

ENVIRONMENTAL SCOPING REPORT

PROPOSED UPGRADE AND CONTINUED OPERATION OF THE EXISTING NKURENKURU FUEL RETAIL FACILITY AT NKURENKURU

- KAVANGO WEST REGION -



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EXECUTIVE SUMMARY

An Environmental Scoping Assessment (ESA) has been commissioned by Total Namibia (Pty) Ltd. for the proposed storage alterations / upgrade and continued operations of the existing Nkurenkuru Service Station at Nkurenkuru, in the Kavango West Region.

Considering the nature of the proposed development and its activities, the ESA has been undertaken in accordance with the requirements of existing national legislations, of which the National Environmental Assessment Policy (1995), 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 are considered most important. Some existing international policies are also taken into account and are used as guidelines.

Impacts identified from baseline studies, site visits and stakeholder consultation process have been assessed making use of a comprehensive assessment methodology as provided by the Department of Environmental Affairs (DEA) of Namibia. This included looking at impact significance through, its nature, extent, duration, probability and intensity. Major issues or impacts identified are soil, surface and ground water impacts; air quality (including dust pollution); ecological impacts; risk of fires and explosions; hygiene and health impact; heritage impacts; generation of waste; traffic safety, especially during construction; noise pollution; safety and security; and cumulative impacts.

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

Socio-economic impacts amongst others include creation of part-time and permanent employment opportunities and economic spin-offs for the local businesses and suppliers. Waste generation during the construction activities is eminent; however implementation of proper management strategies should address these issues. Minor surface spillages during the continued operations of the facility may result in a collective long-term significant impact on surface and groundwater.

Cumulative impacts expected as a result of the fuel retail facility include, dust and exhaust emissions from vehicles frequenting the facility during all phases of the development, coupled with the existing emissions from vehicles in the surrounding areas; the air quality will be impacted. An increase in traffic around the area due to the new modern fuel facility will also be observed.

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. All environmental risks can be minimised and managed through implementation of preventative measures and sound management systems. Environmental audits should be carried out to ensure compliance of the EMP and environmental regulations of Namibia.

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List of Abbreviations

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



PROJECT DETAILS

TEAM MEMBERS		
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GLOSSARY OF TERMS

Project area - Refers to the entire study area encompassing the total area as indicated on the study area map.

Project site - Refers to the geographical setting (piece of land) on which the proposed development is to be located.

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

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 – Is the complex of natural and anthropogenic factors and elements that are mutually interrelated and affect the ecological equilibrium and the quality of life. As defined in the Environmental Policy and Environmental Management Bill of Namibia - *“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 Scoping Assessment (ESA) – process of assessment of the effects of a development on the environment.

Environmental Management Plan (EMP) - A legally binding working document, which stipulates environmental and socio-economic mitigation measures that must be implemented by several responsible parties throughout the duration of the proposed project.

Fuel retail facility / 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.

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.

Environmental Assessment Practitioner - A person designated by a proponent to manage the assessment process.

Local Authority - Means a local authority council as defined in section 1 of the Local Authorities Act, 1992 (Act No. 23 of 1992).

1. BACKGROUND AND INTRODUCTION

Total Namibia (Pty) Ltd. has commissioned an Environmental Scoping Assessment (ESA) for the proposed storage alterations / upgrade and continued operations of the existing Nkurenkuru Service Station at Nkurenkuru, in the Kavango West Region. See Figure 3.

The fuel retail facility has been operated under the umbrella of Total Namibia (Pty) Ltd. for over 10 years now, of which Total Namibia now plans on refurbishing the site into a modern fuel service station. The proposed upgrade forms part of Total Namibia's commitment to world-class standards of operation in safety, reliability and the environment. The development is currently supplying fuel to the general public and is expected to continue to do so after the upgrade phase.

Matrix Consulting Services was appointed to undertake the Environmental Scoping 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*

The upgrade of the fuel facility will provide the much-needed modern fuelling point with all its associated modern services, especially to local and long distance motorists frequenting the settlement. The facility also aims at alleviating the fuel shortage experienced by motorists in the area.

Potential spin-offs:

- ❖ **Employment:** Apart from the existing workforce at the fuel facility, additional 2 to 3 new jobs are expected to be created. It is estimated that the new jobs will improve the livelihoods of the new workers and their families. Given the unemployment rate of 46.8% in the region, this in itself is regarded as a significant benefit to the socio-economic situation in the region (The Namibia Labour Force Survey, Namibia Statistics Agency, 2018).
- ❖ **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** at Nkurenkuru and the surrounding areas, especially the immediate businesses and residence; and



- ❖ Expansion of trade and industrial activity in the area.

1.2. Project Phases

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

Construction Phase:

- ❖ Demolish and removal of all existing fuel storage tanks; and part or all associated fuel infrastructure.
- ❖ Excavation for the new pipeline trenches and tank pit(s).
- ❖ Transport and installation of the storage tanks and relevant material.
- ❖ Installation of fuel pipelines.
- ❖ Constructions 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

Total Namibia (Pty) Ltd. has commissioned an Environmental Scoping Assessment (ESA) for the proposed storage alterations / upgrade and continued operations of the existing Nkurenkuru Service Station. The fuel retail facility is located at 17.62627°S; 18.61210°E.

Matrix Consulting Services was appointed to undertake the Environmental Scoping 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 and that they are mitigated. The environmental scoping 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 the proposed storage alterations / upgrade and continued operations of the existing 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. List of activities identified in the EIA Regulations that apply to the proposed project

Activity Description:	Description of Activity	Activities
Activity 8.9 Water Resource Developments	Construction and other activities within a catchment area.	The project entails activities that will be undertaken within the Okavango River catchment area.
Activity 9.4 Hazardous Substance Treatment, Handling and Storage	The storage and handling of 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.
Activity 9.5 Hazardous Substance Treatment, Handling and Storage	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.	The project includes an upgrade of the existing service station and continued operations thereof.

4. SCOPE

The scope of the ESA aims at identifying and evaluating potential environmental impacts emanating from the construction, operations and possible decommissioning of the existing 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 scoping assessment report aims to address the following:

- Identification of potential positive and negative environmental impacts.
- Provide sufficient information to determine if the proposed project will result in significant adverse impacts.
- 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) Consult relevant stakeholders (i.e. local authority etc.) regarding the proposed development.

5. METHODOLOGY

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

- a) Information about the site and its surroundings was obtained from existing secondary information and site visits.

6. STATUTORY REQUIREMENTS

The ESA 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 1.

