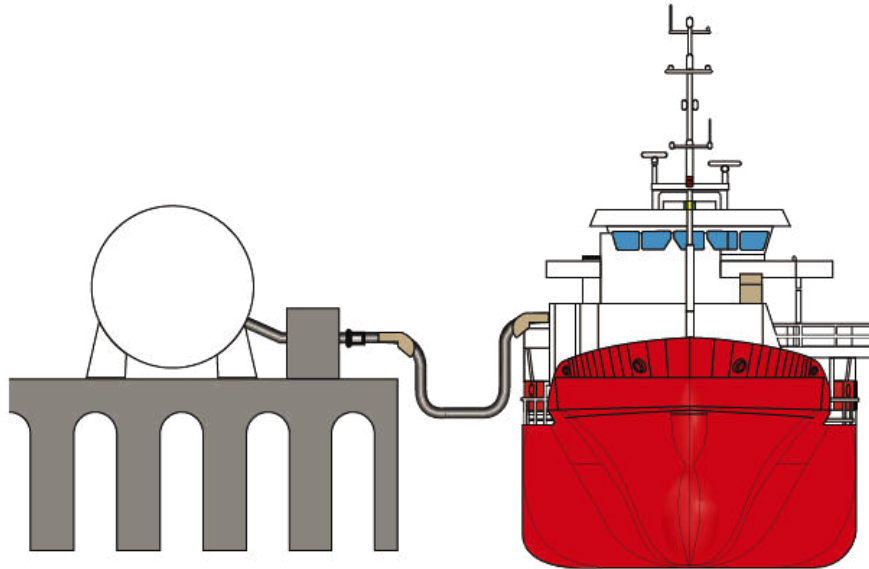

FINAL: ENVIRONMENTAL MANAGEMENT PLAN (EMP)



**FOR THE PROPOSED OFFSHORE REFINED OIL BUNKERING OPERATIONS IN THE NAMIBIAN
EXCLUSIVE ECONOMIC ZONE**

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PROJECT DETAILS

TITLE: FINAL ENVIRONMENTAL MANAGEMENT PLAN FOR THE PROPOSED OFFSHORE REFINED OIL BUNKERING OPERATIONS IN THE NAMIBIAN EXCLUSIVE ECONOMIC ZONE

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DECLARATION

I hereby declare that:

- a. I have the knowledge of and experience in conducting assessments, including knowledge of the Acts, regulations, and guidelines that are relevant to the proposed exploration project.
- b. I have performed the work relating to the application in an objective manner, even if this results in views and findings that are not favorable to the applicant.

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ABBREVIATIONS AND ACRONYMS

CBNRM	Community Based Natural Resource Management
COLREG	Convention on the International Regulations for Preventing Collisions at Sea
DEAF	Department of Environmental Affairs and Forestry
DWAF	Department of Water Affairs
DWSSC	Directorate of Water Supply and Sanitation Coordination
EA	Environmental Assessment
EIA	Environmental Impact Assessment
ENC	Environmental Coordinator
EMP	Environmental Management Plan
EMS	Environmental Management System
MARPOL	International Convention for the Prevention of Pollution from Ships
MEFT	Ministry of Environment, Forestry and Tourism
MAWLR	Ministry of Agriculture, Water and Land Reform
NACSO	Namibian Association of CBNRM Support Organisation
EEZ	Exclusive Economic Zone
NIMPA	Namibian Islands' Marine Protected Area
NGO	Non-Governmental Organisation
NNF	Namibia Nature Foundation
NRM	Natural Resource Management
PPE	Personal Protection Equipment
SANS	South African National Standards

1. ENVIRONMENTAL MANAGEMENT PLAN

1.1. BACKGROUND

Central oil pty LTD intends to operate a refined oil bunkering service in the Namibia's Exclusive Economic Zone. In this respect the proponent has appointed Advanced Environmental Agency Cc to undertake an Environmental Assessment, formulate an Environmental Management Plan (EMP) and apply for an Environmental Clearance Certificate (ECC) to the Ministry of Environment, Forestry and Tourism (MEFT): Directorate of Environmental Affairs and Forestry (DEAF) for the intended development.

This document forms part of the application to the DEAF's office for an ECC for the proposed fuel retail facility (service station) establishment, according to the guidelines and statutes of the Environmental Management Act No.7 of 2007 and the Environmental Impacts Regulations (GN 30 in GG 4878 of 6 February 2012).

1.2. WHAT IS AN EMP

An Environmental Management Plan (EMP) can be defined as *"an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the projects are enhanced"*. EMPs are therefore important tools for ensuring that the management actions arising from Environmental Impact Assessment (EIA) processes are clearly defined and implemented through all phases of the project life-cycle (construction, operation and decommissioning).

