ENVIRONMENTAL IMPACT ASSESSMENT

FOR THE

PROPOSED FUEL RETAIL FACILITY ON ERF 38, EHEKE, ONDANGWA RURAL CONSTITUENCY, OSHANA REGION.

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LIST OF ABREVIATIONS

TERMS	DEFINITION
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
DEA	Department of Environmental Affairs
PPPPs	Projects, Plans, Programmes and Policies
ULP	Unleaded Petrol
SANS	South African National Standards
I&APs	Interested and Affected Parties

Contents

INTRODUCTION

Project Overview

Fly Investments cc proposes to construct and operate a fuel retail facility on Erf 38, Eheke Settlement, Ondangwa Rural Constituency in Oshana Region. The retailer intends to supply fuel to the general public in and around Eheke Settlement.

Nghivelwa Planning Consultants has been appointed to conduct an Environmental Impact Assessment and Environmental Management Plan (EMP) for the proposed Gwakapiya Service Station on Erf 38, Eheke. The Environmental Impact Assessment has been conducted to meet the requirements of Namibia's Environmental Management Act (No. 7 of 2007) and Petroleum Products and Energy Act (Act No. 13 of 1990).

An EIA may be defined as: a formal process to predict the environmental consequences of human development activities and to plan appropriate measures to eliminate or reduce adverse effects and to augment positive effects.

EIA thus has three main functions:
To predict problems,
To find ways to avoid them, and
To enhance positive effects.

Terms of Reference

The proposed project for the construction of the fuel retail facility (Gwakapiya Service Station) in Eheke Settlement is a listed activity that cannot be undertaken without an Environmental Clearance Certificate. Therefore, as part of the commissioning process an Environmental Impact Assessment (EIA) is required. Thus, Fly Investments CC appointed Nghivelwa Planning Consultant to provide consultancy services to undertake an environmental impact assessment in compliance with the Environmental Management Act (2007).
The Terms of References (ToR) for the consultants is, but not limited to the following:

- The collection of all possible data on the environmental, social and natural resource components and parameters of necessity;
- A description of the location of the proposed project including the physical area that may be affected by the project activities;
- Description of the design of the proposed project;
- Description of the activities that will be undertaken during the project construction, operation and decommissioning phases;
- Listing of the materials to be used, products and by products, including waste to be generated by the project and the methods of disposal;
- Identification of the potential environmental impacts of the proposed project and
- The mitigation measures to be taken during and after implementation of the project;
- Accidents during the project cycle;
- Establishment of a plan to ensure the health and safety of the workers and neighbouring communities;
- Identification of the economic and socio-cultural impacts of the proposed project
- Economic and social analysis of the project including project risk and measures to mitigate them.
- Establishment of an action plan for the prevention and management of possible (EMP).
- The consultant will prepare recommendation on the project for its future use.

Acknowledgement

Nghivelwa Planning Consultant has prepared this EIA Scoping Report on behalf of Fly Investments CC. The proponent (Fly Investments CC) has been extremely forthcoming in providing the necessary information and documents and in providing necessary guidance during undertaking of the study and preparation of the report.

Therefore, the Consultant (Nghivelwa Planning Consultant) hereby acknowledges the help, advice and information provided by the proponent, as well as the support and interest shown by all the identified stakeholders.

EIA METHODOLOGY

The objective of the assessment of impacts is to identify and assess all the significant impacts that may arise from the undertaking of an activity and the findings used to inform the competent authority's decision whether the activity should be authorised subject to conditions that will reduce the impacts to acceptable levels, or should not be accepted. In this sense impacts are defined as the changes in an environmental or social parameter that result from undertaking the proposed activity. The following general methodology was used in this EIA of the proposed Gwakapia Service Station on Erf 38, Eheke; to investigate the potential impacts on the social and natural environment due to the construction and operation of the fuel retail facility:

The key activities undertaken during the assessment included the following:

Establishment of the environmental baseline

This involved study and description of the receiving environment on which the proposed project is to be implemented. Thus, it involved a site visit, physical inspection of the study area's soil, biology, topography, animal species, water resources, climate and the local socio-economic environment.

Impact analysis

This involves the identification of impacts that are usually associated with the construction, operation or maintenance and decommissioning of the propose activity and are generally obvious and quantifiable. These impacts were analyzed and evaluated.

Impacts mitigation

This involves the identification of the impacts and once impacts have been identified and predicted for a particular activity, then appropriate mitigation measures need to be established. Mitigation measures are the modification of certain activity in a way that will reduce the impacts on the physical- and socio-economic environment. The objectives of mitigation are to:

- Find more environmentally sound ways of doing things;
- Enhance the environmental benefits of a proposed activity;

- Avoid, minimize or remedy negative impacts; and ensure that residual negative impacts are within acceptable levels.