Line Ministry: Ministry of Environment and Tourism

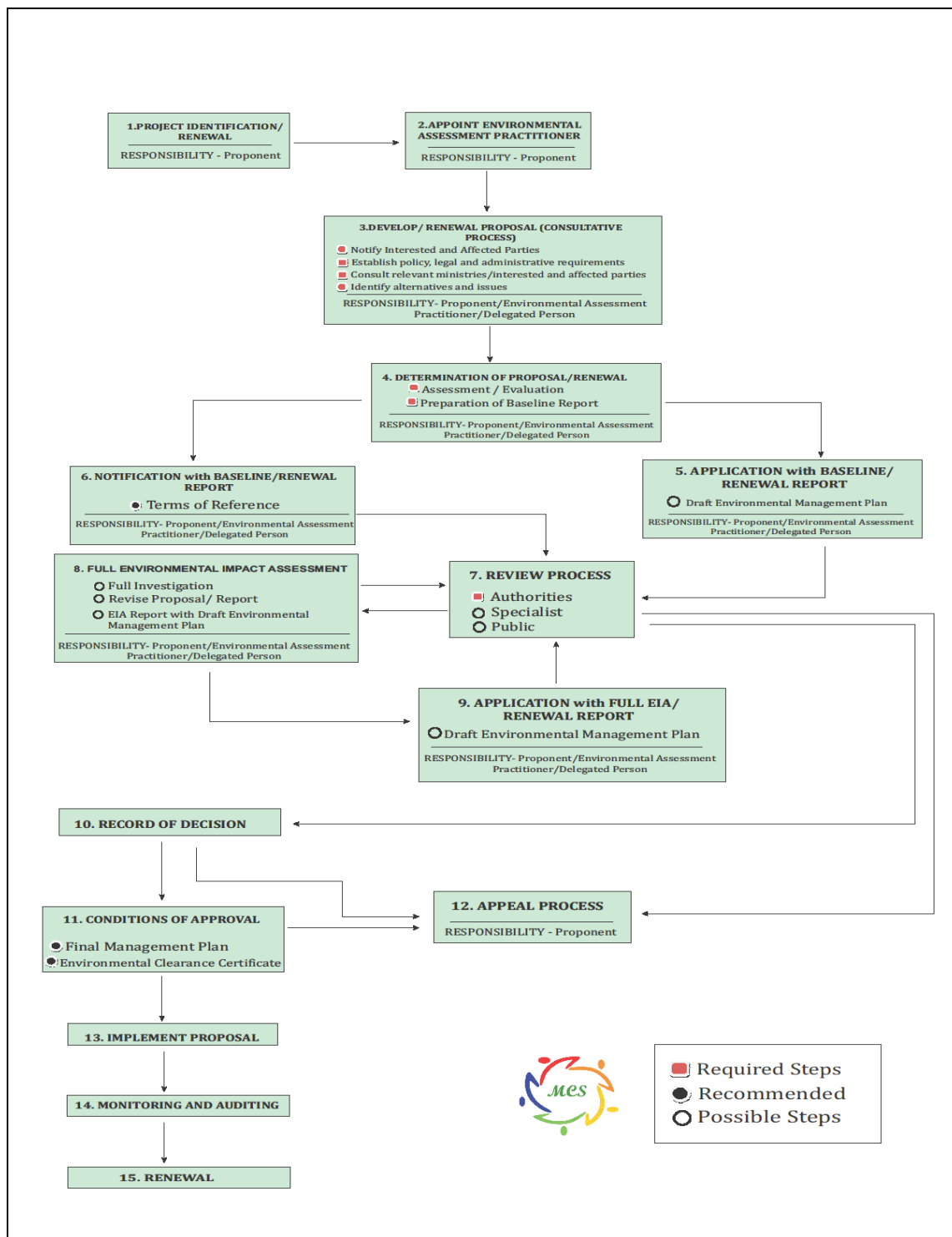


Figure 1. Environmental Assessment Procedure of Namibia (Adapted from the Environmental Assessment Policy of 1995)

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 upgrade of Nkurenkuru fuel retail facility in Nkurenkuru, 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

7. INSTALLATIONS AND RELATED ACTIVITIES

7.1 Existing UST and Pump Specifications

The existing fuel infrastructure consists of two pump islands with two double-hose dispensing pumps connected to three underground storage tanks. The forecourt area and tank farm are covered by soil, with no spill containment system and oil-water separator system present at the site.

See Figure 1 to 4 for the existing infrastructure at the project site.



Photo 1. Existing canopy and forecourt



Photo 2. Existing underground storage tanks



Photo 3. Existing islands and dispensing points



Photo 4. Existing islands and dispensing points

7.2 *Proposed Upgrade Specifications*

The total rebuild of the facility will entail the removal of all existing tanks and associated fuel infrastructure. A new forecourt area with a canopy will also be installed at the site. The supplier's guidelines for tank removal must be followed to reduce the risk of spillage and groundwater contamination.

A new pump island with multi-hose dispensing pumps, multi-compartmental underground storage tanks with associated reticulation pipelines, spill control facilities and a 3-chamber separator pit will be installed at the site. See Figure 3 for new site layout plan. Detailed drawings of the site are contained in Appendix C.

The proposed installation will consist of two (2) new multi-compartmental underground storage tanks, namely;

- ❖ 1 x Tank – 25m³ unleaded petrol (ULP),
- ❖ 1 x Tank – 25m³ diesel UST (50ppm),

All new tanks will be double walled underground perma- tanks, which will be constructed according to the latest Total Namibia's standards. All tanks will be interlinked to feed all islands. The new site will be configured in such a way as to allow safe and ease of traffic flow at the site.

Concrete spill containment slabs, drainage, construction and expansion joints will be installed to Total specifications. The grid inlets positions of the spill slabs will be installed to suite the site conditions. The upgrade and fuel storage alterations at the 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.