1.3. TERMS OF REFERENCE

The Environmental Scoping Assessment conducted by Advanced Environmental Agency Cc producing both Scoping and EMP reports documenting the following:

- A complete description of the existing site proposed for development;
- Significant environmental issues of concern that were based on the baseline data compiled by the environmental assessment team, which took into consideration social, cultural and heritage information;

- An assessment of the public perception on the proposed development.
- Identification of Policies, Legislation and Regulations relevant to the project;
- Prediction of the likely short, medium and long-term impact of the development on the environment, including direct, indirect and cumulative impacts, and their relative importance to the design of the development's facilities;
- Identification of any mitigation actions to be taken to minimize predicted adverse impacts and provide associated costs where applicable and practical;
- Development of an environmental monitoring plan which will ensure that the mitigation measures are adhered to during the implementation phase;

1.4. OBJECTIVES OF THIS EMP

The Environmental Management Plan (EMP) provides a detailed plan of action required in implementation of the mitigation measures for minimizing and maximizing the identified negative and positive impacts respectively. This EMP gives commitments including financial and human resources provisions for effective management of the likely environmental liabilities during and after the exploration. The specific objectives of this EMP are:

- Ensuring compliance with regulatory authority stipulations and guidelines;
- To formulate measures that will mitigate the adverse impacts of the proposed project on various environmental components, which have been identified during the environmental impact assessment.
- To formulate measures to protect environmental resources where possible.
- To formulate measures to enhance the value of environmental components where possible.
- Responding to changes in project implementation not considered in the EIA;
- Responding to unforeseen events; and
- Providing feedback for continual improvement in environmental performance.

1.5. SCOPE OF THIS EMP

To achieve the above objectives, the scope of this EMP will include the followings:

- Definition of the environmental management objectives to be realized during the life of a project (i.e. Planning, Operation and/or decommissioning phases) in order to enhance benefits and minimize adverse environmental impacts.
- Description of the detailed actions needed to achieve these objectives, including how they will be achieved, by whom, by when, with what resources, with what monitoring/verification measures, and to what target or performance level.
- Clarification of institutional structures, roles, communication and reporting processes required as part of the implementation of the EMP.
- Description of requirements for record-keeping, reporting, review, auditing and updating of the EMP.

1.6. HIERACHY OF MITIGATION MEASURES IMPLEMENTATION

This EMP have adopted a hierarchy of methods for mitigating significant adverse effects identified in order of preference and as follows:

- i. Enhancement, e.g. provision of new habitats;
- ii. Avoidance, e.g. sensitive design to avoid effects on ecological receptors;
- iii. Reduction, e.g. limitation of effects on receptors through design changes, and;
- iv. Compensation, e.g. community benefits

1.7. MITIGATION MEASURES IMPLEMENTATION

The EMP provides a detailed plan of action required in the implementation of the mitigation measures for minimizing and maximizing the identified negative and positive impacts respectively. The EMP also provides the management actions with roles and responsibilities requirements for the implementation of environmental management strategies by the proponent through the contractors and subcontractors who will be part and parcel of the proposed project

1.8. WHAT ARE THE LEGAL IMPLICATIONS AND OBLIGATIONS UNDER THIS PLAN?

The EMP will be sent to the Directorate of Environmental Affairs and Forestry (DEAF) of the Ministry of Environment, Forestry and Tourism (MEFT) for approval. Once the DEAF is satisfied with the contents of the EMP, they will issue an Environmental Clearance Certificate (ECC) to the Proponent to go ahead with the proposed project (Operation of the refined oil bunkering activities in the Namibia's Exclusive Economic Zone). The ECC is linked with the recommendations of the Environmental Management Plan.

Once the ECC is issued, the EMP becomes a legally binding document and each role-player including contractors and sub-contractors are made responsible to implement the relevant sections of the EMP and is required to abide by the conditions stipulated in this document.

2. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

An important part of the Environmental Assessment is identifying and reviewing the administrative, policy and legislative situation concerning the proposed activity, to inform the proponent about the requirements to be fulfilled in undertaking the proposed activities. This section looks at the legislative framework within which the proposed development will operate under.

The focus is on the compliance with the legislation during the planning, construction and operational phases. All relevant legislation, policies and international statutes applicable to the project are highlighted in Table 2: Relevant legislation, policies and international statutes applicable to the project below as specified in the Environmental Management Act, 2007 (Act No.7 of 2007) and the regulations for Environmental Impact Assessment as set out in the Schedule of Government Notice No. 30 (2012). Table 1 shows an explanation is additionally provided regarding how these provisions apply to this project

