

APP: 231002002199

# Amended report

## ENVIRONMENTAL IMPACT ASSESSMENT

### PROPOSED NEW FUEL RETAIL FACILITY ON PORTION 4 OF TSES TOWN AND TOWNLANDS NO. 425, TSES, //KHARAS REGION



### TSES SERVICE STATION

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Sep 2023

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## EXECUTIVE SUMMARY

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An Environmental Impact Assessment (EIA) has been commissioned by Milka Mungunda, for the proposed Tses fuel retail facility. The EIA is being undertaken in accordance with the requirements of the National Environmental Assessment Policy (1995) and the Environmental Management Act (2007) and its regulations of 2012, and other relevant legislations and regulations pertaining to Environmental Assessments and protection of the environment in the Republic of Namibia.

Impacts identified from baseline studies, site visits and stakeholder consultation process have been assessed. This included looking at impact significance through, its nature, extent, duration, probability and intensity. Major issues or impacts addressed are:

- Surface and ground water contamination;
- Air quality (dust pollution);
- Ecological impacts;
- Risk of fires and explosions;
- Health and safety impact;
- Heritage impacts;
- Generation of waste;
- Heritage impacts;
- Traffic safety, especially during construction;
- Noise pollution;
- Socio-economic issues; and
- Cumulative impacts.

These impacts are assessed in each of the three stages of project development namely, construction, operation and possible decommissioning phases.

Socio-economic impacts amongst others include creation of temporary and permanent employment opportunities, economic spin-offs for the local businesses and suppliers, in-migration of job seekers to the village of Tses and surroundings. Cumulative impacts expected as a result of the proposed fuel retail facility include, increase in noise and dust pollution, increase in-migration of job seekers etc.

Necessary mitigation measures for the potential impacts have been provided. The impacts to the environment are rated as acceptable, and can be managed. It is the findings of this EIA report that environmental impacts can be sufficiently mitigated. All environmental risks can be minimised and managed through implementing preventative measures and sound management systems, and on condition of the fulfilment of the Environmental Management Plan. This document should be used as an on-site tool during all phases of the proposed fuel retail facility. Monitoring of both surface and groundwater pollution should be conducted regularly at the site.

With regards to public and key stakeholder involvement, the public have been engaged, and intensive public participation processes has been conducted throughout the public participation process.



## **TABLE OF CONTENTS**

<b>EXECUTIVE SUMMARY</b> .....	<b>1</b>
<b>GLOSSARY OF TERMS</b> .....	<b>5</b>
<b>1. BACKGROUND AND INTRODUCTION</b> .....	<b>7</b>
1.1 Project Rationale.....	7
1.2 Project Phases.....	8
<b>2. TERMS OF REFERENCE</b> .....	<b>9</b>
<b>3. ENVIRONMENTAL STUDY REQUIREMENTS</b> .....	<b>9</b>
<b>4. DESCRIPTION OF ALTERNATIVES</b> .....	<b>10</b>
4.1 No-Go Alternative.....	10
4.2 Site Alternative.....	10
<b>5. SCOPE</b> .....	<b>11</b>
<b>6. METHODOLOGY</b> .....	<b>11</b>
<b>7. STATUTORY REQUIREMENTS</b> .....	<b>12</b>
<b>8. PROPOSED INSTALLATIONS</b> .....	<b>16</b>
<b>9. GENERAL ENVIRONMENT OF THE STUDY AREA</b> .....	<b>18</b>
9.1 Location and Land Use.....	18
9.2 Topography and Surface Water.....	19
9.3 Climate (Mandelsohn et al, 2003).....	20
9.4 Geology of the Study Area.....	20
9.4 Hydrogeology of the Study Area.....	21
9.4.1 Groundwater Pollution Vulnerability.....	22
9.4.2 Groundwater and Surface-water Pollution Monitoring.....	23
9.5 General Ecology.....	25
9.6 Socio-Economic Aspects.....	28
9.7.1 Regional information.....	28
9.7.2 Tses	
9.7.2.1 Economic activities.....	28
9.7.2.2 Employment (Job Opportunities).....	28
9.7.2.3 Livelihoods.....	29
9.7.2.4 Procurement.....	29
9.7.2.5 Tourism.....	30
9.7.2.6 In - Migration.....	30
9.7.2.7 HIV & Prostitution.....	30
9.7.2.8 Infrastructure & Increased Traffic.....	31
<b>10. STAKEHOLDER PARTICIPATION</b> .....	<b>32</b>
<b>11. ENVIRONMENTAL IMPACT EVALUATION</b> .....	<b>36</b>
11.1 Construction Phase of the proposed fuel retail facility.....	36
11.2 Operational Phase of the proposed fuel retail facility.....	42
11.3 Decommissioning Phase.....	47
<b>12. CUMMULATIVE IMPACTS</b> .....	<b>47</b>
<b>13. ENVIRONMENTAL MANAGEMENT PLAN</b> .....	<b>48</b>
<b>14. CONCLUSIONS</b> .....	<b>48</b>
<b>11. REFERENCES</b> .....	<b>49</b>

### **List of Tables**

<b>Table 1. Activities identified in the EIA Regulations relevant to proposed project</b> .....	<b>9</b>
<b>Table 2. General Fauna Diversity (Mandelsohn et al, 2003)</b> .....	<b>26</b>
<b>Table 3. I&amp;APS</b> .....	<b>35</b>
<b>Table 4. Impact Evaluation Criterion (DEAT 2006)</b> .....	<b>36</b>

### **List of Figures**

<b>Figure 1. Project location (25.882946° S; 18.109067° E)</b> .....	<b>8</b>
<b>Figure 2: Environmental Assessment Procedure of Namibia</b> .....	<b>14</b>
<b>Figure 3: Proposed layout of the facility</b> .....	<b>17</b>
<b>Figure 4: Hydrogeological map</b> .....	<b>22</b>
<b>Figure 5. Proposed groundwater monitoring boreholes</b> .....	<b>25</b>



Figure 6: Vegetation map.....	27
Figure 7: Public Meeting at Tses Community Hall.....	34

## Appendices

- Appendix A - Environmental Management Plan**
- Appendix B - Background Information Document (BID)**
- Appendix C - Meeting Minutes**
- Appendix D - Meeting Attendance Register**
- Appendix E - Local Authority Consent**
- Appendix F - Site Layout Drawings**
- Appendix G - Newspaper Adverts**
- Appendix H - Lead Consultant Resume**

## List of Abbreviations

<b>EIA</b>	Environmental Impact Assessment
<b>EMP</b>	Environmental Management Plan
<b>EMA</b>	Environmental Management Act
<b>EMS</b>	Environmental Management System
<b>ESA</b>	Environmental Scoping Assessment
<b>I&amp;Aps</b>	Interested and Affected Parties
<b>PPPPs</b>	Projects, Plans, Programmes and Policies
<b>LRP</b>	Lead Replacement Petrol
<b>ULP</b>	Unleaded Petrol
<b>SANS</b>	South African National Standards



## **PROJECT DETAILS**

### **TEAM MEMBERS**

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#### **REPORT STATUS:**

**FINAL**

#### **CLEARANCE ISSUED TO:**

*Please note that the environmental certificate should be made out to the proponent:*

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## **GLOSSARY OF TERMS**

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

**Proponent (Applicant)** – means a person who intends or undertakes a project, policy, programme or plan.

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

**Sewage** - Sewage is water-carried waste, in solution or suspension, which is intended to be removed from a community.

**Environmental Clearance Certificate** - This Certificate obtained from the Ministry of Environment and Tourism (Directorate of Environmental Affairs) approving the EIA study and providing clearance to the proponent to initiate work.

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

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

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

**Environment** – As defined in the Environmental Policy and Environmental Management Act No7 of 2007 - “land, water and air; all organic and inorganic matter and living organisms as well as biological diversity; the interacting natural systems that include components referred to in sub-paragraphs, the human environment insofar as it represents archaeological, aesthetic, cultural, historic, economic, paleontological or social values”.

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

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



**Service Station** - is defined as any land, building or equipment used for the sale or dispensing of petrol or oils for motor vehicles or incidental thereto and includes the whole of the land, building or equipment whether or not the use as a petrol station is the predominant use or is only a part thereof.

**Hazard** - Anything that has the potential to cause damage to life, property and/or the environment. The hazard of a particular material or installation is constant; that is, it would present the same hazard wherever it was present.

**Interested and Affected Party (I&AP)** - any person, group of persons or organization interested in or affected by an activity; and any organ of state that may have jurisdiction over any aspect of the activity.

**Proponent (Applicant)** – means a person who intends or undertakes a project, policy, programme or plan.

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

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

**Interested and Affected Party (I&AP)** - any person, group of persons or organization interested in or affected by an activity; and any organ of state that may have jurisdiction over any aspect of the activity.



# 1. BACKGROUND AND INTRODUCTION

Milka Mungunda has commissioned an Environmental Impact Assessment (EIA) for the proposed construction and operation of the Tses Service Station (25.882946° S; 18.109067° E), Tses, //Kharas Region. The project was issued with an ECC on , and the Town council has given an alternative area for this development, this application is aimed at amending the location to the area (-25.882126 S, 18.109735 E) opposite the prior approved erven.

Matrix Consulting Services was appointed to undertake the Environmental Impact Assessment of the proposed fuel retail facility. This study will enable decision makers to make an informed decision regarding the development and make sure it does not have significant impacts on the environment and that they are mitigated. The environmental scoping assessment was conducted to comply with Namibia's Environmental Assessment Policy and the Environmental Management Act.

## 1.1. Project Rationale

As a result of the increasing development in the area, the need for a new fuel retail facility rose due to an increasing number of motorists frequenting Tses and its surroundings. The facility will provide an alternative for motorists to reduce their waiting time at the fuel retail facility in the village. This facility will secure fuel availability in Tses, even in the peak tourism or holiday periods.