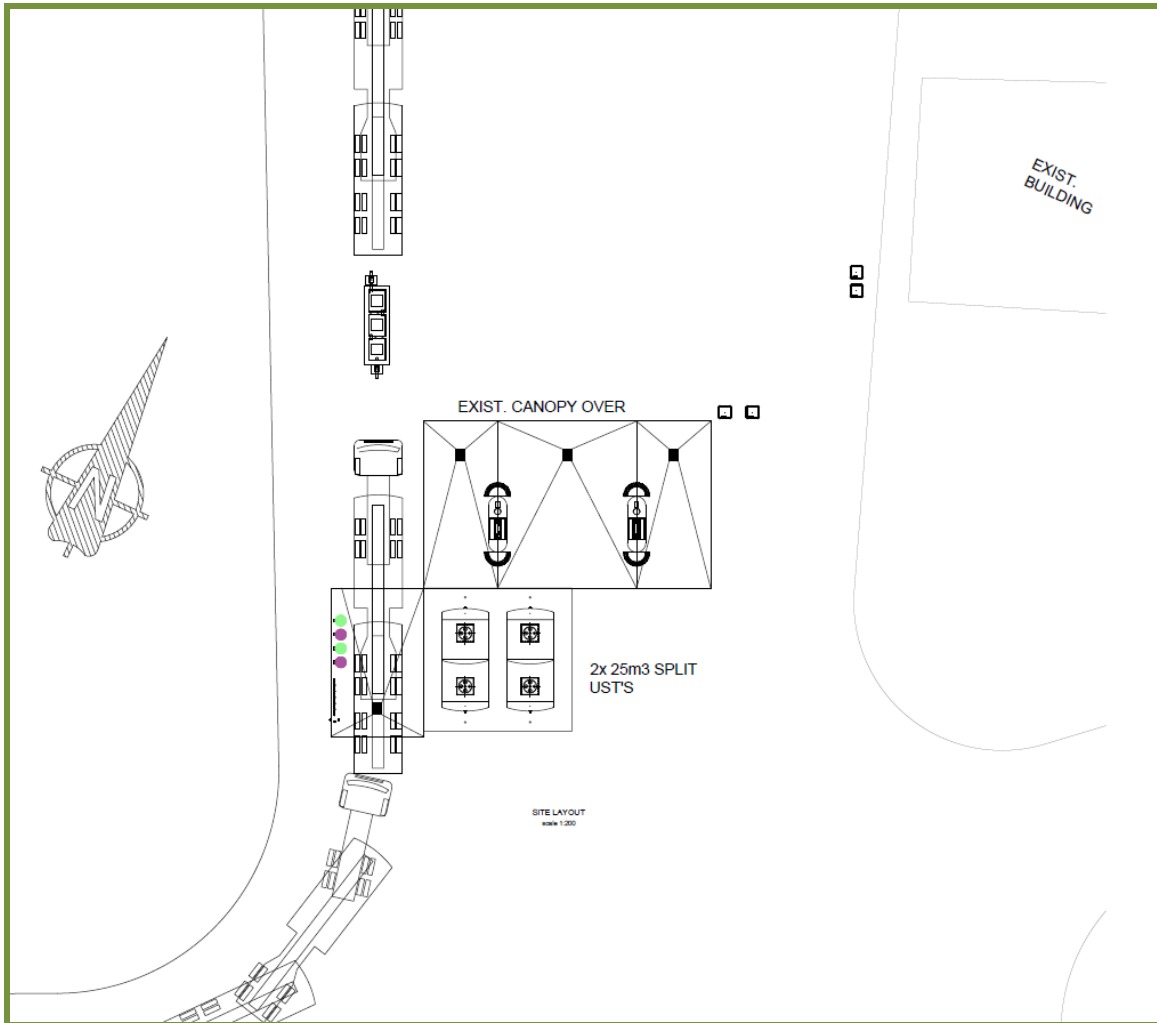


Figure 2. Proposed new layout plan of the facility

8. 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.

8.1 Location and Land Use

The project site (17.62627°S; 18.61210°E) is situated along the D3405 road, in Nkurenkuru. The town (1.093m above sea level) is situated on the southwestern banks of the Kavango River. It is the capital of the Kavango West Region and is located 140km west of Rundu. See Figure 4 for the locality map. The fuel installation occupies an approximate land size of 1000m².

The site is surrounded mainly by residential properties, with a few scattered business properties situated as you move away. Although the facility has been in operation for over 10 years, no proper spill containment systems exists at the site.

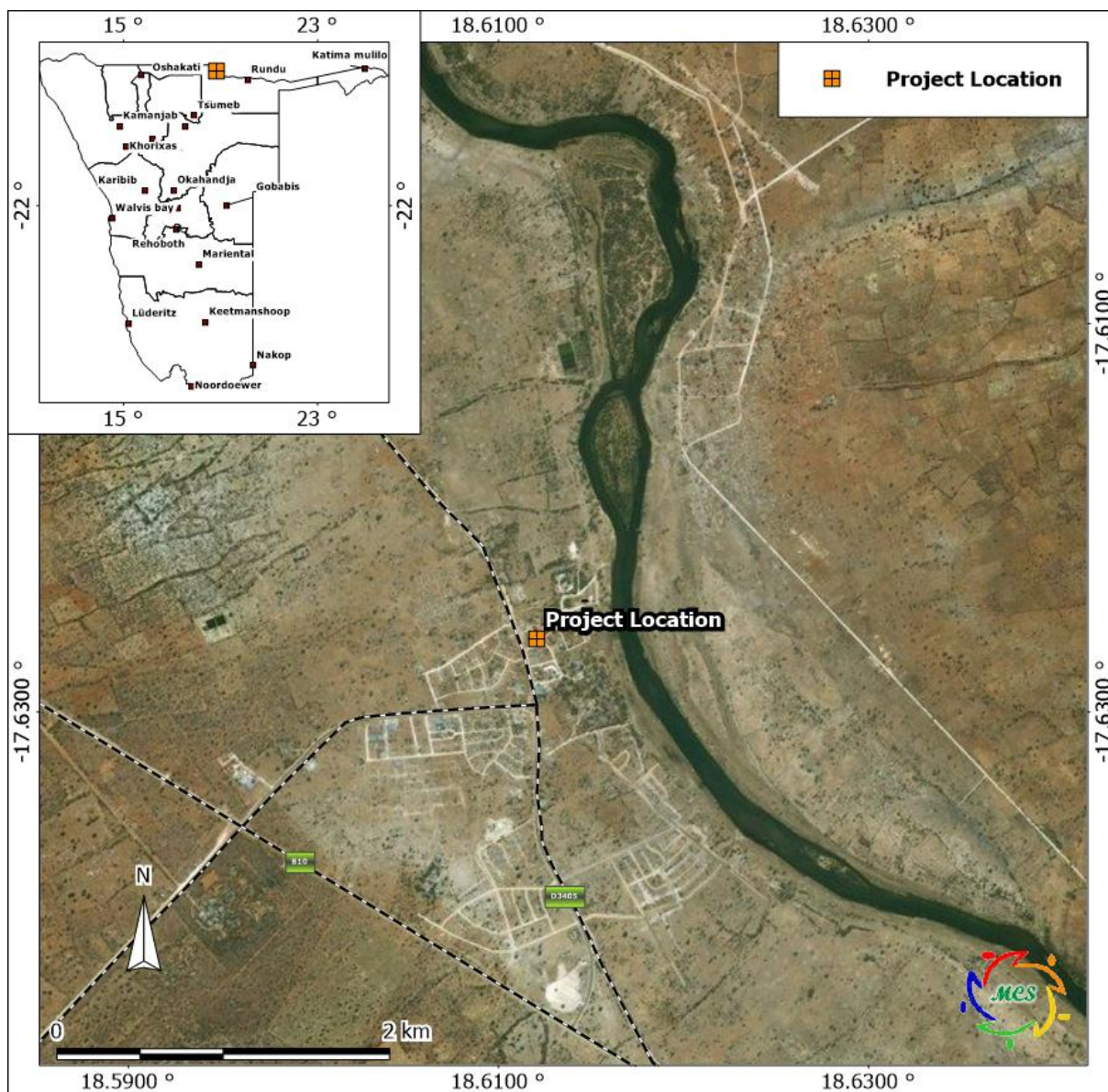


Figure 3. Project location (17.62627°S; 18.61210°E)

8.2 Topography and Drainage

The site is generally flat with very little runoff expected from the site. The landscape is classified as being in the Kalahari Sandveld which is characterised by palaeo dunes and pans; and the Okavango Valley which is characterised by large riverine valley and floodplains. The site is located within the catchment of the Kavango River, a perennial river, draining in an eastern direction. The Okavango River is situated approximately 480m east of the site.

Due to the relatively flat topography at the site, proper drainage systems should be developed at the facility, in order to control the flow of surface water run-off from the site; thereby preventing any possible surface pollution emanating from daily operational activities at the fuel retail facility. Storm water management systems should form part of the engineering designs.