Table 1: Legal instruments relevant to this project

Regulatory Framework	Summary	Applicability
The Namibian Constitution	The State shall actively promote and maintain the welfare of the people by adopting policies aimed at ... The maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future	Protection of the environment and biodiversity
Namibian Ports Authority Act 2 of 1994	To provide for the establishment of the Namibian Ports Authority to undertake the management and control of ports and lighthouses in Namibia and the provision of facilities and services related thereto; and to provide for matters incidental thereto.	Port Bunkering
Marine Traffic Act, No. 2 of 1981 as amended by the Marine Traffic Amendment Act 15 of 1991.	To amend the Marine Traffic Act, 1981, in order to adjust its provisions in view of the independence of Namibia; and to provide for incidental matters.	Monitoring of maritime traffic
Prevention and Combating of Pollution of the Sea by Oil Act No 6 of 1981 (as amended by Act 24 of 1991).	To provide for the prevention and combating of pollution of the sea by oil; to determine liability in certain respects for loss or damage caused by the discharge of oil from ships, tankers or offshore installations; and to provide for matters connected therewith.	To prevent pollution at sea
Environmental Management Act No. 7 of 2007	This act aims to promote the sustainable management of the environment and the use of natural resources and to provides for a process of assessment and control of activities which may have significant effects on the environment; and to provide for incidental matters	The acts provide a list of activities that may not be undertake without an environmental clearance certificate to prevent environmental damages

Water Act No, 54 of 1956	This act states that, all water resources belong to the State. It prevents pollution and promotes the sustainable utilization of the resource. To protect these resources, this act requires that permits are obtained when activities involve the following; (a) Discharge of contaminated into water sources such as pipe, sewer, canal, sea outfall and (b) Disposal of water in a manner that may cause detrimental impact on the water resources	Prevent discharge of pollutant in water
Petroleum Productand Energy Act No, 13 of 1990	This Act provides a framework for handling and distribution of petroleum products which may include purchase, sale, supply, acquisition, possession, disposal, storage or transportation thereof.	Bunkering involves handling of fuel
Draft Pollution Control and Waste Management Bill	This Bill serves to regulate and prevent the discharge of pollutants to air and water as well as providing for general waste management	To protect the Environment from possible pollution
Environmental Policy framework (1995)	This policy subjects all developments and project to environmental assessment and provides guideline for the Environmental Assessment.	Consideration of all possible impacts and incorporate them in the development stages
Hazardous Substances Ordinance 14 of 1974;	To provide for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances	Risk to people during handling fuel
Namibia's 1st National Oil Spill Contingency Plan (NOSCP)	The NOSCP was approved by Cabinet, giving effect to Namibia's obligations under the United Nations Convention on the Law of the Sea, 1982 and the International Convention on Oil Pollution Preparedness, Response and Cooperation, 1990.	The NOCSP provided for a coordinated and integrated national system for dealing with oil spills in Namibian waters.

Regulations Related to the Health and Safety of Employees at Work. Reg No. 156	Promotes the Safety and Health of employees at the work place	Employees working at the facility are prone to water borne disease, especially during cleaning and maintenance.
Public Health Act No. 1 of 2015	To Protect the public from nuisance and states that no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.	Application of proper mitigation measure to prevent water pollution
Labour Act No. 11 of 2007	This Act outlines the labour laws which encompass protection and safety of employees at work.	Ensure that employees at work place are protected
Water Resource Management Act No.11 of 2011	Provide for the management, protection, development, use and conservation of water resources; to provide for the regulation and monitoring of water services and to provide for incidental matters.	Possibility of surface and groundwater contamination.

Table 2: Relevant Multilateral Environmental Agreements for Namibia and the Development

INTERNATIONAL CONVENTIONS	
The International Convention for the Protection of Submarine Cables (1884)	Provide for the protection of submarine cable by establishing that the breaking or injury of a submarine cable, done wilfully or through culpable negligence, and resulting in the total or partial interruption or embarrassment of telegraphic communications, shall be a punishable offence, but the punishment inflicted shall be no bar to a civil action for damages
Geneva Convention on the High Seas (1958)	This convention give provision that the High Seas as being open to all nations; no State may validly purport to subject any part of them to its sovereignty. Freedom of the High Seas is exercised in accordance with other rules of international law, where coastal and non-coastal States shall have freedom of navigation, fishing, lay submarine cables and pipelines and fly over.
United Nations Convention on the Law of the Sea (UNCLOS) (1982)	Namibian is a signatory to UNCLOS which gives provision to claims rights within a 12 nautical mile territorial water and a 200 nautical mile Exclusive Economic Zone (EEZ). Namibia reserves the rights to establish conditions for bunkering in its territory or territorial sea, or its jurisdiction
International Convention for the Prevention of Pollution from Ships (MARPOL) London, 1973	The is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes.

Table 3: Standards or Codes of Practice

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 requirement for spill control s infrastructure.
Namport Specifications and Legislation	<ul style="list-style-type: none"> - Enforced Standards and Codes which governs construction and operations relating to the port.
International Dangerous Goods Code (IMDG Version 10 of 2010)	<ul style="list-style-type: none"> - Prescribed by Namport for handling and storage of dangerous cargo

3. ANTICIPATED ENVIRONMENT IMPACTS, MITIGATION MEASURES – OPERATION AND MAINTANANCE

3.1. POSITIVE IMPACTS

3.1.1. SKILLS, TECHNOLOGY AND DEVELOPMENT

During various phases of operations, training will be provided to a portion of the workforce associated with the bunkering activities. Skills are transferred to an unskilled workforce for general tasks. The technology required for the development of the facility is often new to the local industry, aiding in operational efficiency. Development of people and technology are key to economic development. Employment is sourced locally where possible while skilled labour/contractors may be sourced from other regions.

