2 SCOPE

The scope of the environmental assessment is to:

1. Determine the potential environmental impacts emanating from the construction, operational and possible decommissioning activities of the consumer fuel installation,
2. Identify a range of management actions which could mitigate the potential adverse impacts to acceptable levels,
3. Comply with the requirements of the EMA,
4. Provide sufficient information to the relevant competent authority and Ministry of Environment, Forestry and Tourism (MEFT) to make an informed decision regarding the construction, operations and possible decommissioning of the facility.

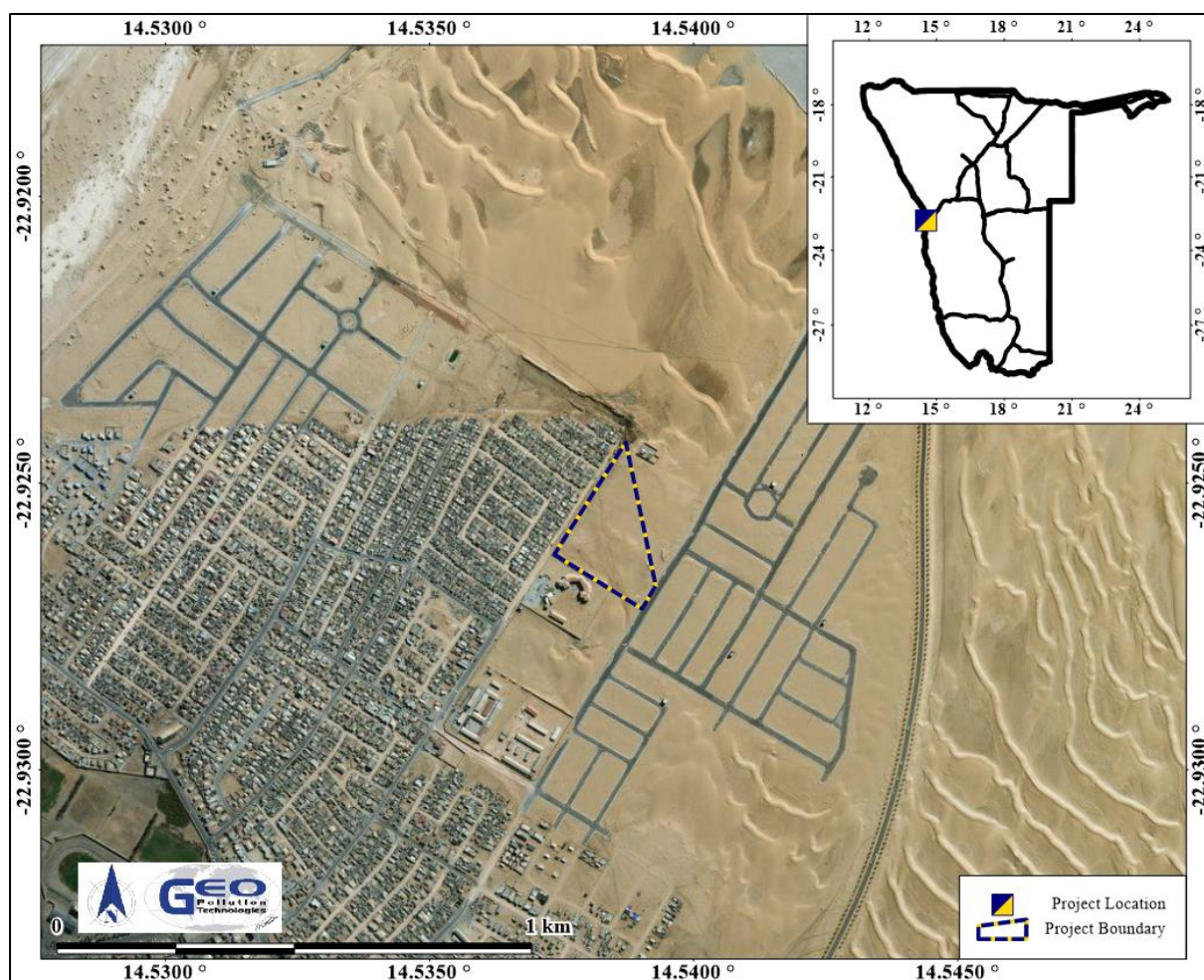


Figure 2-1. Project location

3 METHODOLOGY

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

1. Baseline information about the site and its surroundings was obtained from primary information, existing secondary information as well as from a reconnaissance site visit.
2. As part of the scoping process to determine potential environmental impacts, interested and affected parties (IAPs) were consulted about their views, comments and opinions all of which are presented in this report.
3. Potential environmental impacts emanating from the construction, operations and decommissioning of the facility were determined and possible enhancement measures were listed for positive impacts while mitigation / preventative measures were provided for negative impacts.
4. As per the findings of this scoping report, an environmental management plan (EMP) was incorporated into this report to be submitted to the MEFT.

4 FACILITY OPERATIONS AND RELATED ACTIVITIES

It is anticipated that the construction of the installation will commence once an environmental clearance certificate has been issued by the MEFT and the various additional permits and licences, such as per the Ministry of Mines and Energy, have been issued by the various regulatory bodies.

4.1 PLANNED INFRASTRUCTURE

The proposed consumer fuel installation will form part of the operations of a proposed new police station and supply fuel to the NAMPOL fleet operational in the area.

The facility will have a driveway leading to a refuelling area with one pump island (Figure 5-1). The pump island will host two dispensers which will thus allow for two vehicles to be filled simultaneously. Two underground storage tanks of 23 m³ each will be installed for the storage of 50 ppm diesel and unleaded petrol. Underground pipes will be installed for the reticulation of diesel and petrol from the tanks to pumps.

The refuelling surface will be surfaced with concrete spill control slabs with drains connected to an oil water separator. The oil water separator overflow will be connected to the municipal sewer.

Safety systems will include emergency shutoff systems, channelling of storm water in order to prevent its contamination with hydrocarbons, and firefighting equipment. Fire extinguishers and emergency stops will be placed throughout the facility and within easy reach of attendants. Additional infrastructure on site will include ablution facilities and a staff locker room already present on site.

The proposed layout of the installation can be seen in Figure 4-1 and Figure 5-1. Minor changes may however be made to the layout during finalisation of the design. The facility will adhere to all Namibian legislation and to relevant South African National Standards (SANS), ensuring safety and environmental protection.

4.2 OPERATIONAL ACTIVITIES

Unleaded petrol and 50 ppm diesel will be received from tanker trucks and stored in the underground storage tanks. Fuel will be dispensed to NAMPOL fleet via the dispenser on a pump island by authorised employees as required. Employees will be provided with in-house training for refuelling and operations. Regular tank dips and reconciliation of fuel volumes will be performed to detect any possible leaks.



Photo 4-1. View of proposed installation site from service entrance



Photo 4-2. Western view from site



Figure 4-1. Proposed police station layout

5 ALTERNATIVES TO THE PROPOSED FACILITY

Since the facility must adhere to SANS standards or better no alternatives in design parameters adhering to SANS is proposed. From an environmental perspective the environmental assessment did not find any reason why the facility may not continue at the initially proposed site on condition that it complies with SANS standards or better as prescribed by Namibian legislation.

It was initially proposed by the members of the Municipality of Walvis Bay that the consumer fuel installation be moved more towards the eastern side of the site, in order to reduce possible traffic impacts and fire risk associated with the Tatuleni informal settlement (see Section 8). During further consultation it was however pointed out that the fuel storage will be approximately 48 m from the nearest residential property and the entrance in Johanna Benson Road will mainly be used as a service entrance. Based on this, the location was accepted by the Municipality (see Appendix A). The alternatives are assessed in Table 5-1.

Table 5-1. Alternatives comparison

Alternative	Advantages	Disadvantages	Preferred option
Consumer installation more towards the eastern side of erf 5774	<p>Reduced fire risk to the Tatuleni informal settlement.</p> <p>Reduced traffic in Johanna Benson Road if access to the police station is gained from Khomashochland Street east of the site.</p>	<p>Significant expenses due to changes that needs to be made to the site layout.</p> <p>Delays in project development due to new approvals required for the site layout etc.</p>	<p>As changes to the layout of the site at this stage of development will not be feasible, and result in significant expense and time constraints, the preferred location is the initial approved</p>

<p>Consumer installation at initial approved location</p>	<p>Development can proceed as per initially approved building plans and layout. No additional expenses and time constraints. Reduced traffic in Johanna Benson Road if access to the police station is gained from Khomashochland Street east of the site.</p>	<p>Increased fire risk to the Tatuleni informal residential area when compared to the location further east from the settlement. Fire risk will however be mitigated by adherence to SANS standards.</p>	<p>location. The likelihood of fires at SANS compliant fuel facilities is very low. Furthermore, access to the site will be gained from a side road from Khomashochland Street, with the access Johanna Benson Street used as a service entrance, reducing possible traffic impacts in Johanna Benson Road.</p>
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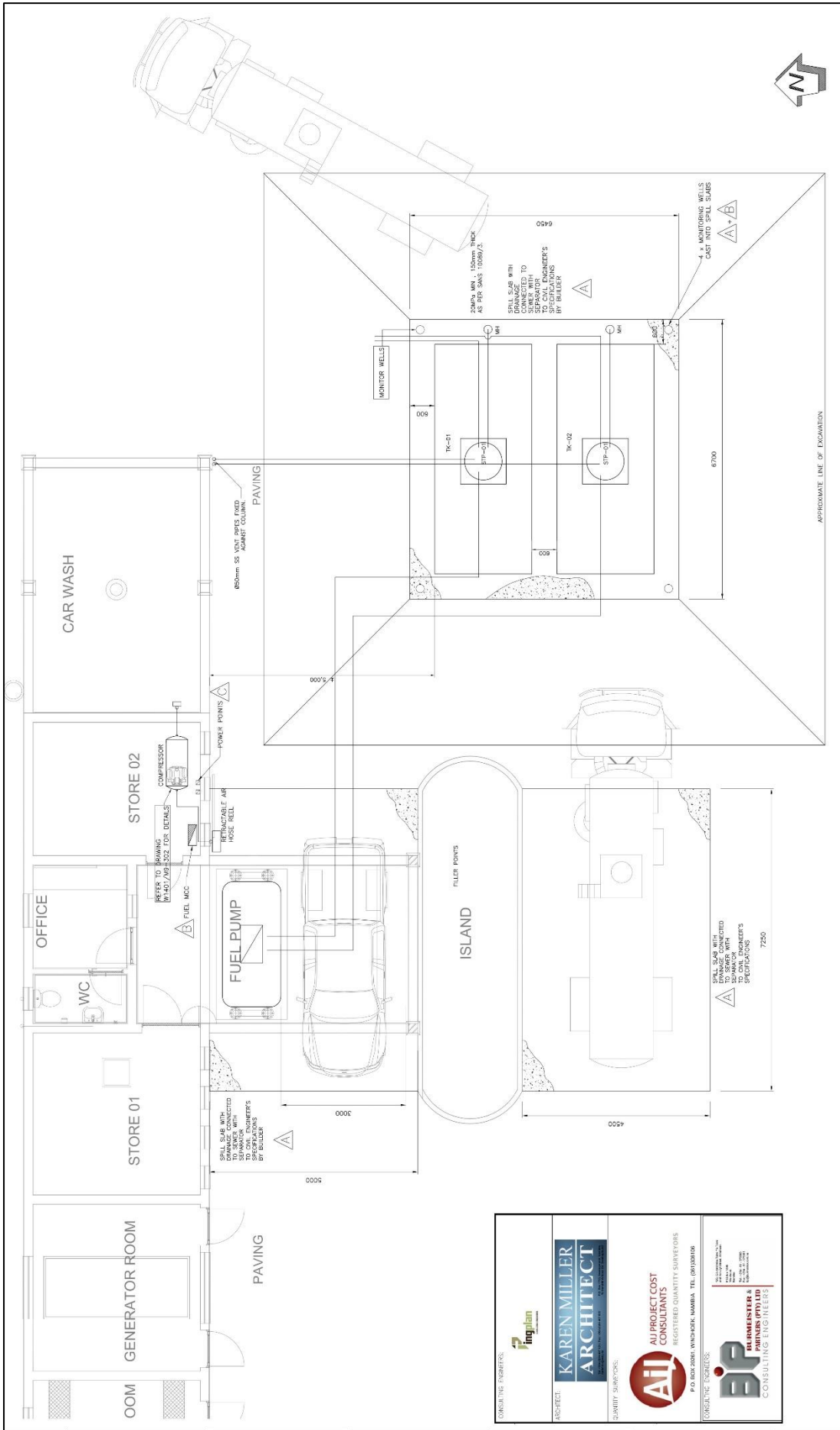