8.3 Climatic Conditions

Classification of climate:	Semi-arid area
Average rainfall:	Rainfall in the area is averaged to be more than 600 mm per year.
Variation in rainfall:	Variation in rainfall is averaged to be less than 30% per year.
Average evaporation:	Evaporation in the area is averaged to be between 2600-2800 mm per year.
Precipitation:	Sporadic and unpredictable, high intensity, highly localised storm events between October and April does occur.
Water Deficit:	Water deficit in the area is averaged to be less than 1300 mm per year.
Temperatures:	The temperatures are highest on average in December, at around 25.7°C. The lowest average temperatures in the year occur in July, when it is around 17.4°C.
Wind direction:	Wind direction in the area is predominantly easterly.

8.4 Hydrogeology of the Study Area

Soil cover at the site consists of sand, clay and gravel of the Kalahari Group (Tk). The Kalahari group consists mainly of unconsolidated formations, but some degree of consolidation may be present. The dominant soil at site consists of ferralic Arenosols and Eutric Fluvisols. The thickness of the Kalahari soil cover at the site is unknown.

Auger drilling was conducted at the site in order to evaluate the top soil profile with depth. Dark brown to brown fine to medium grained loamy soil was intersected from 0 – 0.4mbgl, whilst a lighter more gravel soil was intersected deeper down. The holes were drilled to approximately 1.5mbgl.

Groundwater flow would be mostly through primary porosity in the Kalahari formation and flow from site can be expected in southwesterly direction. Local drainage patterns may vary due to groundwater abstraction in the area.

The Nkurenkuru area does not fall within a Water Control Area; however groundwater remains the property of the Namibian government. According to the Department of Water Affairs (DWA) database, 7 boreholes / wells are located within a 3km radius, whilst 14 boreholes / wells are located in a 10km radius of the site. The nearest borehole to the site is situated 460m east, along the river. Two



more boreholes are situated in the same area along the Okavango River. Water quality is generally good in the area; however shallow perched aquifers with better quality water are present. The local water table depth in the area is expected to be less than 25mbgl.

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. See Figure 4 below, for the hydrogeological.

No known spillage and / or leakages is known or reported at the site, however the consultant assumes that possible historic leaks, from underground storage tanks and/or from leaking reticulation pipelines and/or from spillages caused during dispensing may have occurred during the many years of operations of the facility. Groundwater water pollution monitoring should form an integral part of the post-upgrade monitoring of the site.

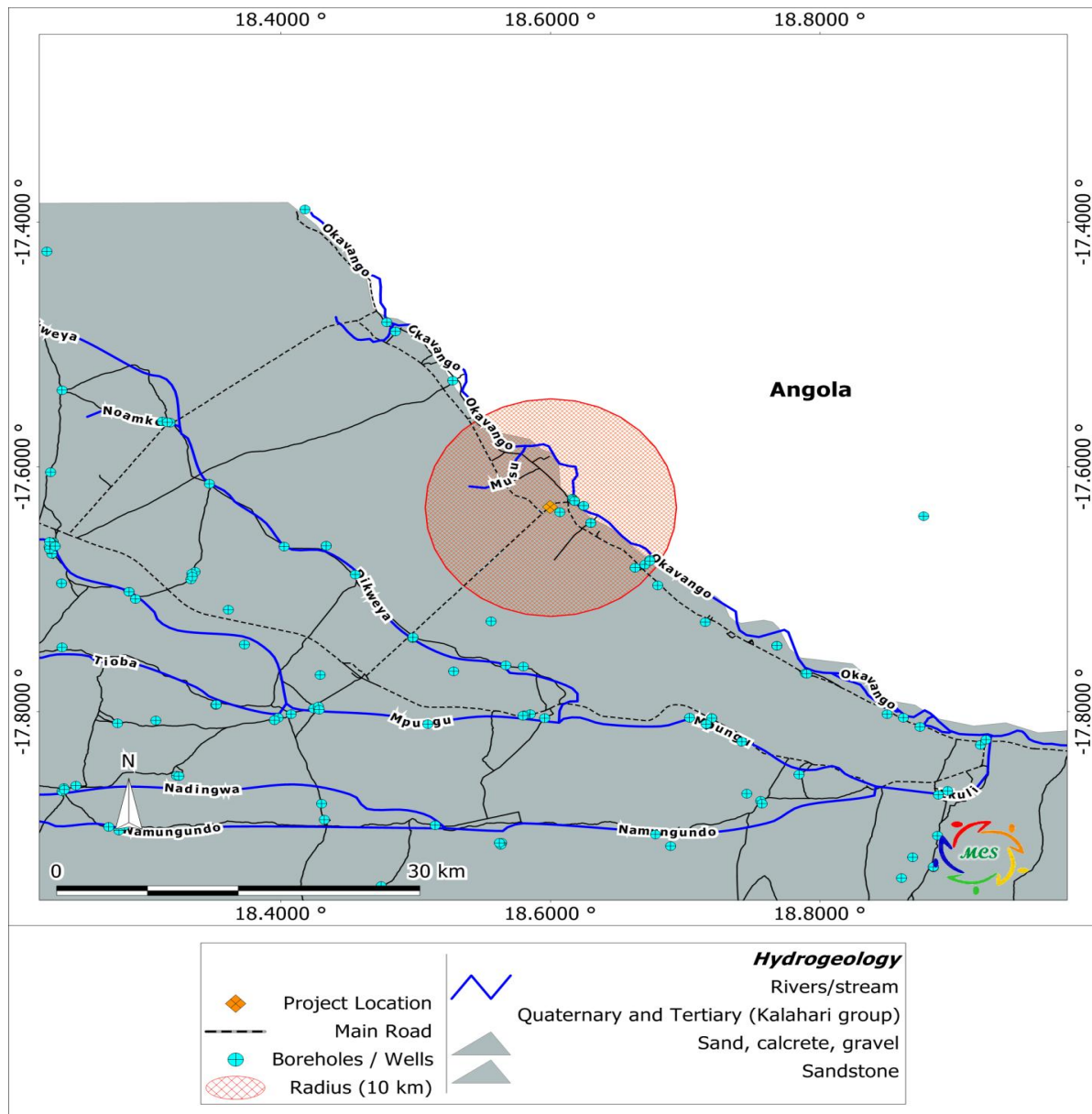


Figure 4. Hydrogeology of Area

8.4.1 Portable Water Supply to Nkurenkuru

The settlement of Nkurenkuru derives its water from the Okavango River via Namwater pipelines. The river is situated approximately 480m east of the site. This water resource supports livelihood of most of the Kavango regions and should be protected at all cost.

Due to the proposed modern design of the facility and its new containment systems to be installed; and the structural design of the Namwater water pipelines, the consultant does not consider the water supply to be at risk from this development.

8.4.2 Okavango wetland resource & users

The Okavango River is one of the most pristine river systems in Southern Africa, if not in the world. The Okavango wetland resources support the livelihood of about 140,000 people along the river and about 100,000 in the rest of the catchment in Namibia. At present, Namibia uses about 20 million m³ of water per annum from the Okavango, mainly for domestic use and agricultural purposes. Namibia has an extremely arid hydro-climate. The rivers in the interior of the country are therefore ephemeral in nature and the recharge to groundwater sources is limited. This means that Namibia will be looking to its perennial border rivers to augment the scarce water resources in the interior of the country.