Table 4: Enhancement actions for Skills, Technology and Development created by the proposed project

Project Phase	Actions (Enhancement)
Operation	<ul style="list-style-type: none">• If the skills exist locally, contractors must first be sourced from the town, then the region and then nationally. Deviations from this practice must be justified.• Skills development and improvement programs to be made available as identified during performance assessments

Desired Outcome: To see an increase in skills in Walvis Bay, Luderitz and other towns within the proximity of the EEZ, as well as development and technology advancements in associated industries.

Responsible body:

- Contractors
- Proponent

Data Sources and Monitoring:

- Record should be kept of training provided.

- Ensure that all training is certified or managerial reference provided (proof provided to the employees) inclusive of training attendance, completion and implementation.

3.1.2. REVENUE GENERATION AND EMPLOYMENT

The change in land use has led to changes in the way revenue is generated and paid to the national treasury. An increase of skilled and professional labour has and will continue to take place due to the operations of the facility. Employment is sourced locally while skilled labour/contractors may be sourced from other regions.

Table 5: Enhancement actions for revenue generated and employment created by the proposed project

Project Phase	Actions (Enhancement)
Operation	<ul style="list-style-type: none"> • 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.

Desired Outcome: Contribution to national treasury and provision of employment to local Namibians.

Responsible Body:

- Proponent

Data Sources and Monitoring:

Bi-annual summary report based on employee records.

3.2. NEGATIVE IMPACTS

3.2.1. OIL SPILLS (SURFACE WATER CONTAMINATION AND RELATED ECOLOGICAL IMPACTS)

The operations of the bunkering system may result in oil spillage even though not likely. Accidental spillages might occur during. Failure of pipes during fuel transfer and hoses can result in hydrocarbon spills. Hydrocarbons can affect plants and animals in the marine ecosystem. Especially the heavier fuel oils settle on beaches and can affect birds and other organisms. It also settles on ocean floors and can impact on benthic (bottom dwelling) organisms. Oil impacts algae, disrupts major food chains and decreases the yield of edible crustaceans. It also coats birds impairing their flight or reducing the insulating property of their feathers, thus making the birds more vulnerable to cold. Oil endangers fish hatcheries in coastal waters and contaminates the flesh of commercially valuable fish within the EEZ. Oil spills can harm marine mammals such as seals, whales and dolphins.

Table 6: Prevention/Mitigation actions of the proposed activities on surface water contamination and related ecological impacts

Project Phase	Actions (Prevention/Mitigation)
Operation	<p>Prevention:</p> <ul style="list-style-type: none">• Strict regulations: Enforce stringent bunkering procedures and spill response protocols.• Regular inspections: Conduct regular inspections of bunkering vessels and equipment to ensure proper maintenance.• Investment in spill response: Invest in equipment and training for rapid and effective spill response.• Develop an emergency response plan for any accidental spill and ensure contact details of all emergency response teams and the Directorate of Maritime Affairs are readily available.• Risk of impact from this can be lowered through proper training of staff.• Tanks must be fitted with alarms to warn on the level reaching a

predetermined level to prevent overfilling.

- Agreed quantities and pumping rates for bunker fuel transfer to the vessels must be confirmed and communicated properly, to eliminate spillage. Tanks must be inspected before the transfer of fuel commences.
- Fuel transfer may only be initiated when environmental conditions (e.g. Wind speed and wave heights) are within parameters that allows the safe transfer of fuel to minimise risks of spills.
- Pipes, hoses must be thoroughly inspected before starting with bunker fuel supply activities.
- Since accidental spills are always possible, recovery vessels, oil fences, and treatment chemicals must be prepared with a view to minimizing dispersal and spills on the surface of the sea.
- Attempts to mitigate the human error factor would include the engineering of specific technologies that will work even in the event of human error.
- Impact on the coastal areas can be mitigated through operating preferably more than 20 km off land, so as to reduce the risk of oil being washed onto beaches.
- The Ministry of Work and, Transport, Directorate of Maritime Affairs, has been designated as the national responsible authority with regard to Oil Spill preparedness, response and cooperation for the Republic of Namibia. The National Marine Pollution Contingency Plan provides a framework for national response to an oil spill. The Plan involves a command structure under which the National Response Team would rapidly respond to any incident with appropriate mechanisms of mobilizing resources in the event of a spill, and even international resources in the event

of a major oil spill. This plan is guided by international norms and practices. The plan outlines the responsibilities for initiating and coordinating the necessary actions to affect protection and clean-up operations.