Figure 5-1. Consumer fuel installation proposed layout

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6 ADMINISTRATIVE, LEGAL AND POLICY REQUIREMENTS

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

Table 6-1. Namibian law applicable to the consumer fuel installation

Law	Key Aspects
The Namibian Constitution	<ul style="list-style-type: none"> ◆ Promote the welfare of people ◆ Incorporates a high level of environmental protection ◆ Incorporates international agreements as part of Namibian law
Environmental Management Act Act No. 7 of 2007, Government Notice No. 232 of 2007	<ul style="list-style-type: none"> ◆ Defines the environment ◆ Promote sustainable management of the environment and the use of natural resources ◆ Provide a process of assessment and control of activities with possible significant effects on the environment
Environmental Management Act Regulations Government Notice No. 28-30 of 2012	<ul style="list-style-type: none"> ◆ Commencement of the Environmental Management Act ◆ List activities that requires an environmental clearance certificate ◆ Provide Environmental Impact Assessment Regulations
Petroleum Products and Energy Act Act No. 13 of 1990, Government Notice No. 45 of 1990	<ul style="list-style-type: none"> ◆ Regulates petroleum industry ◆ Makes provision for impact assessment ◆ Petroleum Products Regulations (Government Notice No. 155 of 2000) <ul style="list-style-type: none"> ○ Prescribes South African National Standards (SANS) or equivalents for construction, operation and decommissioning of petroleum facilities (refer to Government Notice No. 21 of 2002)
The Water Act Act No. 54 of 1956	<ul style="list-style-type: none"> ◆ Remains in force until the new Water Resources Management Act comes into force ◆ Defines the interests of the state in protecting water resources ◆ Controls the disposal of effluent ◆ Numerous amendments
Water Resources Management Act Act No. 11 of 2013	<ul style="list-style-type: none"> ◆ Provide for management, protection, development, use and conservation of water resources ◆ Prevention of water pollution and assignment of liability ◆ Not in force yet
Local Authorities Act Act No. 23 of 1992, Government Notice No. 116 of 1992	<ul style="list-style-type: none"> ◆ Define the powers, duties and functions of local authority councils ◆ Regulates discharges into sewers
Public Health Act Act No. 36 of 1919	<ul style="list-style-type: none"> ◆ Provides for the protection of health of all people

Law	Key Aspects
Public and Environmental Health Act Act No. 1 of 2015, Government Notice No. 86 of 2015	<ul style="list-style-type: none"> ◆ Provides a framework for a structured more uniform public and environmental health system, and for incidental matters ◆ Deals with Integrated Waste Management including waste collection disposal and recycling; waste generation and storage; and sanitation.
Labour Act Act No 11 of 2007, Government Notice No. 236 of 2007	<ul style="list-style-type: none"> ◆ Provides for Labour Law and the protection and safety of employees ◆ Labour Act, 1992: Regulations relating to the health and safety of employees at work (Government Notice No. 156 of 1997)
Atmospheric Pollution Prevention Ordinance Ordinance No. 11 of 1976	<ul style="list-style-type: none"> ◆ Governs the control of noxious or offensive gases ◆ Prohibits scheduled process without a registration certificate in a controlled area ◆ Requires best practical means for preventing or reducing the escape into the atmosphere of noxious or offensive gases produced by the scheduled process
Hazardous Substances Ordinance Ordinance No. 14 of 1974	<ul style="list-style-type: none"> ◆ Applies to the manufacture, sale, use, disposal and dumping of hazardous substances as well as their import and export ◆ Aims to prevent hazardous substances from causing injury, ill-health or the death of human beings
Pollution Control and Waste Management Bill (draft document)	<ul style="list-style-type: none"> ◆ Not in force yet ◆ Provides for prevention and control of pollution and waste ◆ Provides for procedures to be followed for licence applications

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

Municipal By-laws, Guidelines or Regulations	Key Aspects
Integrated Urban Spatial Development Framework for Walvis Bay	<ul style="list-style-type: none"> ◆ Overall vision to transform Walvis Bay to being the primary industrial city in Namibia ◆ Aims to ensure that appropriate levels of environmental management is enforced for all developments in Walvis Bay
Integrated Environmental Policy of Walvis Bay (Agenda 21 Project)	<ul style="list-style-type: none"> ◆ Indicates the directions that the Municipality of Walvis Bay will move towards in the forthcoming years to fulfil its responsibilities to manage the environment of Walvis Bay together with the town's residents and institutions ◆ Strong focus on conservation and protection of environment
Municipal By-law 19 and 20 on Effluents Entering Sewers	<ul style="list-style-type: none"> ◆ Regulates the discharge of effluent into sewers and prohibits the introduction of certain wastes or products including steam into the sewers system.

Table 6-3. Relevant multilateral environmental agreements for Namibia and the development

Agreement	Key Aspects
Stockholm Declaration on the Human Environment, Stockholm 1972.	<ul style="list-style-type: none"> ◆ Recognizes the need for a common outlook and common principles to inspire and guide the people of the world in the preservation and enhancement of the human environment.
1985 Vienna Convention for the Protection of the Ozone Layer	<ul style="list-style-type: none"> ◆ Aims to protect human health and the environment against adverse effects from modification of the Ozone Layer are considered. ◆ Adopted to regulate levels of greenhouse gas concentration in the atmosphere.
United Nations Framework Convention on Climate Change (UNFCCC)	<ul style="list-style-type: none"> ◆ The Convention recognises that developing countries should be accorded appropriate assistance to enable them to fulfil the terms of the Convention.
Convention on Biological Diversity, Rio de Janeiro, 1992	<ul style="list-style-type: none"> ◆ Under article 14 of The Convention, EIAs must be conducted for projects that may negatively affect biological diversity.

Table 6-4. Standards or codes of practise

Standard or Code	Key Aspects
South African National Standards (SANS)	<ul style="list-style-type: none"> ◆ The Petroleum Products and Energy Act prescribes SANS standards for the construction, operations and demolition of petroleum facilities. ◆ SANS 10089-3:2010 is specifically aimed at storage and distribution of petroleum products at fuel retail facilities and consumer installations. <ul style="list-style-type: none"> ○ Provide requirements for spill control infrastructure

The project is listed as an activity requiring an environmental clearance certificate as per the following points from Section 9 of Government Notice No. 29 of 2012:

- ◆ 9.1 “The manufacturing, storage, handling or processing of a hazardous substance defined in the Hazardous Substances Ordinance, 1974.”
- ◆ 9.2 “Any process or activity which requires a permit, licence or other form of authorisation, or the modification of or changes to existing facilities for any process or activity which requires an amendment of an existing permit, licence or authorisation or which requires a new permit, licence or authorisation in terms of a law governing the generation or release of emissions, pollution, effluent or waste.”
- ◆ 9.4 “The storage and handling of a dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic meters at any one location.”
- ◆ 9.5 “Construction of filling stations or any other facility for the underground and aboveground storage of dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin.”

7 ENVIRONMENTAL CHARACTERISTICS

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

7.1 LOCALITY AND SURROUNDING LAND USE

The consumer fuel installation will form part of the new police station on a portion of erf 5774 in Kuisebmond, Walvis Bay (22.9257°S, 14.5380°E) (Figure 2-1). The property is situated within the municipal area of Walvis Bay and is zoned for institutional use (Figure 7-1). According to the town planning scheme of Walvis Bay, fuel storage (service station) is not allowed on properties zoned for institutional use, the site will thus need to be rezoned to the appropriate zoning. The greater area is generally classified as special designated area (low cost housing) and institutional with residential and institutional related activities. There are no heritage or cultural sites located on or in close proximity to the site. The adjacent land uses are listed in Table 7-1.



Photo 7-1. Northern neighbour



Photo 7-2. Eastern neighbour



Photo 7-3. Southern neighbour



Photo 7-4. Western neighbour

Table 7-1. Direct surrounding land use

Direction	Land Use	Neighbour
East	Residential	Residential properties
South	Institutional	Tatuleni High School
West	Special designated area	Residential (informal)
North	Institutional	Tatuleni pump station (sewage)

Implications and Impacts

The site is situated in an area used mainly for institutional and residential purposes. The police station will aid in increasing safety in the area. No significant land use impact is expected on nearby establishments from the operations of the related consumer fuel installation.

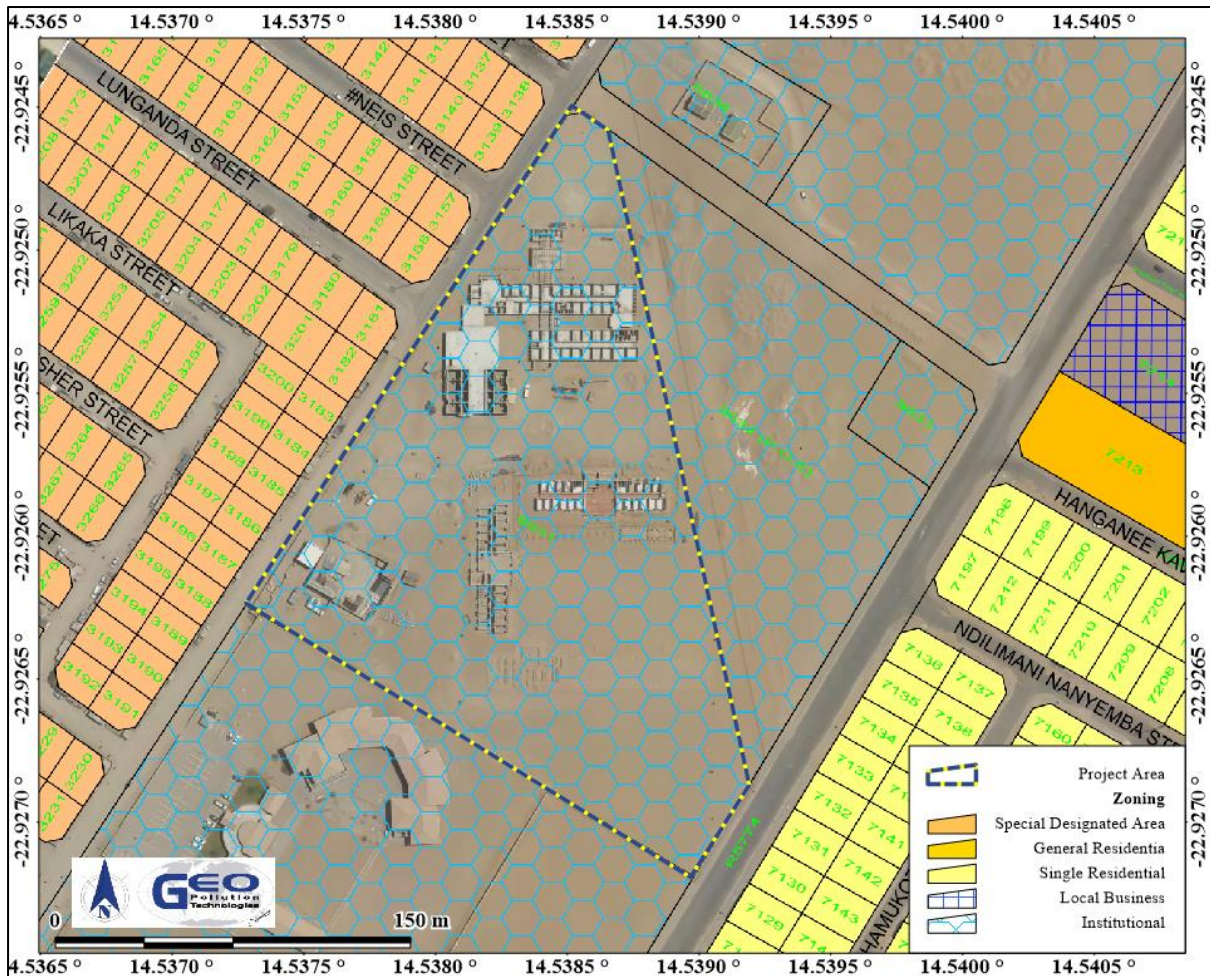


Figure 7-1. Surrounding land use

7.2 CLIMATE

Namibia’s climate is dominated by dry conditions for most of the year and particularly so in the west. The location of Namibia with respect to the Intertropical Convergence Zone, Subtropical High Pressure Zone and Temperate Zone is what determines the climate, with the Subtropical High Pressure Zone being the major contributor to the dry conditions (Atlas of Namibia Project, 2002; Bryant, 2010). 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.

