

## **Environmental Management Plan (EMP)**

### **Operations and Maintenance of the Existing Fuel (Diesel) Tank at Engoyi for the Upgrading Works of DR3645 (16.3km: Engoyi to Omuntele) in the Oshikoto Region**



**ECC Application No.:**

**APP-004188**

**Document Version:**

**Draft as prescribed by Regulation 8(j) of the EIA Regulations (2012) – It is a living document that can be updated throughout the project cycle, as deemed necessary**

**Proponent:**

**Roads Contractor Company Limited (RCC)**

**P.O. Box 44 Ondangwa, Namibia**




**July 2024**

**DOCUMENT INFORMATION**

Title: Environmental Management Plan (EMP) for the Operations and Maintenance of the Existing Fuel (Diesel) Tank at Engoyi for the Upgrading Works of DR3645 (16.3km: Engoyi to Omuntele) in the Oshikoto Region

**Prepared by:**

<b>Author:</b>	<b>Fredrika N. Shagama (Hydrogeologist &amp; Environmental Consultant / EAP*)</b>
<b>Qualifications:</b>	<p><b>PhD. Student: Civil Engineering (Geotechnics &amp; Hydrogeology)</b>, VSB - Technical University of Ostrava, Czech Republic</p> <p><b>MSc. Geological Engineering</b> (<i>cum laude</i>) with primary focus in Hydrogeology, VSB - Technical University of Ostrava, Czech Republic</p> <p><b>BSc. Geological Engineering</b>, VSB - Technical University of Ostrava, Czech Republic</p>
<b>Professional Affiliations:</b>	<p>International Association of Hydrogeologists (IAH) - Full Member, Membership No.139790</p> <p>Namibian Hydrogeological Association (NHA) – Member</p> <p>Environmental Assessment Professionals of Namibia (EAPAN) - Ordinary Member Practitioner (Membership No. 183)</p>
<b>Contact Details:</b>	<p>Mobile: +264 81 749 9223</p> <p>Email: <a href="mailto:eias.public@serjaconsultants.com">eias.public@serjaconsultants.com</a></p> <p>Postal Address: P. O. Box 27318 Windhoek, Namibia</p>
<b>Signature:</b>	
<b>Date:</b>	16 July 2024

**EAP\* - Environmental Assessment Practitioner**

**SERJA' STATEMENT OF INDEPENDENCE**

As the Appointed Environmental Consultant to prepare this Environmental Management Plan (EMP) for the Operations and Maintenance of the Existing Fuel (Diesel) Tank at Engoyi for the Upgrading Works of DR3645 (16.3km: Engoyi to Omuntele) in the Oshikoto Region, Serja Hydrogeo-Environmental Consultants cc declare that we:

- do not have, to our knowledge, any information or relationship with Roads Contractor Company Limited (RCC), hereinafter referred to as the Proponent nor the Ministry of Environment, Forestry and Tourism (MEFT)'s Department of Environmental Affairs and Forestry (DEAF) that may reasonably have potential of influencing the outcome of this EMP and the subsequent ECC applied for.
- have knowledge of and experience in conducting environmental assessments, the Environmental Management Act (EMA) No. 7 of 2007 and its 2012 Environmental Impact Assessment (EIA) Regulation as well as other relevant national and international legislation, guidelines, policies, and standards that govern the activities as presented herein.
- have performed work related to the ECC application in an objective manner, even if the results in views and findings or some of these may not be favorable to the Proponent.
- have complied with the EMA and other relevant regulations, guidelines and other applicable laws as listed in this document.
- declare that we do not have and will not have any involvement or financial interest in the undertaking/implementation of the project activities, other than remuneration (professional fees) for work performed to conduct the EIA and apply for the ECC in terms of the EIA Regulations' requirement as an Environmental Assessment Practitioner (EAP).

**Disclaimer:** Serja Hydrogeo-Environmental Consultants will not be held responsible for any omissions and inconsistencies that may result from information that was not available at the time this document was prepared and submitted for evaluation.



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**Signature:**

Fredrika N. Shagama: Principal Environmental Assessment Practitioner & Hydrogeologist

**Date:** 16 July 2024

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## List of Abbreviations

CIC:	Consumer Installation Certificate
DEAF:	Department of Environmental Affairs and Forestry
EAP:	Environmental Assessment Practitioner
EAPAN:	Environmental Assessment Professionals of Namibia
ECC:	Environmental Clearance Certificate
EIA:	Environmental Impact Assessment
EMA:	Environmental Management Act
EMP:	Environmental Management Plan
GG:	Government Gazette
GN:	Government Notice
HSE:	Health, Safety and Environment
I&APs:	Interested and Affected Parties
LVS:	Low Volume Seal
MEAC:	Ministry of Education, Arts and Culture
MEFT:	Ministry of Environment, Forestry and Tourism
MME:	Ministry of Mines and Energy
MURD:	Ministry of Urban and Rural Development
NORED:	Northern Regional Electricity Distributor
OTA:	Ondonga Traditional Authority
PM:	Particulate Matter
PPE:	Personal Protective Equipment
Reg, S:	Regulation, Section
VOC:	Volatile Organic Compounds

# 1 INTRODUCTION

## 1.1 Project Background and Location

Roads Contractor Company Limited (RCC) (hereinafter referred to as the Proponent) has been appointed by the Roads Authority of Namibia to upgrade the existing 16.3km District Road 3645 (DR3645): Engoyi-Omuntele to low volume seal (LVS) standards in the Oshikoto Region. The road was constructed in 2007 using labour-based methods and now being upgrading from gravel to tarred road (LVS). As part of the road upgrading works, RCC has installed a 23,000-litre diesel storage tank at the contractors' campsite at Engoyi (Engoyi B Village) to ensure uninterrupted supply of fuel to project machinery and vehicles. The campsite where the tank is installed is located on the right-hand side of the DR3645 from Engoyi Settlement (at the junction of B1 and DR3645) towards Omuntele side - Figure 1-1.

