MANICA GROUP NAMIBIA (PTY) LTD

Environmental Management Plan (EMP) for Manica's Storage, Transportation and Handling of Chemicals and Lubricants at the Rennies Container Depot

Located in the Industrial Area of Walvis Bay, Namibia

August 2025

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CURRENT REVISION	DRAFT

ENVIRONEMNTAL CONSULTANT'S EXPERTISE

I.N.K Enviro Consultants cc is the independent firm of environmental consultants that has been appointed by Manica Group Namibia (Pty) Ltd to compile this EMP document.

Immanuel N. Katali, the Environmental Assessment Practitioner holds a B. Arts (Honors) Geography, Environmental Studies and Sociology and has over ten (10) years of relevant experience in conducting/managing Environmental Impact Assessments (EIAs), and Environmental Compliance/Monitoring Audits in Namibia. Immanuel is certified as an Environmental Assessment Practitioner under the Environmental Assessment Professionals Association of Namibia (EAPAN).

Mr. Lucky Bengela, the Hazardous Risk Assessor is a qualified Health and Safety Practitioner and Risk Assessor, with over 20 years of experience ranging from Mining, Construction and Infrastructure Development and Fishing. Lucky is a certified Health and Safety Practitioner by the Namibia Training Authority (NTA).

DECLARATION OF INDEPENDENCE

I.N.K Enviro Consultants cc herewith declare that this report represents an independent assessment of the activities relating to the Storage, Transportation and Handling of Chemicals at the Rennies Container Depot. The Environmental Consultant has prepared this report based on an agreed scope of work and acts in all professional manner as an Independent Environmental Consultant to Manica Group Namibia (Pty) Ltd and exercises all reasonable skill and care in the provision of its environmental professional services in a manner consistent with the level of expertise exercised by members of the environmental profession

DISCLAIMER.

The information, statements and commentary contained in this report have been prepared by I.N.K Enviro Consultants cc from information provided by Manica Group Namibia (Pty) Ltd and a site visit. I.N.K Enviro Consultants cc does not express an opinion as to the accuracy or completeness of the information provided, the assumptions made by the party that provided the information or any conclusions reached. I.N.K Enviro Consultants cc has based this report on information received or obtained, on the basis that such information is accurate and, where it is represented to I.N.K Enviro Consultants cc as such, complete.

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1 INTRODUCTION

1.1 Purpose of the Report

The Environmental Management Plan (EMP) will be implemented during operation. This EMP contains the recommended and control/mitigation measures for monitoring, auditing and taking corrective action during implementation, which are crucial interventions to successfully implement the EMP.

The EMP detail actions to ensure compliance with regulatory bodies. EMP implementation is a cyclical process that converts mitigation measures into actions and through cyclical monitoring, auditing, review and corrective action. Through monitoring and auditing, feedback for continual improvement in environmental performance must be provided and corrective action taken to ensure that the EMP remains effective.

1.2 Introduction and Background

Manica Group Namibia (Pty) Ltd (hereinafter referred to as Manica) presently possesses an Environmental Clearance Certificate (ECC) for the handling and storage of chemicals and lubricants at the Rennies Container Depot (Figure 1).

Manica's ECC was first issued in October 2016 with a validity period until October 2019 to handle and store Swakop Uranium's chemicals and reagents at the Container Depot Facility and Rennies Container Depot. After the ECC has expired, a renewal application was submitted in November 2019 and granted in July 2020.

The first ECC amendment application was submitted in May 2021 with approval granted by the Ministry of Environment, Forestry and Tourism (MEFT) in October 2021. This amendment included the following:

- The inclusion of unitised/packaged lubricants to be stored at all under roof facilities.
- An additional seven (7) chemicals to the current and 2016 approved fifteen (15) chemicals.
- An additional four (4) chemical storage facilities to the current and 2016 approved two (2) storage facilities.

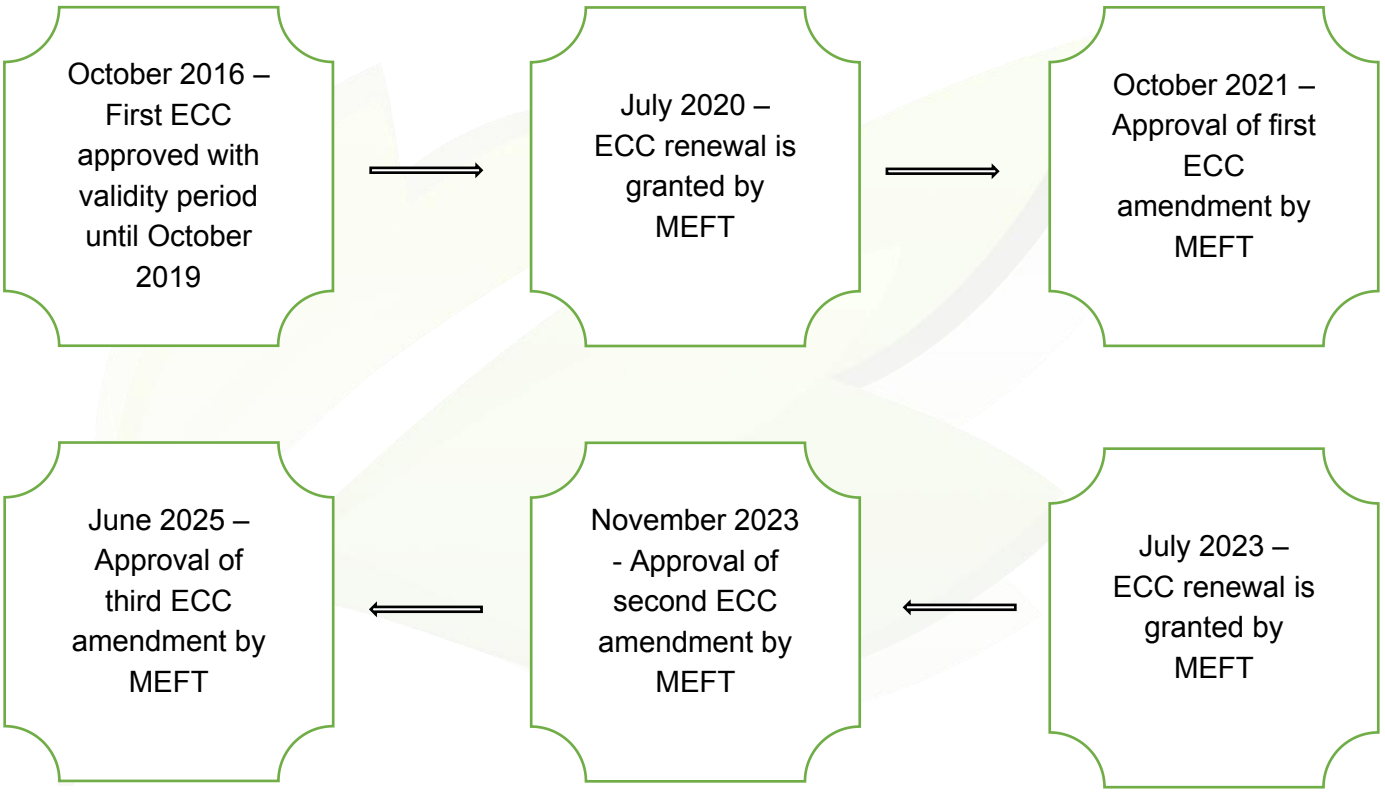
After the ECC expired in July 2023, a renewal application was submitted in April 2023 and approved in July 2023. The second amendment was further approved by MEFT in November 2023 for the inclusion of the following:

- Zinc, Nickel, Chrome, Copper and Coal concentrate in bulk and breakbulk form (breakbulk refers to 1 – 2-ton sling bags or any other industry best practice or customer requests, unitized packaging.