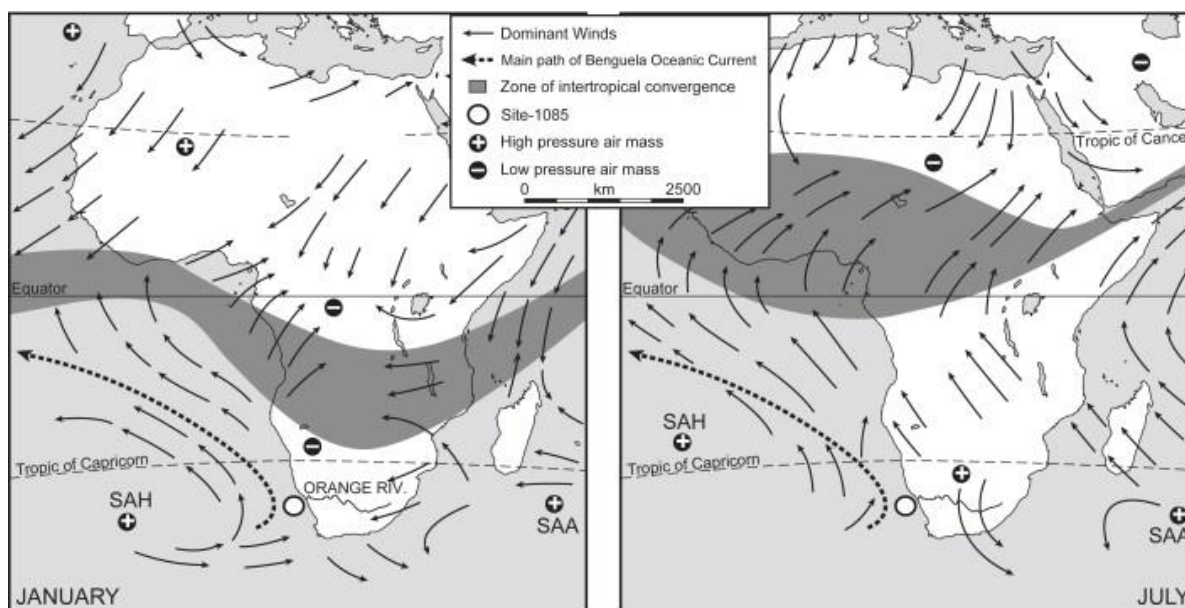


Figure 7-2. Map indicating the Intertropical Convergence Zone, Subtropical High Pressure Zone (SAH+), Benguela Current and Temperate Zone south of Tropic of Capricorn (not indicated) (from: <http://www.meteoweb.eu>)

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 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 result in strong southerly (longshore) winds blowing northwards up the coastline of Namibia (Bryant, 2010; Corbett, 2018). This longshore wind is responsible for upwelling of the cold, deep waters of the Benguela Current. As a result of the temperature difference between the cold surface water of the Benguela Current and the warm coastal plains, the southerly wind is diverted to a south-south-westerly to south-westerly wind along the coast. At Walvis Bay the temperature gradient that forms over the warmer darker sands south of the Kuiseb River, compared with the cooler lighter coloured gravel plains 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. This, together with topographical changes and land-use, causes a local deflection of wind flow over the Walvis Bay area, from south to southwest in Walvis Bay (Figure 7-3), to more southwest to westerly further inland, as well as reduced wind speeds. More low speed, westerly winds are for example experienced at the Walvis Bay Airport (Rooikop) (Figure 7-4).

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

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

temperatures between water and land is similar, and then weak easterly winds as the temperature difference increase.

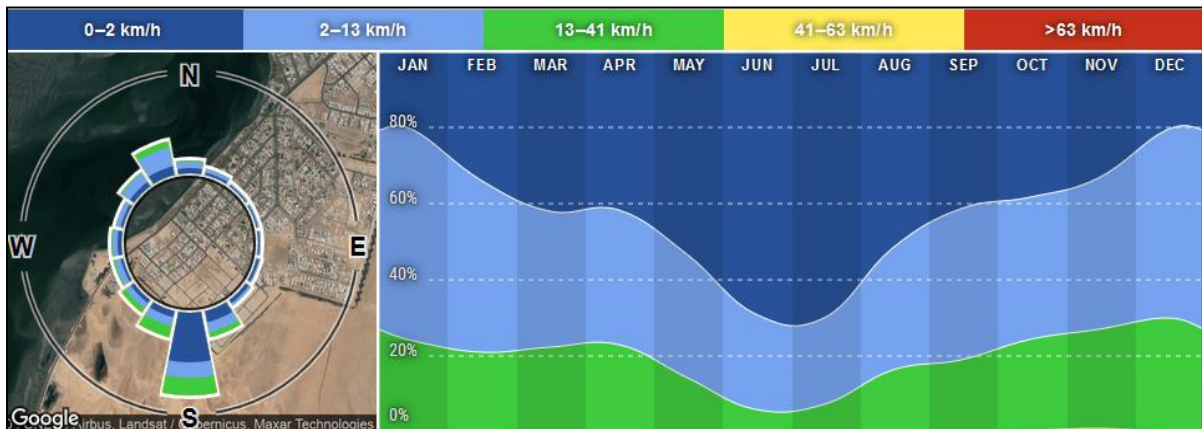


Figure 7-3. Wind direction and strength at the Walvis Bay Lagoon as measured between 2013 and 2020 (From: https://www.windfinder.com/windstatistics/walvis_bay_airport)

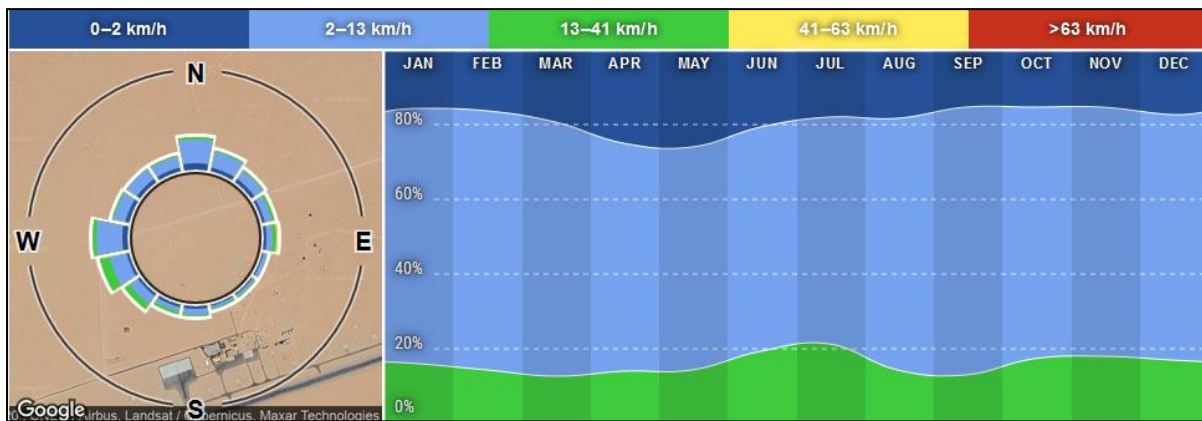


Figure 7-4. Wind direction and strength at the Walvis Bay Airport as measured between 2003 and 2020 (From: https://www.windfinder.com/windstatistics/walvis_bay_airport)

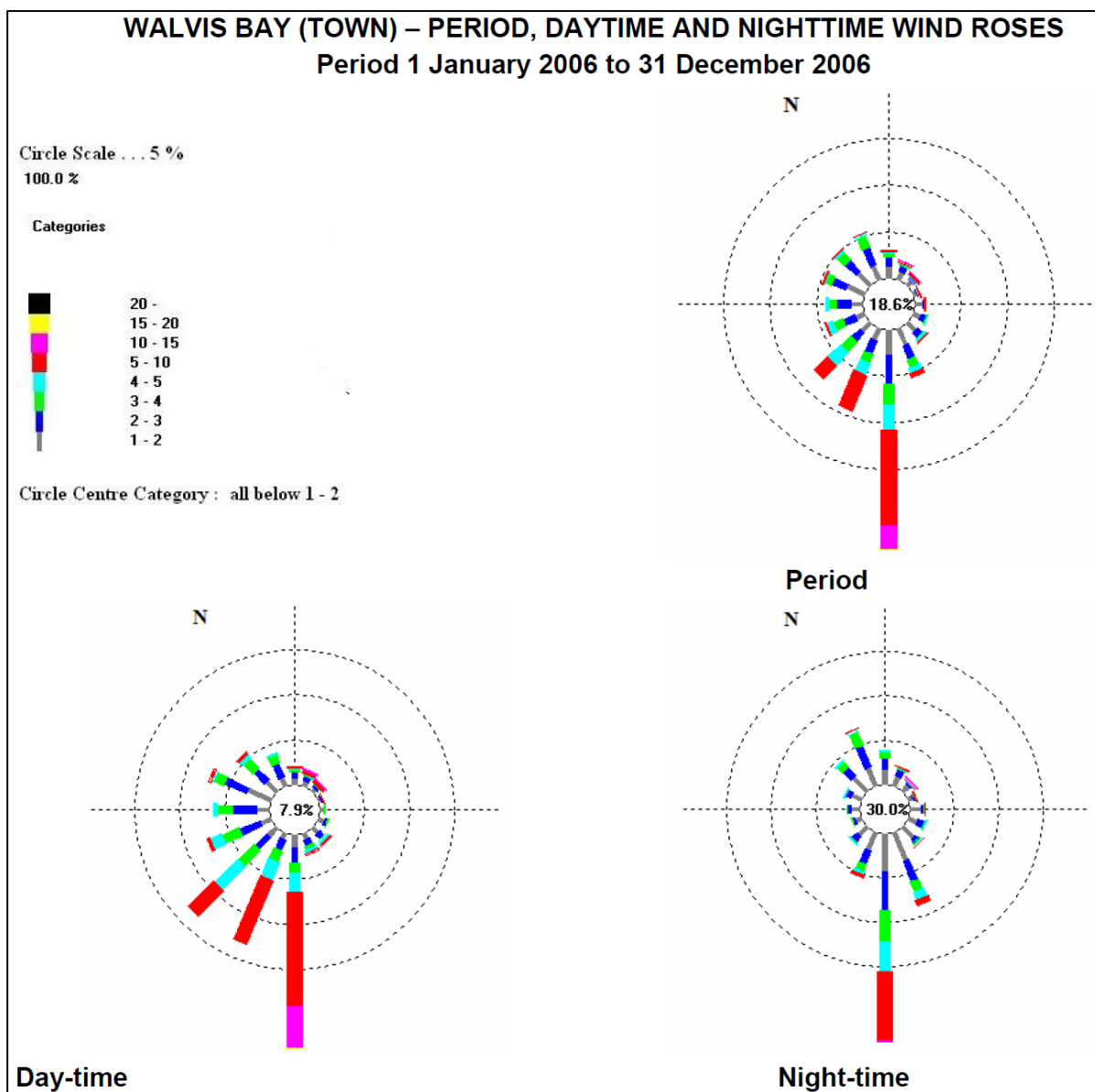


Figure 7-5. Period, daytime and night-time wind roses for Town for the period 2006 (From: Petzer & von Gruenewaldt 2008)

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

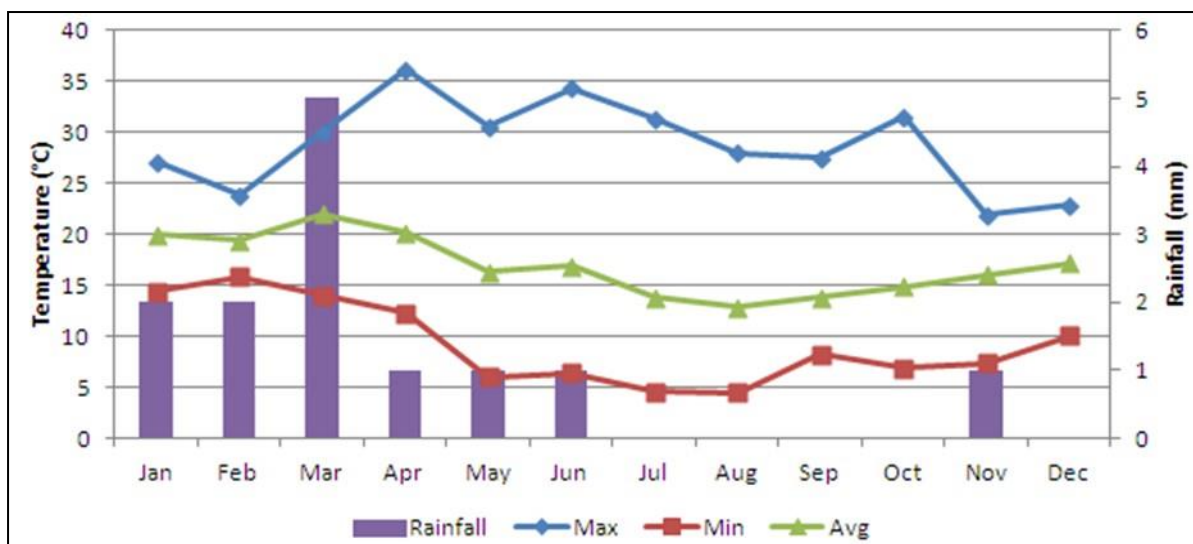


Figure 7-6. Temperature and rainfall at Walvis Bay (From: uMoya-NILU, 2020)

As explained above, the SAH severely limits the amount of rainfall over Namibia and especially at the coast and over the Namib Desert. As such, the average annual rainfall in Walvis Bay is below 50 mm (Figure 7-6), with variation in annual rainfall exceeding 100%. Infrequent, heavy rainfall do 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 stormwater. Fog plays a very significant role as source of water for many plants and animals along Namibia's coast and the Namib Desert. Walvis Bay has up to 900 hours of fog per year and it results from the cold Benguela water cooling the humid air above it to such a temperature that the water vapour condenses to form fog and low level clouds (Mendelsohn et al., 2002).

Implications and Impacts

Water is a scarce and valuable resource in Namibia and Walvis Bay is characterized by low and extremely variable seasonal rainfall. This makes water an extremely vulnerable resource. Occasional flooding does occur and if the facility is not adequately designed may experience damage.