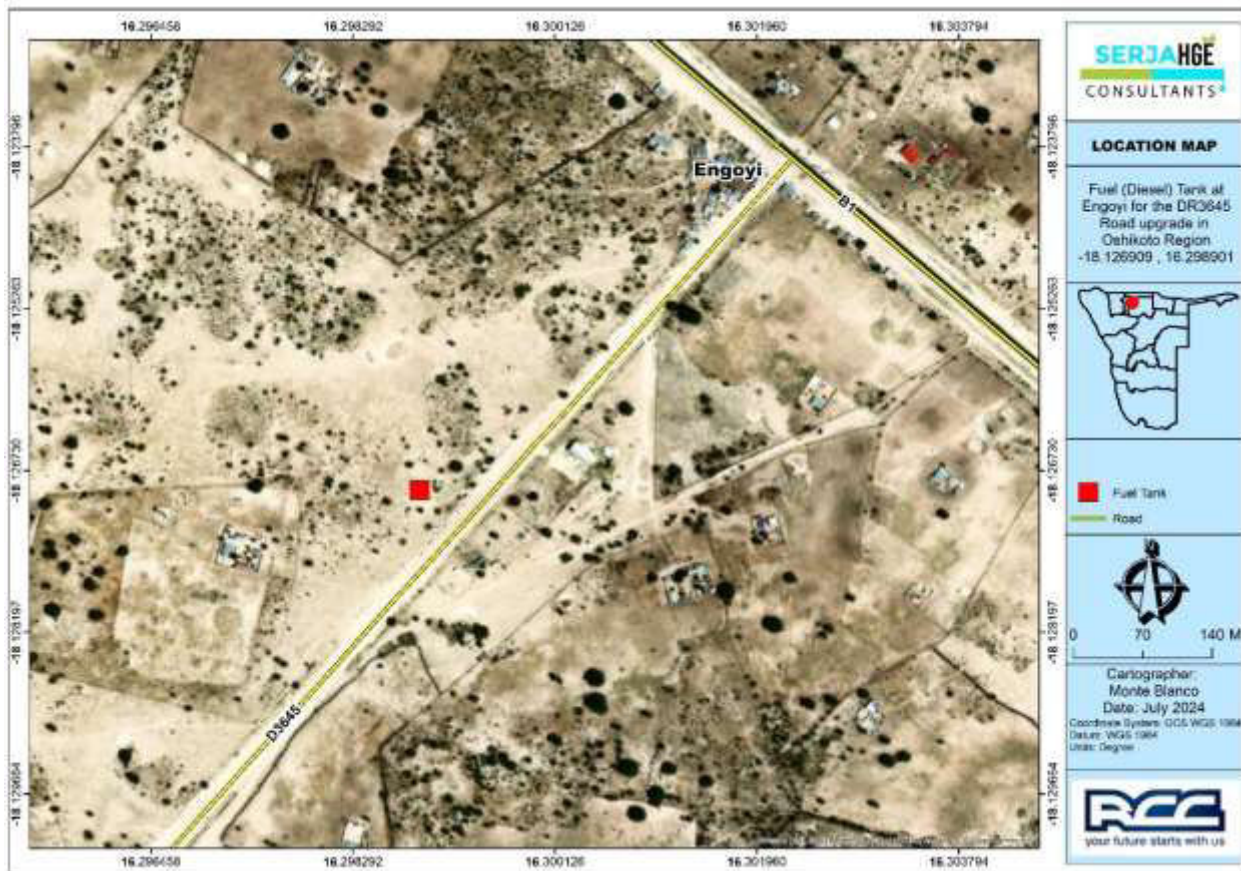


Figure 1-1: Locality map of the fuel tank at the DR3645 construction campsite at Engoyi Settlement in the Oshikoto Region

## 1.2 The Need and Desirability of the Fuel Tank

The fuel tank is required to ensure that the road works are carried out timely and without any delay to meet the project deadlines by providing fuel when needed. Furthermore, the fuel tank needs to be an EMP and eventually environmentally cleared so that a consumer installation certificate (CIC) can be issued for the tank onsite by the Ministry of Mines and Energy (MME). This is done in compliance with the Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001): Regulation 3(2) (b). This Act states that “No person shall possess or store any fuel except under authority of a licence or a certificate, excluding a person who possesses or stores such fuel in a quantity of 600 litres or less in any container kept at a place outside a local authority area”.

## 1.3 Need for an Environmental Clearance Certificate (ECC)

The installation and handling of hydrocarbons (fuels) is one of the listed activities in the Environmental Impact Assessment (EIA) Regulations (2012) of the Environmental Management Act (EMA) No. 7 of 2007 that may not be undertaken without an Environmental Clearance Certificate (ECC). The listed activities that are relevant to project (fuel tank) activities are as follows:

### Listed Activity 9. Hazardous Substance Treatment, Handling and Storage

- 9.1 The manufacturing, storage, handling or processing of a hazardous substance defined in the Hazardous Substances Ordinance, 1974.
- 9.4 The storage and handling of a dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic meters at any one location.
- 9.5 Construction of filling stations or any other facility for the underground and aboveground storage of dangerous goods, including petrol, diesel, liquid, petroleum, gas or paraffin.

Subsequently, to comply with the EMA and its EIA Regulations and ensure environmental sustainability, the Proponent has appointed Serja Hydrogeo-Environmental Consultants CC (*Serja HGE Consultants*), independent environmental consultants to apply for the ECC on their behalf.

An application for the ECC is being launched with the Ministry of Environment, Forestry and Tourism (MEFT)'s Department of Environmental Affairs and Forestry (DEAF) by Serja Consultants. Upon screening of this Background Information Document (BID), Serja Consultants will be required to prepare an Environmental Management Plan (EMP) in an application for the ECC. The EMP will be submitted to the MEFT's for evaluation and consideration of the ECC.

#### 1.4 Purpose of the Draft Environmental Management Plan (EMP)

The Draft EMP is developed in accordance with Regulation 8(j) of the EIA Regulations (2012), that it should be included as part of the Environmental Assessment (EA) Scoping report. A 'Management Plan' is defined as:

*“...a plan that describes how activities that may have significant environments effects on the environment are to be mitigated, controlled and monitored.”*

An EMP is one of the most important outputs of the EA process as it synthesizes all the proposed management & mitigation and monitoring actions, set to a timeline and with specific assigned responsibilities. It is important to note that an EMP is a statutory document and a person who contravenes the provisions of this EMP may face imprisonment and/or a fine. This EMP is a living document and can be amended to adapt to address changes on the site activities and/or environmental conditions and feedback from compliance monitoring.

The EMP is therefore aimed at guiding environmental management throughout the two main phases of the site activities pertaining to the fuel tank, namely: operational & maintenance and decommissioning phases:

- **Operation and maintenance phase** – this is the phase when the fuel tank is operational, i.e., the fuel tank is filled with diesel and fuel from the tank is dispensed into the road construction/upgrading vehicles and machinery, when needed. It is also during this phase when the Proponent is undertaking maintenance of the fuel tank and its associated facilities.
- **Decommissioning phase** – this is the phase during which the fuel tank is safely and effectively removed from service or fuel tank operations are discontinued.