Furthermore, impacts associated with all the stages of the proposed project were identified and mitigated. An Environmental Management Plan has been prepared as framework for mitigation of impacts and environmental monitoring of the project.

Review of alternatives

This entailed a review of the alternatives to the proposed project. This was aimed at determining better ways of avoiding or minimizing environmental impacts while still realizing the project goals. The review of alternatives provided opportunities for environmental enhancement. The alternatives reviewed were alternative sites, alternative implementation technology, alternative designs, alternative fuel sources and the no project alternative.

Public Participation Process (PPP)

The public participation process was carried out by informing relevant stakeholders to the proposed project and by conducting a site meeting on the proposed project site. The public was invited to raise their concerns on the proposed project through newspaper advertisements that were placed in two (2) local newspapers the New Era and the Confidente of the 18th and 25th March 2022. A site meeting was held on the 8th of April 2022 and more than 10 people showed up to the meeting, including the staff members of the Eheke Settlement Office.

POLICY AND OTHER RELEVANT LEGISLATIONS

The following are the legal instruments that govern or advocate the construction and operation of a Fuel Retail Facility:

The Namibian Constitution

The Constitution of Namibia encourages wise and sustainable use of its resources. According to Article 95 of Namibia's Constitution provides that the State shall actively promote and maintain the welfare of the people by adopting policies aimed at the maintenance of ecosystems, essential

ecological processes and biological diversity of Namibia and utilization of living natural resources in a sustainable way for the benefit of all Namibians, both present and future.

Article 95 of Namibia's constitution stipulates that: "The State shall actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at the following:

(l) management of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future; in particular, the Government shall provide measures against the dumping or recycling of foreign nuclear and toxic waste on Namibian territory."

This article recommends that a relatively high level of environmental protection is called for in respect of pollution control and waste management.

Environmental Assessment Policy (1994)

The environmental assessment policy details the principles of achieving and maintaining sustainable development that underpin all policies, programmes and projects undertaken in Namibia. This is related in particular, to the wise utilization of the country's natural resources, together with the responsible management of the biophysical environment, which is intended to benefit both present and future generation. The policy also provides guidance on undertaking the assessment procedures.

It further provides a guideline list of all activities requiring an impact assessment. The proposed development is listed as a project requiring an impact assessment as per the following points in the policy:

- Transportation of hazardous substances & radioactive waste.
- Storage facilities for chemical products.
- Industrial installation for bulk storage of fuels.

The policy provides a definition to the term "environment" - broadly interpreted to include biophysical, social, economic, cultural, historical and political components and provides reference

to the inclusion of alternatives in all projects, policies, programmes and plans. Cumulative impacts associated with proposed developments must be included as well as public consultation. The policy further requires all major industries and mines to prepare waste management plans and present these to the local authorities for approval.

Apart from the requirements of the Draft 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.

Environmental Management Act of Namibia (2007)

The Environmental Management Act, No.7 of 2007 specifies the environmental assessment procedures to be followed and the activities that require an EIA. The Act provides a procedure for environmental assessments as indicated under Part VII and Part VIII, which is set out to:

- Better inform decision makers and promote accountability in decisions taken;
- Strive for public participation and involvement of all sectors of the Namibian community in the environmental assessment process;
- Take into account the environmental costs and benefits of proposed policies, programmes and projects;
- Take into account the secondary and cumulative environmental impacts of policies, programmes and projects; and
- Promote sustainable development in Namibia, and especially ensure that a reasonable attempt is made to minimize the anticipated negative impacts and maximize the benefits associated with the development.

Environmental Management Act Regulations (2012)

The Environmental Management Act Regulations have been finalised (February 2012) and have been used as guidance in the compilation of this scoping report. Namibia's Environmental Assessment Policy was the first formal effort in the country to regulate the application of environmental impact assessment. The regulation set out the process to be followed during the compilation of EIA reports as well as the minimum requirements for such reports.

National Heritage Act No. 27 of 2004

The Heritage Act of 2004 makes provision for the developer to identify and assess any archaeological and historical sites of significance. The existence of any such sites should be reported to the Monuments Council as soon as possible. The Council may serve notice that prohibits any activities as prescribed within a specified distance of an identified heritage/archaeology site.

Water Resource Management Act on Namibia (2004)

The Water Resources Management Act, No.24 of 2004 provides for the management, development, protection, conservation, and use of water resources; to establish the Water Advisory Council, the Water Regulatory Board and the Water Tribunal; and to provide for incidental matters. Section 25 imposes an obligation on the Minister responsible for health to ensure that the water supply is healthy and safe.