The consultant recommends that groundwater pollution be monitored with the installation of three (3) monitoring boreholes in and around the site. All boreholes should be drilled with a drill diameter of 165mm. The holes shall be installed with 2.9m-uPVC plain (140mm OD) casing, followed by factory slotted casing to final depth. Casing bottom caps shall be installed in each hole. Gravel pack and bentonite powder shall 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 any pollution in the subsurface and to monitor the migration of possible pollution off site. The borehole construction parameters above are designed to allow ease of groundwater remediation and/or data collection (where necessary).

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

holes on a regular basis and send to laboratories for chemical of concern analysis.

8.5 General Ecology

The site falls within the Tree and shrub savanna biome, which is characterised by Okavango valley fields and shrublands type vegetation. The vegetation structure type is classified as Dense shrubland. See Figure 5 below for vegetation structure map.

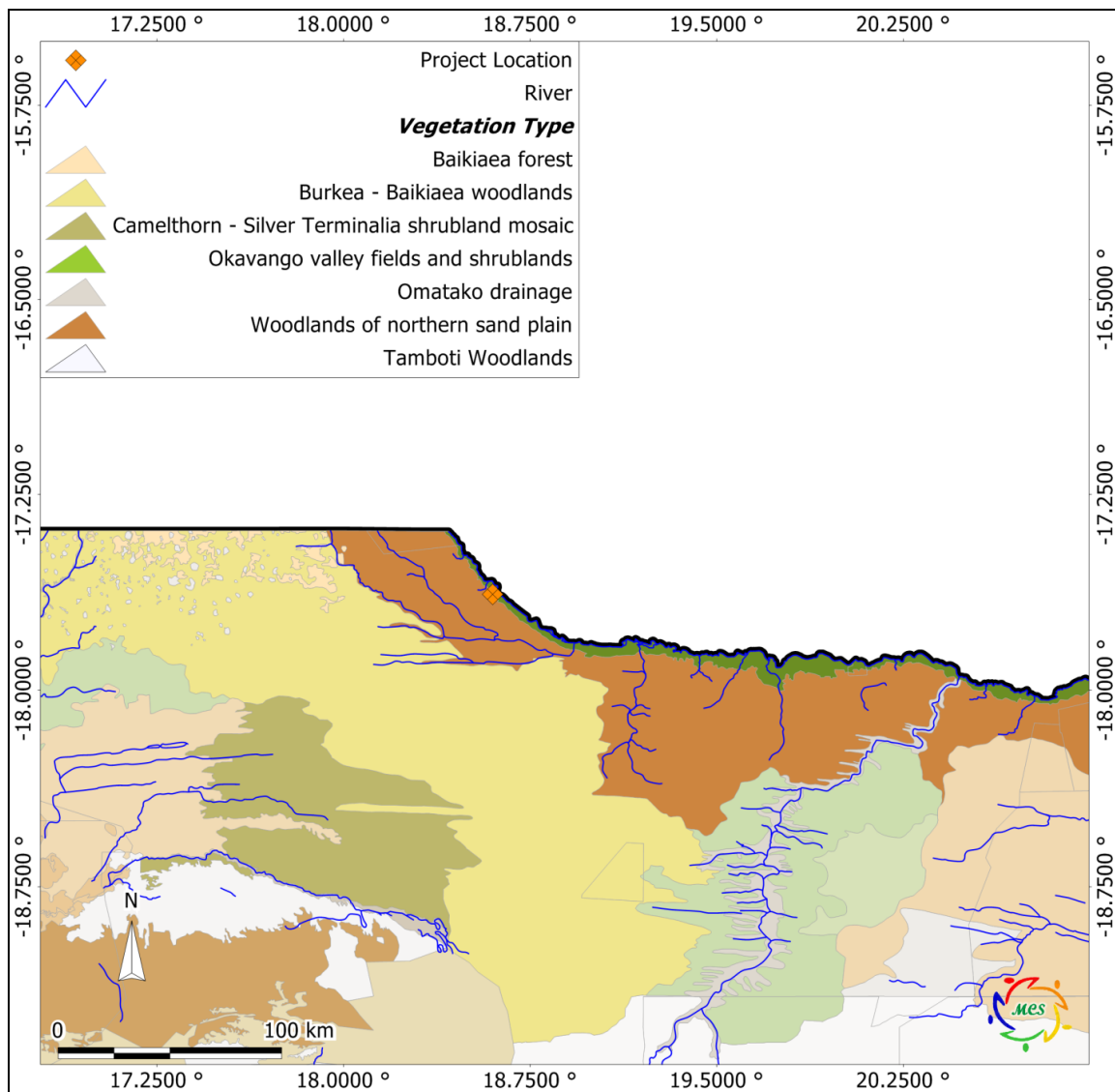


Figure 5. Vegetation map of study area

The project site is situated in an already built-up setting of the existing establishment which is already disturbed and developed. As a result, very little vegetation exists at the site. Some large trees, grass and shrubs are however observed on surrounding land.

Deducing from the Atlas of Namibia, the proposed site is within the area that is known to have 400 to 500 plant species and a low diversity of higher plants (Mandelsohn et al (2003)).

With regards to fauna, no wildlife has been observed in the vicinity of the study area, but livestock and domestic animals do frequent the site.

Faunal species diversity is presented in the table below:

Table 2. General Fauna Diversity (Atlas of Namibia)

	<u>Diversity</u>	<u>Endemism</u>
Mammal Diversity	76 - 90 Species	Mammal Diversity
Scorpion Diversity	6 - 9 Species	Scorpion Diversity
Bird Diversity	141 - 170 Species	Bird Diversity
Reptile Diversity	51 - 60 Species	Reptile Diversity
Frog Diversity	20 - 23 Species	Frog Diversity
Lizard Diversity	16 - 19 Species	Lizard Diversity
Termite Diversity	13 - 19 Genera	Termite Diversity

8.6 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.

8.6.1 Regional information

The existing fuel facility situated is situated in Nkurenkuru, in the Kavango West Region of Namibia. The total current population is estimated to be 202 691 (96 515 males and 106 176 females) (NPC, 2001). Seventy percent of the population of the Kavango West Region over 15years of age are literate. The estimated unemployment rate in the region is 46.8%. The population density in the region is relatively high at 4.2 persons per km², compared to the national average of 2.1 persons per km².

8.6.2 Nkurenkuru

8.6.2.1 Economic activities

Nkurenkuru is the capital centre of the Kavango West Region and the gateway to the Ohangwena Region (west) and the Zambezi Region (east). The town forms part of the hub for all economic activities in the area and the region at large. It also links Namibia with neighbouring Angola via the Katwitwi Border Post.

Economic activities in the area included farming and tourism. Subsistence fishing also played a role in the nutrition of the people residing near the Kavango River.

8.6.2.2 Employment Creation (Job Opportunities)

Unemployment still hampers most of the developing world and Nkurenkuru and the region at large is no exception. The Construction phase of the project will provide job opportunities, of which 80% are expected to be unskilled and semi-skilled people and can be sourced from the unemployed labour force of the town and the surrounding areas.