## 2 BRIEF DESCRIPTION OF THE PROJECT ACTIVITIES

### 2.1 Operations and Maintenance

The fuel tank was recently installed on the 3<sup>rd</sup> of June 2024 and is in operation. The 23,000-litre (23m<sup>3</sup>) and 0.84m high diesel tank is contained (bunded) mounted on a steel stand inside a concrete plinth which is 110% larger than its size. The surface area covered by the tank facility is 30m<sup>2</sup>. Some photos of the tank taken during site visit on the 02<sup>nd</sup> of July 2024 are shown in Figure 2-1 below.

The base of the tank is lined with the impermeable Polyvinyl chloride (PVC) material under concrete layer to prevent infiltration of accidental oil spills into the soil and groundwater. There are oil spills control measures onsite, i.e., the absorbent material contained in the fuel spill equipment (natural sponge-like material) that can absorb accidental fuel spillage or leaks.



Figure 2-1: The diesel (fuel) tank within the contractors' campsite near Engoyi Settlement

The fuel is dispensed through the typical pumping system (as shown above) to supply the project machinery as often as needed, while the refilling of the tank is done once a week.

#### 2.1.1 Occupational Health and safety

All site workers are supplied with appropriate and adequate personal protective equipment (PPE) while carrying project activities onsite. The site is also equipped with one fully furnished first aid kit.

The fuel tank site is well equipped and marked with clear and visible warning and prohibition signage for operations.

#### 2.1.2 Accidental Fire Management

There are two fire extinguishers for the fuel tank in the site office and these will be installed (mounted on the bund wall) next to the tank once the erection of the roof structure (roof for the tank shade) is completed.

### 2.1.3 Waste management

There are three main waste types potentially generated onsite and these are as follows:

- Solid waste: All solid waste generated from the project activities are sorted, stored on site in designated waste containers and transported to the Ondangwa's dumping site.
- Hazardous waste: There is no hazardous waste yet generated from the tank, however, measures are in place (provided herein) to mitigate and or manage potential accidental fuel spills or leakage. The hazardous waste will be properly captured, stored on site in designated waste containers and transported to Oluno temporary storage facility before the waste is transported to the appropriate hazardous waste management facility (in Windhoek). No hazardous waste will be disposed of in any other waste management facility.
- Sewage (human) waste: The appointed contractor has flushing toilets with septic tank for the workers and project related visitors. The tank is emptied according to the manufacturer's instruction and as regularly as deemed necessary.

### 2.1.4 Other services required

The following services are also supporting the operations of the fuel tank:

- Water supply for operations: The fuel tank operations do not require water.
- Power supply: the electricity required for the pumping of fuel from the tank into vehicles is provided from the nearest power grid (transformer) by the northern regional electricity distributor (NORED) that connects the campsite to the grid.
- Sewage: There are septic-supported flushing toilets at the campsite used by the project staff (personnel) and visitors.

## 2.2 Decommissioning Phase

The decommissioning phase for fuel tanks usually involves the following steps and procedures to safely and effectively remove a fuel tank from operations. It is important to note that compliance with the MME requirements, environmental protection measures, and safety protocols is paramount to ensure the safe and responsible removal (discontinuing) of the fuel tank. These steps are to be undertaken in this order when the time (to decommission) comes:

- Planning and Preparation: This phase begins with assessing the tank's condition and developing a decommissioning plan. The plan includes identifying potential hazards, ensuring compliance with regulatory requirements, and outlining the sequence of activities.
- Tank Cleaning: Before decommissioning, the tank must be emptied of any remaining fuel and thoroughly cleaned to remove sludge, residues, and vapors. This is done to minimize environmental and safety risks during the decommissioning process.

- Tank Purging: After cleaning, the tank is purged of any remaining vapors or gases. This may involve flushing the tank with inert gases or other appropriate methods to ensure it is safe for further work.
- Cutting and Removal: Depending on the tank's size and location, it may need to be cut into manageable sections for removal. Specialized equipment and techniques are used to safely cut and extract the tank from its installation site.
- Disposal or Recycling: Once removed, the tank must be disposed of or recycled according to local regulations and environmental standards. This would often involve transporting the tank to a licensed facility for proper treatment and disposal such as the hazardous waste management facility in Windhoek (Oiltech Namibia <https://oiltech.com.na/> (waste oil recyclers)).
- Site Remediation: After the tank is removed, the surrounding area may require remediation to address any soil or groundwater contamination that occurred during the tank's operational lifespan. This can involve soil excavation, groundwater monitoring, and remediation activities to restore environmental quality.
- Documentation and Reporting: Throughout the decommissioning process, detailed documentation is maintained, including records of tank cleaning, purging, cutting, removal, disposal, and any remediation efforts. These records are important for regulatory compliance and future reference.
- Closure and Verification: Once all decommissioning activities are complete, the site is closed and verified to ensure that all steps have been executed properly and that environmental and safety concerns have been addressed.

The decommissioning measures are provided under Chapter 5, section 5.2.2 (Table 5-2 and Table 5-3).

### 3 LEGAL FRAMEWORK: PERMITTING AND LICENSES

The Proponent has the responsibility to ensure that the project activities conform to the principles of the EMA and must ensure that employees act in accordance with such principles. Table 3-1 below lists the requirements of an EMP as stipulated by Section 8 (e) of the EIA Regulations, primarily on specific approvals and permits that may be required for the project activities.

**Table 3-1: List of legal requirements and permits for the installed fuel tank and its associated fuel handling and disposal activities**

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
Environmental Management Act (No. 7 of 2007) and 2012 Environmental Impact Assessment (EIA) Regulations: regulated by the <b>Ministry of Environment, Forestry and Tourism (MEFT)</b>	The EMA has stipulated requirements to complete the required documentation to obtain an Environmental Clearance Certificate (ECC) for permission to undertake certain listed activities.	The ECC should be renewed every 3 years (counting from the date of issuance) at least 3 months before expiry date. <b>The contact details at the Department of Environmental Affairs and Forestry (DEAF), MEFT.</b>  <b>Office of the Environmental Commissioner:</b> <b>Mr. Timoteus Mufeti, Tel: +264 61 284 2701</b>
Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001): regulated by the <b>Ministry of Mine and Energy (MME)</b>	Regulation 3(2)(b) states that "No person shall possess or store any fuel except under authority of a licence or a certificate, excluding a person who possesses or stores such fuel in a quantity of 600 litres or less in any container kept at a place outside a local authority area"	The fuel tank has a capacity of 2,300 litres (2,3m <sup>3</sup> ) which is more than 600 litres and it is outside a local authority area. Therefore, the Proponent should obtain a consumer installation certificate (CIC) / Permit from the Petroleum Affairs at the MME to store fuel at the road construction campsite in Engoyi.  <b>Mr. Carlo Mcleod: Acting Director of Petroleum Affairs, Tel: +264 61 284 8291</b>