- Fuel transfers may not be conducted near any of Namibia's islands and within the Namibian Islands' Marine Protected Area (NIMPA). Until such time as the NIMPA regulations may outline regulations on where bunkering may occur with respect to the NIMPA, the guidelines as proposed in the 2012 EIA (Botha & Hooks 2012) must be followed. These are: Figure 3-1 below shows a map of the whole coast with details of MPAs and suggested zones for controlled fuelling. See the coordinates for the limits of the buffer around the NIMPA in Table 3-1. The following points give a brief description for the map:
- A 100 km buffer around the islands, isles and rocks in the NIMPA should not be used for bunkering operations.
- From Conception Bay to Just North of Cape Cross a controlled bunker fuelling buffer zone of 40 km as per the [previous] National Oil Spill Contingency Plan is advised. The greatest risk is during extreme weather conditions (i.e. northwest winds causing southward moving surface current).
- Whenever the wind direction is towards the land, fuelling should be conducted more than 40 km away from the shoreline.
- Fuelling along the coastline inside the controlled bunkering zone more than 100 km south of the NIMPA should take place only with special permission from the Directorate of Maritime Affairs.
- Extra care should be taken whenever fuelling south of Cape Cross and especially so when fuelling closer to the NIMPA areas, when

extreme wind conditions prevail or are predicted.

- Any fuelling within these controlled bunkering zones must have special permission from the Directorate of Maritime Affairs. Onshore wind conditions and rough seas will indicate to the Master of the vessel that no fuelling be carried out even if special permission was granted to fuel closer to the coast. It is important to note that special permission to fuel closer to the coast should not be given for the coastline where the NIMPA exist.

Mitigation:

- Initiate the emergency response plan without delay.

Desired Outcome: To prevent the contamination of the marine environment.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- National Marine Pollution Contingency Plan, MSDS and related maritime standards.
- Report all spills, no matter how small, to the Directorate of Maritime Affairs and other relevant authorities.
- 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, and a copy of documentation in which spill was reported

3.2.2. AIR QUALITY

In terms of air quality, hydrocarbon vapours will normally be released during delivery of bunker fuel to tanks, as liquid displaces the gaseous mixture in the tanks. This will be released through vent pipes on the tanks. The air quality impact will be limited to the bunkering vessel and the receiving vessel. Prolonged exposure of workers to such vapours may have carcinogenic effects.

Table 7: Prevention/Mitigation actions for impacts of the proposed activities on air quality

Project Phase	Actions (Prevention/Mitigation)
Operation	<p>Prevention:</p> <ul style="list-style-type: none">• Vent pipes must be placed in such a manner as to prevent impact on potential receptors. These include ignitions sources and confined spaces where normally frequented by workers• Encourage the use of cleaner fuels with lower sulfur content.• Promote the adoption of emission control technologies on bunkering vessels to reduce air pollution.• Implement proper waste management practices to prevent oil-contaminated water from entering the ocean <p>Mitigation:</p> <ul style="list-style-type: none">• Employees should be trained and capacitated on the dangers of fuel vapours.

Desired Outcome: To prevent health impacts related to fuel vapours

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Any complaints received from workers 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.

3.2.3. HEALTH, SAFETY AND SECURITY

Various activities associated with the operational phase is reliant on human labour and therefore exposes workers to health and safety risks. Activities such as the operation of machinery and handling of hazardous chemicals (inhalation and carcinogenic effect of some petroleum products), poses the main risks to employees. Working at sea increases potential risks to employees which may be realised during rough sea conditions, etc. Security risks are related to unauthorized access, theft and sabotage.

Table 8: Prevention/Mitigation actions for Impacts of the proposed activities on Health, Safety and Security

Project Phase	Actions (Prevention/Mitigation)
Operation	<p>Prevention:</p> <ul style="list-style-type: none">• All Health and Safety standards specified in the Labour Act and various maritime procedures and protocols should be complied with.• Clearly label dangerous and restricted areas as well as dangerous equipment and products.• Ensure material safety data sheets for all related materials are kept on board.• 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.• Implementation of maintenance register for all equipment.• Strict corporate housekeeping as well as active monitoring and screening of the vessels• Equipment that will be locked away on site must be placed in a way that does not encourage criminal activities (e.g., theft).

- Firefighting equipment and first aid kit should be made available and must be serviced regularly.

Mitigation:

- Ensure that all personnel receive adequate training on operation of equipment.
- Personnel to be trained in correct chemical handling procedures, the dangers of chemical exposure, and potential risks of injuries on site.
- All hazardous substances should be handled according to the Material Safety Data Sheets (MSDS).
- 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.
- Maintain a MSDS file on site at a readily accessible location. The MSDS file must continuously be updated and the relevant personnel informed and trained as per the MSDS content.
- Security procedures and proper security measures must be in place to protect workers and other equipment that remain at the site.
- Strict security that prevents unauthorised entry during all phases should be practiced, with access logs for vehicles and personnel.

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

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Labour Act and relevant maritime procedures and protocols.
- Audit results (Health and Safety ISO certificates)

- Any incidents must be recorded with action taken to prevent future occurrences.
- A report should be compiled every 6 months of all incidents reported. The report should contain dates when trainings were conducted and when safety equipment and structures were inspected and maintained.

