ENVIRONMENTAL MANAGEMENT PLAN (EMP)

ROCKY CREST SERVICE STATION

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1. INTRODUCTION AND BACKGROUND

This Environmental Management Plan (EMP) serves as a managing tool for the construction, operation and possible decommissioning of the proposed new fuel retail facility in Rocky Crest (Windhoek). The EMP is developed to outline measures to be implemented in order to minimise adverse environmental degradation associated with this development.

The EMP serves as a guiding tool for the contractors and workforce on their roles and responsibilities concerning environmental management on site, and also provides an environmental monitoring framework for all project phases of the development. This environmental management plan aims to take a pro-active route by addressing potential problems before they occur. The EMP acts as a stand-alone document, which can be used during the various phases of the development.

In this report,

a) the **Contractor** (its sub-contractors, including fuel suppliers) refers to construction personnel responsible for the *construction and maintenance activities* of the project.

b) the **Proponent** refers to VIVO Energy Namibia Ltd / Rocky Crest Service Station, its employees and staff responsible for the *operation activities* of the project.

The purpose of the EMP is to:

- ✓ Train employees and contractors with regard to environmental obligations.
- ✓ Promote and encourage good environmental management practices.
- ✓ Outline responsibilities and roles of Vivo Energy Ltd and the contractor in managing the environment.
- ✓ Describe all monitoring procedures required to identify environmental impacts.
- ✓ Minimise disturbance of the natural environment.
- ✓ Develop waste management practices.
- ✓ Prevent all forms of pollution.
- ✓ Protect the natural environment.
- ✓ Prevent soil and water erosion.
- ✓ Comply with all applicable laws, regulations and standards for environmental protection.

The construction and operation of the proposed fuel retail facility entails:

- ✓ Construction of buildings and associated facilities.
- ✓ The installation of new fuel retail facility.
- ✓ Construction of spill control measures.

- ✓ Installation of associated electrical supply.
- ✓ Installation of reticulation pipelines and associated dispensing points.
- ✓ Transport of fuel supply with road transport tanker trucks.
- ✓ Dispensing of fuel into vehicles and other approved containers.

The possible decommissioning of the proposed fuel retail facility entails:

- ✓ Removal of all infrastructure not reused during future use of land; and
- ✓ Rehabilitation of the land.

2. LEGISLATIVE FRAMEWORK

A. The Namibian Constitution

The Namibian Constitution has a section on principles of state policy. These principles cannot be enforced by the courts in the same way as other sections of the Constitution. But they are intended to guide the Government in making laws which can be enforced.

The Constitution clearly indicates that the state shall actively promote and maintain the welfare of the people by adopting policies aimed at management of ecosystems, essential ecological processes and biological diversity of Namibia for the benefit of all Namibians, both present and future.

B. Environmental Management Act No.7 of 2007

This Act provides a list of projects requiring an Environmental assessment. It aims to promote the sustainable management of the environment and the use of natural resources and to provide for a process of assessment and control of activities which may have significant effects on the environment; and to provide for incidental matters.

The Act defines the term "*environment*" as an interconnected system of natural and human-made elements such as land, water and air; all living organisms and matter arising from nature, cultural, historical, artistic, economic and social heritage and values.

The Environmental Management Act has three main purposes:

(a) to make sure that people consider the impact of activities on the environment carefully and in good time

(b) to make sure that all interested or affected people have a chance to participate in environmental assessments

(c) to make sure that the findings of environmental assessments are considered before any decisions are made about activities which might affect the environment.

Line Ministry: Ministry of Environment and Tourism

C. Water Resources Management Act of Namibia (2004) *(Guideline only)*

The Water Resource Management Act (2004) has been promulgated but not yet implemented as the regulations are still being drafted. This act repealed the existing South African Water Act No.54 of 1956 which was used by Namibia, however the Act describes procedures and stipulations which are much more stringent than those contained in the Water Amendment Act.

This Act ensures that Namibia's water resources are managed, developed, protected, conserved and used in ways which are consistent with fundamental principles depicted in section 3 of this Act. Part IX regulates the control and protection of groundwater resources. Part XI, titled Water Pollution Control, regulates discharge of effluent by permit.