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
Traditional Authority Act No. 25 of 2000: regulated by the <b>Ministry of Urban and Rural Development (MURD)</b>	The Act also stipulates that Traditional Authorities (TAs) should ensure that natural resources are used on a sustainable basis that conserves the ecosystem. The implications of this Act are that TAs must be fully involved in the planning of land use and development for their area.	The fuel tank is located on communal land under the Ondonga Traditional Authority (OTA). Therefore, they should be engaged through their local representative, i.e. Engoyi B Village Headman.
Water Resources Management Act 11 of 2013 and its 2023 Regulations: regulated by the <b>Ministry of Agriculture, Water and Land Reform (MAWLR)</b>	Prohibits the pollution of water and implements the principle that a person disposing of effluent or waste has a duty of care to prevent pollution (S3 (k)).	The protection (both quality and quantity/abstraction) of water resources should be a priority.
Hazardous Substance Ordinance, No. 14 of 1974: <b>regulated by the Ministry of Health and Social Services</b>	The ordinance provides for the control of toxic substances. It covers manufacture, sale, use, disposal and dumping as well as import and export. Although the environmental aspects are not explicitly stated, the ordinance provides for the importing, storage, and handling.	RCC should handle and manage the storage and use of hazardous substances onsite so that they do not harm or compromise the site environment.  For better management and handling of waste fuel, RCC can contact Waste oil recyclers (Oiltech Namibia CC Windhoek, <a href="https://oiltech.com.na/">https://oiltech.com.na/</a> )  <b>Tel: +264 81 343 5676</b>  OR  WESCO Group Namibia (Walvis Bay)  Tel: +264 64 213 200  <a href="https://www.wesco.com.na/page/waste-management">https://www.wesco.com.na/page/waste-management</a>

The responsibilities of implementing the EMP are provided under the next chapter.

## 4 EMP IMPLEMENTATION RESPONSIBILITIES

The Proponent is ultimately responsible for the implementation of the EMP. However, the Proponent may delegate this responsibility or part of it at any time, as they deem necessary. The roles and responsibilities of all delegates/parties involved in the effective implementation of this EMP are set in Table 4-1.

**Table 4-1: The EMP implementation responsibilities for the operation and maintenance of the diesel tank**

Role	Responsibilities
Roads Contractor Company (RCC) / The Proponent	<p>The Proponent will be responsible in:</p> <ul style="list-style-type: none"> <li>-Managing the implementation of this EMP and updating and maintaining it when necessary.</li> <li>-Managing and monitoring of individuals and/ or equipment on-site in terms of compliance with this EMP and issuing fines for contravening EMP provisions.</li> <li>-Ensuring that relevant commitments contained in the EMP are adhered to.</li> <li>-Compiling relevant procedures and method statements for approval by the Site Manager prior to initiation of project activities onsite.</li> <li>-Ensure that all relevant staff are trained in procedures.</li> </ul>
Site Manager	<p>This individual is responsible for ensuring that the project activities are completed on time. The Manager's duties and responsibilities will include:</p> <ul style="list-style-type: none"> <li>-Ensure that relevant commitments contained in the EMP are adhered to.</li> <li>-Ensure relevant staff is trained in procedures entailed in their duties.</li> <li>-Maintain records of all relevant environmental documentation for the project.</li> <li>-Reviewing the EMP annually and amending the document when necessary.</li> <li>-Issuing fines to individuals who may be in breach of the EMP provision and if necessary, removing such individuals from the site.</li> <li>-Cooperate with interested &amp; affected parties (I&amp;APs) / stakeholders.</li> <li>-Development and management of schedules for daily activities</li> </ul>
Health, Safety, & Environmental (HSE) Officer or Safety Officer	<p>The Proponent may assign the responsibility of ensuring EMP compliance throughout the project life cycle to a designated member of staff or external</p>

Role	Responsibilities
	<p>qualified and experienced person, referred to in this EMP as the HSE/Safety Officer. This officer will have the following responsibilities:</p> <ul style="list-style-type: none"> <li>-Management and facilitation of communication between the Proponent and stakeholders regarding this EMP.</li> <li>-Conducting site inspections of all areas with respect to the implementation of this EMP (monitor and audit its implementation).</li> <li>-Advising the Proponent or Site Manager on the removal of person(s) and/or equipment not complying with the provisions of this EMP.</li> <li>-Making recommendations to the Site Manager with respect to the issuing of fines for contraventions of the EMP.</li> <li>-Undertaking an annual review of the EMP and recommending additions and/or changes to this document.</li> <li>-Ensuring that the operations onsite are conducted in accordance with the International System organization (ISO) standard 14001: 2015.</li> </ul>

## 5 ENVIRONMENTAL MANAGEMENT MEASURES

### 5.1 Key identified Potential negative Impacts

The key potential positive and negative impacts identified and for which the management measures (action plans) have been provided herein are listed below:

#### Potential positive impacts:

-Uninterrupted supply of fuel to the roadworks for long-term benefit in the area, i.e., improved accessibility between Engoyi and Omuntele.

#### Potential negative (adverse) impacts (continued)

-Accidental fire outbreaks that poses safety and health hazards to site employees, vehicles and other properties onsite and around the site.

#### Potential negative (adverse) impacts:

-Noise: excessive noise associated with the un/loading operations at the fuel tank site can interfere with communication and auditory warnings in fuel tank facilities, potentially compromising safety protocols and increasing the risk of accidents onsite.

-Soil and water pollution: improper handling of fuel during refilling or refuelling vehicles or machinery may lead to pollution of surrounding soils and eventually water resources systems (through runoff and infiltration).

Leaks and or spills from the fuel tank can contaminate soil and groundwater with hazardous substances (diesel). These chemicals can migrate over long distances, potentially affecting drinking water sources and posing risks to human health and the environment.

-Occupational and community health and safety: improper handling of fuels may cause health and safety risks to workers. Furthermore, workers involved in operating and maintaining, or decommissioning of the fuel tank can be potentially exposed to diesel, fire hazards, and physical hazards associated with handling heavy equipment and machinery at the tank area.

-Community health and safety: flammable diesel or leakages and improper handling can lead to fires or explosions, posing immediate risks to nearby communities, buildings, (private and public properties).