3.2.4. FIRE AND EXPLOSION

Operational and development activities may increase the risk of the occurrence of fires. Hydrocarbons are volatile under a certain condition and their vapour in specific concentrations are flammable, therefore if precautions are not followed it may result in fire and subsequent safety risks. Certain products that may be kept on site can be flammable in nature and can even become explosive when exposed to incompatible materials. Diesel stored in the consumer fuel installation also presents a fire risk.

Table 9: Prevention/Mitigation actions for possible fire and explosion from the proposed activities

Project Phase	Actions (Prevention/Mitigation)
Operation	Prevention: <ul style="list-style-type: none"> • Emergency response procedures should be in place so as to alert the employees on how to react to fire and explosions incidents. • Ensure all chemicals are stored strictly according to MSDS and SANS instructions. This includes segregation of incompatible products. • 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 operation and maintenance of the consumer fuel installation. All dispensers must be equipped with

devices that cut fuel supply during fires.

- A holistic fire protection and prevention plan is needed for flammable products and the consumer fuel installation. This plan must include an emergency response plan, firefighting plan and spill recovery plan, and should include specific substances handled at the site.
- Ensure sufficient water is available all the time for firefighting purposes
- Maintain firefighting equipment, good housekeeping and personnel training (firefighting, fire prevention and responsible housekeeping practices).
- An incident reporting procedure should also be implemented to make the employees aware of how, when and to whom to report fire and explosion incidents
- It is recommended that electrical wiring of the facility is properly installed and approved by qualified electrician who issues a certificate of compliance.

Mitigation:

- In case of a fire, the firefighting plan must be initiated immediately and all emergency procedures must be performed as practiced during training.

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

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 every 6 months of all incidents reported. The report should contain dates when fire drills were conducted and when fire equipment was tested and training given.

3.2.5. NOISE

An increase in noise pollution will be observed during the operation phase as a result of bunkering activities. Underwater noise generated by bunkering operations can disrupt marine mammals' communication and navigation, affecting their behavior and survival.

Table 10: Prevention/Mitigation actions for possible noise impacts from the proposed activities

Project Phase	Actions (Prevention/Mitigation)
Operation	<p>Prevention:</p> <ul style="list-style-type: none">• All machinery must be regularly serviced to ensure minimal noise production.• During the design phase, the facility should be designed to minimize noise impacts. This could include using noise barriers or sound-absorbing materials to reduce noise levels.• Quieter bunkering technologies: Encourage the development and adoption of quieter bunkering technologies. <p>Mitigation:</p> <ul style="list-style-type: none">• Time restrictions: Restrict bunkering activities to specific times to minimize disruption to marine life.

Desired Outcome: To prevent any nuisance and disruption of marine life due to excessive noise.

Responsible body:

- Proponent
- Contractors

Data Sources and Monitoring:

- WHO Guidelines.
- Maintain complaints register.

3.2.6. WASTE GENERATION

Activities on board the bunker barge will create various types of waste. These include oils and greases from maintenance activities, sewerage, kitchen waste from the galleys and plastics and paper from packaging and administration activities. Waste entering the ocean (accidentally or purposefully discarded) can remain there for long periods of time or come ashore and litter the beaches. Waste may include hazardous waste associated with the handling of hydrocarbon products and used products (such as old oil, chemicals) etc.

Table 11: Prevention/Mitigation actions for possible waste generated from the proposed activities

Project Phase	Actions (Prevention/Mitigation)
Operation	<p>Prevention:</p> <ul style="list-style-type: none">• Adhere to International Convention for the Prevention of Pollution from Ships (Marpol) requirements related to waste and sewerage handling and or discharge.• Waste reduction measures should be implemented and all waste that can be re-used / recycled must be kept separate.• Ensure adequate temporary waste storage facilities are available.• Ensure waste cannot be blown away by wind.• Biodegradable sewerage waste may be dumped in the ocean according to accepted maritime standards. The sewage waste discharge from the ship is regulated under MARPOL Annex IV. The regulation states that: – Every ship of 400 GT and above which is engaged in international voyages, and carrying minimum 15 persons onboard must be equipped with either a sewage holding tank of appropriate capacity or an approved sewage Treatment

	<p>Plant (STP) or both. The sewage discharge from the ship is allowed if it has an approved sewage treatment plant, which can treat the raw sewage and discharge comminuted and disinfected sewage. With this arrangement, the discharge is allowed at a distance of more than 3 nautical miles from the nearest land when the ship is proceeding with a speed of 4 knots and above.</p> <ul style="list-style-type: none"> • The support vessel that supplies crew changes should be used to remove all other forms of waste which when brought to land can be dumped at the local landfill <p>Mitigation:</p> <ul style="list-style-type: none"> • Employ and maintain spill control measures for accidental hydrocarbon pollution according to industry requirements.
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Desired Outcome: To reduce the amount of waste produced, and prevent pollution and littering.