Line Ministry: Ministry of Agriculture, Water Affairs and Forestry

D. Water Act No. 54 of 1956

This Act provides for Constitutional demands including pollution prevention, ecological and resource conservation and sustainable utilisation. In terms of this Act, all water resources are the property of the State and the EIA process is used as a fundamental management tool.

A water resource includes a watercourse, surface water, estuary or aquifer, and, where relevant, its bed and banks. A watercourse means a river or spring; a natural channel in which water flows regularly or intermittently; a wetland lake or dam, into which or from which water flows; and any collection of water that the Minister may declare to be a watercourse. Permits are required in terms of the Act for the undertaking of the following activities relevant to the proposed project:

- Discharge of waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit in terms of Section 21 (f); and
- Disposal of waste in a manner that may detrimentally impact on a water resource in terms of Section 21 (g).

E. The Draft Wetland Policy (1993)

The Policy requires that any wetlands and its associated hydrological functions form a part, to be managed in such a way that their biodiversity, vital ecological functions and life support systems are protected for the benefit of present and future generations.

F. Sewerage and Drainage Regulations (amendments) Local authorities act, section 23 (1992)

The regulations make provision for proper construction of pipelines in drainage lines. The regulations also stipulate the prevention of pollution and environmental damage caused by improper construction of sewerage and water pipelines in drainage lines.

G. Soil Conservation Act (No.76 of 1969)

The Act advocates for the Prevention and combating of soil erosion, conservation, improvement and manner of use of soil and vegetation, and protection of water resources.

Line Ministry: Ministry of Environment and Tourism

H. Draft Pollution Control and Waste Management Bill

The proposed project of the fuel retail facility in Rocky Crest, only applies to Parts 2, 7 and 8 of the Bill.

Part 2 stipulates that no person shall discharge or cause to be discharged any pollutant to the air from a process except under and in accordance with the provisions of an air pollution licence issued under section 23. It further provides for procedures to be followed in licence application, fees to be paid and required terms of conditions for air pollution licences.

Part 7 states that any person who sells, stores, transports or uses any hazardous substances or products containing hazardous substances shall notify the competent authority, in accordance with sub-section (2), of the presence and quantity of those substances.

Part 8 calls for emergency preparedness by the person handling hazardous substances, through emergency response plans.

I. Environmental Assessment Policy of Namibia (1995)

Environmental Assessments (EA's) seek to ensure that the environmental consequences of development projects and policies are considered, understood and incorporated into the planning process, and that the term ENVIRONMENT (in the context of IEM and EA's) is broadly interpreted to include biophysical, social, economic, cultural, historical and political components.

Line Ministry: Ministry of Environment and Tourism

Apart from the requirements of the Environmental Assessment Policy, the following sustainability principles needs to be taken into consideration, particularly to achieve proper waste management and pollution control:

- ✓ **Cradle to Grave Responsibility**

This principle provides that those who manufacture potentially harmful products should be liable for their safe production, use and disposal and that those who initiate potentially polluting activities should be liable for their commissioning, operation and decommissioning.

- ✓ **Precautionary Principle**

There are numerous versions of the precautionary principle. At its simplest it provides that if there is any doubt about the effects of a potentially polluting activity, a cautious approach should be adopted.

- ✓ **The Polluter Pays Principle**

A person who generates waste or causes pollution should, in theory, pay the full costs of its treatment or of the harm, which it causes to the environment.

- ✓ **Public Participation and Access to Information**

In the context of environmental management, citizens should have access to information and the right to participate in decisions making.

J. Atmospheric Pollution Prevention Ordinance of Namibia No. 11 of 1976)

The Ordinance prohibits anyone from carrying on a scheduled process without a registration certificate in a controlled area. A certificate must be issued if it can be demonstrated that the best practical means are being adopted for preventing or reducing the escape into the atmosphere of noxious or offensive gases produced by the scheduled process. Best practice would be to notify the line Ministry about emissions but it is not a legal requirement.