The proposed retail fuel facility will also provide the much-needed modern fuelling point with all its associated modern services, especially to motorists in the surrounding area and long distance motorists.

Given the focus on long distance motorists and tourism, the packaging of this development is logical in that all components provide services to passing travellers and tourists. The provision of facilities for the parking, possible loading and unloading of long distance buses at this proposed development will also go some way to alleviating the current congestion associated with these activities experienced in the area.

### Potential spin-offs:

- ❖ **Employment:** The creation of approximately 12 new jobs is expected. It is estimated that the new jobs will improve the livelihoods of the new workers and their families. Given the unemployment rate of 32% in the region, this in itself is regarded as a significant benefit to the socio-economic situation in the region (Census Regional Profile, Namibia Statistics Agency, 2011).
- ❖ **Skills development:** As the construction and operation of the development requires specialised work and skills it can be expected that experts will be training locals in certain skills during development and operation.
- ❖ **Contribution to economic development** (e.g. supply of materials and goods for construction purposes; new businesses, employment etc.).





- ❖ Technology transfer to Namibia: The new facility includes state-of-the-art technology. The construction, operation, maintenance and support of these new technologies will expose local artisans and industries to these technologies. This can have a positive effect on the area.
- ❖ General enhancement of the quality of life in Tses and the surrounding areas, especially the immediate businesses and residence; and
- ❖ Expansion of trade and industrial activity in the area.



**Figure 1. Project location (-25.882126 S, 18.109735 E)**

## ***1.2. Project Phases***

The project is made up of 3 phases, namely the construction, operation and possible decommissioning phase. Activities involved in all phases are as follows:

### **Construction Phase:**

- ❖ Excavation for the pipeline trenches and the tank pits.
- ❖ Transport and installation of the storage tanks and relevant material.
- ❖ Installation of fuel pipelines.
- ❖ Construction of dispensing pump islands and installation of the pumps.
- ❖ Construction of spill control measures.
- ❖ Installation of associated electrical supply.
- ❖ Construction of associated buildings and other infrastructure.

### **Operational Phase:**

- ❖ Filling of the underground storage tanks from road transport tankers.



- ❖ Dispensing of fuel into vehicles and other approved containers.

**Decommissioning Phase:**

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

**2. TERMS OF REFERENCE**

Mrs. Milka Mungunda has commissioned an Environmental Impact Assessment (EIA) for the proposed fuel retail facility, in Tses. The proposed fuel retail facility will be located on portion 4 of Tses Town and Townlands No. 425 (25.882126 S, 18.109735 E).

Matrix Consulting Services was appointed to undertake the Environmental Impact Assessment of the proposed Tses fuel retail facility. This study will enable decision makers to make an informed decision regarding the development and make sure it does not have significant impacts and that they are mitigated. The environmental impact assessment was conducted to comply with the Environmental Assessment Policy (1995) and the Environmental Management Act (2007) and its regulations of 2012.

**3. ENVIRONMENTAL STUDY REQUIREMENTS**

According to the Environmental Management Act no. 7 of 2007, the proponent requires an environmental clearance from the Ministry of Environment and Tourism (Department of Environmental Affairs) to undertake of the construction of the fuel retail facility. The certificate means that the Ministry of Environment and Tourism is satisfied that the activity in question will not have an unduly negative impact on the environment. It may set conditions for the activity to prevent or to minimise harmful impacts on the environment.

The proposed development is listed as a project requiring an environmental assessment as per the following listed activities in the Environmental Management Act no 7 of 2007 and its Guidelines (06 February 2012):

**Table 1. Activities identified in the EIA Regulations relevant to proposed project**

Activity Description:	Description of Activity	Activities
<b>Activity 9.4 Hazardous Substance Treatment, Handling and Storage</b>	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	The project entails the handling of hazardous substances.
<b>Activity 9.5 Hazardous Substance Treatment,</b>	Construction of filling stations or any other facility for the underground and aboveground storage of	The project includes the construction of a service station.



Activity Description:	Description of Activity	Activities
<b>Handling and Storage</b>	dangerous goods, including petrol, diesel, liquid, petroleum, gas or paraffin.	
<b>Activity 10.1 (a) (Infrastructure)</b>	The construction of – Oil, water, gas and petrochemical and other bulk supply pipelines.	The proposed project includes the Connection to bulk municipal services
<b>Activity 8.9 Water Resource Developments</b>	The construction and other activities within a catchment area.	The project entails activities that will be undertaken within a catchment area.
<b>Activity 10.1 (j) (Infrastructure)</b>	The construction of masts of any material or type of any height, including those used for telecommunication broadcasting and radio transmission but excluding lightning conductor poles.	The intended development includes the construction of a filling station flag pole.

## 4. DESCRIPTION OF ALTERNATIVES

### 4.1 No-Go Alternative

The no-development alternative is the option of not establishing the fuel retail facility. Should the proposed development not take place, development in the area and the region at large is hindered due to the few available fuel facilities, resulting in longer waiting time for motorists. The proposed facility will help alleviate shortage of fuel supply in Tses.

The proposed modern fuel retail facility will provide the much-needed modern fuelling point with all its associated modern services, to motorists in the area and long distance motorists alike, especially those that are accessing the Tses Village surrounding area.

The No-development option is thus not considered to be a feasible alternative at this stage.

### 4.2 Site Alternative

The site is located within an urban setting, which is already disturbed and earmarked for development in Tses. The project site is generally suitable for this type of operation. The environmental footprint is expected to be minimal as the project site is already disturbed. The possible impacts at the project location, both environmental and socio-economic, are of such a nature that they can be mitigated through good practice and compliance to the EMP.

The proximity of the Tses River to the site increases the risk of surface water contamination and pollution from fuel spills, which are commonly associated with fuel stations; however the risk will be lowered by the design and management of the



facility. Proper containment mechanisms installed should be able to contain any spillages that might occur during the operation of the facility.

## **5. SCOPE**

The scope of the EIA aims at identifying and evaluating potential environmental impacts emanating from the construction, operations and possible decommissioning of the proposed fuel retail facility. Relevant data have been compiled by making use of secondary sources and from project site visits. Potential environmental impacts and associated social impacts will be identified and addressed in this report.

The environmental impact assessment report aims to address the following:

- a) Identification of potential positive and negative environmental impacts.
- b) Provide sufficient information to determine if the proposed project will result in significant adverse impacts.
- c) Identification of “hotspots” which should be avoided where possible due to the significance of impacts.
- d) Evaluation of the nature and extent of potential environmental impacts
- e) Identify a range of management actions which could mitigate the potential adverse impacts to required levels.
- f) Provide sufficient information to the Ministry of Environment to make an informed decision regarding the proposed project.
- g) Conduct a public participation exercise.
- h) Present and incorporate comments made by stakeholders.

## **6. METHODOLOGY**

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

- a) Information about the site and its surroundings was obtained from existing secondary information and site visits.
- b) Neighbours, interested and affected Parties (I&APs) were consulted and their views, comments and opinions are presented in this report.



## 7. STATUTORY REQUIREMENTS

The EIA process is undertaken in terms of Namibia's Environmental Management act no. 7 of 2007 and the Environmental Assessment Policy of 1995, which stipulates activities that may have significant impacts on the environment. Listed activities require the authorisation from the Ministry of Environment and Tourism (DEA). Section 32 of the Environmental Management Act requires that an application for an environmental clearance certificate be made for the listed activities. The following environmental legislation is relevant to this project:

### I. 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.

### II. 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*



### **III. The Water Act (Act No 54 of 1956)**

The Water Act No. 54 of 1956 as amended, aims to provide management of the national water resources to achieve sustainable use of water for the benefit of all water users.

The Act broadly controls the use and conservation of water for domestic, agricultural, urban and industrial purposes; to control, in certain respects, the use of sea water; to control certain activities on or in water in certain areas; and to control activities which may alter the natural occurrence of certain types of atmospheric precipitation.

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

This act repealed the existing South African Water Act No.54 of 1956 which was used by Namibia. 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.