Responsible body:

- Proponent
- Contractors

Data Sources and Monitoring:

- National Marine Pollution Contingency Plan and relevant maritime procedures (e.g.MARPOL).
- 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.
- Spill control structure should be regularly inspected.
- All information and reporting to be included in a bi-annual report

3.2.7. INCREASED VESSEL TRAFFIC:

Increased bunkering activity leads to more vessel traffic, raising the risk of collisions and groundings, which can damage sensitive marine habitats.

Table 12: Prevention/Mitigation actions for possible solid and liquid waste generated by the proposed project

Project Phase	Actions (Prevention/Mitigation)
Operation	<p>Prevention:</p> <ul style="list-style-type: none">• Appoint only suitably qualified and experienced personnel versed in the details of, among others, the Convention on the International Regulations for Preventing Collisions at Sea (COLREGs).• Ensure all safety and communications equipment on the vessel, regularly inspected and maintained to be in a working order at all times. And that relevant crew are trained in the use of the equipment, including emergency equipment and procedures when normal systems fail. <p>Mitigation:</p> <ul style="list-style-type: none">• Implement traffic separation schemes and designated bunkering zones to minimize congestion and the risk of accidents. The proponent should ensure the Clearly demarcation of bunkering zones and establish communication protocols to ensure safe navigation for all vessels.• Enforce speed restrictions in sensitive areas to reduce the risk of groundings.

Desired Outcome: To prevent collisions between vessels operating in the area.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- COLREGs and other industry standards and regulations

4. ENVIRONMENTAL MANAGEMENT PLAN ORGANIZATION AND IMPLEMENTATION

During the construction phase, contractors, as well as site-in-charge, will be responsible for implementing all the mitigation measures mentioned above. In the operational phase, the work will be continued along with post monitoring. In the preceding sections, the environmental aspects which may be affected by the proposed project have been categorized into negative and positive impacts. As an extension of the preceding sections, this section summarizes the objectives, indicators to be observed, schedules to adhere to, and the roles and responsibilities of various stakeholders to the EMP. The following tables give the mitigation measure to be undertaken during the exploration & operational phase respectively with the agency responsible for implementation.

The following abbreviations are used to indicate who is responsible for what impact mitigation objective:

- | | |
|---|-------------|
| • Contractor Environmental Coordinator | CENC |
| • Site Foreman | SF |
| • Project manager | PM |
| • Project Proponent | PP |
| • Environmental Commissioner | EC |

Table 13: Project Planning and Implementation

Objectives	Indicators	Schedule	Responsibility
Establish a strong environmental protocol from project implementation to final closure to ensure the least possible impacts on the environment	Resources (Financial, human, equipment and safety gear) are provided for the awareness, meetings, monitoring, and reporting.	At the beginning of the Bunkering phase.	PP
To maximize the economic spin-off into the local economy.	Expedite the appointment of a senior person to assume the responsibility of an environmental coordinator (ENC)	At the planning stage or at the beginning of the implementation phase of the bunkering process	PP

5. MONITORING THE EMP

Monitoring of the EMP performance for the proposed project by the Contractor emphasizes early dictation, reporting, and corrective action. It is divided into three parts, namely:

- Monitoring of project activities and actions to be undertaken by the Environmental Coordinator (ENC) appointed by the Contractor.
- The Environmental Coordinator (ENC) shall report all incidents and situations which have the potential of jeopardizing compliance of statutory provisions as well as provisions of this EMP to the Project Proponent.
- The Environmental Coordinator (ENC) shall take corrective prompt measures, adequate and long-lasting in addressing non-compliance activities or behavior.

To ensure compliance of the Contractor ENC to the implementation of the EMP, it is highly recommended that an External Environmental Expert is appointed by the proponent to ensure the implementation of the EMP. The tables (5-9) provided below are to be used for monitoring purposes by the Contractor's ENC.

6. ENVIRONMENTAL CODE OF CONDUCT

The Code of Conduct outlined in this section of the EMP applies and is not limited to, subcontractors, visitors, permanent and temporal workers. Therefore, anybody who finds him or herself within the boundaries of the proponent must adhere to the Environmental Code of Conduct as outlined in this section of the EMP.

- The Contractor ENC will implement on-site environmental guidelines and has the authority to issue warnings as well as discipline any person who transgresses environmental rules and procedures. Persistent transgression of environmental rules will result in a disciplinary hearing and thereafter continued noncompliance behaviour will result in permanent removal from the operation sites.

Natural environment management guidelines

- a. Never feed, tease or play with, hunt, kill, destroy or set devices to trap any wild animal (including birds, reptiles and mammals), livestock or pets. Do not bring any wild animal or pet to the construction sites;
- b. Do not pick any plant or take any animal out of the construction area EVER. You will be prosecuted and asked to leave the project area;
- c. Never leave rubbish and food scraps or bones where it will attract animals, birds or insects. Rubbish must be thrown into the correct rubbish bins or bags provided;
- d. Protect the surface material by not driving over it unnecessarily;
- e. Do not drive over, build upon, or camp on any sensitive habitats for plants and animals;
- f. Do not cut down any part of living trees/bushes for firewood;
- g. Do not destroy bird nest, dens, burrow pits, termite hills, etc. or any other natural objects in the area.