Line Ministry: Ministry of Health and Social Services

K. Hazardous Substances Ordinance No. 14 of 1974

The Ordinance applies to the manufacture, sale, use, disposal and dumping of hazardous substances, as well as their import and export and is administered by the Minister of Health and Social Welfare. Its primary purpose is to prevent hazardous substances from causing injury, ill-health or the death of human beings.

Line Ministry: Ministry of Health and Social Services

3. ENVIRONMENTAL MANAGEMENT PLAN

3.1 Responsibilities for Environmental Management

VIVO Energy Namibia Ltd will be responsible for environmental control on site during the construction and operational phase. It is very important a pre-construction briefing meeting be held to reach an agreement on specific roles of various parties and penalties for non-compliance.

3.2 Training and Induction

Vivo Energy Ltd is bound to be responsible for ensuring that environmental awareness education of all employees and contractors is done satisfactorily. The facility

management should ensure that employees and contractors are made aware of the environmental requirements of the project.

The EMP should form part of the Terms of Reference for all contractors, sub-contractors and suppliers. All contractors, sub-contractors and suppliers will have to sign an agreement to assure that they understood the EMP and that they will comply. All senior staff should familiarise themselves with the full contents of the EMP and its implications. Senior staff is expected to train and assist the rest of the employees on the contents of the EMP.

3.3 Environmental Incident Reporting

All environmental incidents occurring at the proposed site will be recorded. The incident report will have to include time, date, location, and nature of the incident, extent of the incident, actions taken, and personnel involved.

All complaints received from the neighbouring community should be directed to the manager of VIVO Energy Namibia Ltd. Management should be able to respond to the complainant within a week (even if pending further investigation).

3.4 Environmental Monitoring

Periodic environmental monitoring must be taken on a regular basis. Monitoring should be done in order to ensure compliance with all aspects of the EMP. Findings should be liaised with to all responsible officers as chain command.

3.5 EMP Administration

Copies of this EMP shall be kept at the site office and should be distributed to all senior staff members, including those of the contractors.

3.6 EMP Amendments

The EMP amendments can only be made with the approval of the DEA. Amendments to the EMP should be liaised to all employees and contractors.

3.7 Non compliance of the EMP

Problems may occur in carrying out mitigation measures or monitoring procedures that could result in non-compliance of the EMP. The responsible personnel should encourage staff to comply with the EMP, and address acts of non-compliance and penalties.

3.8 Environmental Control Officer

The Environmental Control Officer for the site can be an independent environmental consultant (e.g. Matrix Consulting Services) appointed by VIVO Energy Namibia Ltd to monitor and review the on-site environmental management and implementation of this EMP.

3.9 Site Management

Areas outside this designated working zone shall be considered “no go” areas. The offloading zones must be clearly demarcated when offloading goods to enhance safety around the proposed development.

3.9.1 Access routes and work sites

Vehicular movement, construction trucks and earthmoving equipment will access the construction site from the David Hosea Meroro Road and nearby streets. No new tracks or roads shall be established and only existing roads may be used. Work sites shall be clearly demarcated and road signs erected were needed. The general public should not have unauthorised or uncontrolled access to the waste disposal site during both construction phase.

Vehicle access will be limited to a single entrance (where necessary) to facilitate control. The entrance will be manned during the operation hours, but will be locked during non-operational hours to prevent unauthorised entry.

A notice board, in two languages or more, must be erected at the entrance and must state the most pertinent site health and safety issues, the operator/responsible person and emergency telephone numbers. Suitable signs must also be erected on the approach roads and on-site, to direct drivers and to control speed.

Furthermore, on-going controls, such as fencing and policing, must be implemented.

3.9.2 Fire and safety management

The electrical wiring at the facility will have to be approved by a qualified electrician who will issue a Certificate of Compliance for these buildings prior to occupation.

Hydrocarbons are volatile under certain conditions and their vapours in specific concentrations are flammable. If precautions are not taken to prevent their ignition, fire and subsequent safety risks may arise.