7.3 CORROSIVE ENVIRONMENT

Walvis Bay is located in a very corrosive environment, which may be attributed to the frequent salt-laden fog, periodic winds and abundance of aggressive salts (dominantly NaCl and sulphates) in the soil. The periodic release of hydrogen sulphide (H₂S) from the ocean is expected to contribute to corrosion. See Figure 7-7 for corrosion comparison data with other centres. The combination of high moisture and salt content of the surface soil can lead to rapid deterioration of subsurface metal (e.g. pipelines) and concrete structures. Chemical weathering of concrete structures due to the abundant salts in the soil is a concern.

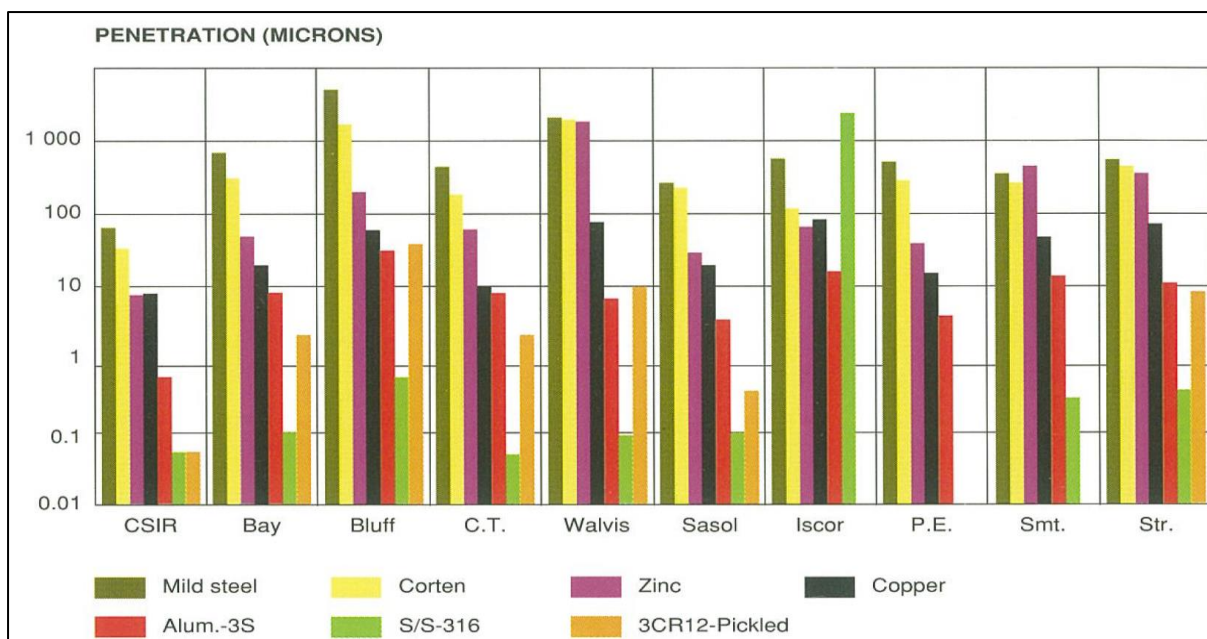


Figure 7-7. Twenty year corrosion exposure results in southern African towns (Callaghan 1991)

Implications and Impacts

Corrosion levels may be high and must be kept in mind when planning the construction of the storage tanks and related infrastructure as well as for general maintenance.

7.4 TOPOGRAPHY AND DRAINAGE

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

The topography is generally flat with a local gentle downward slope in a northerly direction. Drainage is poorly developed due to the lack of rainfall <50 mm/annum received in the area. 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 site and surrounding areas are generally flat.

Implications and Impacts

Any pollutants that are not contained and are transported via surface water flow will be transported out of the site via the storm water drainage lines and potentially pollute the surrounding environment. Therefore, the storage and use of fuel must be strictly controlled according to SANS 10089 standards.

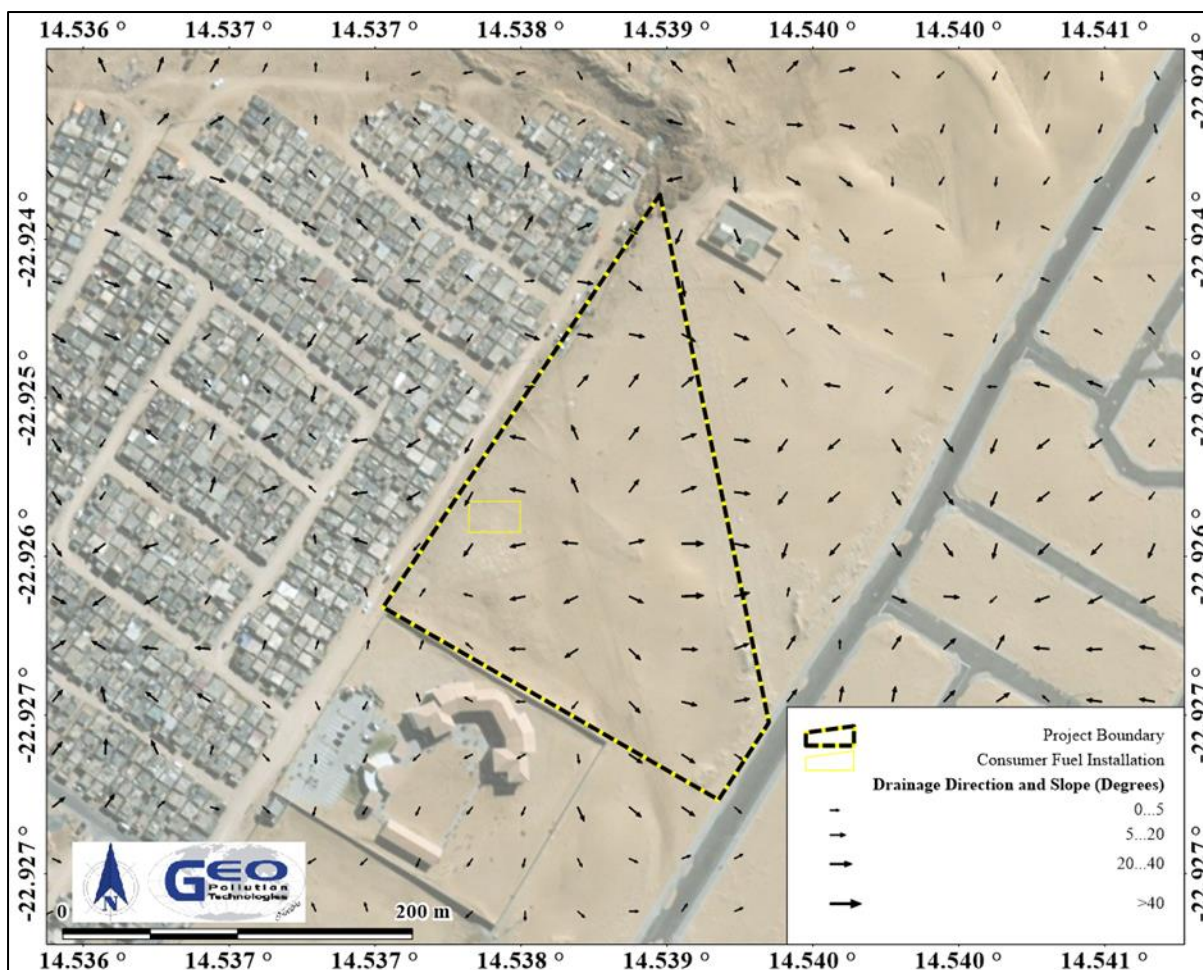


Figure 7-8. Drainage direction and slope

7.5 GEOLOGY AND HYDROGEOLOGY

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

Following the breakup of West-Gondwana during the early Cretaceous (130 – 135 Ma ago), continental uplift took place, enhancing erosional cutback and the formation of the Namibian Escarpment. A narrow pediplain formed, mainly over Damara Age Rocks. The South 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. Depth to bedrock in Walvis Bay is expected to be deeper than 40 m. Sediments under the project area is expected consist of medium to coarse grain sand with thin lenses of more clayey material. The hydraulic conductivity is expected to be moderate to high.

The hydraulic head in the area is very low due to the relative horizontal water table. Pollutants are therefore not expected to rapidly spread, despite the relatively high hydraulic conductivity.

Depth to water table is expected to be less than 2 mbs. The subsurface water is mostly saline and not suitable for human consumption. Groundwater is not abstracted for human consumption in Walvis Bay. The Municipality of Walvis Bay currently purchase fresh/potable water from NamWater, which source water from the Kuiseb Water Supply Scheme.

Implications and Impacts

Groundwater is not utilised in the area. Pollution of the groundwater is however still prohibited. Spill control structures installed and maintained to SANS specifications or better would successfully prevent pollution of groundwater, surface water or soil. Shallow groundwater will lead to rapid lateral spreading of hydrocarbon products spilled or leaked. This will further have potential impact on underground utilities and may cause impacts on neighbouring properties.

7.6 PUBLIC WATER SUPPLY

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

Implications and Impacts

The installation is not expected to have an impact on public water supply. Furthermore it must adhere to SANS standards which should successfully prevent any spills or leaks.

7.7 FAUNA AND FLORA

The site is located within a developed industrial area and has been cleared of all vegetation. No animals of particular significance are expected except for birds flying overhead as a result of a number of breeding, roosting and foraging areas for water birds in the area. Of note nearby (6.5 km southwest) are the Walvis Bay Lagoon, the salt works and the southern part of the bay west of the lagoon, which are the key components of the 12,600 ha RAMSAR site (Wetland of International Importance). It is important both as an over-wintering area for Palaearctic migrant wader species as well as for African species such as Greater and Lesser Flamingos, Great White Pelican and Chestnut-Banded Plovers. Pools of semi-purified sewage effluent, situated 4 km south of the study area, are regarded as a sensitive manmade wetland. Although a manmade fresh water source, it is an attraction for pelicans and flamingos, 53% of the duck and geese population in the area, and many other birds. The wetland is formed by the constant inflow of semi-purified water and supports extensive stands of reeds. There is also a flight path for birds between the sewerage ponds and the offshore bird breeding platform (Ghwano Island) 5 km north of the site.

Implications and Impacts

The proposed installation is located within an already disturbed area. Thus, no immediate threat to biodiversity in the area is expected, however, uncontrolled pollution may and can cause damage to any biodiversity surrounding the site. Lighting used at night may blind or disorientate birds like flamingos that fly at night.

7.8 DEMOGRAPHIC AND ECONOMIC CHARACTERISTICS

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

Table 7-2. Demographic Characteristics of Walvis Bay, the Erongo Region and Nationally (Namibia Statistics Agency, 2011)

	Walvis Bay	Erongo Region	Namibia
Population (Males)	30,500	79,823	1,021,912
Population (Females)	29,000	70,986	1,091,165
Population (Total)	62,096	150,809	2,113,077
Unemployment (15+ years)	N/A	22.6%	33.8%
Literacy (15+ years)	N/A	96.7%	87.7%
Education at secondary level (15+ years)	N/A	71.8%	51.2%
Households considered poor	N/A	5.1%	19.5%

Implications and Impacts

The facility will provide employment to people from the area. Some skills development and training will also benefit employees during the construction and operational phase.

7.9 HERITAGE, CULTURAL AND ARCHAEOLOGICAL ASPECTS

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

8 PUBLIC CONSULTATION

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

Public participation notices were advertised twice in two weeks in the national papers The Namibian Sun and Die Republikein on the 2nd and 9th of February 2021 respectively. A site notice was placed on site and notification letters delivered to identified neighbours. The Municipality of Walvis Bay was also notified by hand delivered letter. See Appendix A for proof of the public participation processes, registered IAPs and municipal feedback.

The Municipality of Walvis Bay requested a meeting where Geo Pollution Technologies presented the proposed project. During the meeting, concerns were raised regarding the location of the consumer fuel installation on the site, and the zoning of the erf. It was noted that the close proximity of the consumer fuel installation to the informal residential areas west of the site raises concern for two reasons: 1) In the event of a fire at the site, the fire may spread to the nearby informal residential area. Since the houses are close to each other and often constructed with flammable objects, a fire in this area is extremely hard to contain. 2) Johanna Benson Road, on the western side of the site is a narrow and busy street, with high traffic volumes of both vehicles and pedestrians. Operational vehicles entering and accessing the site may result in traffic incidents. Based on this, the recommendation was made by members of the Municipality that the location of the installation be moved more towards the eastern side of the erf, and access be gained mainly from Khomashochland Street. During further consultation it was however pointed out that the fuel storage will be approximately 48 m from the nearest residential property and the entrance in Johanna Benson Road will mainly be used as a service entrance. Based on this, the location was accepted by the Municipality (see Appendix A). The points raised by the Municipality are addressed in Table 5-1.