Health and safety guidance

- a. Drink lots of water every day, but only from the freshwater supplies;
- b. Take the necessary precautions to avoid contracting the HIV/AIDS virus;
- c. Never enter any area that is out of bounds, or demarcated as dangerous or wander off without informing or permission of team leader;
- d. Never climb over any fence or trespass on private property without permission of the landowner or consultation with the Environmental Coordinator, Site Manager.
- e. Report to your Contractor if you see a stranger or unauthorized person in the construction area;

- f. Do not remove any vehicle, machinery, equipment or any other object from the construction campsite or along with the profile or at a seismic testing station without permission of your Contractor or Site Manager;
- g. Wear protective clothing and equipment required and according to instructions from your Contractor or Site Manager;
- h. Don not engages in sexual relations with minors and also adheres to zero tolerance to spread HIV/AIDS.

Preventing pollution and dangerous working conditions guidance

- I. Never throw any hazardous substance such as fuel, oil, solvents, etc. into streams or onto the ground;
- II. Never allow any hazardous substance to soak into the soil;
- III. Immediately tell your Contractor or Environmental Coordinator when you spill or notice any spillage of hazardous substance anywhere in the field or camp;
- IV. Report to your Contractor or Environmental Coordinator when you notice any container, which may hold a hazardous substance, overflow, leak or drip;
- V. Immediately report to your Contractor or Environmental Coordinator when you notice overflowing problems or unhygienic conditions at the ablution facilities, vehicles, equipment and machinery, containers and other surfaces.

Disposal of solid and liquid waste guidance

- a. Learn to know the difference between the two main types of waste, namely: General Waste; and Hazardous Waste.
- b. Learn how to identify the containers, bins, drums or bags for the different types of wastes. Never dispose of hazardous waste in the bins or skips intended for general waste or construction rubble;
- c. Never burn or bury any waste on the camp or in the field;
- d. Never overfill any waste container, drum, bin or bag. Inform your Contractor or the Environmental Coordinator/ Site Manager if the containers, drums, bins or skips are nearly full;

- e. Never litter or throwaway any waste on the site, in the field or along any road.
- f. No illegal dumping;
- g. Littering is prohibited.

Dealing with environmental complaints guidance

- a. If you have any complaint about dangerous working conditions or potential pollution to the environment, immediately report this to the Environmental Coordinator
- b. If any person complains to you about noise, lights, littering, pollution, or any other harmful or dangerous condition, immediately report this to your Contractor.

7. CONCLUSION AND RECOMMENDATIONS

7.1. CONCLUSION

The fundamental principle behind environmental assessments (EAs) is to ensure a balance in social, economic and environmental needs, particularly when proposed projects are of such a nature that they negatively affect some needs at the expense of the other. Ultimately, EAs should enhance proposed projects' propensity towards being more beneficial and important by suggesting measures, designing and implementing programs and plans to that effect.

Against this background, it is anticipated that this project will be beneficial and important to the proponent, national economy, the local social conditions, and the local economy if the guidelines and mitigation measures suggested in this EMP are implemented. However, it should be acknowledged that disturbance to the environment will be incurred, but that will be minimal and within legally acceptable levels.

This EMP should be viewed as a framework for integrating mitigation measures and applicable legal tools to ensure both compliance and sustainability. It is therefore very important that the proponent provides adequate resources (human, financial, tangible and intangible assets) for the implementation of the plan.

7.2. RECOMMENDATION

The proposed refined oil bunkering may go ahead provided that all the provisions of the EMP, as well as all issued permits, are followed. Recommended actions to be implemented by the proponent as part of the management of the likely impacts through implementations of the EMP are:

- Contract an Environmental Coordinator / Consultant / suitable in-house resources person to lead and further develop, implement and promote environmental culture through awareness-raising of the workforce, contractors and sub-contractors in the field during the whole duration of the proposed mining program period;
- Provide with other support, human and financial resources, for the implementation of the proposed mitigations and effective environmental management during the planned mining activities;
- Develop a simplified environmental induction and awareness program for all the workforce, contractors and sub-contractors;
- Where contracted service providers are likely to cause environmental Impacts, these will need to be identified and contract agreements need to be developed with costing provisions for environmental liabilities;
- Implement internal and external monitoring of the actions and management strategies developed during the bunkering duration and a final Environmental Monitoring report be prepared by the Environmental Coordinator / Consultant / Suitable in-house resource person and to be submitted to the regulators and to end the proposed oil bunkering project;
- Develop and implement a monitoring program that will fit into the overall company's Environmental Management Systems (EMS) as well as for any future EIA for possible Oil Bunkering projects.

It is hereby recommended that proponent take all the necessary steps to implement all the recommendations of the EMP for the successful implementation and completion of the proposed operation of the refined oil bunkering project in the EEZ .

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