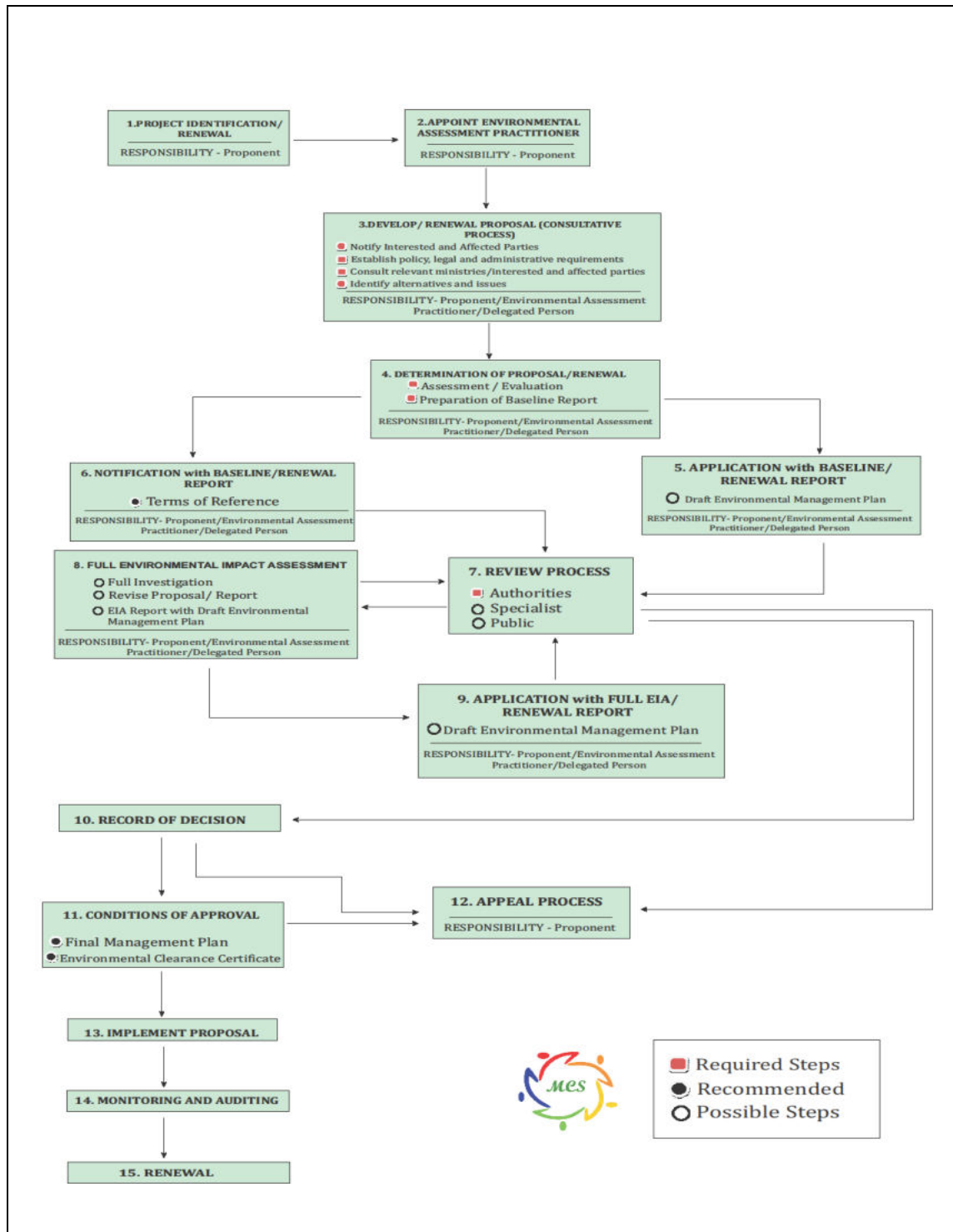
*Line Ministry: Ministry of Agriculture, Water Affairs and Forestry*

### **V. 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.

All listed policies, programmes and projects, whether initiated by the government or the private sector, should be subjected to the established EA procedure as set out in Figure 2.

*Line Ministry: Ministry of Environment and Tourism*



**Figure 2: Environmental Assessment Procedure of Namibia** (Adapted from the *Environmental Assessment Policy of 1995*)

Apart from the requirements of the Environmental Assessment Policy, the following sustainability principles need 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.

## **VI. Petroleum Products and Energy Act of Namibia (Act No. 13 of 1990)**

The Act makes provision for impact assessment for new proposed fuel retail facilities and petroleum products known to have detrimental effects on the environment.

## **VII. Draft Pollution Control and Waste Management Bill (Guideline only)**

The proposed project of the fuel retail facility in Tses, 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.

## **VIII. 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*

## **IX. 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*

## **8. PROPOSED INSTALLATIONS**

The proposed site will be equipped with two (2) underground storage tanks (UST), which is;

- 1 x Tank – 46 m<sup>3</sup> diesel UST (50ppm),
- 1 x Tank – 46 m<sup>3</sup> diesel UST (10ppm)
- 1 x Tank – 46 m<sup>3</sup> ULP

The three tanks will be installed with suitable associated reticulation pipelines. The following will also be erected and installed;

- ❖ Four pump islands,
- ❖ Convenience shop,
- ❖ a forecourt canopy,
- ❖ a three chamber separator pit,
- ❖ a separate pump island with canopy, specifically for the supply of diesel to bulk users.

This facility will be constructed and operated according to relevant SANS standards (or better), with special emphasis on SANS 10089:1999, SANS 100131:1977, SANS 100131:1979, SANS 100131:1982, SANS 100131:1999.

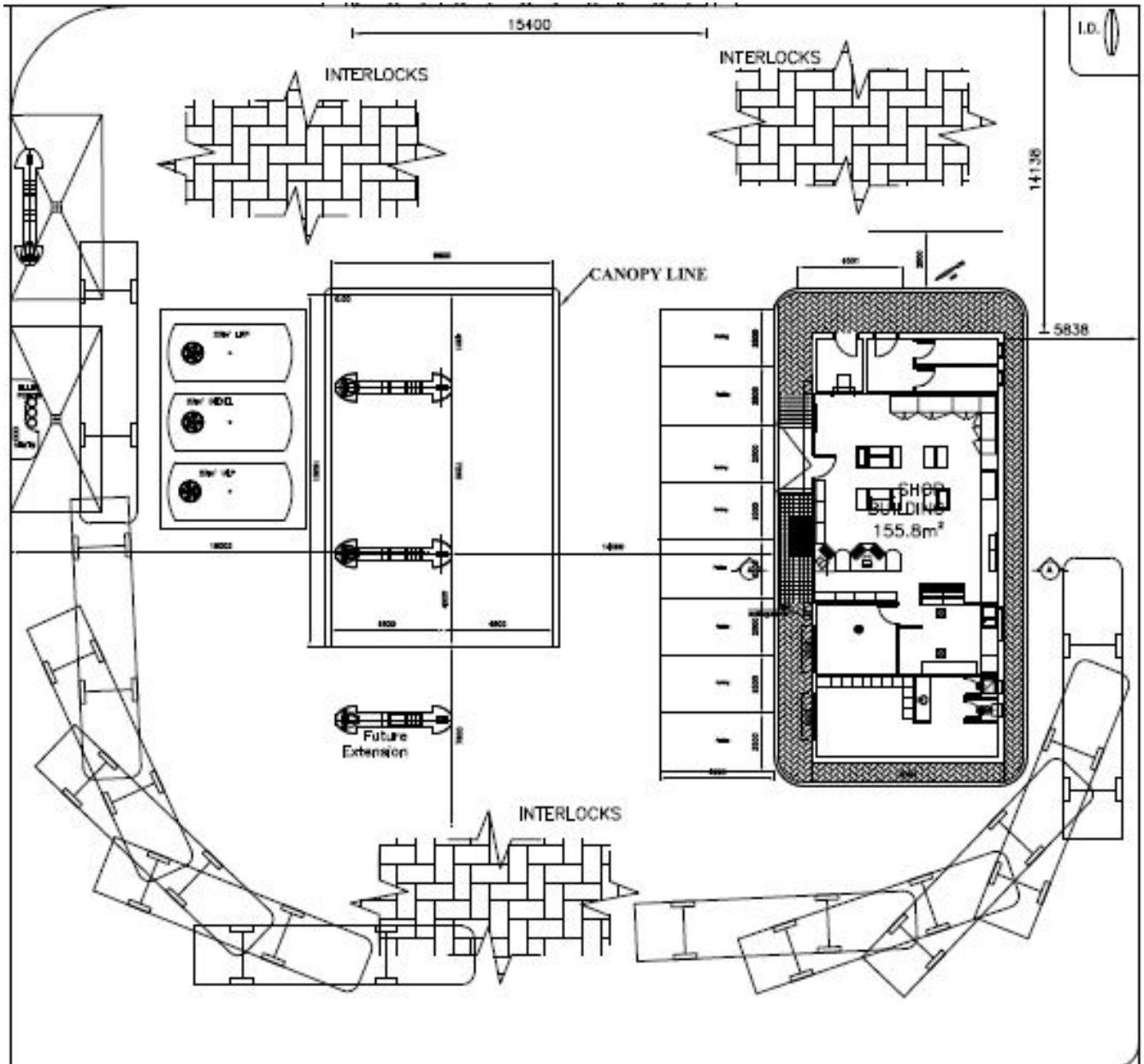
The tanks will be filled from a common filler box. The filler point will be surrounded by secondary sleeving to prevent surface water and soil from entering the filler box. The fuel tanker operator will pump out any spillage into this filler box at the time of fuel delivery.

Fuel from the tanks will be pumped through underground pipelines, which will be laid to the forecourt area, where it will finally be dispensed into customers' vehicles.



Dispensing pumps will be fitted with emergency cut off valves as specified by the relevant legislation and standards.

As per current standard practice, and in fulfilment of the requirements of the SANS 089:1999, all storm water that may potentially be contaminated by fuel or oil spills will be directed to a separator unit prior to exiting the site. See Figure 3 below for a site layout map. Detailed engineering designs and drawings of the proposed development are included in Appendix F.



**Figure 3: Proposed layout of the facility**

## 9. GENERAL ENVIRONMENT OF THE STUDY AREA

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

### 9.1 Location and Land Use

The project site is on portion 4 of Tses Town and Townlands No. 425, along the B1 road, , at Tses in the //Kharas Region. See Figure 1 for location map. Directly west of the site is the B1 road and undeveloped land. South of the site is the Tses Tourism Information Centre and Campsite. North and East of the site is undeveloped land.



View- east of site



View west of site



View -north of site



View -west of site

## ***9.2 Topography and Surface Water***

The site is relatively flat with clear evidence historic clearance. The Nama Karoo basin falls within a large, flat lying plateau that dominates most of Southern Namibia. Sedimentary rocks form the foundation of the landscape. The Fish, Lowen and Konkiep rivers drain the landscape, all flowing south towards the Orange River.

Local drainage will flow from the site southwest ward towards the a tributary of the Tses River. Storm water management systems are in place around the site that form part of the existing town storm water control system, therefore surface water from the service station will be well channeled into the existing drainage system.

Site specific drainage systems should however be developed at the site to control the flow of surface water at the site to avoid flooding (e.g. erection of culverts). A storm water management system should form part of the engineering designs.

### **9.3 Climate** (Mandelsohn et al, 2003)

Classification of climate:	Semi-arid area
Average rainfall:	Rainfall in the area is averaged to be between 100 mm-150 mm per year.
Variation in rainfall:	Variation in rainfall is averaged to be 70-80 % per year.
Average evaporation:	Evaporation in the area is averaged to be between 2300-2500 mm per year.
Precipitation:	The highest summer rains are experienced from January-March.
Water Deficit:	Water deficit in the area is averaged to be between 2100-2300mm per year.
Temperatures:	Temperatures in the area are averaged to be between 20-22°C per year.
Wind direction:	Wind direction in the area is predominantly southerly winds.