Table 8-1. Municipal meeting attendance register

Name	Organisation
Wikus Coetzer	Geo Pollution Technologies

Lovisa Hailaula	Municipality of Walvis Bay – Environmental
Nangula Amatsi	Municipality of Walvis Bay – Environmental
Deville Dreyer	Municipality of Walvis Bay - Health
Peter Etsebeth	Municipality of Walvis Bay – SWEM
Kapalese Katjomuise	Municipality of Walvis Bay
Likoro Gottfried	Municipality of Walvis Bay
Dennis Basson	Municipality of Walvis Bay – Fire Brigade
Kristy Asino	Municipality of Walvis Bay – Town Planning

9 MAJOR IDENTIFIED IMPACTS

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

9.1 HYDROCARBON POLLUTION

This section describes the most pertinent pollution impacts that are expected from the facility and its operations. Groundwater and soil pollution from hydrocarbon products are major issues associated with the storage and handling of such products. Both forms of pollution are prohibited in Namibia.

When a release of hydrocarbon products takes place to the soil, the Light Non-Aqueous Phase Liquids (LNAPL) will infiltrate into the soil and start to migrate vertically. LNAPL transport in the subsurface environment occurs in several phases, including bulk liquid, dissolved, and vapour phases. Mechanisms that influence transport include the physicochemical properties of the specific compounds present such as density, vapour pressure, viscosity, and hydrophobicity, as well as the physical and chemical properties of the subsurface environment, including geology and hydrogeology. Hydrocarbon liquids are typically complex mixtures composed of numerous compounds, each with its own individual physicochemical and, therefore, transport properties.

If small volumes of spilled LNAPL enter the unsaturated zone (i.e. vadose zone), the LNAPL will flow through the central portion of the unsaturated pores until residual saturation is reached. A three-phase system consisting of water, LNAPL, and air is formed within the vadose zone. Infiltrating water dissolves the components within the LNAPL (e.g., benzene, xylene, and toluene) and transports them to the water table. These dissolved contaminants form a contaminated plume radiating from the area of the residual product. Many components found in LNAPL are volatile and can partition into soil air and be transported by molecular diffusion to other parts of the aquifer. As these vapours diffuse into adjoining soil areas, they may partition back into the water phase and transfer contamination over wider areas. If the soil surface is relatively impermeable, vapours will not diffuse across the surface boundary and concentrations of contaminants in the soil atmosphere may build up to equilibrium conditions. However, if the surface is not covered with an impermeable material, vapours may diffuse into the atmosphere.

If large volumes of LNAPL are spilled, the LNAPL flows through the pore space to the top of the capillary fringe of the water table. Dissolved components of the LNAPL precede the less soluble components and may change the wetting properties of the water, causing a reduction in the residual water content and a decrease in the height of the capillary fringe.

Since LNAPL are lighter than water, it will float on top of the capillary fringe. As the head formed by the infiltrating LNAPL increases, the water table is depressed and the LNAPL accumulate in the depression. If the source of the spilled LNAPL is removed or contained, LNAPL within the vadose zone continue to flow under the force of gravity until reaching residual saturation. As the LNAPL continue to enter the water table depression, it spread laterally on top of the capillary fringe. The draining of the upper portions of the vadose zone reduces the total head at the interface between the LNAPL and the groundwater, causing the water table to rebound slightly. The rebounding water displaces only a portion of the LNAPL because the LNAPL remain at residual

saturation. Groundwater passing through the area of residual saturation dissolves constituents of the residual LNAPL, forming a contaminant plume. Water infiltrating from the surface also can dissolve the residual LNAPL and add to the contaminant load of the aquifer.

Decrease in the water table level from seasonal variations may lead to dropping of the pool of LNAPL. If the water table rises again, part of the LNAPL may be pushed up, but a portion remains at residual saturation below the new water table. Variations in the water table height, therefore, can spread LNAPL over a greater thickness of the aquifer, causing larger volumes of aquifer materials to be contaminated.

Hydrocarbon products do biodegrade in the subsurface, although the effectiveness of this process depends on subsurface conditions. The type of hydrocarbon product plays a further role in the duration of biodegradation, with the longer chain components taking much longer to biodegrade.

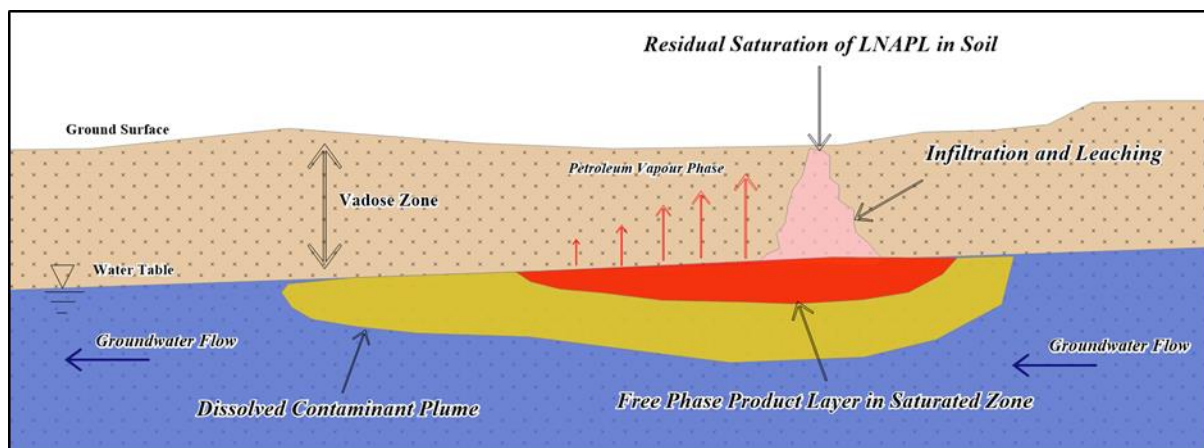


Figure 9-1. Conceptual LNAPL Release to the Vadose Zone

9.2 NOISE IMPACTS

Construction noise will be related to concrete mixing, excavations and vehicles accessing the site. Some noise will exist due to vehicles accessing the site for delivering and collecting fuel during operations.

9.3 TRAFFIC IMPACTS

During construction activities some traffic impacts can be expected in the street and vicinity of the facility as a result of heavy vehicles accessing the site. During operations, traffic flow may be impacted by trucks delivering fuel to the site, impacts are however expected to be minimal during operations as the installation will be situated within the premises of the police station. The facility will in return have a positive impact on traffic flow in other areas of the town.

9.4 FIRE

Diesel and unleaded petrol will be stored at the site in large volumes. Unleaded petrol is extremely flammable and if fuel is not handled according to Material Safety Data Sheet instructions and SANS requirements, a fire risk exist during the operational phase. The proposed fuel storage location is situated around 50 m from informal settlements (shacks) posing a high fire risk. This is due to the flammable nature of the materials houses are constructed with, as well as distances of the houses from each other, uncontrolled fires are frequent, disperse rapidly and are difficult to contain. The flammable nature of the property thus poses a risk to the residential properties as well as vice versa. Fuel storage will however be below ground, and the installation is required to adhere to SANS standards aimed at minimising these risks.

9.5 HEALTH

Hydrocarbons are carcinogenic and dermal contact and inhalation of fumes should be prevented.

9.6 SOCIO-ECONOMIC IMPACTS

Construction activities at the consumer fuel installation will provide employment opportunities and some training and skills development may ensue. The consumer fuel installation will indirectly contribute to sustaining the daily operations of the police station and thus its employee base.

10 ASSESSMENT AND MANAGEMENT OF IMPACTS

The purpose of this section is to assess and identify the most pertinent environmental impacts that are expected from the construction, operational and potential decommissioning activities of the proposed consumer fuel installation. An EMP based on these identified impacts are also incorporated into this section.

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

Ranking formulas are then calculated as follow:

$$\text{Environmental Classification} = A1 \times A2 \times (B1 + B2 + B3)$$

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

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

Table 10-1. Assessment criteria

Criteria	Score
Importance of condition (A1) – assessed against the spatial boundaries of human interest it will affect	
Importance to national/international interest	4
Important to regional/national interest	3
Important to areas immediately outside the local condition	2
Important only to the local condition	1
No importance	0
Magnitude of change/effect (A2) – measure of scale in terms of benefit / disbenefit of an impact or condition	
Major positive benefit	3
Significant improvement in status quo	2
Improvement in status quo	1
No change in status quo	0
Negative change in status quo	-1
Significant negative disbenefit or change	-2
Major disbenefit or change	-3
Permanence (B1) – defines whether the condition is permanent or temporary	
No change/Not applicable	1
Temporary	2
Permanent	3
Reversibility (B2) – defines whether the condition can be changed and is a measure of the control over the condition	
No change/Not applicable	1
Reversible	2

Irreversible	3
Cumulative (B3) – reflects whether the effect will be a single direct impact or will include cumulative impacts over time, or synergistic effect with other conditions. It is a means of judging the sustainability of the condition – not to be confused with the permanence criterion.	
Light or No Cumulative Character/Not applicable	1
Moderate Cumulative Character	2
Strong Cumulative Character	3

Table 10-2. Environmental classification (Pastakia 1998)

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

10.1 RISK ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN

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

The objectives of the EMP are:

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

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

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

10.1.1 Planning

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

- ◆ Ensure that all necessary permits from the various ministries, local authorities and any other bodies that governs the construction activities and operations of the project are in place and remains valid. This includes the consumer installation certificate and municipal approvals.
- ◆ Ensure that design parameters, where required, is approved by relevant authorities prior to construction of the facility. This includes correct zoning of the property.
- ◆ Ensure all appointed contractors and employees enter into an agreement which includes the EMP. Ensure that the contents of the EMP are understood by the contractors, sub-contractors, employees and all personnel present or who will be present on site.
- ◆ Make provisions to have a Health, Safety and Environmental Coordinator to implement the EMP and oversee occupational health and safety as well as general environmental related compliance at the site.
- ◆ Have the following emergency plans, equipment and personnel on site where reasonable to deal with all potential emergencies:
 - Risk management / mitigation / EMP/ Emergency Response Plan and HSE Manuals
 - Adequate protection and indemnity insurance cover for incidents;
 - Comply with the provisions of all relevant safety standards;
 - Procedures, equipment and materials required for emergencies.
- ◆ Establish and maintain a fund for future ecological restoration of the project site should project activities cease and the site is decommissioned and environmental restoration or pollution remediation is required.
- ◆ Establish and / or maintain a reporting system to report on aspects of construction activities, operations and decommissioning as outlined in the EMP.
- ◆ Submit bi-annual reports to the MEFT to allow for environmental clearance certificate renewal after three years. This is a requirement by MEFT.
- ◆ Appoint a specialist environmental consultant to update the EA and EMP and apply for renewal of the environmental clearance certificate prior to expiry.

10.1.2 Skills Transfer, Employment and Income

Various levels of unskilled to skilled labour will be used during the construction phase. Some skills transfer to unskilled workers may result. Some employment will be provided for the operations of the fuel installation. Income through salaries and wages will increase local spending power. Employment will be sourced locally while skilled labour/contractors may be sourced from other regions.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Employment	2	1	2	2	2	12	2	Definite
Daily Operations	Employment	2	1	3	3	1	14	2	Definite

Desired Outcome: Employment and development of local Namibians and increase in their spending power through receipt of wages and salaries.

Actions

Mitigation:

- ◆ The proponent must employ local Namibians where possible.
- ◆ If the skills exist locally, employees must first be sourced from the town, then the region and then nationally.
- ◆ Deviations from this practice must be justified.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ Summary report based on employee records.

10.1.3 Demographic Profile and Community Health

The project is reliant on labour during the construction and operational phase. The scale of the project is limited and it is not foreseen to create a change in the demographic profile of the local community. Community health may be exposed to factors such as communicable disease like HIV/AIDS and alcoholism/drug abuse, especially during the construction phase when an increase in foreign people in the area may potentially increase the risk of criminal and socially/culturally deviant behaviour.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	In-migration and social ills related to unemployment	2	-1	1	1	2	-8	-1	Probable
Daily Operations	In-migration and social ills related to unemployment	2	-1	1	2	1	-8	-1	Improbable

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

Actions:

Prevention:

- ◆ Employ only local people from the area, deviations from this practice should be justified appropriately.
- ◆ Adhere to all municipal by-laws relating to environmental health which includes but is not limited to sand and grease traps for the various facilities and sanitation requirements.

Mitigation:

- ◆ Educational programmes for employees on HIV/AIDS and general upliftment of employees' social status.
- ◆ Appointment of reputable contractors.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

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

10.1.4 Fuel Supply

The operation of the installation will aid in securing fuel supply to the fleet of NAMPOL at the new police station. This will aid in the efficiency of NAMPOL to perform their duties.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Daily Operations	Contribution to the efficiency of the police force	3	1	3	2	1	18	2	Definite

Desired Outcome: Ensure a secure fuel supply remains available to NAMPOL.

Actions

Mitigation:

- ◆ Proper management to ensure constant supply.
- ◆ Record supply problems and take corrective actions.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ Record supply problems and corrective actions taken and compile a bi-annual summary report.

10.1.5 Traffic

The police station itself may increase traffic flow in the adjacent streets, especially in Johanna Benson Road, frequented by pedestrians from the school and residential areas, however the consumer fuel installation is not expected to result in traffic impacts since it is located on the police station premises and fuel deliveries will be infrequent. Construction activities may however result in minor traffic impacts.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Delivery of equipment and building supplies	2	-1	2	2	2	-12	-2	Probable
Daily Operations	Increase traffic, road wear and tear and accidents	2	-1	2	2	1	-10	-2	Improbable

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

Actions

Prevention:

- ◆ Erect clear signage regarding access and exit points at the facility.