- Cobalt concentrates in breakbulk form.

In June 2025, the third ECC amendment was approved by MEFT to accommodate bulk and breakbulk handling/packaging/bagging of 7 new chemicals proposed for under roof and open/outside storage.

The above is summarized in the flow diagram below:



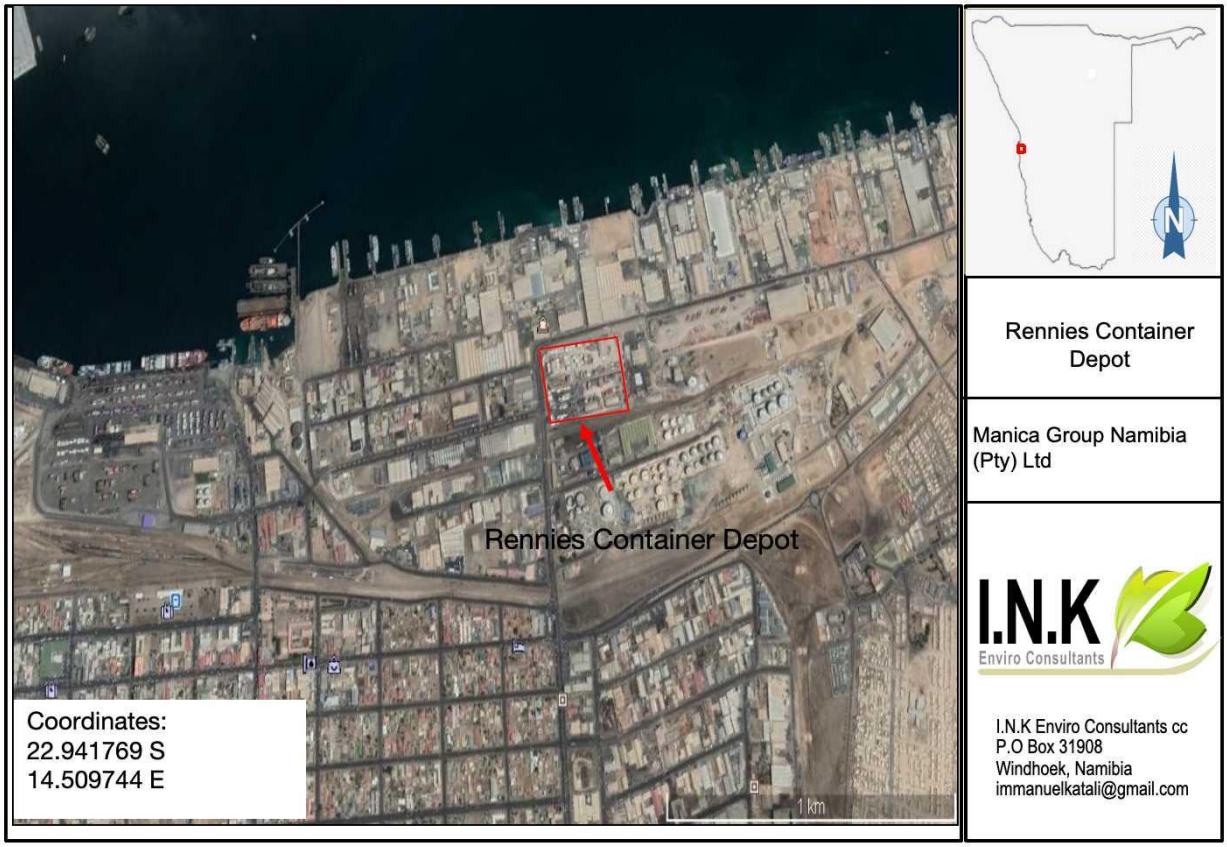


Figure 1: Locality Map

1.3 Rennies Container Depot Storage Description

The table below indicates the storage description of the Container Depot Facility:

Table 3: Rennies Container Depot Storage Warehousing Specifications

Warehouse Area	Type	Area [m^2]	Total [m^2]
Rennies Container Depot	Underroof	2,000	10,000
	Open	8000	

1.4 Project Motivation

Namibia is spending billions expanding its port in Walvis Bay to secure sea lanes and establish itself as a maritime powerhouse on the continent. Its efforts are also designed to capitalize on the growth in shipping demands, increased cargo volumes, oil and gas sectors, business, recreational uses and more.

The Walvis Bay port is part of a much bigger ambition for Namibia to become a logistics hub for southern Africa. The current position of the port is neighbouring residential properties located on the outskirts of the port, indicating that the port does not have enough space to expand and create additional storage space to meet growing demands.

Imported products from landlocked countries, particularly agricultural and mining products, the quantities of chemicals & reagents are extremely large in volumes and need to be loaded onto vessels within a short time. It is not feasible to continuously transport the materials directly to intended parties, locally, regionally, and internationally, over short periods. Temporarily storing the materials within Walvis Bay allows for the materials to be transported to the various target locations over extended periods.

The project has a great potential to boost Namibia's logistics hub capabilities by providing essential warehousing infrastructure, create employment opportunities within the logistics sector and enhance Walvis Bay's status as a regional logistics hub.

1.5 Chemicals and Type of Storage at Rennies Container Depot

The hazardous chemicals/reagents for handling, transportation and storage are as follows:

Table 2: Chemicals and Type of Storage

No.	Chemicals/Reagents	Storage and Handling Conditions
1.	Pyrolusite (Manganese dioxide)	Arriving in shipping containers, packaged in industry standard packaging and stored break bulk.
2.	Activated Carbon	Arriving in shipping containers, packaged in industry standard packaging and stored break bulk.
3.	Flocculant	Arriving in shipping containers, packaged in industry standard packaging and stored break bulk.
4.	Coagulant	Arriving in shipping containers, packaged in industry