The principle of maximising local employment creation can be applied by identifying suitable construction contractors at the town and region. Nkurenkuru is well-supplied with competent small and medium enterprise (SME) construction companies to conduct the proposed development. The project would also give rise to indirect economic benefits through the procurement of materials, goods and local services.

The local economy of the town is expected to benefit from the project. A percentage of moneys derived from salaries and wages earned by construction workers is likely to be spent at the town and surrounding areas. The moneys spent in communities around the project location would create substantial flows of revenue within these 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 settlement, the greater the project's contribution to the growth of the local economy.

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

8.6.2.3 Livelihoods

Economic activities in the region are limited and livelihoods are heavily dependent on wages and salaries. 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.

8.6.2.4 Procurement

Local businesses are to benefit from the envisaged construction and operational activities. Total Namibia (Pty) Ltd. and/or its sub-contractors might need to procure services from these businesses e.g. domestic waste removal, transport, security services etc.

8.6.2.5 Tourism

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.

8.6.2.6 In - Migration

Due to enhanced employment opportunities that could be created by the envisaged project, some in-migration of job seekers to Nkurenkuru 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.

8.6.2.7 HIV & Prostitution

Namibia has a high incidence of HIV/AIDS, which has a strong and adverse socio-economic impact on livelihoods of people in the region. The HIV prevalence rate is estimated at 19.7% for Namibia (Poverty profile 2007).

The spending powers of contractors working for fuel retail 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 Kavango West Region.
- ✓ Diversion of income expenditure to medical care.
- ✓ Increase in orphans and households headed by children.
- ✓ Increase in pregnancy related mortality.
- ✓ The current rate of people per doctor could increase.

Educate workers and surrounding communities on measures to prevent the spread of HIV/AIDs through awareness campaigns, provision of safety equipment for workers, child labour prohibited.

8.6.2.8 Infrastructure & Increased Traffic

The traffic in the area is expected to increase slightly and it might contribute to heavy traffic during peak hours and a higher number of car accidents in the area. The B10 road in the area is a national highway in northern Namibia, running from west to east from the Ohangwena Region to Rundu directly along the Angola Border. In particular, the D3405 road will be affected due to increased vehicular traffic and trucks accessing the site.

9. STAKEHOLDER PARTICIPATION

Stakeholder consultation forms an integral component of an ESA investigation and enables comments on the potential environmental impacts associated with the proposed development and to identify additional issues which they feel should be addressed in the ESA. The primary aims of public participation were:

- ❖ 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 that stakeholders comments are considered for the development.

Decision-making authorities were consulted during 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.

The Ministry of Mines and Energy (MME), who are the national regulators of all petroleum affairs in Namibia, were consulted regarding the proposed development. MME welcomed the proposed upgrade as the new site will meet the all relevant SANS standards as adopted by the MME.

A background information document (See Appendix B) was availed to all stakeholders who were consulted and raised no environmental or social concerns regarding the development.

Table 3. Consulted Stakeholders/I&APS

NAME	ORGANISATION/ERF	DESIGNATION/POSITION
Ms. T. Iyambo	Ministry of Mines and Energy.	EA procedure, Consultation
Ms. S. Angola	Ministry of Environment and Tourism, Directorate of Environmental Affairs.	EA procedure
Mr. P. Ikondja	Total Namibia (Pty) Ltd. / Proponent	Installation Information
Mr. A. Sheehama	Ministry of Mines and Energy / Regulator	Relavent Authority



10. ENVIRONMENTAL IMPACT EVALUATION

The Environmental Scoping 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 3.

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

10.1 Construction Phase

10.1.1 Dust Pollution and Air Quality

Dust will be generated during the construction phase and might be worse during the winter months when strong winds occur. Dust problems are expected to be site specific and could pose a slight nuisance to neighbouring properties and D3405 road users. Dust is regarded as a nuisance as it reduces visibility and affects the human health.

Possible air pollution in the form of emissions from construction vehicles and equipment could also deteriorate air quality in the area.

Proposed Mitigation Measures

- ✚ Ensure measures are in place to minimise dust generated during the construction phase.



- ✚ Use appropriate dust suppression measures when dust generation is unavoidable, e.g. dampening with water, particularly during prolonged periods of dry weather.
- ✚ Avoid excavation, handling and transport of materials which may generate dust under high wind conditions.
- ✚ Locate stockpiles of construction materials in sheltered areas where they are not exposed to erosive effects of the wind.
- ✚ Ensure all vehicle, plant and equipment are in good condition.
- ✚ Encourage reduction of engine idling.

Impact
Evaluation:

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

10.1.2 Noise Impact

Although noise pollution already exists at the site due to vehicular movement along the D3405 road and nearby streets, an increase of ambient noise levels at the construction site is expected due to the construction activities. Noise pollution due to heavy-duty equipment and machinery will be generated. It is not expected that the noise generated during construction will impact any third parties very much.

Proposed Mitigation Measures

- ✚ Ensure the use of construction vehicles and equipment that emit reduced noise levels.
- ✚ Ensure proper maintenance is conducted on vehicles to ensure the reduction of noise emission.
- ✚ The construction staff should be equipped with ear protection equipment.
- ✚ Audio equipment (if any) should not be played at levels considered intrusive by others.
- ✚ Construction activities will be limited to a period between 07h00 and 17h00.

Impact
Evaluation:

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

10.1.3 Safety & Security

Safety issues could arise from the construction vehicles, earthmoving equipment and tools that will be used on site during the construction phase. This increases the possibility of injuries and the contractor must ensure that all staff members are made aware of the potential risks of injuries on site. Construction sites usually house construction building material and equipment on site which may attract criminal activities.

Proposed Mitigation Measures



- ✚ Display telephone numbers of emergency services at the project location.
- ✚ Provide suitable emergency and safety signage on site (manufactured of durable, weatherproof material). The signage signs should be placed at strategic locations to ensure awareness.
- ✚ Demarcate and barricade any areas which may pose a safety risk (including hazardous substances, deep excavations etc). These notices must be worded in English and local languages.
- ✚ Enforce the use of appropriate Personal Protective Equipment (PPE) for the right task or duties at all times.
- ✚ Prevent illegal access to the construction site by implementing appropriate security measures. These security measures must not pose a threat to surrounding communities.
- ✚ Should a construction camp be necessary, it should be located in such a way that it does not pose a risk to the public.
- ✚ Equipment housed on site must be placed in a way that does not encourage criminal activities.
- ✚ For safety and security reasons it is recommended that the entire site (construction site and camp) be fenced-off and security personnel be employed to safeguard the premises and to avert criminal activities.
- ✚ 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.
- ✚ Adequate lighting within and around the construction location should be erected, when visibility becomes an issue.

Impact
Evaluation:

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

10.1.4 Traffic

Construction vehicles will access the project site from the D3405 road; and the nearby streets. Construction related activities are expected to have a minimal impact on the movement of traffic along this road, due to the fact that construction vehicles will frequent the site only periodically.

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

Proposed Mitigation Measures

- ✚ Install and maintain official traffic signalling (where necessary) along these roads with local or national traffic regulations. The local or regional traffic law enforcement agency must be consulted in this regard.