No fire, whether for cooking or any other purpose, is to be made at the fuel retail facility during any of the three phases (construction, operational and decommissioning). The Contractor shall take all reasonable measures and active steps to avoid increasing the risk of fire through activities on site and prevent the accidental occurrence or spread of fire; and shall ensure that there is sufficient fire-fighting equipment on site at all times. This equipment shall include fire extinguishers. The Contractor should be prepared for such events.

VIVO Energy Namibia Ltd. together with contractors shall take all reasonable measures to avoid increasing the risk of fire and shall ensure that there is sufficient fire-fighting equipment on site at all times.

3.9.3 Staff management

The Contractor must ensure that their employees have suitable personal protective equipment and properly trained in fire fighting and first aid.

3.9.4 Waste management

The developer shall remove all waste off-site to designated waste disposal sites. Sufficient bins or containers on-site to store any solid or liquid waste produced should be provided by VIVO Energy Namibia Ltd. The bins and containers should be weatherproof and scavenger-proof.

3.9.5 Cement and concrete batching

The contractor is advised that cement and concrete are regarded as materials that are potentially damaging to the natural environment on account of the very high pH of the material, and the chemicals contained therein. The contractor shall ensure that all operations that involve the use of cement and concrete are carefully controlled. Concrete mixing shall only take place in agreed specific areas on site.

Water and slurry from concrete mixing operations shall be contained to prevent pollution of the ground surrounding the mixing points. Old cement bags shall be placed in wind and spill proof containers as soon as they are empty. The contractor shall not allow closed, open or empty bags to lie around the site.

Where exposed aggregate finishes are specified the contractor shall collect all cement-laden water and store it in conservancy tanks for disposal off site at an approved disposal site.

All visible remains of excess concrete shall be physically removed immediately and disposed of as waste. Washing the visible signs into the ground is not acceptable. All excess aggregate shall also be removed.

All excess concrete shall be removed from site on completion of concrete works and disposed of. Washing of the excess into the ground is not allowed. No cement or concrete laden water will be permitted to be drained directly into any surface water source.

3.9.6 Hydrocarbons management

If any spillage occurs, contaminated soil shall be collected in a holding tray or drum and which will then disposed at a licensed hazardous waste site. Any

spillage of more than 200 litres must be reported to the Ministry of Mines and Energy as per the Petroleum Products Act.

The Contractor shall take all reasonable measures to prevent surface or groundwater pollution from the release of oils and fuels. Sufficient space should be left in fuel storage tanks to allow for fuel expansion and to prevent leakage of fuel from the fuel retail facility.

3.9.7 Flood management

The fuel retail facility will be designed in a way that it can withstand flooding. Storm water management of the site should be a key aspect of flood management on site. All culverts should be kept clean to allow storm water to flow freely.