No.	Chemicals/Reagents	Storage and Handling Conditions
		standard packaging and stored break bulk.
5.	Grinding Media (SAG mill)	Arriving in shipping containers, packaged in industry standard packaging and stored break bulk.
6.	Grinding Media (Ball mill)	Arriving in shipping containers, packaged in industry standard packaging and stored break bulk.
7.	Extractant	Arriving in shipping containers, packaged in industry standard packaging and stored break bulk.
8.	Modifier	Arriving in shipping containers, packaged in industry standard packaging and stored break bulk.
9.	Sodium Carbonate	Arriving in shipping containers, packaged in industry standard packaging and stored break bulk.
10.	Sodium Hydroxide	Arriving in shipping containers, packaged in industry standard packaging and stored break bulk.
11.	Diatomaceous Earth	Arriving in shipping containers, packaged in industry standard packaging and stored break bulk.
12.	U IX resin	Arriving in shipping containers, packaged in industry standard packaging and stored break bulk.
13.	Ferrous Sulphate	Arriving in shipping containers, packaged in industry standard packaging and stored break bulk.
14.	Sulphur	Arriving in shipping containers, packaged in industry standard packaging and stored bulk and break bulk
15.	Lime	Arriving in shipping containers, packaged in industry standard packaging and stored break bulk.
16..	Urea	Arriving in shipping containers, packaged in industry standard packaging and stored break bulk.
17.	Limestone Ammonium Nitrate	Arriving in shipping containers, packaged in industry standard packaging and stored break bulk.
18.	Mono Ammonium Phosphate	Arriving in shipping containers, packaged in industry standard packaging and stored break bulk.
19.	NPK (Nitrogen, Phosphorous and Potassium)	Arriving in shipping containers, packaged in industry standard packaging and stored break bulk.
20.	Potassium Chloride	Arriving in shipping containers, packaged in industry standard packaging and stored break bulk.
21.	Potassium Sulphate	Arriving in shipping containers, packaged in industry standard packaging and stored break bulk.
22.	Calcium Ammonium Nitrate	Arriving in shipping containers, packaged in industry standard packaging and stored break bulk.

No.	Chemicals/Reagents	Storage and Handling Conditions
23.	Lubricants	Arriving in shipping containers, packaged in industry standard packaging and stored break bulk.
24.	Zinc	Arriving in shipping containers, packaged in industry standard packaging and stored bulk and break bulk
25.	Nickel	Arriving in shipping containers, packaged in industry standard packaging and stored bulk and break bulk
26.	Coal	Arriving in shipping containers, packaged in industry standard packaging and stored bulk and break bulk
27.	Chrome	Arriving in shipping containers, packaged in industry standard packaging and stored bulk and break bulk
28.	Cobalt	Arriving in shipping containers, packaged in industry standard packaging and stored break bulk.
29.	Copper Ore and Concentrates	Arriving in shipping containers, packaged in industry standard packaging and stored bulk and break bulk
30.	Copper Metals	Arriving in shipping containers, packaged in industry standard packaging and stored bulk and break bulk
31.	Diammonium Phosphate	Arriving in shipping containers, packaged in industry standard packaging and stored bulk and break bulk
32.	Light Burned Magnesium Oxide (Magchem-40)	Arriving in shipping containers, packaged in industry standard packaging and stored bulk and break bulk
33.	Magnesium Oxide	Arriving in shipping containers, packaged in industry standard packaging and stored bulk and break bulk
34.	Sodium Hydrosulphide	Arriving in shipping containers, packaged in industry standard packaging and stored bulk and break bulk
35.	Sodium Isobutyl Xanthate	Arriving in shipping containers, packaged in industry standard packaging and stored bulk and break bulk
36.	Sodium Metabisulphite / Sodium Pyrosulphite (SMBS)	Arriving in shipping containers, packaged in industry standard packaging and stored bulk and break bulk
37.	Lithium Ore	Arriving in shipping containers, packaged in industry standard packaging and stored bulk and break bulk

1.6 Goods received from international markets (Imports into SADC)

The table below presents the process for product handling and storage for goods received from international markets. Please take note that the table only includes the products currently in the market.

Table 4: Goods received from international markets (Imports into SADC)

Product	Condition at Receipt	Quayside Activity	Condition of receipt at warehouse	Activities at Warehouse	Condition of storage
Urea	Bulk	Bag into 1-2-ton Bags	1-2-ton bags	Storage of bags and loading of trucks	Underroof
Urea	Bulk	Bulk discharge using hopper into tipper trucks	Bulk receipt from tipper trucks into underroof storage	Bagging into 50kg, 1-2-ton bags (as per customer request), Storage of bags and loading of trucks	Underroof
Diammonium Phosphate	Bulk	Bag into 1-2-ton Bags	1-2-ton bags	Storage of bags and loading of trucks	Underroof and Open storage
Light Burned Magnesium Oxide (Magchem-40)	Containerised	Discharge of containers	In containers	Destuffing of containers, Storage of Bags and Loading of trucks	Underroof and Open storage
Magnesium Oxide	Containerised	Discharge of containers	In containers	Destuffing of containers, Storage of Bags and Loading of trucks	Underroof and Open storage
Sodium Hydrosulphide	Containerised	Discharge of containers	In containers	Destuffing of containers, Storage of Bags and Loading of trucks	Underroof and Open storage
Sodium Isobutyl Xanthate	Containerised	Discharge of containers	In containers	Destuffing of containers, Storage of Bags and Loading of trucks	Underroof and Open storage
Sodium Metabisulphite / Sodium Pyrosulphite (SMBS)	Containerised	Discharge of containers	In containers	Destuffing of containers, Storage of Bags and loading of trucks	Underroof and Open storage
Limestone Ammonium Nitrate	Bulk	Bulk discharge using hopper into tipper trucks	Bulk receipt from tipper trucks into underroof storage	Bagging into 50kg, 1-2-ton bags (as per customer request), Storage of bags and loading of trucks	Underroof

Product	Condition at Receipt	Quayside Activity	Condition of receipt at warehouse	Activities at Warehouse	Condition of storage
Limestone Ammonium Nitrate	Bulk	Bag into 1-2-ton Bags	1-2-ton bags	Storage of bags and loading of trucks	Underroof and Open storage
Mono Ammonium Phosphate	Bulk	Bulk discharge using hopper into tipper trucks	Bulk receipt from tipper trucks into underroof storage	Bagging into 50kg, 1-2-ton bags (as per customer request), storage of bags and loading of trucks	Underroof
Mono Ammonium Phosphate	Bulk	Bag into 1-2-ton Bags	1-2-ton bags	Storage of bags and loading of trucks	Underroof and Open storage
NPK (Nitrogen, Phosphorous and Potassium)	Bulk	Bulk discharge using hopper into tipper trucks	Bulk receipt from tipper trucks into underroof storage	Bagging into 50kg, 1-2-ton bags (as per customer request), Storage of bags and loading of trucks	Underroof
NPK (Nitrogen, Phosphorous and Potassium)	Bulk	Bag into 1-2-ton Bags	1-2-ton bags	Storage of bags and loading of trucks	Underroof and Open storage
Potassium Chloride	Bulk	Bulk discharge using hopper into tipper trucks	Bulk receipt from tipper trucks into underroof storage	Bagging into 50kg, 1-2-ton bags (as per customer request), storage of bags and loading of trucks	Underroof
Potassium Chloride	Bulk	Bag into 1-2-ton Bags	1-2-ton bags	Storage of bags and loading of trucks	Underroof and Open storage
Calcium Ammonium Nitrate	Bulk	Bulk discharge using hopper into tipper trucks	Bulk receipt from tipper trucks into underroof storage	Bagging into 50kg, 1-2-ton bags (as per customer request), storage of bags and loading of trucks	Underroof
Calcium Ammonium Nitrate	Bulk	Bag into 1-2-ton Bags	1-2-ton bags	Storage of bags and loading of trucks	Underroof and Open storage

1.7 Goods received from Local and Regional Markets (Exports)

The table below presents the process for product handling and storage for goods received from local and regional markets (exports). Please take note that the table only includes the products currently in the market.