In addition, noise can cause stress and fatigue that can affect workers' productivity and overall well-being. Chronic exposure to noise has been linked to increased cardiovascular problems and mental health issues such as anxiety and depression.

-Vehicular traffic: Vehicles transporting fuel and conducting operations (such as tankers, trucks, and service vehicles) emit pollutants such as particulate matter (PM), nitrogen oxides, volatile organic compounds (VOCs), and carbon monoxide contributing to local air pollution in nearby communities.

Other vehicle related impacts include increased vehicular traffic related accidents, collisions, and spills involving fuel tankers or other vehicles carrying hazardous materials (safety hazards).

Another vehicular impact is infrastructure deterioration (impact on local roads) when heavy vehicles associated with fuel tank operations accelerates road deterioration, leading to increased maintenance costs and traffic disruptions.

-Structural integrity risks: aging as well as improperly maintained tank can corrode or develop structural weaknesses over time. This increases the risk of leaks, spills, and potential catastrophic failures which may result in soil and water pollution.

-Air quality: during fuel transfer operations or due to tank venting, volatile organic compounds (VOCs) and other pollutants can be released into the air. Prolonged exposure to these pollutants can lead to respiratory problems, irritation of the eyes, nose, and throat, and exacerbate existing health conditions such as asthma to surrounding communities.



## 5.2 Environmental Management and Mitigation Measures

The management actions are aimed at avoiding the above-listed potential negative impacts, where possible, and where it is impossible to avoid these impacts, measures are provided to reduce the impacts' significance. The Management action plans (management and mitigation measures) recommended for the potential impacts cover the following two phases:

- Operational and maintenance phase (Table 5-1),
- Decommissioning and site rehabilitation phase (Table 5-2 and Table 5-3).

### 5.2.1 Environmental Management and Mitigation measures for the Operations and Maintenance Phase

The environmental measures prescribed for the operations and maintenance of the fuel tank (as described under section 2.1) are provided in Table 5-1 below.

**Table 5-1: Operations & Maintenance Phase management and mitigation measures**

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
EMP implementation and training	Lack of EMP awareness and implications thereof	<p>-EMP trainings should be provided to workers onsite.</p> <p>-All site personnel should be aware of necessary health, safety, and environmental considerations applicable to their work.</p> <p>-The implementation of this EMP should be monitored.</p> <p>The site should be inspected, and a compliance audit <b><u>bi-annually for overall EMP implementation.</u></b></p> <p>-EMP non-compliance penalty system should be implemented.</p>	<p>-Records of EMP compliance/monitoring conducted bi-annually</p> <p>-The ECC is renewed every 3 years</p> <p>-Records of EMP training conducted.</p>	<p>-Proponent / RCC</p> <p>-Site Manager</p> <p>-Safety Officer</p>	Throughout the operations and maintenance phase, and when deemed necessary (for certain activities such as ECC renewal)
Authorizations	Lack of Permits/ Licenses and tank maintenance	<p>-All the required agreements and licenses or permits should be applied for and obtained. The permits, agreements referred to herein include:</p> <p><i>-Environmental Clearance Certificate (ECC)</i></p> <p><i>-Consumer Installation Certificate (CIC)</i></p>	<p>-Applicable permits and licenses to obtained from relevant authorities and kept on site for records keeping and future inspections</p>	<p>-Proponent / RCC</p> <p>-Site Manager</p>	During this phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-An experienced fuel tank maintenance company should be appointed for the project.	-The ECC and CIC are being applied for from MEFT and MME, respectively.		
Procurement of goods and services	Empowerment of local businesses	-Where possible, preference for tank maintenance works should be given to a local contractor (in Oshikoto Region near the site). Out-of-area procurement of maintenance contractor should be justified, for example by the unavailability of local businesses.	-The contractor is Oshikoto Region based, otherwise, justification for an out-of-region contractor is provided	-Proponent / RCC (Procurement Unit)	Throughout this phase
Hazardous (fuel) substances	Improper handling of waste fuels	<p>-All waste hydrocarbon material should be collected and stored in appropriate containers and transported off-site to a suitably qualified third party which routinely handles such waste. An example is <b>Oiltech Namibia</b> (<a href="https://oiltech.com.na/">https://oiltech.com.na/</a>). The City of Windhoek also has facilities to handle hydrocarbon waste (<a href="http://www.windhoekcc.org.na/depa_infra-solid_waste_management.php">http://www.windhoekcc.org.na/depa_infra-solid_waste_management.php</a>).</p> <p>-The fuel storage tank should be regularly maintained to ensure that it is in good condition, thus, preventing leaks and spills.</p> <p>-Proper conduct on handling the fuel should be implemented and these include specific operations such as dispensing and tank filling)</p> <p>*Generally when handling hydrocarbons within the facility (no smoking, prohibited use of cell phones open fires in proximity of the tank, etc.)</p> <p>*Emergency procedures such as fire drills, spill control etc. should be put in place and training thereto provided to fuel tank operators.</p>	<p>-The fuel handling procedures are in place and measures are implemented</p> <p>-The fuel tank operators (drivers and refilling/dispensing personnel are trained on handling fuel)</p> <p>-Fuel spill equipment are in place</p>	<p>-Site Manager</p> <p>-Safety Officer</p>	Throughout this phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		<p>*Appropriate fuel spill equipment/"kits" should be kept on-site. Fuel spills should be cleaned immediately, using appropriate absorbent material contained in the fuel spill equipment.</p>			
Soil and water resources pollution	Soils and water pollution by improper disposal of waste	<p>-Oil and wastewater spill control preventive measures should be in place on site to management soil contamination, thus preventing and minimizing the contamination from reaching water bodies. Some of the soil control preventive measures that can be implemented include:</p> <p>*Spill control preventive measures should be in place on site to management soil contamination, thus preventing and or minimizing the contamination from reaching any nearby water bodies and groundwater systems.</p> <p>*All project employees should be sensitized about the impacts of soil pollution and advised to follow appropriate fuel delivery and handling procedures.</p> <p>*Develop and prepare countermeasures to contain, clean up, and mitigate the effects of an oil spill. This includes keeping spill response procedures and a well-stocked cache of supplies easily accessible.</p> <p>*Ensure employees receive basic Spill Prevention, Control, and Countermeasure (SPCC) Plan training and mentor new workers as they get hired.</p> <p>*Project machines and equipment should be equipped with drip trays to contain possible oil spills when operated on site.</p> <p>*Polluted soils should be removed immediately and put in a designate waste type container for later disposal.</p> <p>*Drip trays must be readily available and monitored to ensure that accidental fuel spills around the tank site are cleaned up on time (soon after the spill has happened).</p>	<p>-No complaints of pollutants on the soils and eventually in the water due to development activities</p> <p>-No visible oil spills on the ground or pollution spots.</p> <p>-Different waste containers are provided at the campsite</p>	<p>-RCC</p> <p>-Site Manager</p> <p>-Safety Officer</p>	Throughout this phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		<p>*Polluted soil must be collected and transported away from the site to an approved and appropriately classified hazardous waste treatment facility.</p> <p>*Washing of equipment contaminated hydrocarbons, as well as the washing and servicing of vehicles should take place at a dedicated area, where contaminants are prevented from contaminating soil or water resources.</p>			
<p>Vehicular traffic safety</p>	<p>Presence of fuel tank related heavy vehicles onsite and movement of fuel related vehicles on local roads</p>	<ul style="list-style-type: none"> <li>-Vehicles drivers and equipment operators should be in possession of valid and appropriate driving licenses and adhere to the road safety rules.</li> <li>-Drivers should only drive at a maximum speed of 60km/hour or less) while travelling around.</li> <li>-Vehicle drivers should not be allowed to operate vehicles while under the influence of alcohol.</li> <li>-There should be demarcated areas for fuel tank related vehicles and machinery such as parking, offloading, and loading zones onsite.</li> <li>-Project vehicles should be parked inside the site premises and not along the public roads, when not associated with the roadwork.</li> <li>-Vehicles should be road worthy and serviced regularly to avoid accidents owing to mechanical faults.</li> <li>-Vehicle drivers to site should only make use of designated site access roads provided.</li> <li>-Deliveries of fuel to site should be done optimally during weekdays and between the hours of 8am and 5pm.</li> <li>-To mitigate the movement of fuel heavy vehicles and impact on local infrastructures (roads), the delivery should be limited to least twice a week and maximum thrice.</li> </ul>	<ul style="list-style-type: none"> <li>-No complaints from members of the public regarding vehicular traffic issues related to the campsite.</li> <li>-The drivers are encouraged to adhere to the road speed</li> <li>-All personnel operating the site related vehicles and machinery are appropriately licensed and possession of valid driving licenses.</li> </ul>	<ul style="list-style-type: none"> <li>-Proponent</li> <li>-Site Manager</li> <li>-Safety Officer</li> </ul>	<p>Throughout the phase</p>