4. MANAGEMENT OF ENVIRONMENTAL ASPECTS DURING ALL PHASES

Groundwater

Construction/Decommissioning phase	
Description	Groundwater contamination can be caused by leakages and spills of petroleum products (i.e. oil leakages, hydrocarbon fuel, lubricants and grease) from machinery and heavy-duty vehicles during construction and decommissioning phase. Care must be taken to avoid contamination of soil and groundwater. Any overflow of the temporary sewage systems available, may transport the effluent to any nearby surface water bodies; or to areas where sensitive geological structures and formations are present. Inflow into these structures and formations would cause a pollution threat.
Proposed Mitigation Measures	➢ Prevent spillages of any chemicals and petroleum products (i.e. oils, lubricants, petrol and diesel). Use drip trays, linings or concrete floors when evidence of leaks are observed on vehicles or equipment. ➢ No major servicing and maintenance of vehicles and/or equipment should be conducted at the site. ➢ All fuelling, storage and chemical handling should be conducted on surfaces provided for this purpose. Drip trays, linings or concrete floors must be used when removing oil from machinery. ➢ Spillage control procedures must be in place according to relevant SANS standards or better. Waste water collection systems should be connected to these systems. ➢ Should temporary toilet facilities be necessary, adequate containment systems should be erected at the site for use during the construction phase. ➢ Waste should properly be contained to avoid any leakages and/or spillages, and should regularly be disposed off at a suitable sewage disposal site. Run-off from these toilets due to overflows should be avoided at all cost. ➢ Proper environmental awareness and remedial response training of operators must be conducted on a regular basis.
Proposed Monitoring	Regular visual inspection.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	Groundwater quality could be impacted through leachate of oil leakages, hydrocarbon fuel, lubricants and grease from trucks and vehicles frequenting the facility. Spillages may also occur during fuel delivery to the above ground storage tanks from road transport tanker trucks. Care must be taken to avoid contamination of soil and groundwater.
Proposed Mitigation Measures	↓ All operational surfaces and fuel storage facilities must be installed with spill containment areas as per the relevant SANS standards (or better). Special emphasis is placed on SANS 10089:1999, SANS 100131:1977, SANS 100131:1979, SANS 100131:1982, SANS 100131:1999. ↓ Proper monitoring of the product levels must take place to eliminate overfilling. ↓ All operational surfaces at the facility must be installed with spill containment areas. ↓ Ensure that any petroleum products, such as grease, waste oils and lubricants are contained in containment structures (e.g. plastic liners, drip trays etc.). ↓ Avoid discharge of pollutants (such as cement, concrete, lime, chemicals, contaminated waste water or leachate) into stormwater channels and water courses. ↓ Equipment and materials to deal with spill cleanup must be readily available on site and staff must be trained as to how to use the equipment and briefed about reporting procedures. ↓ Develop and implement a groundwater monitoring system and programme, with the aim of monitoring possible contamination to the water resources. ↓ Groundwater monitoring boreholes installed should be sampled and analysed periodically. ↓ Regular tank and pipeline tightness inspections are advised to eliminate the risk of impact on the environment due to leakage. ↓ The condition of the fuel reticulation system will have to be checked regularly and repaired to prevent leakages;
Proposed Monitoring	Regular visual inspection.
Responsible Party	Proponent / Contractors.

Surface Water

Construction/Decommissioning phase	
Description	Local drainage is well developed and runoff takes place through small river courses in the area, towards Goreangab Dam. Contamination of surface water might occur through petroleum, chemical and hazardous substances. Contaminants in the form of oil leakages, diesel, lubricants and grease from the construction vehicles, machinery and equipment may occur during the construction phase. Oil Spills may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could be impaired. Care must be taken to avoid contamination of soil and any nearby surface water present in the area.
Proposed Mitigation Measures	➢ Any spillage of hazardous substances including fuel, oil, paint or cleaning solvent must be cleaned up and disposed off at the designated disposal facility. ➢ Drip trays and/or plastic sheeting should be used to contain any leaks emanating from the construction plant. ➢ Prevent discharge of any pollutants, such as cements, concrete, lime, chemicals, and hydrocarbons into nearby water ways and courses. ➢ Properly secure all temporary / portable toilets (if any) to the ground to prevent them toppling due to wind or any other cause. No urinating outside these designated facilities. ➢ Maintain toilets in a hygienic state and remove waste to a licensed disposal facility. ➢ Ensure that no spillages occur when the toilets are cleaned or emptied. Prohibit urination on site, other than at designated facilities. ➢ Contain contaminated water from batching operations and allow sediments to settle before being disposed of as waste water. ➢ Stabilise cleared areas as soon as possible to prevent and control surface erosion. ➢ Proper environmental awareness and remedial response training of operators must be conducted on a regular basis. ➢ An emergency plan should be in place on how to deal with spillages and leakages during this phase.
Proposed Monitoring	Regular visual inspection. Surface water quality monitoring in cases of evident pollution.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	Spillages might occur during fuel delivery to the underground storage tanks from road transport tanker trucks. This may also occur during filling of vehicles. Spillages and/or leakages of various possible contaminants might occur due to failure of reticulation pipelines or storage tanks. Contaminated soil might pose a risk to surface water.
Proposed Mitigation Measures	➢ Proper containment mechanisms installed should be able to contain any spillages that might occur during the operation of the facility. ➢ All spills should be cleaned up as soon as possible. ➢ Use drip trays, linings or concrete floors when evidence of leaks are observed on construction vehicles or equipment. ➢ Remove leaking vehicles from project location immediately. ➢ The presence of an emergency response plan and suitable equipment is advised, so as to react to any spillage or leakages properly and efficiently. ➢ Ensure all stormwater drains or channels are clear of litter or obstructing material. ➢ Remove all excess sedimentation, rubble and any other waste material present in the waterway to ensure proper drainage runoff.
Proposed Monitoring	Regular visual inspection. Surface water monitoring sampling for hydrocarbon pollution.
Responsible Party	Proponent / Contractors.