Table 5: Goods received from Local and Regional markets (Exports)

Product	Condition at Receipt	Condition of receipt at warehouse	Activities at Warehouse	Condition of storage	Quayside Activity
Sulphur	Bulk	Bulk/Break Bulk	Storage and Handling of Bags, Container packing of break bulk bags, and loading of containers onto trucks	Underroof and Outside	Receipt of full containers, or receipt of full skips and discharge onto vessel hull/hold
Copper Concentrates	Break Bulk	Break Bulk	Storage and Handling of Bags, Container packing of break bulk bags, decanting into bulk stockpiles (as per customer request), loading of skips using front-end loader, or loading of containers onto trucks	Underroof and Outside	Receipt of full containers, or receipt of full skips and discharge onto vessel hull/hold
Copper Concentrates	Bulk	Bulk	Storage and Handling of Bulk as per customer request and loading of skips using front-end loaders.	Underroof	Receipt of full skips and discharge onto vessel hull/hold
Cobalt	Break Bulk	Break Bulk	Storage and Handling of Bags, Container packing of break bulk bags, and loading of containers onto trucks	Underroof and Outside	Receipt of full containers and loading onto vessel hull/hold
Zinc	Break Bulk	Break Bulk	Storage and Handling of Bags, Container packing of break bulk bags, decanting into bulk stockpiles (as per customer request), loading of skips using front-end loader, or loading of containers onto trucks	Underroof and Outside	Receipt of full containers, or receipt of full skips and discharge onto vessel hull/hold
Zinc	Bulk	Bulk	Storage and Handling of Bulk as per customer request and loading of skips using front-end loaders.	Underroof	Receipt of full skips and discharge onto vessel hull/hold

Product	Condition at Receipt	Condition of receipt at warehouse	Activities at Warehouse	Condition of storage	Quayside Activity
Nickel	Break Bulk	Break Bulk	Storage and Handling of Bags, Container packing of break bulk bags, decanting into bulk stockpiles (as per customer request), loading of skips using front-end loader, or loading of containers onto trucks	Underroof and Outside	Receipt of full containers, or receipt of full skips and discharge onto vessel hull/hold
Nickel	Bulk	Bulk	Storage and Handling of Bulk as per customer request and loading of skips using front-end loaders.	Underroof	Receipt of full skips and discharge onto vessel hull/hold
Coal	Break Bulk	Break Bulk	Storage and Handling of Bags, Container packing of break bulk bags, decanting into bulk stockpiles (as per customer request), loading of skips using front-end loader, or loading of containers onto trucks	Underroof and Outside	Receipt of full containers, or receipt of full skips and discharge onto vessel hull/hold
Coal	Bulk	Bulk	Storage and Handling of Bulk as per customer request and loading of skips using front-end loaders.	Underroof	Receipt of full skips and discharge onto vessel hull/hold
Chrome	Break Bulk	Break Bulk	Storage and Handling of Bags, Container packing of break bulk bags, decanting into bulk stockpiles (as per customer request), loading of skips using front-end loader, or loading of containers onto trucks	Underroof and Outside	Receipt of full containers, or receipt of full skips and discharge onto vessel hull/hold
Chrome	Bulk	Bulk	Storage and Handling of Bulk as per customer request and loading of skips using front-end loaders.	Underroof	Receipt of full skips and discharge onto vessel hull/hold

2 IDENTIFICATION OF APPLICABLE ENVIRONMENTAL AND SOCIAL GUIDELINES

2.1 Introduction

The Republic of Namibia has five tiers of law and several policies relevant to environmental assessment and protection, which include:

- The Constitution.
- Statutory law.
- Common law.
- Customary law.
- International law.

As the main source of legislation, the Constitution of the Republic of Namibia (1990) makes provision for the creation and enforcement of applicable legislation. In this context and in accordance with its constitution, Namibia has passed numerous laws intended to protect the natural environment and mitigate against adverse environmental impacts.

In the context of the proposed project activities, there are several laws and policies currently applicable. Key legislation and policies are summarized below, and all relevant National Acts, Policies, Plans, as well as International Conventions and Protocols, are listed below.

The EIA Policy (1995) is enforced through the Environmental Management Act, 7 of 2007 and the EIA Regulations of 6 January 2012 (EIA Regulations). In terms of this legal framework certain identified activities may not commence without an environmental clearance issued by MEFT.

2.2 Line Ministries

The following line ministries are applicable:

- Ministry of Environment, Forestry and Tourism.
- Ministry of Agriculture, Water and Land Reform.
- Ministry of Fisheries and Marine Resources.
- Ministry of Health and Social Services.

- Ministry of Mines and Energy.

2.3 National Policies and Plans

Namibia's policies provide the framework to the applicable legislation. Whilst policies do not often carry the same legal recognition as official statutes, policies are used in providing support to legal interpretation. The following policies and plans are applicable:

- The EIA Policy (1995).
- Namibia's Environmental Assessment Policy for Sustainable Development and Environmental Conservation (1995).
- Namibia Vision 2030.
- National Development Plan, 201/2018 – 2021/2022, guided by Vision 2030.
- Policy for the Conservation of Biotic Diversity and Habitat Protection, 1994.
- Namibia's Second National Biodiversity Strategy and Action Plan (2013-2022).
- National Environmental Health Policy (2002).
- National Solid Waste Management Strategy (2020).
- The National Climate Change Policy of Namibia (2010).
- Atmospheric Pollution Prevention Ordinance of 1976.
- Hazardous Substance Ordinance of 1974.

2.4 Summary of Applicable legislation and standards

The following legislation is applicable:

- The Public Health Act 36 of 1919.
- Soil Conservation Act 76 of 1969.
- The Constitution of the Republic of Namibia of 1990.
- Road Traffic and Transport Act, 1999 (No. 22 of 1999).
- Pollution Control and Waste Management Bill (3rd Draft September 2003).
- Labour Act, 2007 (No. 11 of 2007).
- Environmental Management, Act 7 of 2007.
- Regulations promulgated in terms of the Environmental Management Act 7 of 2007.

- Public and Environmental Health Act No. 1 of 2015.
- Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act No. 36 of 1947.
- Air Quality Act (No. 39 of 2004).

3 EMP ADMINISTRATION

Copies of the EMP shall be kept at the site office and will be distributed to all senior contract personnel. All senior personnel shall be required to familiarize themselves with the contents of this document.