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
Occupational and locals (community) health and safety	General health and safety associated with fuel tank operations and maintenance	<p>-Any projected loads to the fuel tank site should be securely fastened to vehicles to avoid falling and injuring people.</p> <p>-Heavy vehicle, equipment and machinery should be properly secured to prevent any harm or injury to site/project personnel and community members moving near the site.</p> <p>-Workers at the fuel tank site should be properly equipped with personal protective equipment (PPE) such as coveralls, masks, gloves, safety boots, earplugs, safety glasses, and hard hats.</p> <p>-Personnel should not be allowed to consume alcohol or other intoxicants prior to and refilling of fuel and refuelling hours as this may lead to mishandling of equipment resulting in health and safety risks.</p>	<p>-Comprehensive health and safety plan for the activities is compiled.</p> <p>-Availability of fully-furnished first aid kit in the maintenance vehicle</p> <p>-Trained worker to administer first aid</p>	<p>-Site Manager</p> <p>-Safety Officer</p>	Throughout the phase
	Community health and safety (fire and explosion hazard)	<p>-No unauthorized persons is allowed to enter the campsite and or wander around the fuel tank.</p> <p>-The projected loads goods and materials transported to and from the fuel tank site should be tightly fastened on the vehicles so that they do not fall off and injure locals near or along the road</p> <p>-Educate the local community and raise awareness on the danger of fuel storage tanks.</p> <p>-Inform the community members passing by the campsite to not throw any object to the fuel tank over or through the fence.</p> <p>-Involve the community in monitoring safety measures by encouraging them to report any suspicious behaviours around the campsite, specifically the fuel tank site area. This can also help minimize potential hazards associated with the fuel tank.</p>	<p>-The goods and materials are securely fastened to the vehicles and required load signage fixed to the loads</p> <p>-Community awareness on the danger of fuel storage tanks is raised and integrated in the usual community meetings</p> <p>-Community members are well informed and warned of certain behaviours towards fuel tank.</p>	<p>-Site Manager</p> <p>-Safety Officer</p>	Throughout the phase
	Accidental fire outbreak	<p>-Portable and serviced fire extinguishers should be availed onsite and availed at the fuel tank site.</p> <p>-Smoking while operating near or at the fuel tank is strictly prohibited (no smoking within 50m of the tank area).</p>	<p>-Fire extinguishers</p> <p>-There are no signs or records of smoking or starting open fires within 50m of the tank</p>	<p>-Site Manager</p> <p>-Safety Officer</p>	Throughout the phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		<p>-Make provision for smoking areas for workers who smoke. This is to ensure that the cigarettes' fire is completely put out to and disposed of in allocated bins onsite and not near the tank area.</p> <p>-Open fires are strictly prohibited at the fuel tank site or within 50m of the tank.</p> <p>-There should be sufficient warning signs at the fuel tank and ensure that workers are sensitized of handling and dispensing fuel onsite.</p> <p>-All personnel must be sensitised about responsible fire protection measures and good housekeeping such as the removal of flammable materials (e.g., rubbish, plastics, papers, clothing, dry vegetation, and hydrocarbon-soaked soil) from the vicinity of the tank area. In other words, these flammable materials should not be left or thrown near the tank site. Regular inspections should be carried out to check for these materials at the site.</p> <p>-Electrical equipment and fittings must comply with local fire prevention regulations for this class of product (diesel). Refer to national or local regulations covering safety at petroleum handling and storage areas for diesel.</p> <p>-Emergency training and an emergency drill program must be implemented to be given at least every 6 months on Emergency Procedures.</p>	<p>-there are enough warning signs at the tank area</p>		
Littering and waste management	Environmental Pollution – Solid waste	<p>-Dispose of waste in a responsible manner and not to litter.</p> <p>-The fuel tank area and campsite should be equipped with separate waste bins for solid and general/domestic waste.</p> <p>-Ensure that there is no waste scattered within or outside the campsite premises at all times.</p>	<p>-No visible litter on or around the site premises</p> <p>-Provision of sufficient waste storage containers</p> <p>-Waste management awareness to both site</p>	<p>-Site Manager</p> <p>-Safety Officer</p>	Throughout the phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		<p>-All domestic and general operational waste produced daily should be contained onsite in provide waste bins until such that time it can be transported to Ondangwa Town Council dumpsite.</p> <p>-No waste may be buried or burned on site or anywhere else.</p> <p>-A penalty system for irresponsible disposal of waste onsite and anywhere at the fuel tank area, within the campsite and general area should be implemented.</p>	<p>personnel (workers) and visitors</p> <p>-Waste disposal permits obtained from local authority</p>		
	Sewage generated onsite	<p>-Encourage the site staff and visitors to use the provided toilet facilities for workers for both "number 1 and 2" when nature calls.</p> <p>-Open defecation is strictly prohibited on and around the campsite.</p> <p>-Sewage associated with the campsite (where tank is) should be transported to Ondangwa Town Council sewage management ponds twice a week.</p> <p>-Appoint an experienced sewage removal operator to properly empty the septic tank and safely transport for disposal at the Ondangwa Town Council ponds. Consent should be obtained.</p>	<p>-There are sufficient toilets within the campsite premises</p> <p>-Sewage is transported to the Ondangwa Town Council as often as needed</p> <p>-The sewage removal company is appointed and the contract is in place.</p>	<p>-Site Manager</p> <p>-Safety Officer</p>	Throughout the phase
Air Quality	Air pollution owing to dust generation and fumes / emissions	<p>-Vehicles driving onsite at the fuel tank for refueling and any vehicle onsite should be driven at a speed of 40 km/h or less to avoid dust generation around the area.</p> <p>-Machinery and vehicles refueled onsite should be regularly maintained to ensure to reduce emissions of harmful gases.</p> <p>-Refueled vehicles and machinery at the fuel tank should not be left idling so as to not release harmful gases into the air.</p>	-No complaints from the public about machinery and vehicle emissions onsite	<p>-RCC</p> <p>-Safety Officer</p>	Throughout the phase
Noise	Noise from refilling trucks and refuelled	-Noise from vehicles and equipment onsite should be reduced to acceptable levels.	-No complaints of noise associated with the project activities from site	<p>-RCC</p> <p>-Safety Officer</p>	Throughout the phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
	machinery and vehicles	<p>-When there is excess noise, fuel tank operating workers should be equipped with hearing protection (earplugs) to reduce exposure to excessive noise.</p> <p>-Make use of noise-reducing equipment, barriers, and enclosures to contain and minimize noise emissions.</p> <p>-Anticipated noisy operations at the fuel tank site should be scheduled during less sensitive times, i.e., 8am and 12pm and then 2pm to 5pm).</p> <p>-Implement the monitoring of noise levels during fuel delivery and act promptly to address any exceedances.</p>			