Tses and its surroundings can be classified as a water deficit area with annual evaporations exceeding the mean annual rainfall by far. Summer rainfall dominates precipitation in the form of thundershowers and seasonal run off events might occur in the form of flash floods. The aridity of the region causes the water resource to be a scarce commodity and has to be conserved and protected from pollution at all cost.

### **9.4 Geology of the Study Area (M. Shippiki)**

The geology of Fish River Basin consists of flat lying Nama sediments, Namaqua Metamorphic Complex rocks, Quaternary calcretic and conglomerate deposits. The oldest units belong to the Namaqua Metamorphic Complex (NMC); they were deposited about 1800 millions years.

Some 770 million years ago, the metamorphic units (amphibolites, schists and granulite) were swarmed by dark mafic dolerite dykes that are quite prominent in the NE areas of Gibeon. Due to tectonic uplift and erosion over the years the Namaqua rocks were exposed further into lift grabens resulting into formation of a shallow sea. Within this sea the shales, siltstones, limestones and sandstones of the Nama Group where deposited. The original sediments are believed to have originated from the northern Damara Orogen, after their deposition no major metamorphic and deformation occurred. Thus to this day the Nama rocks preserve the spectacular horizontal structures and forming the sharp plateau geomorphology



with Namaqua rocks. Moreover, some 350 Ma modern erosion formed large valleys and depressions.

During the Dwyka glaciations stage the valleys and grabens were widened deeper by southwards flowing rivers, forming the Karoo Sequence. The canyon present today was formed during post-Karoo times, during this time severe erosion removed most of the Karoo units, preserving the NMC and some Nama units.

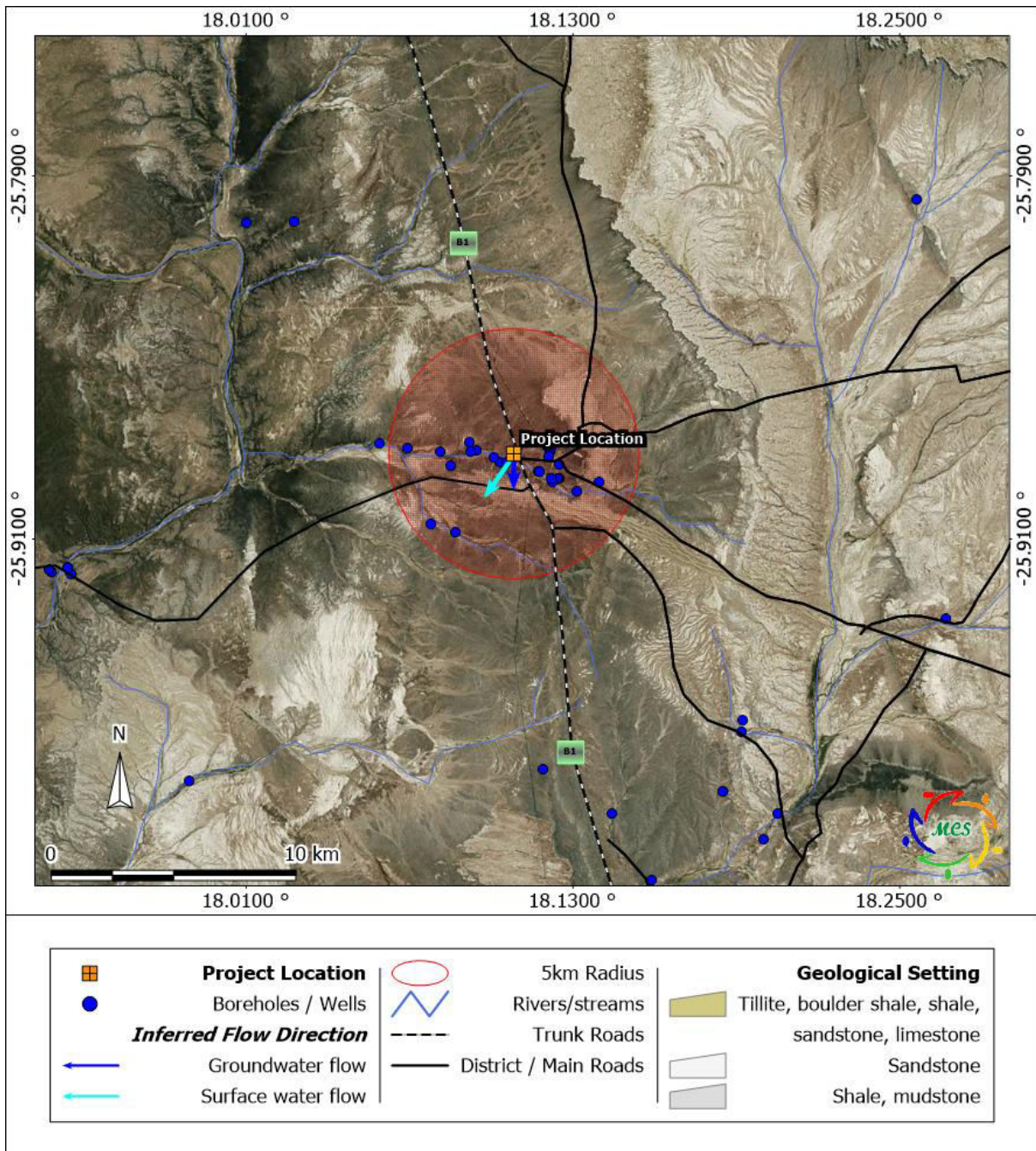
#### **9.4 Hydrogeology of the Study Area (M.Shippiki)**

From a hydrogeological perspective, it is quite difficult to find primary groundwater aquifers, unless of very recent river sediments. In and around Tses town the main aquifer is the recent surficial sedimentary overburden that have accumulated over time, this could be  $\pm 10\text{m}$  deep before bed rock.

The dominant aquifers are the secondary aquifers of the Nama and Karoo sediments that have been structurally faulted and jointed to form storage volumes for water. Springs are also common which are as a result of groundwater rising in major fault zones forming an artesian aquifer (water table/potentiometric surface above ground surface). In areas where erosion has incised till undeformed units of the Namaqua Complex and Namaqua rocks it may be quite difficult to find any water within these rocks. This is a very common event in the south-western and western areas of Tses. High evaporation events have affected the groundwater quality mostly in the south and eastern areas of the Tses district.

The water supply to Tses is supplied by the Tses Namwater Scheme and is sourced from boreholes in the area. Subsurface water in the area is utilized with 18 boreholes known to exist within a 5km radius of the site.

The area does not fall within a groundwater control area; however groundwater remains the property of the government of Namibia. This means that government controls the exploration and usage of it.



**Figure 4: Hydrogeological map**

#### 9.4.1 Groundwater Pollution Vulnerability

The geological framework that hosts the groundwater systems of the project area consists of intensely folded Namaqua Metamorphic Complex rocks. The numerous tectonic uplifts and erosion, graben lifts, thrusting and faulting episodes, of which the geology of the area was subjected to, resulted in geological structures and lineaments been created. Structures are not, however, easily visible on the surface because of cover of unconsolidated sands. Landsat and aerial photographs are therefore of limited use, but aeromagnetic data combined with the satellite imagery has been used successfully in detecting fault-related lineaments in sand-covered areas.

The presence of sensitive geological structures present in the area might form preferential pathways to the underlying aquifer. In order to protect these groundwater resources, pollution to these structures should be avoided at all cost.

#### **9.4.2 Groundwater and Surface-water Pollution Monitoring**

Surface water and groundwater systems are connected in most landscapes. Streams interact with groundwater in three basic ways, i.e. *streams gain water from inflow of groundwater through the streambed, streams lose water by outflow through the streambed, or they do both depending upon the location along the stream.* It is the groundwater contribution that keeps streams flowing between precipitation events.

Point sources of contamination (if any) to surface water bodies (i.e. nearby Tses River) are an expected side effect of development. Possible point sources considered in this project include direct discharges (i.e. spills and leaks) from the operations of the fuel retail facility, and storm water drains. Depending on relative flow magnitudes of the point source and of the stream, discharge from the point source such as any fuel spillages or leakages may affect a large percentage of the water in the stream directly downstream from the source. Hydrocarbon contaminants in streams can easily affect groundwater quality, especially where streams normally seep to groundwater, and where groundwater withdrawals induce seepage from the stream, and where floods cause stream water to become bank storage.

Point sources of contamination to groundwater to be considered at the site can include fuel storage tanks, fuel reticulation pipelines, and oil-water separator systems. If any hydrocarbon contaminants reach the water table, the contaminants are expected to be transported by the slowly moving ground water of site. If the source continues to supply the contaminant over a period of time, the distribution of the contamination will take a characteristic “plume like” shape. This contamination plume can discharge into the nearby Tses River. If the concentration of contamination is low and the rate of discharge of plume water also is small relative to the volume of the receiving surface water body, the discharging contaminant plume will have only a small, or perhaps unmeasurable, effect on the quality of the receiving surface water body. It is imperative that the release of any contamination to the environment be avoided at all costs, as local communities and farmers in the area rely upon the Tses River surface water source for human, agricultural and animal consumption.

The consultant recommends that ground-and surface water pollution be monitored at all times at the site. These water sources are essentially one resource, physically connected by the hydrologic cycle. As a result, groundwater and surface water pollution monitoring must form an integral part of the





Environmental Management Plan (EMP). Surface water pollution on site should be mitigated by the construction of proper surface run-off drainage systems with built-in oil-water separator pits. All of the facilities should be constructed and operated according to relevant SANS standards (or better). Visual inspection of surface water pollution should be adopted, with support of water sampling at specific locations as guided by visual inspections.