4 ROLES AND RESPONSIBILITIES

The implementation of the EMP requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during each phase.

4.1 SHEQ Manager and General Manager (Rennies Consolidated)

The SHEQ Manager together with the General Manager will delegate powers to the Operations Manager and Supervisors who will be required to execute the responsibilities, in compliance with relevant legislation and the EMP.

Any on-site decision regarding environmental management is ultimately shared between the SHEQ Manager, General Manager and Operations Manager, having the following responsibilities in terms of the implementation of this EMP:

- Assisting in finding environmentally responsible solutions to problems with input from Supervisors and relevant personnel where necessary.
- Taking appropriate action where the mitigations/recommendations are not followed.
- Monitoring the undertaking of environmental awareness training for all new personnel coming onto site.

4.2 Operations Manager/Supervisors

The Operations Manager and/or Supervisors will be competent persons (SHE Reps) appointed by Manica or its subsidiaries to implement the on-site environmental

management of this EMP. The Operations Manager and/or Supervisor shall be on site daily and their duties will include the following:

- Maintaining open and direct lines of communication with the SHEQ Department regarding environmental matters.
- Daily site inspections of all areas regarding compliance with the EMP.
- Daily monitoring and verifying adherence to the EMP monitoring and verifying that environmental impacts are kept to a minimum.
- Assisting the SHEQ Department in finding environmentally responsible solutions to problems.

5 ENVIRONMENTAL MONITORING AND AUDITING

Auditing should be conducted bi-annually by an Independent Environmental Consultant. Benefits derived from the audit process may include:

- Identification of environmental risk.
- Development or improvement of the environmental management system.
- Avoidance of financial loss.
- Avoidance of legal sanctions.
- Increase in staff awareness.
- Identify potential cost savings.
- Improve dealings with employees, environmental groups, the community, regulators, media, shareholders, or insurance & finance institutions.
- Establish a history of environmentally responsible operational activities, e.g., through environmental incident reports, environmental monitoring and recording, and reporting to committees or authorities.
- Commonly, the audit of a site will cover all management procedures, operational activities and systems, and environmental issues. The environmental audit will be compiled objectively and conducted by independent entity.

6 ENVIRONMENTAL AWARENESS

Manica shall ensure that the EMP is distributed to all relevant personnel. It is the responsibilities of the Operations Manager and Supervisors to ensure that the workers comply to the EMP measures during operations.

As a minimum, the Operations Managers and Supervisors, along with the SHEQ Coordinator should:

- Explain the importance of complying with the EMP.
- Discussion of the potential environmental impacts of operational activities.
- The benefits of improved personal performance.
- Employees' roles and responsibilities including emergency preparedness.
- Explanation of the mitigation measures that must be implemented when carrying out their activities.
- Explanation of the specifics of this EMP and its specification (no-go areas, etc.)
- Explanation of the management structure of individuals responsible for matters pertaining to the EMP.
- The Operations Manager and Supervisors shall keep records of all environmental training sessions, including names, dates and the information presented.

7 PUBLIC PARTICIPATION

An ongoing process of public participation shall be maintained during operations to ensure the continued involvement of interested and affected parties (I&APs) in a meaningful way. The issues that may arise from the public shall be recorded and presented to the environmental consultant during the bi-annual compliance auditing.

8 ENVIRONMENTAL ACTION PLANS

The management measures proposed to mitigate the potential impacts relating to the construction phase are detailed in the action plans below.

8.1 Action plans to achieve objectives and goals

Table 6:: Action Plan – CHEMICAL PROPERTIES

Objective:

To ensure that the chemical properties of each product are well understood prior to storage and handling/packaging.

CHEMICAL	CHEMICAL CLASS	HANDLING & STORAGE	INCOMPATIBLE MATERIALS	REACTIONS & HEALTH CONCERNS
Pyrolusite (Manganese dioxide)	Stable at ambient temperatures	Store in dry place. Keep away from surface water and groundwater.	Strong oxidiser, reducing agents, aluminium, hydrogen sulphide.	Harmful if swallowed or inhaled, May cause damage to organs (brain) through prolonged or repeated exposure (if inhaled)
Activated Carbon	Stable	Store in dry place. Avoid dust formations	Strong oxidisers, peroxides.	Harmful if swallowed or inhaled.
Flocculant	Stable at ambient temperatures	Cool, dry ventilated area and out of direct sunlight. Store away from sources of heat. Tightly closed containers.	Anionic polymers	Causes severe skin irritation and eye damage

CHEMICAL	CHEMICAL CLASS	HANDLING & STORAGE	INCOMPATIBLE MATERIALS	REACTIONS & HEALTH CONCERNS
Coagulant	Stable at ambient temperatures	Dry ventilated area. Store away from sources of heat.	Aluminium, bases, brass, copper, galvanised metals, iron, steel, zinc	Corrosive to metals. Causes serious eye damage.
Grinding Media (SAG mill)	Stable	Avoid dust formations	Acids, oxidizers, strong reducers, water, oxides of nitrogen, halogens, acetaldehyde, metal carbonates, metal acetylides, metal hexafluorides.	Unlikely to cause hazard in terms of contact.
Grinding Media (Ball mill)	Stable	Avoid dust formations	Acids, oxidizers, strong reducers, water, oxides of nitrogen, halogens, acetaldehyde, metal carbonates, metal acetylides, metal hexafluorides.	Unlikely to cause severe hazard in terms of contact.
Extractant	Stable	No special measures required. Tightly closed containers.	Strong oxidising or reducing agents. Strong acids or strong bases.	Unlikely to cause severe hazard in terms of contact.
Modifier	Stable at ambient temperatures	Store away from sources of heat, sparks or flames. Cool, dry well-ventilated area.	Avoid acids and oxidising agents	Harmful if swallowed or inhaled. Causes severe skin irritation and eye damage

CHEMICAL	CHEMICAL CLASS	HANDLING & STORAGE	INCOMPATIBLE MATERIALS	REACTIONS & HEALTH CONCERNS
Sodium Carbonate	Stable	Avoid dust formations. Original and tightly closed containers	Aluminium, powdered aluminium and acids.	Harmful if swallowed or inhaled. Causes severe skin irritation and eye damage
Sodium Hydroxide	Reactive with water	Cool, dry ventilated area. Tightly closed containers.	Water, strong oxiders, strong acids, metals, combustible materials	Causes severe skin burns and eye damage.
Diatomaceous Earth	Stable under normal conditions	Ensure adequate ventilation. Tightly closed containers. Dry well-ventilated area.	None	Prolonged exposure may cause cancer.
U IX resin	Stable under normal conditions	Tightly closed containers. Dry well-ventilated area.	Strong oxidising agents, nitric acid.	Unlikely to cause severe hazard in terms of contact.
Ferrous Sulphate	Stable under normal conditions	Avoid dust formation. Tightly closed containers. Dry well-ventilated area.	Strong oxidising agents.	Harmful if swallowed or inhaled. Causes severe skin irritation and eye damage
Sulphur	Stable	Avoid dust formation. Tightly closed containers. Cool, dry well-ventilated area away from flammable materials.	Oidising agents, alkali metals, hydrogen, chlorine, fluorine, steel.	Harmful if swallowed or inhaled. Causes severe skin irritation and eye damage