### 5.2.2 Environmental Management and Mitigation measures for the Decommissioning Phase

The measures prescribed for the decommissioning of the fuel tank when the times come are provided in Table 5-2 below. These measures will be implemented alongside the steps under section 2.2 and specifically procedures provided in Table 5-3.

**Table 5-2: General Environmental decommissioning management and mitigation measures**

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
Authorizations and all permissions	Lack of communication and engagement with the key stakeholder	<p>-The Petroleum Commissioner and Director of Petroleum Affairs at MME should be notified of the intention to decommission the fuel tank.</p> <p>-An experienced fuel tank removal company should be appointed for the project.</p>	-Applicable permits and licenses to be obtained from relevant authorities prior to decommissioning of the tank	-Proponent / RCC	Prior to decommissioning activities
Fuel tank structures		<p>-Remove the tank and fuel off site for resale/use.</p> <p>-Safely demolish the storage tank in which the diesel was stored.</p> <p>-Decontaminate the tank and associated structures at dedicated decontamination bay at the nearest and approved hazardous handling and treatment waste facility in Walvis Bay or Windhoek.</p>	-The tank and associated infrastructures are have been successfully and safely demolished / removed from site	<p>-Proponent</p> <p>-Safety Officer</p>	During this phase and before leaving the site



Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		<b>Alternatively, contact Oiltech Namibia</b> <a href="https://oiltech.com.na/">https://oiltech.com.na/</a> (waste oil recyclers) for their services to assist with this.	-No signs of spilled oil or contaminated soils onsite		
Physical land (soils)	Stockpiled soils may trigger erosion onsite	<ul style="list-style-type: none"> <li>-The stock piled soils put aside to enable the removal of the tank should be put back and ground surface levelled.</li> <li>-Trenches or pits excavated to allow decommissioning onsite should be backfilled and ground levelled.</li> <li>-Stabilise disturbed site areas to prevent erosion and sediment mobilisation.</li> <li>-Demolish and excavate concrete foundations to 1m below ground level. Alternatively, in appropriate instances the concrete slabs of “clean” infrastructure can be covered with a 1,000mm soil cover as part of site re-profiling and integrated into the surrounding topography.</li> </ul>	-No visible stockpiled topsoil onsite after decommissioning	-Site Manager (advising the decommissioning contractor)	During this phase and before leaving the site
Soil and water resources pollution	Soils and water pollution by improper disposal of waste fuels	<ul style="list-style-type: none"> <li>-Clean up contaminated soils and these must be collected and transported away from the site to an approved and appropriately classified hazardous waste treatment facility.</li> <li>-Spill control preventive measures should be in place on site to management soil contamination, thus preventing and or minimizing the contamination from reaching water resources.</li> <li>-Develop and prepare countermeasures to contain, clean up, and mitigate the effects of an oil spill. This includes keeping spill response procedures and a well-stocked cache of supplies easily accessible.</li> <li>-Drip trays must be readily available to ensure that accidental fuel spills at the tank are cleaned up timely (soon after the spill has happened).</li> </ul>	<ul style="list-style-type: none"> <li>-No complaints of pollutants on the soils and eventually in the water due to decommissioning activities</li> <li>-No visible oil spills on the ground or pollution spots.</li> </ul>	<ul style="list-style-type: none"> <li>-RCC</li> <li>-Site Manager</li> <li>-Safety Officer</li> </ul>	Throughout this phase

The first step to decommissioning a fuel tank and its associated infrastructures is to:

- Notify to the licensing authority, i.e., the Petroleum Commissioner at the MME must be advised on which course of action it is proposed to take to render a decommissioned tank safe and can be in attendance when tank is filled.