Mitigation:

- ◆ Tanker trucks delivering fuel should not be allowed to obstruct any traffic or entrances / exists of surrounding properties.
- ◆ If any traffic impacts are expected, traffic management should be performed to prevent these.
- ◆ The placement of signs to warn and direct traffic will mitigate traffic impacts.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ Any complaints received regarding traffic issues should be recorded together with action taken to prevent impacts from repeating itself.
- ◆ A report should be compiled of all incidents reported, complaints received, and action taken.

10.1.6 Health, Safety and Security

Activities associated with the construction and operational phases are reliant on human labour and therefore exposes them to health and safety risks. Activities such as the operation of equipment and handling of hazardous chemicals (inhalation and carcinogenic effect of some petroleum products), poses the main risks to employees. Security risks are related to unauthorized entry, theft and sabotage.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Physical injuries, exposure to chemicals and criminal activities	1	-2	3	3	1	-14	-2	Probable
Daily Operations	Physical injuries, exposure to chemicals and criminal activities	1	-2	3	3	2	-16	-2	Probable

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

Actions

Prevention:

- ◆ Clearly label dangerous and restricted areas as well as dangerous equipment and products.
- ◆ Equipment that will be locked away on site must be placed in a way that does not encourage criminal activities (e.g. theft).
- ◆ Provide all employees with required and adequate personal protective equipment (PPE).
- ◆ Ensure that all personnel receive adequate training on operation of equipment / handling of hazardous substances.
- ◆ All Health and Safety standards specified in the Labour Act should be complied with.
- ◆ Implementation of maintenance register for all equipment and fuel/hazardous substance storage areas.

Mitigation:

- ◆ Selected personnel should be trained in first aid and a first aid kit must be available on site. The contact details of all emergency services must be readily available.
- ◆ Implement and maintain an integrated health and safety management system, to act as a monitoring and mitigating tool, which includes: colour coding of pipes, operational, safe work and medical procedures, permits to work, emergency response plans, housekeeping rules, MSDS's and signage requirements (PPE, flammable etc.).
- ◆ Strict security that prevents unauthorised entry during construction phases.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Any incidents must be recorded with action taken to prevent future occurrences.
- ◆ A report should be compiled of all incidents reported. The report should contain dates when training were conducted and when safety equipment and structures were inspected and maintained.

10.1.7 Fire

Operational and maintenance activities may increase the risk of the occurrence of fires. The installation will be located in an urban setup neighboured by informal settlement (shacks) that presents a high fire risk. The surrounding areas may also increase the difficulty of fighting fires. Fuel, especially unleaded petrol, is highly flammable and therefore presents a fire risk.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Fire and explosion risk	1	-2	2	2	1	-10	-2	Improbable
Daily Operations	Fire and explosion risk	2	-2	2	2	1	-10	-2	Probable

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

Actions:

Prevention:

- ◆ Ensure all chemicals are stored according to MSDS and SANS instructions.
- ◆ Maintain regular site, mechanical and electrical inspections and maintenance.
- ◆ Clean all spills / leaks.
- ◆ Special note must be taken of the regulations stipulated in sections 47 and 48 of the Petroleum Products and Energy Act, 1990 (Act No. 13 of 1990).
- ◆ Follow SANS standards for design, operation and maintenance of the installation, this includes refuelling locations and distances from boundaries.
- ◆ All dispensers must be equipped with devices that cut fuel supply during fires.
- ◆ The proponent should liaise with the local Fire Brigade to ensure that all fire requirements are met. This includes, but is not limited to SANS 10400 T: 2011.

Mitigation:

- ◆ A holistic fire protection and prevention plan is needed. This plan must include an emergency response plan, firefighting plan and spill recovery plan.
- ◆ Maintain firefighting equipment, good housekeeping and personnel training (firefighting, fire prevention and responsible housekeeping practices).

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

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

10.1.8 Air Quality

Fuel vapours will be released into the air during refuelling of storage tanks as well as at dispensing points. Prolonged exposure may have carcinogenic effects. Dust may be generated during construction activities.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Excessive dust generated from maintenance and upgrade activities	1	-1	2	2	2	-6	-1	Probable
Daily Operations	Fuel vapours	1	-1	2	2	1	-5	-1	Probable

Desired Outcome: To prevent health impacts and minimise the dust generated.

Actions

Mitigation:

- ◆ Personnel issued with appropriate masks where excessive dust or vapours are present.
- ◆ A complaints register should be kept for any dust related issues and mitigation steps taken to address complaints where necessary e.g. dust suppression.
- ◆ Employees should be coached on the dangers of fuel vapours.
- ◆ Vent pipes must be properly placed as per SANS requirements.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ Any complaints received regarding dust or fuel vapours should be recorded with notes on action taken.
- ◆ All information and reporting to be included in a bi-annual report.

10.1.9 Noise

Construction activities may generate excessive noise. This will be a temporary impact. During operations, noise pollution will be limited and may be related to vehicles accessing the site to offload fuel and during maintenance activities.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Excessive noise generated from construction activities – nuisance and hearing loss	1	-1	2	2	1	-5	-1	Probable
Daily Operations	Noise generated from the operational activities – nuisance	1	-1	2	2	2	-6	-1	Probable

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

Actions

Prevention:

- ◆ Follow World Health Organization (WHO) guidelines on maximum noise levels (Guidelines for Community Noise, 1999) to prevent hearing impairment.
- ◆ All machinery must be regularly serviced to ensure minimal noise production.

Mitigation:

- ◆ Hearing protectors as standard PPE for workers in situations with elevated noise levels.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ WHO Guidelines.
- ◆ Maintain a complaints register.
- ◆ Report on complaints and actions taken to address complaints and prevent future occurrences.

10.1.10 Waste production

Waste will be produced during the construction and operational phase. Waste may include hazardous waste associated with the handling of hydrocarbon products etc. Waste presents a contamination risk and when not removed regularly may become a fire hazard. Construction waste may include building rubble and discarded equipment contaminated by hydrocarbon products. Contaminated soil and water is considered as a hazardous waste.

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

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

Actions

Prevention:

- ◆ Waste reduction measures should be implemented and all waste that can be re-used / recycled must be kept separate.
- ◆ Ensure adequate disposal storage facilities are available.
- ◆ Ensure waste cannot be blown away by wind.
- ◆ Prevent scavenging (human and non-human) of waste.
- ◆ All regulation and by-laws relating to environmental health should be adhered to.

Mitigation:

- ◆ Waste should be disposed of regularly and at appropriately classified disposal facilities, this includes hazardous material (empty chemical containers, contaminated rugs, paper water and soil).
- ◆ The spill catchment traps and oil water separator should be cleaned regularly and waste disposed of appropriately. Surfactants (soap) may not be allowed to enter the oil water separator.
- ◆ See the material safety data sheets available from suppliers for disposal of contaminated products and empty containers.
- ◆ Liaise with the municipality regarding waste and handling of hazardous waste.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ A register of hazardous waste disposal should be kept. This should include type of waste, volume as well as disposal method/facility.
- ◆ Any complaints received regarding waste should be recorded with notes on action taken.
- ◆ The oil water separator must be regularly inspected and all hydrocarbons removed once detected. Outflow water must comply with effluent quality standards.
- ◆ All information and reporting to be included in a bi-annual report.

10.1.11 Ecosystem and Biodiversity Impact

The nature of the operational activities is such that the probability of creating a habitat for flora and fauna to establish is low. No significant impact on the biodiversity of the area is predicted as the site is currently void of natural fauna and flora. Impacts are therefore mostly related to pollution of the environment. Bright lights may disorientate birds flying at night.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Impact on fauna and flora. Loss of biodiversity	1	-1	3	2	2	-7	-1	Improbable
Daily Operations	Impact on fauna and flora. Loss of biodiversity	1	-1	3	2	2	-7	-1	Improbable

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

Actions.

Mitigation:

- ◆ Report any extraordinary animal sightings to the MEFT.
- ◆ Mitigation measures related to waste handling and the prevention of groundwater, surface water and soil contamination should limit ecosystem and biodiversity impacts.
- ◆ Avoid scavenging of waste by fauna.
- ◆ Direct all lights down to working surfaces and use minimal lighting at night.
- ◆ The establishment of habitats and nesting sites at the facility should be avoided where possible.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ All information and reporting to be included in a bi-annual report.

10.1.12 Groundwater, Surface Water and Soil Contamination

Operations entail the storage and handling of hydrocarbons which present a contamination risk. Contamination may either result from failing storage tanks, pumps or pipelines, or spills and leaks associated with overfilling or human error. Such spills may contaminate surface water, soil and groundwater.

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

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

Actions

Prevention:

- ◆ Spill control structures and procedures must be in place according to SANS standards or better and connection of all surfaces where fuel is handled, with an oil water separator.
- ◆ All fuelling should be conducted on surfaces provided for this purpose. E.g. Concrete slabs with regularly maintained seals between slabs.
- ◆ The procedures followed to prevent environmental damage during service and maintenance, and compliance with these procedures, must be audited and corrections made where necessary.
- ◆ Proper training of operators must be conducted on a regular basis (Fuel handling, spill detection, spill control).

Mitigation:

- ◆ Any spillage of more than 200 litre must be reported to the Ministry of Mines and Energy.
- ◆ Spill clean-up means must be readily available on site as per the relevant MSDS.
- ◆ Any spill must be cleaned up immediately.
- ◆ The spill catchment traps and oil water separator should be cleaned regularly and waste disposed of at a suitably classified hazardous waste disposal facility.
- ◆ Surfactants (soap) may not be allowed to enter the oil water separator e.g. soap usage on spill control surfaces.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ A report should be compiled bi-annually of all spills or leakages reported. The report should contain the following information: date and duration of spill, product spilled, volume of spill, remedial action taken, comparison of pre-exposure baseline data (previous pollution conditions survey results) with post remediation data (e.g. soil/groundwater hydrocarbon concentrations) and a copy of documentation in which spill was reported to Ministry of Mines and Energy.

10.1.13 Visual Impact

This impact is not only associated with the aesthetics of the site, but also the structural integrity. The facility will form part of the police station and will have a minimal impact regarding aesthetics.

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

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

Actions

Mitigation:

- ◆ Regular waste disposal, good housekeeping and routine maintenance on infrastructure will ensure that the longevity of structures are maximised and a low visual impact is maintained.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ A maintenance record should be kept.
- ◆ A report should be compiled of all complaints received and actions taken.

10.1.14 Impacts on Utilities and Infrastructure

Construction activities such as excavation and heavy vehicles accessing the site may lead to accidental damage to utilities and infrastructure, which in turn may lead to interruption of services such as water and electricity supply to the area.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction Phase	Disruption of services and damage to infrastructure	2	-2	2	2	1	-20	-3	Probable
Daily Operations	Disruption of services and damage to infrastructure	2	-1	2	2	1	-10	-2	Improbable

Desired Outcome: No impact on utilities and infrastructure.

Actions

Prevention:

- ◆ Appointing qualified and reputable contractors is essential.
- ◆ The contractor must determine exactly where amenities and pipelines are situated before construction commences (utility clearance e.g. ground penetrating radar surveys).
- ◆ Liaison with the suppliers of services is essential.

Mitigation:

- ◆ Emergency procedures for corrective action available on file.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ A report should be compiled every 6 months of all incidents that occurred and corrective action taken.

10.1.15 Cumulative Impact

Possible cumulative impacts associated with the construction and operational phase include increased noise and traffic in the area. This will have a cumulative impact on traffic flow on surrounding streets.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction Phase	The build-up of minor impacts to become more significant	2	-2	1	2	2	-20	-3	Probable
Daily Operations	The build-up of minor impacts to become more significant	2	-2	2	2	2	-24	-3	Probable

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

Actions

Mitigation:

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

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ Annual summary report based on all other impacts must be created to give an overall assessment of the impact of the operational phase.

10.2 DECOMMISSIONING AND REHABILITATION

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

10.3 ENVIRONMENTAL MANAGEMENT SYSTEM

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

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

11 CONCLUSION

The consumer fuel installation will have a positive impact on the operations of the police station, by ensuring a reliable supply of fuel is available to all fleet vehicles. This in turn will aid in increasing safety and security in Walvis Bay, making the town more attractive to investors, see Table 11-1. In addition to a reliable fuel supply, the facility indirectly contributes locally to skills transfer and training which in turn develops the local workforce, especially during the construction phase.

Negative impacts can successfully be mitigated. SANS standards relating to the petroleum industry and prescribed by Namibian law must be followed during all operations of the consumer fuel installation. Noise pollution should at all times meet the prescribed WHO requirements to prevent hearing loss and not to cause a nuisance. Fire prevention should be adequate, and health and safety regulations should be adhered to in accordance with the regulations pertaining to relevant laws and internationally accepted standards of operation. Any waste produced must be removed from site and disposed of at an appropriate facility or re-used or recycled where possible. Hazardous waste must be disposed of at an approved hazardous waste disposal site.