CHEMICAL	CHEMICAL CLASS	HANDLING & STORAGE	INCOMPATIBLE MATERIALS	REACTIONS & HEALTH CONCERNS
Lime	Stable under normal conditions	Avoid dust formation.	Acids. Water.	Harmful if swallowed or inhaled. Causes severe skin irritation and eye damage
Urea	Flammable solids (at high temperatures), otherwise stable	Cool, dry ventilated area. Tightly closed containers.	Oxidizing agents Hypochlorites (calcium/sodium) Sodium nitrate	Decomposes upon heating, can form ammonia, oxides, nitrogen, carbon dioxide or cyanic acid.
Limestone Ammonium Nitrate	Stable at ambient temperatures	Keep away from heat/ignition sources. Keep away from combustible materials. Tightly closed containers. Cool, dry well-ventilated storage.	Sulphur and urea Combustible materials Reducing agents Strong acids/bases Hydrocarbons	Decomposes upon heating, can form ammonia or NOx gases.
Mono-Ammonium Phosphate	Stable at ambient temperatures	Tightly closed containers. Cool, dry well-ventilated storage. Protect from moisture	Alkalis and caustic materials Copper and its alloy Strong acids	Emits irritating fumes when heated. Decomposition released ammonia.
Nitrogen	Compressed gas	Keep away from heat/sunlight.	None	Explosion
Phosphorus	Flammable solids	Keep away from heat/sparks/ open flames. No smoking.	Sulphur Oxidizing agents Nitrates and chlorates	Dust explosion. Combustion.

CHEMICAL	CHEMICAL CLASS	HANDLING & STORAGE	INCOMPATIBLE MATERIALS	REACTIONS & HEALTH CONCERNS
			Organic substances	
Potassium	Reactive with water	Keep away from moisture/water – reacts violently.	Moisture/water Oxidizing agents	Release of flammable gases. Explosion.
Potassium Chloride	Stable	Tightly closed containers Well ventilated	Strong acids/oxidizers	Formation of hydrogen chloride or potassium oxide.
Potassium Sulphate	Stable	Tightly closed containers Well ventilated	Strong oxidizing agents	Formation of sulphur oxides
Calcium Ammonium Nitrate	Stable at ambient temperatures	Keep away from heat/ignition sources. Keep away from combustible materials. Hygroscopic – cakes or disintegrates in humid conditions.	Sulphur Oxidizing agents Organic substances Metallic salts/powders Other fertilizers	Release of nitrogen monoxide/dioxide and ammonia at high temperatures (170degC).
Lubricants	Hydrocarbons	Keep away from heat/ignition sources. Tightly closed containers. Cool, dry, well-ventilated storage.	Bromine, chlorine, chromic acid, fluorine, hydrogen peroxide, and sodium peroxide. Strong oxidizers.	Decomposes in fire conditions or when heated to high temperatures, and inflammable and toxic gases may be released

CHEMICAL	CHEMICAL CLASS	HANDLING & STORAGE	INCOMPATIBLE MATERIALS	REACTIONS & HEALTH CONCERNS
Zinc	Stable under normal conditions	Tightly closed containers. Cool, dry, well-ventilated storage.	Oxidixing Agents. Strong acids/bases.	Reacts with water
Nickel	Stable under normal conditions	Tightly closed containers. Cool, dry, well-ventilated storage.	None	Harmful if swallowed or inhaled. Causes severe skin irritation and eye damage, Causes cancer.
Copper	Stable under normal conditions	Tightly closed containers. Cool, dry, well-ventilated storage.	Ammonium nitrate, bromates, iodates, chlorates, ethylene oxide, hydrazoic acid, potassium oxide, potassium dioxide, dimethyl sulfoxide, trichloroacetic acid, hydrogen peroxide, sodium peroxide, sodium azide, sulfuric acid, hydrogen sulfide, lead azide, chlorine, fluorine, hydrazinium nitrate.	Minimize dust generation and accumulation. Causes severe skin irritation and eye damage.

CHEMICAL	CHEMICAL CLASS	HANDLING & STORAGE	INCOMPATIBLE MATERIALS	REACTIONS & HEALTH CONCERNS
Chrome	Stable under normal conditions	Tightly closed containers. Cool, dry, well-ventilated storage.	Oxidizing agents, acids and alkalis	Harmful if swallowed or inhaled. Causes severe skin irritation and eye damage
Coal	Stable under normal conditions	Tightly closed containers. Cool, dry, well-ventilated storage.	None	Harmful if swallowed or inhaled. Causes severe skin irritation and eye damage
Diammonium Phosphate	Stable at ambient temperatures	Keep away from heat/ignition sources. Cool, dry, well-ventilated storage.	Alkalis, caustic products, strong acids, copper and its alloys	Causes skin irritation and eye irritation, Harmful if swallowed or inhaled
Light Burned Magnesium Oxide (Magchem-40)	Stable at ambient temperatures	Tightly closed containers. Avoid dust formation	Acids	Causes skin irritation and eye irritation. Harmful if swallowed or inhaled

CHEMICAL	CHEMICAL CLASS	HANDLING & STORAGE	INCOMPATIBLE MATERIALS	REACTIONS & HEALTH CONCERNS
Magnesium Oxide	Non-reactive under normal conditions	Tightly closed containers. Avoid dust formation	Acids, bases, oxidising agents	Causes skin irritation and eye irritation. Harmful if swallowed or inhaled
Sodium Hydrosulphide	Hygroscopic	Tightly closed containers. Avoid dust formation. Cool, dry, well-ventilated storage.	Acids, strong oxidising agents, metals, copper.	Causes skin irritation and eye irritation. Harmful if swallowed or inhaled
Sodium Isobutyl Xanthate	Hygroscopic	Tightly closed containers. Avoid dust formation. Cool, dry, well-ventilated storage	Water, oxidising agents, combustible materials, acids, phosgene, sulfur chlorides, copper and copper alloys.	Causes skin irritation and eye irritation. Harmful if swallowed or inhaled
Sodium Metabisulphite / Sodium Pyrosulphite (SMBS)	Stable at ambient temperatures	Keep away from heat/ignition sources. Tightly closed containers.	Strong reducing agents, powdered metals, phosphorous, sulfur compounds, zinc, ammonia, organic materials, acids, amines.	Causes skin irritation and eye irritation. Harmful if swallowed or inhaled

CHEMICAL	CHEMICAL CLASS	HANDLING & STORAGE	INCOMPATIBLE MATERIALS	REACTIONS & HEALTH CONCERNS
Lithium Ore	Stable under normal conditions	Keep away from heat/ignition sources. Tightly closed containers.	Strong oxidizing agents.	Causes skin damage and eye damage. Harmful if swallowed or inhaled.