Groundwater pollution should be monitored by the installation of four (4) monitoring boreholes around the proposed fuel retail facility. All boreholes will be drilled with a drill diameter of 165mm. The holes will be installed with 2.9m-uPVC plain (140mm OD) casing, followed by factory slotted casing to final depth. Casing bottom caps will be installed in each hole. Gravel pack and bentonite powder will be installed around casing in each installed borehole to prevent any possible surface pollution inflow from the facility. A protective manhole will then be placed over each borehole installed. The purpose of these boreholes is to quantify levels of pollution in the subsurface and to monitor the migration of possible pollution off site.

- 1) **Monitoring Holes 1 (MH1)** will be installed 10m north of the northern boundaries of the site to monitor any pollution migration from the site towards the north.
- 2) **Monitoring Holes 2 (MH2)** will be installed 10m east of the eastern site boundaries to monitor any pollution migrating eastward from site.
- 3) **Monitoring Holes 3 (MH3)** will be installed 10m south from the southern site boundaries to monitor any pollution from site southward.
- 4) **Monitoring Holes 4 (MH4)** will be installed 10m west from the western boundaries of the site to monitor possible migration of pollution westward. See figure 7.

Baseline water samples should be collected from the boreholes immediately after borehole drilling completion, in order to represent baseline conditions at the site. As such, they can be important in forecasting potential environmental impacts should the development proceed, and can become measurements against which future changes are compared.

Groundwater samples will be collected from the monitoring holes regularly (quarterly) and send to laboratories for chemical of concern analysis (i.e. Diesel Range Organics, Gasoline Range Organics). Results should be compared against time to determine levels of pollution and migration thereof to any potential receptors.





**Figure 5. Proposed groundwater monitoring boreholes**

### ***9.5 General Ecology***

The site falls within the Nama Karoo biome, which is characterised by Dwarf Shrub Savanna vegetation type. The dominant vegetation structure is low shrubs that usually grow on Eutric Leptosols soils present in this area.

The Nama Karoo is known to support a varied assemblage of plant communities, ranging from deciduous shrub vegetation to perennial grasslands and succulent shrubs. The great wealth of plant species in the area is brought about by the geological substrates, soils and land forms. Seven vegetation types occur within the Nama Karoo biome of which most is arid (See figure 2, for vegetation map).

The area has been previously disturbed with pedestrian movement (i.e. pedestrian walkways and tracks). Undisturbed vegetation is however also observed within the study area. The dominant vegetation on site consists mainly of medium height grass, scattered shrubs and weedy species and few scattered thorn bush and trees. No conservation worthy vegetation exists at the project location.

The following photos below illustrate the vegetation on site.



Vegetation on site

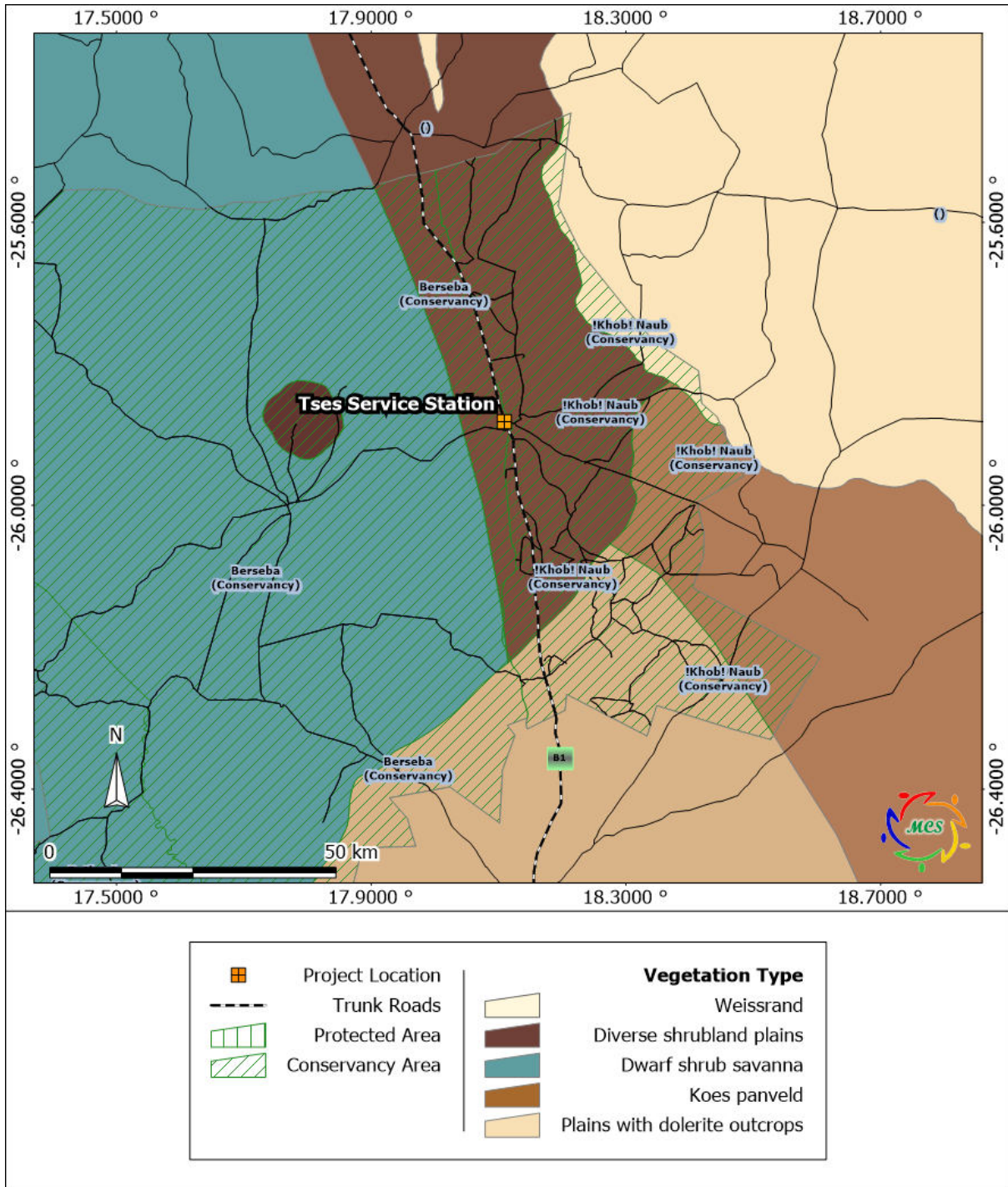


Deducing from the Atlas of Namibia, the proposed site is within the area that is known to have between 50 to 99 plant species (Mandelsohn et al, 2003). With regards to fauna, it is estimated that at least 51 to 60 reptiles, 61 to 75 mammal and 141 to 170 bird species (breeding residents) are known to or are expected to occur in the project area of which only a very few proportions are endemics. Faunal species diversity is presented in the table below:

**Table 2. General Fauna Diversity (Mandelsohn et al, 2003)**

	<u>Diversity</u>	<u>Endemism</u>
<b>Mammal</b>	61 - 75 Species	5 - 6 Species
<b>Scorpion</b>	12 - 13 Species	0 Species
<b>Bird</b>	80-110 Species	0 Species
<b>Reptile</b>	51 - 60 Species	9 - 12 Species
<b>Frog</b>	4-7 Species	N/A
<b>Termite</b>	1 - 6 Genera	N/A





**Figure 6: Vegetation map**

## **9.6 Socio-Economic Aspects**

This section provides an overview of socio-economic characteristics of the study area. It provides regional and local information on the, economic activities, population dynamics, vulnerability, and social services currently available in the area.

### **9.7.1 Regional information**

The proposed Tses service station will be situated in the //Kharas Region of Namibia. The total current population is estimated to be 77,421 with 38,014 females and 39,407 males (NSA, 2011). Ninety-seven percent of the population living in the //Kharas Region over 15 years of age are literate (NSA, 2011). The estimated unemployment rate in the //Kharas region is 32% (NPC, 2011). The population density in the //Kharas Region is 0.5 persons per km<sup>2</sup>. The life expectancy in //Kharas region is 61 years for females and 54 years in males (NPC, 2011).

### **9.7.2 Tses**

Tses is a town in southern Namibia. It is located 60km north of Keetmanshoop, along the main road B1.

#### **9.7.2.1 Economic activities**

Tses is a village in the //Kharas Region, south of Namibia. The village is close to Keetmanshoop which is the hub for all economic activities in the //Kharas Region and is linked to Namibia's air and road network, making it well situated to service Southern Namibia and South Africa.

Mining, farming and government services constitute the main economic activities in the urban parts while sheep, goat and cattle farming are most common in the rural areas. Farming produce is used locally and also exported to neighbouring countries. Tses is a town with no recreational places, such as a swimming pool, the youth and local community still wander the streets and frequent shebeens/bars for leisurely purposes.

#### **9.7.2.2 Employment (Job Opportunities)**

In the //Kharas region only 75 percent of the population older than 15 years belong to the economically active group, which form the labour force, whereas 25 percent is outside the labour force. The labour force rate is higher for males (83%) than for females (63%), Of the 24 percent outside the labour force 28% are students, 40% stay at home, and 32% are retired. While only 72% of the active labour force is actually employed. More than one third of the employed population work in the mining, agriculture, game-farming, hunting, forestry or fishing sector (all male dominated).



The principle of maximising local employment creation can be applied by identifying suitable construction contractors in the region.

It is highly likely that suitable construction contractors would be identified in the immediate vicinity of the project location, and the region. The project site is located in the town of Tses which has few competent small and medium enterprise (SME) construction companies to execute the proposed project. The project would also give rise to indirect economic benefits through the procurement of materials, goods and local to regional services.

The local economy of the town and surrounding farming communities is expected to benefit from the project. A percentage of money derived from salaries and wages earned by government and farm workers is likely to be spent in the vicinity of the project area. The money spent at the town or nearby communities would create substantial flows of revenue within the town and communities, thus acting as a catalyst for growth in the local economy.