Air Quality (Dust Pollution)

Construction/Decommissioning phase	
Description	Dust may be produced during the construction and decommissioning phase; and might be worsened when strong winds occur. These are expected to be site specific and could potentially pose a slight nuisance to any properties. Possible air pollution in the form of emissions from construction vehicles and equipment could also deteriorate air quality in the area.
Proposed Mitigation Measures	➢ It must be ensured that all vehicles entering the site and machinery used in construction activities are in good working order to prevent unnecessary emissions. ➢ Encourage reduction of engine idling at the project site. ➢ Vent pipes should be placed in such a manner as to prevent impact on potential receptors. Use vapour recovery equipment and techniques to avoid air pollution and minimise fuel loss. ➢ Excavation, handling and transport of materials must be avoided under high wind conditions. ➢ Dust suppression measures (e.g. dampening with water) may be required from time to time, should dust become a nuisance.
Proposed Monitoring	Regular visual inspection.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	Air quality around the site could be impacted by exhaust fumes from the vehicles accessing the facility. Hydrocarbon vapours will be released during delivery and dispensing, as liquid displaces the gaseous mixture in the tanks. In terms of fuel storage tanks, the vapours will be released through vent pipes on the tanks.
Proposed Mitigation Measures	➢ Vehicle idling time shall be minimised by putting up educative signs. ➢ All venting systems and procedures have to be designed according to SANS standards (SANS 1929:2011) and placed in a sensible manner. ➢ Vent pipes should be placed in such a manner as to prevent impact on potential receptors.
Proposed Monitoring	It is recommended that regular air quality monitoring be conducted at the facility. A complaints register regarding emissions/smell should be kept and acted on if it becomes a regular complaint.
Responsible Body	Proponent / Contractors.

Health and Safety

Construction/Decommissioning phase	
Description	Safety issues could arise from the construction vehicles, earthmoving equipment and tools that will be used on site during the construction phase. This increases the possibility of injuries and the contractor must ensure that all staff members are made aware of the potential risks of injuries on site.
Proposed Mitigation Measures	➢ Equipment and machinery operators should be equipped with ear protection equipment. ➢ Operations should be strictly between 07H00 to 19H00. First aid and safety awareness training for contractors. ➢ Ensure the general safety and security at all times by providing day and night security guards and adequate lighting within and around the premises. ➢ The construction staff must be properly trained on safety and health issues of the project. ➢ Workers should be fully equipped with personal protective equipment gear. ➢ The site must be clearly demarked and fenced off to prevent unauthorised persons from accessing the site, who could get injured on site.
Proposed Monitoring	Safety procedures evaluation. Health and safety incident monitoring.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	The operations of the fuel retail facility can cause health and safety risks to workers on site. Occupational exposures are normally related to inhalation of fuel vapours and physical contact with fuels.
Proposed Mitigation Measures	➢ Ensure the general safety and security at all times by providing day and night security guards and adequate lighting within and around the premises. ➢ Operators must be properly trained on safety and health issues of the project. ➢ Well stocked first aid box which is readily available and accessible should be provided within premises. ➢ Signs such as 'NO SMOKING' must be prominently displayed in parts where inflammable materials are stored on the premises. ➢ Workers should be fully equipped with personal protective equipment gear.
Proposed Monitoring	Regular inspection and incident monitoring report evaluation.
Responsible Body	Proponent / Contractors.