8.2 Action plans to achieve objectives and goals

APPLICABLE TO OPEN/OUTSIDE AND BULK AND BREAKBULK STORAGE AND HANDLING/PACKAGING

Table 7: Action Plan – MANAGEMENT AND MONITORING

Objective: To ensure that the provisions of the EMP are implemented during operation.

Management and mitigation measures	Action plan	
	Frequency / target date	Responsible parties
• Manica shall ensure that all aspects of EMP are implemented during operation. • The environmental consultant shall conduct bi-annual site inspection and make provision for reporting on every aspect of the EMP.	(On- going	SHEQ Manager, General Manager and Operations

Table 8: Action Plan – Communication and Stakeholder Consultation

APPLICABLE TO OPEN/OUTSIDE AND BULK AND BREAKBULK STORAGE AND HANDLING/PACKAGING

Objective:

To ensure that all stakeholders are adequately informed throughout operations and that there is effective communication.

Management and mitigation measures	Action plan	
	Frequency / target date	Responsible parties
• Manica shall take responsibility for the implementation for all provisions of this EMP and to liaise between community (neighbours) and the authorities (Walvis Bay Municipality and MEFT). • Initiate an efficient Grievance Mechanism to allow potentially affected individuals to voice their concerns on the project.	(On- going	SHEQ Manager, General Manager and Operations

Table 9: Action Plan - Labor Rights

APPLICABLE TO OPEN/OUTSIDE AND BULK AND BREAKBULK STORAGE AND HANDLING/PACKAGING

Objective:

To ensure labour standards are complied with.

Management and mitigation measures	Action plan

Management and mitigation measures	Action plan	
	Frequency / target date	Responsible parties
• Ensure that workers have access to and are aware about the Grievance Mechanism. • Ensure minimum legal labor standards as per ILO regulations (child/forced labor, no discrimination, working hours, minimum wages) are met. • Manica should comply with relevant labor Laws as stipulated by the Labor act. • Ensure all workers implement code of conduct concerning employment and workforce behavior (including but not limited to safety rules, zero tolerance for substance abuse, environmental sensitivity of the area, dangers of sexually transmissible diseases and HIV/AIDS, gender equality and sexual harassment, respect for the beliefs and customs of the populations and community relations in general.) • In case of security personnel at the site, ensure proper training and in the use of force and appropriate conduct toward workers.	(On- going	Human Resources,SHEQ Coordinator.Supervisors

Table 10: **Action Plan – Health and Safety**

APPLICABLE TO OPEN/OUTSIDE AND BULK AND BREAKBULK STORAGE AND HANDLING/PACKAGING

Objective: To ensure health and safety of workers and the public at all times during operations

The following scenarios could lead to hazardous reagents/chemicals being released (spilled), potentially impacting third parties' health and safety:

1. A bag or container being dropped or damaged on the quay side during ship-offloading and breaking open (or in the case of bulk sulphur being off-loaded by the modified grab and hopper – the volume of the grab bucket released).
2. A damaged bag(s) or Intermediate Bulk Container (IBC) spilling its content along the route while being transported between the port and the Manica Facilities
3. A bag or container being dropped or damaged during off-loading at the Manica facilities.
4. A bag, IBC or pallet box being damaged by the forklift or the sun if stored under direct sunlight for long periods at the facility.

Management and mitigation measures	Action plan	
	Frequency / target date	**Responsible parties**
• Manica shall prepare a strategy to ensure the least possible disruption to traffic and potential safety hazards during operations. • The strategy should include a schedule of work including when and how road crossings (operations at existing intersections) will be made. • Proper traffic and safety warning signs must be placed at the warehouses. • The Contractor must adhere to the regulations pertaining to Healthy and Safety, including the provision of personal protective clothing. • Dust protection masks shall be provided where required.	On- going	SHEQ Coordinator, Supervisors and SHE Reps.

Management and mitigation measures	Action plan	
• The contractor must enforce relevant Health and safety Regulations for these specific activities. • Ensure speed limits at the warehouses and on transporting routes. • Use equipment and vehicles in appropriate technical conditions. • Ensure vehicles and equipment are switched off when not in use. • Use protective hearing equipment for workers conducting noisy activities. • Maintain high standard in housekeeping on site. • Provide necessary fire prevention equipment on site in line with applicable regulations. • Implement incident report access to incidents occurring at the warehouses as soon as possible and not later than 24 hours after the incident occurred (including short-and long-term response measures). A major incident is a e.g., fatality, injury, major oil spill, social unrest, outbreak of violence, labour strikes etc. • MSDS obtained prior to purchase/order of chemicals • Risk assessment of area where chemicals are delivered • Training provided for workers who receive chemical deliveries • Rationalizing chemical storage to ensure: • accepting adequate quantities • compatibility of chemicals • adequate storage facilities and space available • all required signage and PPE are available		

Management and mitigation measures	Action plan	
• Proper sign-off strategies for chemicals received, as well as condition in which received • Safe delivery areas and equipment for offloading chemicals • Chemical training for workers • Use personal protective equipment as described in the MSDS • "Firewatch" staff will be identified and trained. • Local induction and emergency training • Emergency procedures in place • Spill kits available • First aid kits and trained first aiders/safety representatives		

Table 11: **Action Plan – Chemical Product/Handling and Storage**

APPLICABLE TO OPEN/OUTSIDE AND BULK AND BREAKBULK STORAGE AND HANDLING/PACKAGING

Objective:

To minimise exposure and spillages as a result of handling and storage

In the very unlikely event of a (large) fire, it shall be assumed that more than one reagent is burning and that the packing material will most likely be involved in the fire. A fire is not a controlled chemical reaction (especially with a variety of reagents and chemicals and packing material); therefore, the release of toxic, corrosive combustion gases, vapours and dusts is likely.

The risk of fires or explosions during handling and transport of the reagents and chemicals is very low (especially considering that the two flammable liquids would have a flash point of app. 100ºC) as long as the containers are in an undamaged state, have not been exposed due to damage to the containers by to excessive UV-radiation (sun) and the shelf life of the chemical is not expired. The flammable reagents and chemicals will only ignite if the containers have been damaged and there are sparks or heat created (mechanical or electrical) in the vicinity of the reagents and chemicals.

Management and mitigation measures	Action plan	
	Frequency / target date	**Responsible parties**
• Regular housekeeping and safety inspections/audits to be conducted by management personnel to ensure continuous compliance with safe operating procedures and safety standards. • "Firewatch" staff will be identified and trained. • Full building Inspections will be carried out by Safety Reps as part of a monthly program. Daily walk-rounds must be carried out to identify any potential issues • The reagents and chemicals shall only be stored in original containers being undamaged and sealed. • Containers, bags, etc. must be handled carefully and stored accordingly to the manufacturer's specifications. • Damaged containers, bags, etc. shall be sealed/repaired immediately with appropriate material. • Broken/damaged bags must be correctly handled & repaired to avoid contamination of	Throughout o(On- going	SHEQ Coordinator, Supervisors and SHE Reps.