In addition, procurement of construction materials, goods and services would have beneficial downstream economic impacts by stimulating demand up the supply chain. The more goods and services procured from local SMEs or enterprises at the town, the greater the project's contribution to the growth of the local economies.

It is therefore recommended that, where feasible, contractors employ local labour by recruiting from local communities and the region at large; and that procurement of materials, goods and services from local suppliers be encouraged.

### **9.7.2.3 Livelihoods**

In the //Kharas region, Formal employment with wages and salaries is the main source of income for 69% of households. More than 61% are employed in the private sector (largest employer), the government (second largest employer) employs about 27% of all employed people while individual employers account for 3% of all employed persons. Farming (7%), Non-farming businesses (5%), cash remittance (6%) and pensions (10%) constitute the main source of income for the remaining households in the //Kharas region. The livelihoods of the local community are likely to be positively impacted therefore predicted to be better than before the development of the facility in the area.

### **9.7.2.4 Procurement**

Local businesses are to benefit from the envisaged construction and operational activities. Tses Service Station and/or its sub-contractors might need to procure services from these businesses e.g. domestic waste removal, transport, security services etc.



#### **9.7.2.5 Tourism**

Many tourists that visit the Tses and the //Kharas Region, come to enjoy the safari and hunting experiences offered here in the south. In addition, private game farms and conservancies offer protection for wildlife, which then becomes an attraction to tourists and trophy hunters.

The area attracts a lot of tourists from all over the world. Excessive waste, dust, noise and vibrations can have negative impacts on the tourism industry in the area, as it can become a nuisance to tourists. Mitigation measures at the site must be put in place to reduce these impacts.

#### **9.7.2.6 In - Migration**

Due to enhanced employment opportunities that could be created by the envisaged project, some in-migration of job seekers to Tses can be expected. Depending on the amount of in-migration, local areas may start experiencing overcrowdings, over use of infrastructure, local conflicts, increase of goods prices due to increased demand etc.

#### **9.7.2.7 HIV & Prostitution**

Namibia is one of the ten worst affected countries in terms of the HIV/AIDS epidemic. The HIV prevalence rate for the age group 15 to 49 is estimated at 21.3% for Namibia (UNDP, 2005). The HIV/AIDS prevalence rate in pregnant women aged 15 to 49 years in the //Kharas region is 17%.

The spending powers of contractors working for Tses Service Station project are likely to increase, and this might be a perfect opportunity for sex workers to explore. Migrant labourers from other regions and expatriates are normally vulnerable and may use the services rendered by the sex workers.

Construction camps (if any) often become a focal point for promiscuous sexual activities. Such activities, particularly when carried out without protection, can result in increases in sexually transmitted diseases (STDs) and especially AIDS among neighbouring communities, construction workers and their partners.

Should the HIV prevalence increase, the following consequential issues could arise:

- ✓ Reduced workforce in the //Kharas Region.
- ✓ Diversion of income expenditure to medical care.
- ✓ Increase in orphans and households headed by children.
- ✓ Increase in pregnancy related mortality.
- ✓ Increase in the number of people per doctor



### **9.7.2.8 Infrastructure & Increased Traffic**

The traffic in the area would be expected to increase slightly and it might contribute to heavy traffic during peak hours and a higher number of car accidents along the B1, and local streets. Infrastructure like roads will be affected due to increased traffic and heavy-duty cargo trucks.

In the //Kharas Region, 92% of households have access to safe water. About 23% have no access to toilet facilities, 28% of all households have access to wood or charcoal for cooking, 74% of all households have access to radio and only 67% to electricity for lighting purposes. Keetmanshoop state hospital is one of the largest available health care facilities in the town.

### **9.7.2.9 Regional Education Status**

According to EMIS (2011), there are a total number of 49 schools of which 38 are state owned and 11 privately owned in the //Kharas Region. In addition, of the 20,110 learners in the //Kharas Region 16,832 are enrolled in public schools while the remaining 3,278 attend private schools. Only 79 of all 826 teachers in the //Kharas Region are without training. The percentage literacy for persons older than 15 years is 92% which is relatively high in comparison with the 81% of Namibia. The //Kharas Region is not rated high in the country in terms of education, but some schools certainly offer quality education to the young ones as from primary to high schools.

### **9.7.2.10 Poverty status**

//Kharas Region's Human Poverty Index of 21 percent is above the national average of 33. The majority of the communities agree that unemployment, lack of assets and the inability to meet basic needs are characteristics of the 'very poor' or 'poor'. Further on 'poor' people do not have access to agricultural land ,do not own livestock, have never been employed, and thus are unable to pay for their children's education, buy them food, clothes, shoes and provide proper shelter for them. Therefore, a good quality of life in the //Kharas Region is represented by the total opposite factors mentioned above, which includes formal employment, owning land, livestock and transport (cars).





## 10. STAKEHOLDER PARTICIPATION

The principles of EMA govern many aspects of EIA's, including consultation with interested and affected parties (I&APs). Consultation with the public forms an integral component of an EIA investigation and enables I&APs e.g. neighbouring landowners, local authorities, environmental groups, civic associations and communities, to comment on the potential environmental impacts associated with the proposed development and to identify additional issues which they feel should be addressed in the EIA.

The primary aims of public participation were:

- ❖ To initiate participation of Interested and affected parties (I&APs).
- ❖ To inform I&APs and key stakeholders about the proposed development
- ❖ To identify issues and concerns of key stakeholders and I&APs with regards to the proposed development.
- ❖ To provide information to enable informed decision making
- ❖ To develop a communication structure with stakeholder and I&APs
- ❖ To promote transparency of the project
- ❖ To ensure the public and stakeholders comments are considered for the development.
- ❖ To provide answers to I&APs queries
- ❖ To encourage shared responsibility and sense of ownership.

Public participation posters notices were placed in strategic locations in the vicinity of the proposed fuel retail facility. Amongst others, the strategic locations included the site itself, Tses Village Council Offices, Tses Nampost, and Arnold Tjihenuna General Dealer.

The posters provided background information about the project and gave interested and affected parties an opportunity to forward their issues and comments about the project.





posters placed at strategic locations



Decision-making authorities were consulted throughout from the onset of the study, and have been engaged throughout the project process. Consultation with the department of Environmental Affairs (MET) included the environmental assessment procedure and application procedure.



Public participation notices were advertised in two local newspapers on two different occasions, namely; (See Appendix H).

- ✓ The New Era Newspaper, 9th and 16th May 2018
- ✓ The Namibian, 9th and 16th May 2018

In the adverts an e-mail address, phone number and fax number was provided to the general public to register as interested and affected parties; and to request a background information document for the project. As indicated before, notification posters were placed at strategic locations to invite interested and affected parties to the public consultation meeting.

The Tses Village Council (local authority) was also consulted, and the Acting Chief Executive Officer, Mr. Amulungu indicated no obvious environmental concerns regarding the proposed project. A background information document was available to all interested and affected parties who were consulted.



**Figure 7: Public Meeting at Tses Community Hall**

A public consultation meeting was held on the 23rd May 2018, in the Tses Community Hall. The interested and affected parties raised concerns during the meeting, and can be summarised as fuel retail market issues, jobs for locals and the inclusion of local contractors in the project. See minutes of the meeting in Appendix C. All the issues raised during the public participation process by relevant stakeholders and I&APs have been captured in the minutes.

- ✓ See appendix E for local authority consent letter,
- ✓ See appendix C for meeting minutes,
- ✓ See appendix D for Meeting Attendance Register,
- ✓ See appendix F for Layout drawings,

**Table 3. I&APS**

<b>NAME</b>	<b>ORGANISATION/ERF</b>	<b>OWNER/POSITION</b>
Mrs. M. Mungunda	Proponent	Installation Information
Mr. S. Swartbooi	Tses Resident	Interested or Affected Parties
Mr. M. Isaacks	Tses Resident	Interested or Affected Parties
Mr. M. April	Tses Resident	Interested or Affected Parties
Mr. A. Plaatjie	Tses Resident	Interested or Affected Parties
Ms. S. Tjihenuna	Tses Resident	Interested or Affected Parties
Ms. J. Christiaan	Tses Resident	Interested or Affected Parties
Mr. A. Goliath	Tses Resident	Interested or Affected Parties
Mr. B. Jahrs	Tses Resident	Interested or Affected Parties
Mr. W. Gariseb	Tses Resident	Interested or Affected Parties
Mr. M. Orr	Tses Resident	Interested or Affected Parties
Mr. K. Plaathies	Tses Resident	Interested or Affected Parties
Mr. J.J. Basson	Tses Resident	Interested or Affected Parties
Ms. S. Gariseb	Tses Resident	Interested or Affected Parties
Mr. A. Swartz	Tses Resident	Interested or Affected Parties
Mr. J.B. Awaseb	Tses Counsellor	Interested or Affected Parties
Mr. R. Jossop	Tses Resident	Interested or Affected Parties
Mr. H. Jospo	Tses Resident	Interested or Affected Parties
Mr. H. Rooi	Tses Resident	Interested or Affected Parties
Mr. C. Awsman	SHANNA Investments cc	Interested or Affected Parties
Mr. F. P. Rooi	Tses Resident	Interested or Affected Parties
Mr. D. Karab	MOHSS-Tses Clinic	Interested or Affected Parties
Mr. R. Orr	Tses Resident	Interested or Affected Parties
Ms. S. Orr	Tses Resident	Interested or Affected Parties
Ms. C. Vries	Tses Resident	Interested or Affected Parties
R. McKay	Tses Resident	Interested or Affected Parties

Consultation with the department of Environmental Affairs (MET) included the environmental assessment procedure and application procedure.