- ✚ Speed limit and construction site warning signs must be erected to minimise accidents.
- ✚ Construction vehicles and machinery must be tagged with reflective signs or tapes to maximise visibility and avoid accidents.
- ✚ Where feasible, Construction vehicles should not travel to and from the site during peak times (07h00 to 09h00 and 16h00 to 18h00), to minimise impacts on traffic.
- ✚ Construction vehicles should not be allowed to obstruct the road, hence no stopping in the road, wholly or partially, but rather pull off the road or park on the roadside.

Impact
Evaluation:

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

10.1.5 Groundwater

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

Proposed Mitigation Measures

- ✚ Prevent spillages of any chemicals and petroleum products (i.e. oils, lubricants, petrol and diesel). Use drip trays, linings or concrete floors when evidence of leaks are observed on vehicles or equipment.
- ✚ All major servicing and maintenance of vehicles and/or equipment should be conducted at suitable workshops and containment structures.
- ✚ All fuelling, storage and chemical handling should be conducted on surfaces provided for this purpose. Drip trays, linings or concrete floors must be used when removing oil from machinery.
- ✚ Spillage control procedures must be in place according to relevant SANS standards or better. Waste water collection systems should be connected to these systems.
- ✚ Existing ablution facilities at the site should be used. No urinating outside these designated facilities shall be allowed.
- ✚ Should portable ablution facilities be necessary, adequate containment systems should be erected for these facilities.
- ✚ Waste should properly be contained to avoid any leakages and/or spillages, and should regularly be disposed off at a suitable sewage disposal site. Run-off from these toilets due to overflows should be avoided at all cost.
- ✚ Proper environmental awareness and remedial response training of operators must be conducted on a regular basis.

Impact
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated



Groundwater	-VE	2	2	4	2	M	L
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10.1.6 Surface Water

Surface drainage in the area is poorly developed and runoff usually collects in depressions (oshanas, pans and omurambas). Contaminants in the form of oil leakages, diesel, lubricants and grease from the construction equipment and machinery may occur during the construction phase.

Proposed Mitigation Measures

- ✚ Use drip trays, linings or concrete floors when evidence of leaks are observed on construction vehicles or equipment.
- ✚ Remove leaking vehicles from project site immediately.
- ✚ No servicing and maintenance of vehicles and/or equipment should be conducted on site.
- ✚ Any spillage of hazardous substances including fuel, oil, paint or cleaning solvent must be cleaned up immediately and disposed off at a designated disposal facility.
- ✚ Prevent discharge of any pollutants, such as cements, concrete, lime, chemicals, and hydrocarbons into the nearby water ways and courses.
- ✚ Existing ablution facilities at the site should be used. No urinating outside these designated facilities will be allowed.
- ✚ Properly secure all temporary / portable toilets (if any) 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.
- ✚ 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	2	4	2	M	L

10.1.7 Generation of Waste

Waste material will be generated during the construction activities of the fuel retail facility. Waste in the form of rock cuttings, pipe cuttings, electrical cuttings, oil spills or leakages of petroleum products might occur during the construction phase.



Proposed Mitigation Measures

- ✚ Ensure that sufficient weather- and vermin- proof bins / containers are present on site for the disposal of solid waste. Waste and litter generated during this phase must be placed in these disposal bins.
- ✚ Empty bins regularly as required.
- ✚ The Contractor shall institute a waste control and removal system for the site.
- ✚ All waste shall be disposed off site at an approved landfill site.
- ✚ No disposal of /or burying of waste on site should be conducted. No waste should be burned on site.
- ✚ Hazardous waste storage is to be clearly marked to indicate the presence of hazardous substances, and the protocols associated with handling of such hazardous wastes shall be known by all relevant staff members.
- ✚ Existing ablution facilities at the site shall be used by the contractor during this phase. No urinating outside these designated facilities.
- ✚ Regular inspection and housekeeping procedure monitoring should be maintained at all times.
- ✚ Awareness of the hazardous nature of various types of waste should be enforced.

Impact
Evaluation:

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

10.1.8 Heritage Impacts

There are no known heritage areas envisaged to be impacted by the development; however the contractor might come across archaeological features or objects that possess cultural values during construction activities.

Proposed Mitigation Measures

- ✚ 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 (i.e. the local police and National Heritage Council of Namibia) should be contacted immediately.

Impact
Evaluation:

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

10.1.19 Ecological Impacts

The site is already disturbed, built-up and developed. As a result, very little vegetation exists at the site and the area is free of sensitive flora and fauna.



Proposed Mitigation Measures

- ✚ Disturbance of areas outside the designated working zone is not allowed.
- ✚ No vegetation should be removed outside the designated project area.

Impact
Evaluation:

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

10.1.10 Socio-Economic Aspects

Temporary employment opportunities are anticipated to be created during construction, both directly through construction workers and indirectly through suppliers, service providers, and informal traders attracted to the project site.

Proposed Mitigation Measures

- ✚ The construction contractor should be sourced from the settlement, or region at large (where feasible).
- ✚ The construction workers should be sourced from the settlement, or region at large (where feasible).
- ✚ Suppliers of construction materials should be sourced from the settlement, or region at large (where feasible).
- ✚ Locally source services required during the construction process, such as securities, rental of portable toilets, plant hire, etc.

Impact
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Socio-economic	-VE	1	1	6	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 site upgrade activities 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 pollution, 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.

10.2 Operational Phase

10.2.1 Spillages

Spillages are bound to occur during delivery of fuel to the tanks; overfilling of tanks and vehicles during dispensing of fuel over the operational phase of the fuel retail facility.



Proposed Mitigation Measures

- ✚ Risk of impact from this can be lowered through proper training of staff.
- ✚ Installation of suitable containment structures around the dispensing points and all other operational areas. The containment system must be connected to a 3-chamber separator pit.
- ✚ Staff must be provided with emergency response procedures which they should be familiar with.
- ✚ Fuel storage tanks should be placed in suitable containment structures, such as bund walls or plastic liners to avoid the spread of spills.
- ✚ 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.

A spill management plan should be adopted to ensure effective response to spills. Ensure all staff is familiar with the plan and it is regularly updated. The general response to fuel spills at a service station is:

- Switch off all pumps using the automatic pump cut-off. Switches should be located within easy reach of the console attendant and be clearly marked. Cut-offs at the fuse board is not acceptable;
- Contain the spill. Use booms or a sand / soil dam to prevent the spill from entering stormwater drains. Use the absorbents in the spill kit to soak up as much fuel as possible;
- Notify the site manager and / or relevant authority;
- Call the local Fire Brigade if a major spill occurs;
- Keep the public away from the spill;
- Contact a licensed waste contractor to dispose of the absorbents used in the clean-up operation.

Impact
Evaluation:

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

10.2.2 Air Quality

Air quality around the site could be impacted by exhaust fumes from the vehicles accessing the facility. Hydrocarbon vapours will be released during delivery and dispensing, as liquid displaces the gaseous mixture in the tanks. In terms of fuel storage tanks, the vapours will be released through vent pipes on the tanks.