Management and mitigation measures	Action plan	
the road and other third parties' facilities. • A Standard Operating Procedure (SOP) must be developed for bag and container handling. • After truck discharge, bags must be inspected to ensure they are not damaged in transit to site and no reagents/chemicals have or will be released. • The storage of hazardous substances indoors will be carried out in well ventilated, cool and dry. • Should deterioration of bags occur due to UV light or any other cause, the bags shall be sealed/repaired immediately with appropriate material. • Storage shall be carried out in facilities with appropriate bunding, specifically relating to the liquids. • Ensure systems are in place to maintain stringent housekeeping standards. • Employees must receive initial training prior to commencing work with hazardous substances and be adequately supervised until they are trained and found competent. • Provide annually rigorous re-fresher safety training to employees to ensure that they remain familiar with the dangers associated with the various hazardous chemicals and reagents. In-house training program being developed for employees. • Manica, various companies/clients will arrange insurance policies with adequate cover to protect third parties against incidents for which Manica and/or various		

Management and mitigation measures	Action plan	

companies/clients is legally liable and such policies will be in line with best practice for Namibian mining/ processing/ and exporting companies.
• Keep the various companies/clients chemicals/reagents away from the other products being stored to avoid any contamination. (refer to specific hazardous substance storage prohibitions above).
• Temporary wind screens should be stored on site to be placed around a spill to further reduce the wind speeds and reduce the potential for wind-blown material in the event of a spill.
• Ensure controls are in place, such as, but not limited to:
  ○ regular inspection is undertaken of NamPort lifting gear on quayside.
  ○ correct inspection of bags prior to filling by dockside personnel is undertaken.
  ○ there are suitable off-loading procedures.
  ○ there is control of ignition sources on quayside during unloading of sulphur.
• Manica to undertake an audit of transportation operations to ensure that proper controls are in place.
• Manica to ensure that there is segregation of incompatible materials
• Manica to ensure an offsite emergency plan is generated with relevant emergency responders.		

Management and mitigation measures	Action plan	
• Manica to ensure an onsite emergency plan is generated. • No foodstuffs will be stored within the facilities where chemicals are stored.		

Table 12: **Action Plan – Waste Management and Water Resource Management**

APPLICABLE TO OPEN/OUTSIDE AND BULK AND BREAKBULK STORAGE AND HANDLING

Objective:

-To avoid contribution to potential surface and groundwater pollution.

-To ensure that sound waste management practices are adhered to during operations.

Management and mitigation measures	Action plan	
	Frequency / target date	**Responsible parties**
• Ensure suitable receptacles with lids for waste disposal is available on site at all times. • If rubbish containers are used, ensure these can be sealed from strong wind • Regular environmental awareness should include potential risks associated with hydrocarbons. • Soil contaminated with hydrocarbons shall be excavated and and transported for disposal at the nearest disposal facility (Walvis Bay Hazardous Disposal Facility).	(On- going	SHEQ Coordinator, Supervisors and SHE Reps.

Management and mitigation measures	Action plan	
• Adequate separate containers for hazardous and domestic waste must be provided on site. • The workforce must be sensitized to dispose of waste in a responsible manner and not to litter. • Oils and lubricants are prevented from spilling using drip trays or other suitable containers. • Accidental spills must be cleaned immediately. The contaminated soil must be suitable for hazardous waste. • Fire extinguishers must be in close proximity to fuel kept on site. There should be trained personnel to handle this equipment. At least two extinguishers should be placed at every entrance/exit.		

Table 13: **Action Plan – Traffic Management**

APPLICABLE TO OPEN/OUTSIDE AND BULK AND BREAKBULK STORAGE AND HANDLING/PACKAGING

Objective:

The objective of the management measure is to appropriately manage traffic impacts

Management and mitigation measures	Action plan	
	Frequency / target date	Responsible parties

Management and mitigation measures	Action plan	
• Ensure that an Emergency Response Plan is in place, in event of an accident. • Ensure dust suppression methods is done at all times to limit the impact of dust on the neighbouring community. • Proper care should be taken when crossings railways in the vicinity of the site. • All drivers must adhere to the speed limit of Namport, while travelling inside the port and when entering warehouses. • Ensure implementation of a detailed safety code of conduct for transport contractor; to be closely monitored with penalties enforced if necessary. • Ensure the trucks keep their distance from one another, to allow other road users to pass safely. • Ensure that an Emergency Response Plan is in place, in event of an accident. The Manica Emergency Response Procedure (OHS-P-001) outlines what must be done in the event of an accident.	(On- going	SHEQ Coordinator, Supervisors and SHE Reps.

Table 14: **Action Plan – Soils**

APPLICABLE TO OPEN/OUTSIDE AND BULK AND BREAKBULK STORAGE AND HANDLING/PACKAGING

Objective:

The objective of the management measures is to minimize hydrocarbon leaks and spills occur (from vehicles and/or machinery) this could result in contamination of the site.

Management and mitigation measures	Action plan	
	Frequency / target date	Responsible parties
• All machinery and vehicles will be adequately maintained so as to prevent leaks and spills. • Should any leaks and hydrocarbon spills occur, these will be contained and cleaned up immediately and disposed of at the Walvis Bay Hazardous waste facility. • Carefully manage the storage and handling of hydrocarbons and other hazardous materials. • Ensure that surface runoff is controlled and impacts on water resources are prevented. • Spill kits will be readily available (i.e. in vehicles or close to transfer positions).	(On- going	SHEQ Coordinator, Supervisors and SHE Reps.

Table 15: Action Plan – Surface Water and Groundwater

APPLICABLE TO OPEN/OUTSIDE AND BULK AND BREAKBULK STORAGE AND HANDLING/PACKAGING

Objective:

To minimize impacts on groundwater and surface water (and the sea)

Management and mitigation measures	Action plan	
	Frequency / target date	Responsible parties

• The area in which the chemicals will be stored will be bounded by bunding and will have an impermeable surface/liner. • An additional measure would be to place the bags which are stored outside onto wooden pallets to raise them above the ground, to protect them from stormwater generated in the area. • Weighted covers (tarpaulin or plastic sheeting) to be placed over the bags to prevent rainfall from falling onto the product and possible contact rainwater ponding below the bags after storms. • Any spillage on site to be cleaned up as soon at seen, to prevent rainwater contact. • Ensure the roof and floor of warehouse are in sound condition. • Repairs to warehouse infrastructure, if leaks are found.	(On- going	SHEQ Coordinator, Supervisors and SHE Reps.

Table 16: Action Plan – Socio-Economic, Noise and Air Quality

APPLICABLE TO OPEN/OUTSIDE AND BULK AND BREAKBULK STORAGE AND HANDLING/PACKAGING

Objective:

To minimize impacts on biophysical environment, neighbours and 3rd parties

Management and mitigation measures	Action plan	
	Frequency / target date	Responsible parties
Emissions from the operations could result in the contamination of the neighboring sites and their products, thereby impacting them economically. The management and mitigation measures in the preceding sections will be implemented in order to manage this risk.	(On- going	SHEQ Coordinator, Supervisors and SHE Reps.