## 11. ENVIRONMENTAL IMPACT EVALUATION

The Environmental Impact Assessment sets out potential positive and negative environmental impacts associated with the proposed development. The following assessment methodology will be used to examine each impact identified, see Table 4:

**Table 4. Impact Evaluation Criterion (DEAT 2006)**

Criteria	Rating (Severity)	
Impact Type	+VE	Positive
	0	No Impact
	-VE	Negative
Significance of impact being either	L	Low (Little or no impact)
	M	Medium (Manageable impacts)
	H	High (Adverse impact)

Probability:	Duration:
5 - Definite/don't know	5 - Permanent
4 - Highly probable	4 - Long-term (impact ceases)
3 - Medium probability	3 - Medium-term (5-15 years)
2 - Low probability	2 - Short-term (0-5 years)
1 - Improbable	1 - Immediate
0 - None	
Scale:	Magnitude:
5 - International	10 - Very high/don't know
4 - National	8 - High
3 - Regional	6 - Moderate
2 - Local	4 - Low
1 - Site only	2 - Minor
	0 - None

### 11.1 Construction Phase of the proposed fuel retail facility

#### 11.1.1 Dust Pollution

Dust problems are expected to be site specific and short termed, and should pose a negligible nuisance and health threat to neighbouring residence. Dust will be generated during the construction phase and might be worse during the winter months when strong winds occur. Dust is regarded as a nuisance as it reduces visibility, affects the human health and retards plant growth.

It is recommended that regular dust suppression be included in the construction phase, when dust becomes an issue. In general, the construction of the proposed fuel facility is envisaged to have minimal impacts on the surrounding air quality.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Dust	-VE	1	2	4	4	L	L



### 11.1.2 Noise Impact

Earthmoving equipment will be utilised during the construction phase and noise would be generated.

It is not expected that the noise generated during construction will impact any third parties very much considering that the development is in the industrial area. The contractor must ensure that all mufflers on vehicles and machinery are in full operational order; and any audio equipment should not be played at levels considered intrusive by others. The construction staff should be equipped with ear protection equipment. Construction activities will be limited to a period between 07h00 and 19h00.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Noise	-VE	1	2	4	2	L	L

### 11.1.3 Safety

Safety issues could arise from the 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. The presence of equipment lying around on site may also encourage criminal activities (theft).

Sensitize operators of earthmoving equipment and tools to switch off engines of vehicles or machinery not being used. The contractor is advised to ensure that the team is equipped with first aid kits and that they are available on site, at all times. Workers should be equipped with adequate personal protective gear and properly trained in first aid and safety awareness.

No open flames, smoking or any potential sources of ignition should be allowed at the project location. Signs such as 'NO SMOKING' must be prominently displayed in parts where inflammable materials are stored on the premises. Proper barricading and/or fencing around the work sites should be erected to avoid entrance of animals and/or unauthorized persons. Safety regulatory signs should be placed at strategic locations to ensure awareness. Adequate lighting within and around the construction locations should be erected, when visibility becomes an issue.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Safety	-VE	1	2	4	2	M	L

### 11.1.4 Traffic

The site is situated with the an industrial township (extension 4). Construction related activities are expected to have a minimal impact on the movement of traffic along the municipal road (street).



No diversion of traffic or closure of the road is expected, however a slight nuisance might be experienced by motorists frequenting the area; and residents of Tses. This will most likely be caused by slow moving vehicles frequenting the construction site. It is however expected to be short-lived.

The local traffic department should be consulted and notified of the proposed construction phase, so that proper mechanisms can be put in place should traffic become an issue during the construction phase.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Traffic	-VE	1	2	2	2	L	L

### 11.1.5 Soil

Possible impacts associated with the construction phase include soil erosion and contamination of soil from poorly managed construction materials.

Soil erosion can be mitigated by the implementation of an appropriately designed and constructed storm water management system; and managing the development in compliance with relevant environmental and water.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Soil	-VE	1	2	2	2	L	L

### 11.1.6 Groundwater

Groundwater quality could be impacted through leachate of petroleum, chemical, harmful and hazardous substances. In particular, oil leakages, diesel, lubricants and grease from vehicles, equipment and machinery utilised during the construction phase may occur. Care must be taken to avoid contamination of soil and groundwater.

Use drip trays, linings or concrete floors when evidence of leaks are observed on vehicles or equipment. No servicing and maintenance of vehicles and/or equipment should be conducted on site. All fuelling, storage and chemical handling (if any) should be conducted on surfaces provided for this purpose. All contaminated soil must be removed from the site and disposed off or treated at a suitable facility. No hazardous waste disposal facility exists in Tses, or the region at large, therefore a controlled bioremediation facility should be developed for any contaminated soil produced during this phase.

Run-off from overflowing onsite temporary sewage systems (if any) might transport the effluent to areas where sensitive geological structures and formations are present. Inflow into these structures and formations would cause a pollution threat.

Proper temporary toilet facilities with adequate containment 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.

Proper environmental awareness and remedial response training of operators must be conducted on a regular basis and that the contents are properly removed from site.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Groundwater	-VE	1	3	2	2	M	L

### 11.1.7 Surface Water

Contamination of surface water might occur through petroleum, chemical, harmful and hazardous substances. Contaminants in the form of oil leakages, diesel, lubricants and grease from the heavy-duty equipment and machinery during the construction phase may occur. Any spillage of hazardous substances including fuel, oil, paint or cleaning solvent must be cleaned up and disposed off to 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 to the ground to prevent them toppling due to wind or any other cause. 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. Hydrocarbon contaminated equipment and clothing should not be washed at project location, or 100m from any surface water course; and no waste material may be disposed off in any nearby water ways and courses (e.g. storm water systems) in the area.

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.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Surface water	-VE	2	3	2	1	L	L





### 11.1.8 Generation of Waste

Waste material will be generated during the construction of the proposed development. Waste in the form of rock cuttings, pipe cuttings, electrical cuttings, oil spills or leakages of petroleum products might occur during the construction phase. Contaminated soil must be removed and disposed off at a suitable waste disposal site.

The contractor must 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. The Contractor shall institute a waste control and removal system for the site. No waste and/or construction debris shall be disposed of by burning, or by burying. Regular inspection and housekeeping procedure monitoring should be maintained at all times.

Proper temporary toilet facilities with adequate containment 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 be regularly disposed off at a suitable sewage disposal site.

All waste shall be disposed off site at an approved landfill site. Consultation with the Tses Village Council should be conducted in this regard.

Unfortunately, no formal hazardous waste disposal site exists in Tses. As a result, the Consultant recommends that the proponent develops a bioremediation facility for rehabilitation of any contaminated hazardous soils etc. Any non-biodegradable hazardous material generated should be properly stored in containment structures, collected and transported to the nearest approved hazardous waste disposal facility (i.e. Walvis Bay, Tsumeb or Windhoek).

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Waste	-VE	1	3	6	4	M	L

### 11.1.9 Heritage Impacts

There are no known heritage areas envisaged to be impacted by the new development.

The contractor might come across archaeological features or objects that possess cultural values during construction activities. If such remains or objects with cultural values (e.g. bones, weapons, ancient cutlery, graves etc) are uncovered at the project location or surrounding, it should be barricaded off and the relevant authorities should be contacted immediately.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Heritage	-VE	1	2	2	2	L	L



### 11.1.10 Ecological Impacts

The project area is considered already disturbed, which is free of any conservation worthy vegetation and fauna. Land will be cleared, leaving the larger trees to be incorporated into the development (where viable). Therefore, impacts on fauna and flora are expected to be minimal. Disturbance of areas outside the designated working zone is not allowed.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Ecology	-VE	1	2	2	2	L	L

### 11.1.11 Increased Spread of HIV/ AIDS

The spending power of locals and expatriates working for the developer and/or its contractors are likely to increase, and this might be a perfect opportunity for sex workers to explore. Migrant labourers from other regions and expatriates are normally vulnerable and may use the services rendered by the sex workers. A key initiative should be to educate workers.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
HIV/Aids Spread	-VE	4	2	6	2	M	L

### 11.1.12 Increased Influx to Tses

More job opportunities may attract more non-local job seekers. This may lead to an increase housing demand with potential stimulation of property values and economic activities through increased spending in area. This impact can be seen as both positive and negative. It is still advised to give employment preference to locals that can proof normal residence in the area.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Increased Influx	-VE	2	1	4	4	L	L

### Summary of all potential impacts during the construction phase:

In general, impacts are expected to be low to medium, mostly short lived and site specific. Mitigation options recommended in the Environmental Management Plan (EMP) will guide and ensure that the impacts of the construction work are minimised. It is further advised that traffic signs and barricades be installed around any excavations to ensure safety. Proper storm water management plans must be in place to minimise the risk of flooding and must form part of the engineering designs.

The appointed contractor should be made aware of the content and environmental requirements of this report through proper induction training.



## 11.2 Operational Phase of the proposed fuel retail facility

### 11.2.1 Spillages and Leakages

Spillages are bound to occur during delivery of fuel over the operational phase of the fuel retail facility. Workers must be properly trained to avoid such incidents, and they must be provided with emergency response procedures which they should be familiar with.

Ensure that fuel tankers delivering fuel to the facility are equipped with sufficient equipment and material to contain and remediate any accidental spills; and to remove any contaminated soil or water.

Ensure that any petroleum products, such as grease, waste oils and lubricants stored on site are contained in containment structures (e.g. plastic liners, drip trays etc.). Leaking containers and/or equipment should be removed from the site to a designated containment area, which should be equipped with a waste water collection system.

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. Staff should at all times be aware of the precautions associated with the handling of petroleum / chemical products as described in the relevant Material Safety Data Sheets.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Spills	-VE	1	2	6	4	M	L

### 11.2.2 Air Quality

Air quality around the site could be impacted by exhaust fumes from the fleet of transport tanker trucks and 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. Vent pipes should be placed in such a manner as to prevent impact on potential receptors. It is recommended that regular air quality monitoring be conducted at the facility.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Air Quality	-VE	1	4	4	2	L	L

### 11.2.3 Fire and Explosion Risks

Emergency response procedures should be in place so as to alert the employees on how to react to fire and explosions incidents. An incident reporting procedure should also be implemented to make the employees aware of how, when and to whom to report fire and explosion incidents.