Vapour emissions are wasteful in terms of product loss and also add volatile organic compounds (VOCs) to the atmosphere, which contribute to the formation of photochemical smog. This is the haze that can be seen over cities on a warm summer's day. Fuel vapours are also a significant source of benzene, a known carcinogen for humans.



Proposed Mitigation Measures

- + Vent pipes should be placed in such a manner as to prevent impact on potential receptors.
- + Use vapour recovery equipment and techniques to avoid air pollution and minimise fuel loss.
- + Ensure fuel is delivered in the forecourt containment area, and can't contaminate stormwater or land.
- + Encourage reduction of engine idling at the project site.
- + Regular air quality monitoring should be conducted at the facility.
- + Keep a complaints register regarding vapour smells at the site; and act on it if becomes a regular complaint.

Impact
Evaluation:

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

10.2.3 Fire and Explosion Risks

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

Proposed Mitigation Measures

- + 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.
- + Ensure sufficient water is available all the time for fire fighting purposes.
- + 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.

Impact
Evaluation:

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

10.2.4 Generation of Waste

Waste such as contaminated soil, litter, empty cans of engine oil and other similar products will be generated during the operational phase.

Proposed Mitigation Measures



- ✚ Contamination of soil should be prevented through the use of containment areas as provided.
- ✚ Any contaminated soil generated must be contained and bioremediated accordingly.
- ✚ 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.
- ✚ Oil-water separator effluent originating from storm water runoff, tank bottoms and washing activities should be separated before disposal of the water.
- ✚ Regular monitoring of the oil-water separator outflow must be conducted.

Impact
Evaluation:

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

10.2.5 Surface Water

Spillages might occur during fuel delivery to the underground storage tanks from road transport tanker trucks. This may also occur during filling of vehicles. Spillages and leakages may also occur due to failure of reticulation pipelines or storage tanks. Contaminated soil might pose a risk to surface water.

Proposed Mitigation Measures

- ✚ Proper containment mechanisms installed should be able to contain any spillages that might occur during the operation of the facility.
- ✚ Use drip trays, linings or concrete floors when evidence of leaks are observed on construction vehicles or equipment.
- ✚ Remove leaking vehicles from project location immediately.
- ✚ The presence of an emergency response plan and suitable equipment is advised, so as to react to any spillage or leakages properly and efficiently.
- ✚ Remove all excess sedimentation, rubble and any other waste material present in the waterway and dispose of in a suitable manner to ensure proper drainage runoff.
- ✚ Ensure that stormwater management systems are regularly maintained and tested, and are in good working order.

Impact
Evaluation:

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



10.2.6 Groundwater

Spillages might occur during delivery of fuel; and overfilling of vehicles at the site. Overfilling of underground storage tanks may also take place during fuel delivery.

Proposed Mitigation Measures

- ✚ Ensure that fuel is delivered in the forecourt containment area, and must not contaminate stormwater or land.
- ✚ Proper monitoring of the product levels must take place to eliminate overfilling.
- ✚ All operational surfaces at the facility must be installed with spill containment areas.
- ✚ Ensure that any petroleum products, such as grease, waste oils and lubricants are contained in containment structures (e.g. plastic liners, drip trays etc.).
- ✚ Avoid discharge of pollutants (such as cement, concrete, lime, chemicals, contaminated waste water or leachate) into stormwater channels and water courses.
- ✚ All hazardous wastes generated in the project area should be safely contained, transported and disposed of, or treated at a designated hazardous waste disposal or bioremediation facility.
- ✚ Equipment and materials to deal with spill cleanup must be readily available on site and staff must be trained as to how to use the equipment and briefed about reporting procedures.
- ✚ Develop and implement a groundwater monitoring system and programme, with the aim of monitoring possible contamination to the water resources.
- ✚ Groundwater monitoring boreholes installed should be sampled and analysed periodically.
- ✚ Regular tank and pipeline tightness inspections are advised to eliminate the risk of impact on the environment due to leakage.

Other guiding principles to the prevention of potential leakages and/or spillages that could lead to groundwater pollution include:

- 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;
- Any spillage of more than 200 litres 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)).

Impact
Evaluation:

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

10.2.7 Health and Safety

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

Safety issues could also arise from the operational vehicles, equipment and tools that will be used on site during the operational and maintenance activities. This increases the possibility of injuries and all project personnel must be made aware of the potential risks of injuries on site.

Proposed Mitigation Measures

- ✚ Staff must be properly trained and made aware of all the MSDS (Material Safety Data Sheets) 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.
- ✚ Display contact details of emergency services in the area at strategic locations of the facility.
- ✚ Demarcate and place signage on any areas which may pose a safety risk (including trenches, excavations etc).
- ✚ The project personnel are advised to ensure that proper personal protective gear and first aid kits are available, at all times.
- ✚ Staff should be properly trained in first aid and safety awareness.

Impact
Evaluation:

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



10.2.8 Traffic

Although negligible, a slight increase in traffic will be experienced along the D3405 road; and nearby streets. This impact will be long-lived, as passenger vehicles, long distance busses and trucks will be frequenting the site.

Proposed Mitigation Measures

- ✚ Speed limits and road signs as set out by national traffic regulations should be adhered to in order to minimise accidents.
- ✚ 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

10.2.9 Ecological Impacts

The proposed facility operations will have minimal impacts on fauna and flora.

Proposed Mitigation Measures

- ✚ The operational activities would not exceed the demarcated area of the fuel retail facility.

Impact
Evaluation:

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

10.2.10 Socio-Economic Aspects

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 jobs will be created.

Proposed Mitigation Measures

- ✚ Employment creation should be targeted at the immediate communities of Nkurenkuru, or region at large
- ✚ Suppliers of operational stock should be sourced from the settlement, or region at large (where feasible).
- ✚ Locally source services required during the operational process, such as securities, rental of portable toilets, plant hire, etc.

Impact
Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Socio-economic	-VE	1	1	8	2	L	L

10.3 Detecting Loss of Product

Leaks and spills of products do not necessarily indicate the potential spill size, however the accuracy of stock monitoring techniques is critical to detecting leaks at



an early stage. It follows that a larger quantity of product may leak to soil and groundwater from a long running undetected pipe work leak than from a catastrophic failure of an underground tank. Thus, it's very important to that proper stock management techniques are implemented prior to the operation of the filling station.

Losses of product are often indicated by stock reconciliation systems, upon investigation it may be determined that losses are not caused by leaks. Dispenser meters should be checked periodically and other sources of loss (e.g. theft, faulty gauge probes etc.) should be considered. The elimination of apparent losses should improve business, performance and improve the leak detection capacity of the systems in use.

10.4 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.

11. 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 site. 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. Coupled potential hydrocarbon pollution from the existing fuel retail facility and the proposed facility could become significant if not managed properly. 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



12. 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 fuel retail facility has been developed and is attached as Appendix A.

13. CONCLUSIONS

In general, the proposed storage alterations / upgrade and continued operations of the existing fuel retail facility would pose limited environmental and social risks.

The site has been in operation for over years and is generally suitable for such a development. 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 relevant authorities and stakeholders on a regular basis.

The Environmental Management Plan should be used as an on-site tool during all phases of the development. Monitoring of water pollution should be conducted every quarter month of the 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 ESA/EMP document before it expires.

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