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

Should the Directorate of Environmental Affairs (DEA) of the MEFT find that the impacts and related mitigation measures, which have been proposed in this report, are acceptable, an environmental clearance certificate may be granted to the Proponent. The environmental clearance certificate issued, based on this document, will render it a legally binding document which should be adhered to. Focus could be placed on Section 10, which includes an EMP for this project. It should be noted that the assessment process's aim is not to stop the proposed 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.

Table 11-1. Impact Summary Class Values

Impact Category	Impact Type	Construction	Operations
<i>Positive Rating Scale: Maximum Value</i>		5	5
<i>Negative Rating Scale: Maximum Value</i>		-5	-5
EO	10.1.2 Skills Transfer, Employment and Income	2	2
SC	Demographic Profile and Community Health	-1	-1
EO	Fuel Supply		2
SC	Traffic	-2	-2
SC	Health, Safety and Security	-2	-2
PC	Fire	-2	-2
PC	Air Quality	-1	-1
PC	Noise	-1	-1
PC	Waste Production	-2	-2
BE	Ecosystem and Biodiversity Impact	-1	-1
PC/BE	Groundwater, Surface Water and Soil Contamination	-2	-2
SC	Visual Impact	-1	-1
PC/SC	Impacts on Utilities, Infrastructure and Seabed Scouring	-3	-2
PC	Cumulative Impact	-3	-3

BE = Biological/Ecological EO = Economical/Operational PC = Physical/Chemical SC = Sociological/Cultural

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Appendix A: Proof of Public Consultation

Notified Interested and or Affected Parties

Designation/subdivision	Contact Person
Notified Authorities	
Designation / Subdivision	Contact Person
Municipality of Walvis bay - Health	Berdine Botha
Municipality of Walvis bay - Health	Dennis Gurirab
Municipality of Walvis Bay – Environmental	David Uushona
Municipality of Walvis Bay – Environmental	Lovisa Hailaula
Municipality of Walvis Bay – Environmental	Nangula Amatsi
Municipality of Walvis Bay - Health	Deville Dreyer
Municipality of Walvis Bay – SWEM	Peter Etsebeth
Municipality of Walvis Bay	Kapalese Katjomuise
Municipality of Walvis Bay – Town Planning	Likoro Gottfried
Municipality of Walvis Bay – Fire Brigade	Dennis Basson
Municipality of Walvis Bay – Town Planning	Kristy Asino
Municipality of Walvis Bay – Town Planning	Ephraim Nambahu
Municipality of Walvis Bay – Town Planning	Jamie-Lee Lawrence
Municipality of Walvis Bay - Office of the Acting CEO	Addra Makhosi
Notified IAPs	
Erf 3188 B	Nangolo Rachel
Erf 3187 D	Hilaria Somaes
Erf 3186 A	Mangano Angula
Erf 3198 B	Emme Bapello
Erf 3184 A	Fransina Kordorz
3183 B	Kapweya Abed
Erf 3183 D	Tobia Tosophina
Erf 3182 A	Constantnage
Erf 3182 D	Lukas Mc
Erf 3158	J. Houwekle
Erf 3157 C	Edward Hambondyo
Erf 3132 D	Hako F.
Erf 3139 C	Loide
Erf 3128 D	Hendrina K.
Erf 3228 C	Daniel Matunga
Erf 7130	Esme Ndimufitu
Erf 7131	Marichen Eichas
Erf 7132	No name given
Erf 7129	Erika Katjirongo
Tatuleni High School (Erf 5774)	Vicente V. Gidevu

Registered IAPs

Designation/subdivision	Contact Person
Municipality of Walvis Bay – Environmental	Lovisa Hailaula
Municipality of Walvis Bay – Environmental	Nangula Amatsi
Municipality of Walvis Bay - Health	Deville Dreyer
Municipality of Walvis Bay – SWEM	Peter Etsebeth
Municipality of Walvis Bay	Kapalese Katjomuise
Municipality of Walvis Bay – Town Planning	Likoro Gottfried
Municipality of Walvis Bay – Fire Brigade	Dennis Basson
Municipality of Walvis Bay – Town Planning	Kristy Asino
Municipality of Walvis Bay – Town Planning	Ephraim Nambahu

Email correspondence from the Municipality of Walvis Bay regarding the development

From: Kristy Asino

Sent: Thursday, 18 February 2021 12:41 pm

To: Wikus Coetzer

Subject: RE: Operations on Erf 4448

Hi Wikus,

Erf 8631 Kuisebmond is zoned as Institutional in terms of the Walvis Bay Town Planning Scheme. Service Stations are not allowed on Institutional zoned erven.

Hence, the proponent is advised to first apply for the:

- subdivision of the site into the proposed service station erf;
- rezoning of the subdivided site either to Local Business or General Business; and
- consent for Service Station on the rezoned site.

Furthermore, it should be noted that the proposed site appears to be closer than 50m from the high density residential development (Tutaleni) and there may be access issues from a narrower street (Johanna Benson Road). It is advisable that the proponent should consider an alternative site (within the subject erf), preferably 50m from the nearby residential areas/erven and where access is obtained from Khomashochland Street, which is about 20m wide.

It should also be noted that the site is still owned by the Municipal Council of Walvis Bay and is part of the land swap (between the Government and Municipal Council). The land swap has not yet been finalised and we are sorting this one out with the Ministry of Works and Transport.

Regards,

Kristy Asino

Town Planner

Department of Roads and Building Control, Municipality of Walvis Bay

Civic Centre, Nangolo Mbumba Drive, Walvis Bay, Namibia

Walvis Bay, Namibia

Tel: +264 64 201 3339

Fax: +264 64 206 135

W: www.walvisbaycc.org.na

From: Karen Miller
Sent: Tuesday, March 30, 2021 10:46 AM
To: Frans Nghifikua; Kristy Asino;
Subject: 199: Kuisebmond Police Station - fuel tank positioning
Importance: High

Dear All,

Attached please find the fuel tank positioning as discussed in our meeting 15.03.2021.

Kind regards
Daphne L. de Jager

KAREN MILLER	Tel: +264 (0)64 407 121 / Fax: +264 (0)64 407 036 karenmil@iway.na
ARCHITECT	P.O. Box 1753, Swakopmund, Namibia 10 Hendrik Witbooi Str. Swakopmund

From: Kristy Asino
Sent: Tuesday, March 30, 2021 17:31
To: Karen Miller
Subject: FW: 199: Kuisebmond Police Station - fuel tank positioning

Please see the response below from Dennis Basson.

Regards,



Kristy Asino

Town Planner

Department of Roads and Building Control, Municipality of Walvis Bay

Civic Centre, Nangolo Mbumba Drive, Walvis Bay, Namibia

Walvis Bay, Namibia

Tel: +264 64 201 3339

Fax: +264 64 206 135

E: [REDACTED]

W: www.walvisbaycc.org.na



From: Dennis Basson
Sent: Tuesday, March 30, 2021 5:15 PM
To: Kristy Asino
Cc: Frans Nghifikua
Subject: RE: 199: Kuisebmond Police Station - fuel tank positioning


Dear Kristy

The distance of the fuel tanks to the residential area is acceptable.



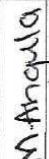






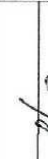

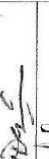



Kindly take note that it is recommended to be approved.

Dennis
CPS

Proof of Notification: Neighbouring Properties



Public Consultation - Notification: Environmental Assessment for the Construction and Operation of a Consumer Fuel Installation in Kuisebmond, Namibia

Name & Surname	Organisation / Address	Tel / Mobile	Email	Signature
Mangob Rachel	3188B			
Hilary Samies	3187D			
Mogano Angula	3186 A			
Ernie Bapell	3188 B			
Neensina Kambanz	3184A			
Kapweya ABeo	3183B			
Tshiso Josephina	3183D			
Constantogee	3182A			
Dukas Nic	3182D			
Thomsonella	3158C			
Edmond Harpendo	3157C			
Hake F	3130D			
Loide	3139.C			
Hendrine K	3188D			
Daniel Matunga	3228C			

Privacy Block

Geo Pollution Technologies

Consumer Fuel Installation – Walvis Bay – February 2021



Public Consultation - Notification: Environmental Assessment for the Construction and Operation of a Consumer Fuel Installation in Kuisebmond, Namibia

Name & Surname	Organisation / Address	Tel / Mobile	Email	Signature
Esmé Nelimufibi	7130			<i>[Handwritten Signature]</i>
Maurichen Eichas	7131			<i>[Handwritten Signature]</i>
Delivered,	7132			
Erika Katjirongo	7129			
VICENTE V. GARCIA	5774 ^{Ambuleni High School}			<i>[Handwritten Signature]</i>
Adaha Mathosi	office of Act:CEO			<i>[Handwritten Signature]</i>
			Privacy Block	

Proof of Municipal Notification

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

To: Interested and Affected Parties 01 February 2021

Re: Environmental Scoping Assessment and Environmental Management Plan for the Construction and Operational Activities of a Consumer Fuel Installation in Kuisebmond, Walvis Bay

Dear Sir/Madam

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/or affected parties (IAPs) that an application will be made to the Environmental Commissioner for an environmental clearance certificate for the following project:

Project: Environmental Scoping Assessment and Environmental Management Plan for the Construction and Operational Activities of a Consumer Fuel Installation in Kuisebmond, Walvis Bay.

Proponent: Ministry of Safety and Security, Government of the Republic of Namibia

Environmental Assessment Practitioner: Geo Pollution Technologies (Pty) Ltd

The Ministry of Safety and Security commissioned the construction of their new Kuisebmond Police Station in Walvis Bay. The facility will be developed on erf 8631 in Kuisebmond. A consumer installation forms part of the proposed development and its future operations and will supply fuel to the Namibian Police Force (NAMPOL) fleet vehicles operational in the area. Diesel and unleaded petrol will be supplied via dispensers from two 23 m³ belowground storage tanks. The installation will be constructed according to South African National Standards (SANS) as prescribed by Namibian law. General operations will involve the receipt of fuel from road tankers, dispensing fuel to fleet vehicles, and day to day administrative tasks.

Geo Pollution Technologies (Pty) Ltd was requested to conduct an environmental assessment for the proposed facility. As part of the assessment we consult with IAPs who are invited to register with the environmental consultant to receive further documentation and communication regarding the project. By registering, IAPs will be provided with an opportunity to provide input that will be considered in the drafting of the environmental assessment report and its associated management plan.

Please register as an IAP and provide comments by **16 February 2021**.

To register, please contact:
 Email: moss@thenamib.com
 Fax: 088-62-6368

Should you require any additional information please contact Geo Pollution Technologies at telephone 081-1452164 / 061-257411.

Thank you in advance.

Sincerely,
 Geo Pollution Technologies

Wikus Coetzer
 Environmental Assessment Practitioner



Directors:

Page 1 of 2
 P. Botha (B.Sc. Hons. Hydrogeology) (Managing)

Press Notice: The Namibian Sun 02 and 19 February 2021

4 TUESDAY 2 FEBRUARY 2021 NEWS Sun

Namibia a SGBV perpetrator's paradise

KENYA KAMBOWE RUNDU

Despite late last year's wave of countrywide protests against sexual and gender-based violence (SGBV), the occurrences of cases continue to rise.

This is according to Ndilokelwa Nthengwe, an activist who was amongst those who spearheaded the SGBV protests under the *ShutItAllDown* movement, which saw thousands of Namibians from all walks of life take to the streets last October.

Nthengwe made the remark when asked about the progress of their petition to government on how to deal with GBV.

The group met with President Hage Geingob last year, however, there has not been progress or a clear-cut plan on how to deal with SGBV in communities, she said.

She added that they continue to wait on feedback from the National Assembly, as they thus far have only received confirmation that their document was received.

"We received a notice of receipt from the National Assembly early December. We are still awaiting feedback on the matters referenced in the petition that we submitted," Nthengwe said.

Perpetrators paradise

Nthengwe said the situation has not improved since the protests, describing the country as a "perpetrator's paradise".

"SGBV cases continue to rise as Namibia has become a perpetrator's paradise."

One of the demands which stood out during the protests was the call for gender minister, Doreen Sioka, to step down.

At one point, the group attempted to have a "farewell braai" at the minister's office.

Sioka has been accused of not serving the ministry well.

Asked whether that stance remains, Nthengwe said they still want Sioka to leave office.


Pandora's box

Last year, Sioka refused to entertain the call for her to resign, saying she does not want to open Pandora's Box.

"That issue, I don't want to dwell into it please, please. I am avoiding it. I don't want to open a Pandora box after we had reconciled. Now you want to bring something out again," Sioka said at the time.

The protesters denied any claims of reconciliation.

Meanwhile, Nthengwe said that there is much coordination and targeted advocacy to be seen for the year from the *ShutItAllDown* movement and activists in the space.



UNABATED: Last year saw a wave of countrywide protests against sexual and gender-based violence, but the scourge continues. PHOTO: FILE

- kenya@namibiansun.com

4 TUESDAY 9 FEBRUARY 2021 NEWS Sun

NAMIBIAN PEACEKEEPERS RETURN FROM DARFUR

ELLANIE SMIT WINDHOEK

Police chief Sebastian Ndeitunga on Friday welcomed back 14 police officers who had served in the United Nations African Union Hybrid Mission in Darfur (UNAMID) for two years.