Regular inspections should be carried out to inspect and test fire fighting equipment and emergency response at the fuel retail facility. It is highly recommended that electrical wiring of the facility be installed and approved by a qualified electrician who will issue a Certificate of Compliance.

All fire precautions and fire control at the fuel retail facility must be in accordance with SANS 10089-1:1999, or better. A holistic fire protection and prevention plan is needed.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Fire & Explosions	-VE	1	2	6	4	M	L

#### 11.2.4 Generation of Waste

Waste such as contaminated soil, litter, empty cans of engine oil and other petroleum products will be generated during the operational phase. Waste bins must be available at the retail facility at all times. Waste must be appropriately collected and disposed off at an approved appropriate waste disposal site. Awareness of the hazardous nature of various types of waste should be enforced.

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 is required, if applicable. 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.

No illegal waste dumping outside designated fuel retail facility footprint; or burying or burning of waste on site.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Waste	-VE	1	2	6	2	L	L

#### 11.2.5 Soil

Possible impacts associated with the operational phase include soil erosion from poorly designed and managed storm water systems; contamination of soil with petrochemicals from leaking or malfunctioning equipment and spillages.

This can be mitigated by the implementation of an appropriately designed and constructed storm water management system; and managing the development in compliance with relevant environmental and water legislations.



Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Soil	-VE	1	2	2	2	L	L

### 11.2.6 Surface Water

Surface runoff from the site is expected in a westerly direction. Runoff from the site poses a risk to the Tses River; however the risk will be lowered due to the design and management of the facility. Proper containment mechanisms installed should be able to contain any spillages that might occur during the operation of the facility.

The presence of an emergency response plan and suitable equipment is advised, so as to react to any spillage or leakages properly and efficiently.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Surface water	-VE	2	2	6	2	M	L

### 11.2.7 Groundwater

Spillages might occur during filling of tanks and/or overfilling of vehicles. Overfilling of the tanker trucks may also take place and 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.

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. Training attendance lists must be kept. The risk can be lowered further through the installation of suitable containment structures.

It is advised that regular tank and pipeline tightness inspections be conducted to eliminate the risk of impact on the environment due to leakage.

Potential leakages and/or spillages that could lead to groundwater pollution can be prevented by applying the following guidelines:

- ✓ All fuelling should only be conducted on surfaces provided for this purpose;
- ✓ Spillage control procedures must be in place according to SANS 10089-1:1999 and SANS 100131-2 standards, or better, including impounding around the loading areas by bunding with appropriate slopes of 1:100, construction of bund walls and floors that are liquid tight and that are not prone to deterioration under the effects of any petroleum product;
- ✓ The procedures followed to prevent environmental damage during service and maintenance, and compliance with these procedures, including the correct use of sumps and regular reporting of spillages must be audited and corrections made where necessary;



- ✓ The condition of the fuel reticulation system will have to be checked regularly and repaired to prevent leakages;
- ✓ Proper training of operators must be conducted on a regular basis;
- ✓ Any spillage of more than 200litres must be reported to the relevant authorities and remediation instituted (refer to section 49 of the Petroleum Products and Energy Act, 1990 (Act No. 13 of 1990)); and
- ✓ Equipment and materials to deal with spill cleanup must be readily available on site and staff must be trained in the usage of these products.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Groundwater	-VE	1	3	6	2	M	L

### 11.2.8 Health and Safety

The operations of the facility can cause health and safety risks to workers on site. Employees could be exposed through skin contact with fuel and inhalation of fuel particulates during handling of such products.

Staff must be properly trained and made aware of all the MSDS sheets of all chemicals on site. Fire fighting equipment and first aid kit should be made available and must be serviced regularly. Employees are expected to be trained on how to use all equipment and how to handle petroleum products, and training attendance lists must be kept.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Health & Safety	-VE	1	3	6	3	M	L

### 11.2.9 Traffic

A slight increase in traffic will be experienced, due to vehicles frequenting the site. This impact will be long-lived, as both passenger vehicles and long distance trucks will be making use of the same site. Appropriate road signs should be erected to reduce these impacts and their spin-offs.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Traffic	-VE	1	4	6	3	M	L

### 11.2.10 Heritage Impacts

There are no known heritage areas / material envisaged to be impacted by the operational phase.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Heritage	-VE	1	2	2	2	L	L



### 11.2.11 Ecological Impacts

The proposed facility operations will have no impact the fauna and flora. The operational activities would not exceed the demarcated area of the fuel retail facility as zoned by the local authority.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Ecology	-VE	1	2	2	2	L	L

### 11.2.12 Noise Impacts

Encourage minimal vehicle idling times of non-moving vehicles at the facility. Any audio equipment should not be played at levels considered intrusive by others.

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.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Noise	-VE	1	1	2	2	L	L

### 11.2.13 Economic Impacts

The creation of new employment opportunities is considered to be a positive impact. It is not clear how many new, permanent employment positions will be created but it is expected to be less than 14.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Economic Input	-VE	2	4	8	4	L	L

### 11.2.14 Stimulation of Economic Development

The development of the new modern fuel facility in Tses is expected to catalyse economic development at the town. The construction of the facility with its convenience shop, and the much needed one stop services are expected to boost development confidence in the town.

Impact  
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Economic Stimulation	-VE	2	4	8	4	L	L



### 11.3 Decommissioning Phase

The impacts associated with this phase will be similar to that of the construction phase. The supplier's guidelines for tank removal must be followed to reduce the risk of spillage and groundwater contamination. The Environmental Management Plan for this phase will have to be reviewed at the time of decommissioning to cater for changes made to the development.

## 12. CUMMULATIVE IMPACTS

**Construction:** Possible cumulative impacts associated with the construction phase include an increase in traffic visiting the site. An increase in emissions from these vehicles will be experienced, decreasing the air quality around the proposed development. Wear and tear on the roads could be expected, coupled with increased risks of road traffic incidences. These impacts will be short lived for the duration of construction.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Cummulative impacts	-VE	2	2	6	2	L	L

**Operational:** Potential cumulative impacts associated with the operational phase include increase in traffic around the area. Emissions from vehicles visiting the proposed fuel retail facility are expected, coupled with the existing emissions from vehicles in the surrounding areas, the air quality will be impacted. These impacts can be long-term as long as the retail facility is operating.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Cummulative impacts	-VE	2	2	6	2	M	L





### **13. ENVIRONMENTAL MANAGEMENT PLAN**

The Environmental Management Plan (EMP) provides management options to ensure impacts of the proposed development are minimised. An EMP is an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented, and the positive benefits of the projects are enhanced.

The objectives of the EMP are:

- ✓ to include all components of the development;
- ✓ to prescribe the best practicable control methods to lessen the environmental impacts associated with the construction of the development;
- ✓ to monitor and audit the performance of construction personnel in applying such controls; and
- ✓ to ensure that appropriate environmental training is provided to responsible construction personnel.

The EMP acts as a stand-alone document, which can be used during the various phases of the proposed fuel retail facility. All contractors taking part in the construction of the facility should be made aware of the contents of the EMP. An EMP for the construction, operational and decommissioning phases of the proposed fuel retail facility has been developed and is attached as Appendix A.

### **14. CONCLUSIONS**

In general, the proposed development would pose limited environmental and social risks.

The site is generally suitable for the proposed fuel retail facility. All environmental risks can be minimised and managed through implementing preventative measures and sound management systems. It is recommended that this information be made available to the community on a regular basis.

The Environmental Management Plan should be used as an on-site tool during all phases of the proposed fuel retail facility. Monitoring of groundwater pollution should be conducted in intervals of 3 months all year.

Future environmental audits should be carried out to ensure compliance of the EMP and environmental regulations of Namibia. Parties responsible for non-conformances of the EMP will be held responsible for any rehabilitation that may need to be undertaken.

The environmental clearance is valid for 3 years only, as per the environmental management act No.7 of 2007, thus it is the responsibility of the proponent to commission an application for renewal of the permit by submitting an updated EIA/EMP document before it expires.



## 11. REFERENCES

DEAT (2006) Guideline 4: Public Participation in support of the Environmental Impact Assessment Regulations, 2006. Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

DEAT (2006) Guideline 5: Assessment of Alternatives and Impacts in support of the Environmental Impact Assessment Regulations, 2006. Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

Department of Environmental Affairs and Tourism (DEAT), (2006): EIA Regulations.

Digital Atlas of Namibia, Ministry of Environment & Tourism.

Environmental Management Act guideline of Namibia.

//Kharas Regional Poverty Profile (2007)

//Kharas Census Regional Profile, National Planning Commission (2011)

Mandelsohn J., Jarvis A., Roberts C. And Robertson T. (2003), Atlas of Namibia, Ministry of Environment and Tourism, David Phillip Publishers, South Africa.

Meteorological Services Department; Climate Data.

National Planning Commission, (2003) 2001 Population and Housing Census, //Kharas Region: Basic Analysis with Highlights. Central Bureau of Statistics, Windhoek.

SANS 100131:1999: The petroleum industry. Part 3: The installation of underground storage tanks, pumps/dispensers and pipework at service stations and consumer installations.

SANS 10089 – 1:1999; The Petroleum Industry. Part 1: Storage and distribution of petroleum products in aboveground bulk installations.

SANS 10089 – 3:1999; The Petroleum Industry. Part 3: The installation of underground storage tanks, pumps/dispensers and pipework at service station and consumer installations.

The Southern African Institute for Environmental Assessment, (2006) Authors (Brownlie S., Walmsley B. and P. Tarr): Guidance document on Biodiversity, Impact Assessment and Decision Making in Southern Africa. CBBIA – IAIA.