Noise Pollution

Construction/Decommissioning phase	
Description	Noise pollution already exists in the area due to vehicular movement along the David Hosea Meroro Road. However, construction vehicles and equipment used during the construction phase will also generated noise. It is expected that the noise generated will not have a significant impact on any third parties.
Proposed Mitigation Measures	➢ Sensitize construction vehicle drivers and machinery operators to switch off engines of vehicles or machinery not being used. ➢ Ensure engines of construction machinery are fitted with mufflers. ➢ Equipment and machinery operators should be equipped with ear protection equipment. ➢ Audio equipment (if any) should not be played at levels considered intrusive by others. ➢ Operations should be strictly between 07H00 to 19H00.
Proposed Monitoring	Strict operational times. Regular inspection.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	Noise pollution may be generated by vehicles, trucks and people frequenting the site.
Proposed Mitigation Measures	▪ Delivery of fuel products by heavy-duty tankers should be limited to normal working hours (07h00 to 19h00). ▪ Loud music from vehicles fuelling up should be restricted. ▪ Maintain the grievance mechanism to capture public perceptions and complaints with regard to noise impacts, track investigation actions and introduce corrective measures for continuous improvement.
Proposed Monitoring	Strict delivery and collection times. Observation of on-site noise levels by the Manager or Supervisor.
Responsible Body	Proponent / Contractors.

Waste Generation

Construction/Decommissioning phase	
Description	This can be in a form of rock cuttings, building rubble, pipe cuttings, electrical cuttings, oil spills or leakages of petroleum products might occur during the construction phase.
Proposed Mitigation Measures	▪ Ensure that sufficient weather- and vermin- proof bins / containers are present on site for the disposal of solid waste. Waste and litter generated during this phase must be placed in these disposal bins. Empty bins regularly as required. ▪ Ensure that no excavated soil, refuse or building rubble generated on site are placed, dumped or deposited on adjacent/surrounding properties or land. ▪ The Contractor shall institute a waste control and removal system for the site. All waste shall be disposed off site at an approved landfill site. ▪ No disposal of /or burying of waste on site should be conducted. No waste should be burned on site. ▪ The hazardous waste storage is to be clearly marked to indicate the presence of hazardous substances, and the protocols associated with handling of such hazardous wastes shall be known by all relevant staff members. ▪ Regular inspection and housekeeping procedure monitoring should be maintained at all times.
Proposed Monitoring	Regular inspection and housekeeping procedure monitoring. Observation of site appearance by the manager.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	Waste such as contaminated soil, litter, empty cans of engine oil will be generated during the operational phase.
Proposed Mitigation Measures	▪ Contaminated soil must be removed and disposed off at a suitable waste disposal site. ▪ Waste bins must be available at the fuel retail facility at all times. Waste must be appropriately collected and disposed off at an approved appropriate waste disposal site. ▪ Oil-water separator effluent originating from storm water runoff, tank bottoms and washing activities should be separated before disposal of the water. ▪ Regular monitoring of the oil-water separator outflow must be conducted. Water containing soaps and other detergents must not enter the oil water / separator as it will place the hydrocarbons in suspension, rendering the oil water separator ineffective. ▪ Care should be taken when handling contaminated material. The cradle to grave principal should be kept in mind during waste disposal. ▪ Any non-biodegradable hazardous material (i.e. oil cans and containers etc.) generated should be properly stored in containment structures, collected and transported to the nearest approved hazardous waste disposal facility.
Proposed Monitoring	Regular visual inspection. Containment area inspections and monitoring of the oil/water separators.
Responsible Body	Proponent / Contractors.