He said conditions in peacekeeping operations are not always conducive, in most cases complex in nature and very often demand officers that are committed, fit both physically and mentally and ready to face challenges in such environments.

"These may include health-threatening conditions such as malaria, allergies, stress, depression and now the outbreak of the coronavirus."

Ndeitunga therefore commended the officers for having been strong and persistent until the end of their mission.

He pointed out that in Namibia the situation is also no longer the same due to the unprecedented threat of the coronavirus that the world is faced with.

"As a result, we as law enforcement are required to be on the front line to oversee the enforcement of some regulations, just to mitigate the spread of the virus in our society."

He further reassured the officers that his office and the entire management of the police were ready to assist them to ensure that they are well prepared for resuming their national duties.

Ndeitunga said their redeployment would be well-coordinated to ensure that the police benefit from the new skills and knowledge that they acquired from the international exposure.

He said despite various challenges the Namibian police remained committed to honour its international obligations of maintaining peace and stability around the world.

"We do this through the deployment of police officers to UN peacekeeping missions, to assist those communities that are affected by conflicts to rebuild their societies for sustainable peace and security."



WELCOME BACK: Major-General Oscar Embubulu welcomed 14 peacekeepers when they returned to Windhoek. PHOTO: CONTRIBUTED

PUBLIC PARTICIPATION NOTICE
ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED CONSTRUCTION AND OPERATIONS OF A CONSUMER FUEL INSTALLATION IN WALVIS BAY

Geo Pollution Technologies (Pty) Ltd was appointed to undertake an environmental assessment for the construction and operations of a consumer fuel installation on erf 8631, Kuisebmond, Walvis Bay. More information is available at: <http://www.thenamib.com/projects/projects.html>

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

The Ministry of Safety and Security commissioned the construction of their new Kuisebmond Police Station in Walvis Bay. A consumer installation forms part of the proposed development and its future operations and will supply fuel to the Namibian Police Force (NAMPOL) fleet vehicles operational in the area. Fuel will be supplied via dispensers from two 23 m³ belowground storage tanks.

All interested and affected parties are invited to register with the environmental consultant. By registering you are provided with the opportunity to share any comments, issues or concerns related to the facility, for consideration in the environmental assessment. Additional information can be requested from Geo Pollution Technologies.

All comments and concerns should be submitted to Geo Pollution Technologies by 16 February 2021.

Wikus Coetzer
Geo Pollution Technologies
Tel: +264-81-1452164 / 061-257411
Fax: +264-88626368
E-Mail: moss@thenamib.com



Press Notice: Die Republiekin 02 and 09 February 2021

2 NUUS
Republiekin
Dinsdag 2 Februarie 2021

PUBLIC PARTICIPATION NOTICE
ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED CONSTRUCTION AND OPERATIONS OF A CONSUMER FUEL INSTALLATION IN WALVIS BAY

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E-Mail: moss@thenamib.com



hektare afgeskaal en hulle gaan ook nie meer vol plant nie," het Eggert gesê.

"Ek is egter nie deel van 'dié Namibië oor 'n week, tussen 8 en 14 Februarie, weer reën sal begin ontvang, met uitsondering van die Namib-woestyn.

Bewolkte toestande sal reeds vandeeweek oordie meeste dele van Namibië voorkom, het die werkkantoor se hoofvertegni-

ook die afgelope week 'n inloop van water gehad het en nou onderskeidelik 90,7% en 101,5% vol is.

-olivia@republiekin.com.na



KALAHARI ANIB LODGE
Besoek www.gondwana-collection.com of die Gondwana Facebook-blad vir meer spesiale aanbiedinge.

Entstof
VAN BL. 1

Dit is net soos enige ander entstof teen byvoorbeeld polio of masels," het sy gesê.

De Wee het beklemtoon Namibië het onder-vinding in massa-immuniseringsveldtogte en inligting oor die uitrol van die entstowwe sal landswyd openbaar gemaak word die oomblik wanneer die datum bekend is wanneer die entstowwe in Namibië verag word.

"Spanne en logistieke reëlings sal in plek wees en die uitrol sal in verskillende fases gedoen word," het sy gesê.

-henriette@republiekin.com.na

Dinsdag 9 Februarie 2021
Republiekin
NUUS 3

Padongelukke eis sewe lewens

Drie mense is Vrydag op slag dood toe die voertuig waarin hulle passasiers was in 'n kop-teen-kopbotsing betrokke was.

Die ongeluk het omstreeks 12:00 op die hoofpad tussen Grootfontein en Tsumeb gebeur. Na bewering het die linkeragterband van 'n VW Polo-sedanvoertuig gebars, die bestuurder het beheer verloor en teen 'n Toyota Corolla-sedanvoertuig gebots. Drie van die vyf insittendes in die VW Polo is op slag dood.

Die oorledenes is me. Jeremias Ngendemo-no (22), mnr. Shalongo Oskar (34) en Nuuyoma Vitalis (ouderdom onbekend). Die bestuurder van die VW Polo en 'n ander passasier is met ernstige beserings in die Katutura-staats-hospitaal opgeneem.

In 'n ongeluk Vrydag omstreeks 20:35 op die hoofpad tussen Okahandja en Karibib is nog twee mense dood. Na bewering het 'n Toyota Corolla-sedanvoertuig vanaf Karibib na Okahandja gery en 'n Jetta-sedanvoertuig in die teenoorgestelde rigting. Die Corolla het op die linkerkant teen die Jetta gebots. Mnr. Ivan Gurirab (38), die bestuurder van die Jetta wat alleen in die voertuig was, is op slag dood. 'n Onbekende passasier in die Corolla is op pad hospitaal toe dood verklaar. Die bestuurder en 'n passasier is in Okahandja se staats-hospitaal opgeneem.

'n Vragmotor wat bakstene vervoer, het Saterdag omstreeks 12:30 op die hoofpad tussen Okahao en Oshakati gery toe 'n baksteen glo van die vragmotor afgeval het. Die baksteen het die voorruit van 'n aankomende voertuig getref en me. Halwoodi Nangula (34), 'n passasier, is op slag dood.

Me. Rimec Kariro (55) is Saterdag omstreeks 11:35 op Oshakati se hoofpad doodgegery.

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Fax: +264-88626368
E-Mail: moss@thenamib.com





GET YOUR EXAMINATION RESULTS

Grade 12 Higher level (NSSCHO),
Grade 12 Ordinary level (NSSCO) and Grade 11

Please note: Send your grade followed by your full Candidate Number via SMS to 99099.
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e.g Grade 12 20PE250025.

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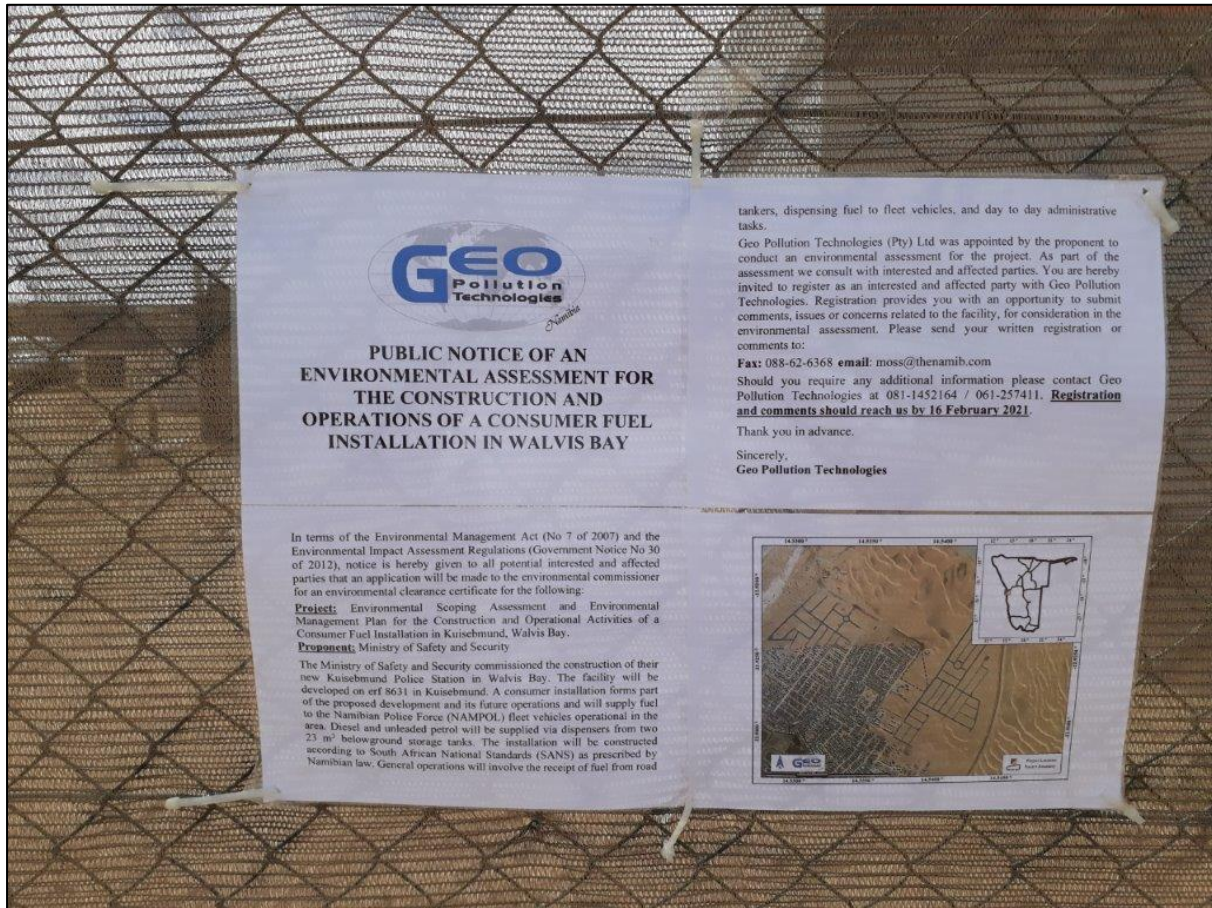
CONTACT LINDY FISCHER 061-2972008 OR lindy@nmh.com.na TO
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Appendix B: Consultants' Curriculum Vitae

ENVIRONMENTAL SCIENTIST**André Faul**

André entered the environmental assessment profession at the beginning of 2013 and since then has worked on more than 140 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	:	18
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
Basic Fire Fighting	EMTSS, 2017

PROFESSIONAL SOCIETY AFFILIATION:

Environmental Assessment Professionals of Namibia (Practitioner)

AREAS OF EXPERTISE:

Knowledge and expertise in:

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

EMPLOYMENT:

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

PUBLICATIONS:

Publications:	5
Contract Reports	+140
Research Reports & Manuals:	5

ENVIRONMENTAL GEOLOGIST**Wikus Coetzer**

Wikus has 5 years' experience in environmental science related fields with 3 years' experience in conducting environmental impact assessments and preparation of environmental management plans. He holds an honours degree in Environmental Sciences – Environmental Geology from the Northwest-University Potchefstroom (NWU) South Africa. He first completed a B.Sc. degree in Geology and Botany in the required time also from the Northwest University Potchefstroom, South Africa. His honours project focused on the rehabilitation and phytoremediation of various tailings types and soils.

He has working experience as an environmental monitor / assisting environmental officer at Petra Diamonds, Cullinan Diamond Mine (CDM) where he gained a proper understanding of environmental monitoring responsibilities as well as legislations, regulations and the implementation of EMS/ISO14001. He started working at Geo Pollution Technologies in 2017, and regularly conducts/assists and report on environmental impact assessments, environmental management plans and pollution surveys.

CURRICULUM VITAE WIKUS COETZER

Name of Firm	:	Geo Pollution Technologies (Pty) Ltd.
Name of Staff	:	WIKUS COETZER
Profession	:	Environmental Geologist
Nationality	:	South African
Position	:	Environmental Geologist
Specialisation	:	Environmental Geology/ Geochemistry
Languages	:	Afrikaans – speaking, reading, writing English – speaking, reading, writing

**EDUCATION AND PROFESSIONAL STATUS:**

B.Sc. Environmental and Biological Sciences – Geology & Botany
B.Sc. (Hons.) Environmental Sciences – Environmental Geology

: NWU Potchefstroom 2013
: NWU Potchefstroom 2014

First Aid Class A EMTSS, 2017
Basic Fire Fighting EMTSS, 2017

AREAS OF EXPERTISE:

Knowledge and expertise in:

- ◆ Phytoremediation
- ◆ Environmental Geology / Geochemistry
- ◆ Environmental Monitoring
- ◆ Environmental Compliance
- ◆ Environmental Impact Assessments
- ◆ Environmental Management Plans

EMPLOYMENT:

2017 - Date: Geo Pollution Technologies
2015 - 2016: Petra Diamonds CDM – Environmental monitor / Assisting environmental officer
2015: Petra Diamonds CDM – Graduate program: Environmental Officer
2014: NWU Potchefstroom department of Geo and Spatial Sciences – Research assistant

PUBLICATIONS:

Contract Reports: +25