**Table 5-3: The specific management and mitigation measures for the decommissioning of the tank onsite (adopted from DP Fuel Tank Services, 2016)**

Aspect	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
<b>Decommissioning Phase and Site Rehabilitation</b>				
Fuel tank	<p><b>1. <u>Abandoning the tank in-situ:</u></b><sup>1</sup></p> <p>Any tank to be abandoned in place should be rendered safe by one of the following methods:</p> <ul style="list-style-type: none"> <li>-by filling with cement slurry using the following procedure:</li> <li>-drain back all pipelines associated with the tank and remove all residual petrol the tank must then be bottomed out which involves the removal of that quantity of petrol and deposits which remain below the pump suction pipeline, using a hand pump or a flame-proof electrical pump. This procedure should be performed by a specialist contractor</li> <li>-the atmosphere in the tank must inerted by means of nitrogen, nitrogen foam or carbon dioxide (see guidance on these inerting methods in HSE Guidance Note CS 15)</li> <li>-disconnect all pipework entering the tank via the tank lid. Flush through and cap at each end all pipelines previously connected to the tank or compartment</li> <li>-remove the tank lid. (It should be remembered that this can be a hazardous exercise unless great is care taken).</li> <li>-the area surrounding the tank as far as boundaries permit should normally be classed as a hazardous area whilst filling the tank is taking place and all necessary precautions should be taken to prevent any source of ignition.</li> <li>-fill the tank with 20 to 1 mix of concrete slurry. Wherever possible the slurry should be assisted to the extremities of the tank by means of a vibrating device. (It is important to remember the previous point). It is essential that a Petroleum Officer of</li> </ul>	-Implementation of the measures	-Proponent (By appointing a specialized contractor for decommissioning fuel tank)	Upon cessation of operations

<sup>1</sup> DP Fuel Tank Services. (2016). Methods of Fuel Tank Decommissioning: <https://dptanks.co.uk/methods-fuel-tank-decommissioning/>

Aspect	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
	<p>the MME (if possible) is in attendance when the slurry fill takes place. Only when the slurry filling has been completed to the satisfaction of the Petroleum Officer/Commissioner is the manhole chamber to be filled with concrete.</p> <p><b><u>2. Removal of the tank</u></b></p> <p>Before excavation work starts, any tank to be removed from the ground should be rendered safe.</p> <p>For a tank without leaks the following initial procedure should be followed:</p> <ul style="list-style-type: none"> <li>-drain all pipelines associated with the tank and remove all residual petrol</li> <li>-the tank must then be bottomed out which involves the removal of that quantity of petrol and deposits which remain below the pump suction pipeline, using a hand pump or a flame-proof electrical pump. This procedure should be performed by a specialist contractor</li> <li>-fill the tank or compartment with water to ensure a liquid seal</li> <li>-disconnect all pipelines (except vent pipes) and add water to the tank or compartment until clear water appears at the vent pipe opening</li> <li>-cap or blank off all openings to the tank or compartment</li> </ul> <p>flush through and cap at each end all pipelines previously connected to the tank or compartment</p>			
Disposal of the tank	<ul style="list-style-type: none"> <li>-Any tank which has been removed from its excavation should be disposed of safely as soon as possible. Preparation for and removal by road should be in accordance with the provisions of the current legislation in force at the time.</li> <li>-The person responsible for removal of a tank from a filling station should ensure that the recipient of the tank is made aware of the tank's previous use and of the need to take adequate precautions against fires and explosions when dealing with it.</li> <li>-Cleaning or demolition of any tank on site should not take place without the agreement of the appropriate authority.</li> </ul>	-Implementation of the measures	-Proponent (By appointing a specialized contractor for decommissioning the fuel tank)	Upon cessation of operations

Aspect	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
	<p>-The location of any abandoned tank should be recorded in the site register and brought to the attention of any person who subsequently becomes responsible for the site.</p> <p>-Further, the MME should be made aware of the destination of any tank which has been removed from the ground.</p>			
Alternative use of the tank	<p>The tank may be used for the storage of diesel or gas oil providing the petrol tank has had all residual of petrol removed from it and been bottomed out (which involves the removal of that quantity of petrol and deposits which remain below the pump suction pipeline, using a hand pump or a flame-proof electrical pump). This procedure should be performed by a specialist contractor.</p> <p>-The tank must be filled totally to dispel any petroleum vapour. It is important to remember to drain down the pump and pipelines thereby removing all petrol before introducing an alternative fuel</p>	-Implementation of the measures	-Proponent (By appointing a specialized contractor for decommissioning the fuel tank)	Upon cessation of operations
Infrastructure and structures: Decommissioning of services and infrastructures associated with the tank	<p>-Dismantling of temporary structures and office spaces and donate them to the nearest local authority (Ondangwa Town Council) to be utilized for other purposes in the town. Or if cannot be donated, these structures can be sold to interested buyers to use for other similar projects.</p> <p>-All the solid waste generated from leading to the last days on site should be transported to the Town Council dumpsite.</p> <p>-Transport all equipment and vehicles to offsite storage facilities.</p>	<p>-Structures are sold or donated to the Town Council</p> <p>-Different waste transported to respective approved waste management sites</p>	<p>-Proponent</p> <p>-Safety Officer</p>	At the end of the site operations
Rehabilitation funds: financial and technical resources	-Make provision of both financial and technical resources for decommissioning.	-Finances set aside for decommissioning	-Proponent	Updated throughout the phase
Generated and Accumulated Waste	<p>-All re-usable pipelines, pumps, tank, valves and other equipment must be removed to another approved site for this type of structure or sold.</p> <p>-Those items that cannot be used again must be scrapped in the appropriate manner.</p> <p>-Upon demolition of buildings and concrete, the rubble must be removed from the</p>	-All waste is disposed of at the respective waste facilities (based on waste types)	<p>-Proponent</p> <p>-Safety Officer</p>	Before complete site closure

Aspect	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
	<p>property and taken to an approved dumpsite designated by the Town Council.</p> <p>-Site Rehabilitation, if necessary, is to be done using the designated funds.</p> <p>-Waste should be sorted accordingly and disposed of at the Town Council waste management site. Hazardous waste should be transported to the applicable waste facility in Windhoek (Oiltech Namibia or WESCO Group Namibia (Walvis Bay) can be consulted for assistance in this regard).</p> <p>-No waste should be buried nor left scattered on site.</p>			

### 5.3 Environmental Monitoring Actions

To ensure that the implementation of recommended environmental management measures is working and produces the desired results (minimizing the "medium" and uphold the "low" significance ratings of impacts), certain key impacts will need to be monitored and reported on. The "Observation, *compliance status and Recommended Action*" columns will be completed for every monitoring done on site.

Environmental monitoring reports are to be compiled by the project Safety Officer, and audited by an Independent Environmental Consultant for submission to the DEAF so that they can be archived on a bi-annual basis (every 6 months throughout the fuel tank operations) or as required by the Environmental Commissioner (as per the ECC conditions).