Traffic

Construction/Decommissioning phase	
Description	The site is situated along the David Hosea Meroro Road. Construction related activities are expected to have a minimal impact on the movement of traffic along this road and nearby streets. However, slow traffic frequenting the construction site may become a nuisance to motorists accessing nearby residential properties.
Proposed Mitigation Measures	▪ Install and maintain official traffic signalling (where necessary) along the access roads / intersection in conjunction with local or national traffic regulations. ▪ Speed limit warning signs must be erected to minimise accidents. ▪ Construction vehicles and machinery must be tagged with reflective signs or tapes to maximise visibility and avoid accidents. ▪ Where feasible, Construction vehicles should not travel to and from the site during peak times (07h00 to 09h00 and 16h00 to 18h00), to minimise impacts on traffic. ▪ Construction vehicles should not be allowed to obstruct the road, hence no stopping in the road, wholly or partially, but rather pull off the road or park on the roadside.
Proposed Monitoring	Observations of the traffic flow on the nearby David Hosea Road.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	Traffic around the Service station
Proposed Mitigation Measures	↓ Delivery of fuel products by heavy-duty tankers should be limited to normal working hours (07h00 to 19h00).
Proposed Monitoring	Strict delivery times monitoring. Observation of traffic by the Manager or Supervisor.
Responsible Body	Proponent / Contractors.

Ecological impacts

Construction/Decommissioning phase	
Description	No conservation worthy vegetation is present at the site. The site was cleared before.
Proposed Mitigation Measures	↓ Limit clearing of vegetation to those areas within the footprint of construction, minimise open areas and reduce the frequency of disturbance. ↓ Disturbance of areas outside the designated working zone is not allowed. ↓ No vegetation should be removed outside the designated project area.
Proposed Monitoring	Regular site inspection.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	The proposed facility operations will have minimal impacts the fauna and flora.
Proposed Mitigation Measures	↓ The operational activities would not exceed the demarcated area of the fuel facility.
Proposed Monitoring	Regular site inspection.
Responsible Body	Proponent / Contractors.

Overfilling of tanks and vehicles

Operational phase	
Description	Overfilling of company trucks and vehicles; and fuel storage tanks may take place.
Proposed Mitigation Measures	↓ This impact can be reduced by the installation of spill containment areas around the pumps and through proper training of the operators. ↓ Proper monitoring of the product levels in the tanks must take place to eliminate overfilling. ↓ Proper training of the operators on site is vital.
Proposed Monitoring	Regular inspection of the level of fuel in tanks.
Responsible Body	Proponent / Contractors.

Visual Impact

Construction/Decommissioning phase	
Description	Aesthetics and inconvenience caused to person trying to access/exit the site, and surrounding areas.
Proposed Mitigation Measures	↓ The Construction supervisor should maintain tidiness on site at all times. Take cognition when parking vehicles and placing equipment. ↓ Construction workers should be attentive to the importance of not littering. Littering is unsightly and has a negative visual impact. ↓ Sufficient waste bins must be provided onsite and must be emptied regularly. ↓ Any building rubble generated should not be allowed to accumulate onsite, but must at regular intervals be removed to a suitable landfill disposal site or to other construction sites where it may be used as fill.
Proposed Monitoring	Regular visual site inspection.
Responsible Party	Proponent / Contractors.

Fire and explosion hazard

Operational phase	
Description	Hydrocarbons are volatile under certain conditions and their vapours in specific concentrations and conditions are flammable.
Proposed Mitigation Measures	↓ There should be sufficient water available for fire fighting purposes. ↓ Ensure that all fire-fighting devices are in good working order and they are serviced. ↓ All personnel have to be trained about responsible fire protection measures and good housekeeping such as the removal of flammable materials on site.
Proposed Monitoring	Regular inspections should be carried out to inspect and test fire fighting equipment.
Responsible Body	Proponent / Contractors.

5. CONCLUSIONS

If the above-mentioned management recommendations are properly implemented, it is anticipated that most of the adverse impacts on the environment can be mitigated. An appointed environmental officer/consultant will need to monitor or audit the site throughout construction to ensure that the EMP is fully implemented and complied with. The EMP caters for all project phases, but will need to be reviewed during all phases of project, especially when revisions are made to the project development plans.

The Environmental Management Plan should be used as an on-site tool during all phases of the proposed project. Parties responsible for contravention of the EMP should be held responsible for any rehabilitation that may need to be undertaken. It is the Proponent's responsibility to initiate the update of the EMP once it has expired after 3 years from the issue date of the environmental clearance.

Matrix Consulting Services

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