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

To provide measures for the saving of petroleum products and an economy in the cost of the distribution thereof, and for the maintenance of a price therefore; for control of the furnishing of certain information regarding petroleum products; and for the rendering of services of a particular kind, or services of a particular standard, in connection with motor vehicles; for the establishment of the National Energy Fund and for the utilization thereof; for the establishment of the National Energy Council and the functions thereof; for the imposition of levies on fuel; and to provide for matters incidental thereto. Regulated by the Ministry of Mines and Energy

Pollution Control and Waste Management Bill (guideline only)

The proposed development of the fuel retail facility (Gwakapiya Service Station) on Erf 38, Eheke Settlement in reference to the above, only applies to Parts 2, 7 and 8 respectively.
Part 2 states 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. And 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 stipulate 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. The competent authority for the purposes of section 74 shall maintain a register of substances notified in accordance with that section and the register shall be maintained in accordance with the provisions. Part 8 provides for

emergency preparedness by the person handling hazardous substances, through emergency response strategies.

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

Part 2 of the Ordinance governs the control of noxious or offensive gases. The Ordinance prohibits anyone from carrying on a scheduled process without a registration certificate in a controlled area. The registration 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. Regulated by the Ministry of Health and Social Services

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. Regulated by the Ministry of Health and Social Services

Public Health Act (Act 36 of 1919)

Section 111 makes provision that requires the local authorities to take measures for the prevention of water pollution. Section 119 provides that no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health. Section 120 requires local authorities to take measures for maintaining their district at all times in a clean and sanitary condition and for preventing the occurrence therein of, or for remedying or causing to be remedies, any nuisance or condition liable to be injurious or dangerous to health.

Various forms of nuisances are set out in section 122. For present purposes the following are most relevant:

a) any dwelling or premises which is or are of such construction or in such a state or so situated or so dirty or so verminous as to be injurious or dangerous to health or which is or are liable to favour the spread of any infectious disease;
(e) any accumulation or deposit of refuse, offal, manure or other matter whatsoever which is offensive or which is injurious or dangerous to health;
g) any public building which is so situated, constructed, used or kept as to be unsafe, or injurious or dangerous to health;
(k) any area of land kept or permitted to remain in such a state as to be offensive, or liable to cause any infectious, communicable or preventable disease or injury or danger to health;
(l) any chimney (not being the chimney of a private dwelling) sending forth smoke in such quantity or in such manner as to be offensive or injurious or dangerous to health;
(n) any other condition whatever which is offensive, injurious or dangerous to health.
The local authority may serve a notice on the author of the nuisance. Should the author refuse or fail to comply the local authority must approach a magistrate to lodge a complaint where upon the latter is required to issue a summons on the author to appear before court.

PROJECT RATIONALE

The aim of this development is to provide fuel, fuel products and services and other services and products to the community of Eheke Settlement. This will be achieved through provision of convenient refuelling for large and small vehicles, creation of employment and development of Eheke Settlement. The rapid population growth, the expanding middle class in the north of Namibia and the lack of services in remote settlements like Eheke are the motivating factors that led to this proposed development.

Gwakapiya Service Station will be the first fuel retail facility in Eheke Settlement and will be the only fuel retail facility within a 15 km radius. The fuel retail facility will bring much needed relief to the people in the area and will also be accompanied by other developments of an ATM, Post Office and Convenience store. Although the proposed development aims to bring about positive change in the area, it also brings changes in the Economic, Social and Environmental aspects that can lead to conflicts.

The Environmental Impact Assessment was conducted to meet the requirements of Namibia's Environmental Management Act (No. 7 of 2007) and Petroleum Products and Energy Act (Act No. 13 of 1990). An EIA may be defined as: a formal process to predict the environmental consequences of human development activities and to plan appropriate measures to eliminate or reduce adverse effects and to augment positive effects.

The proponent proposes to develop a fuel retail facility with components that includes:

- Four pump islands
- Four underground petroleum storage tanks (UPSTs)
- A heavy duty covered man hole for each of the UPSTs
- Oil and water separators
- Air and water point
- An office section
- Sanitary facilities
- A soak pit
- Associated piping work
- Compressor Generator Room

The purpose of the EIA is to incorporate the potential environmental (physical, ecological and cultural/socio-economic) concerns and address them adequately at the inception (design) and construction stages in order to guarantee sustainability in the operational phase of the station. The project is expected to raise both the potentially positive and negative impacts likely to emanate from the proposed project. Integrating Sustainable Environmental Management principles in the planning and implementation processes of any proposed projects is a milestone in reducing/mitigating conflicts as well as enhancing control and revitalization of the much degraded environment.

SCOPE OF THE EIA

The objectives of the scope of the EIA were to ascertain key issues of the environmental impacts that are likely to be more important during all the phases of the Project. Relevant environmental data have been compiled by making use of primary data which is the site assessment done on the 28th March 2022 and secondary data. Potential environmental impacts and associated social impacts was identified and addressed in this report.

The construction and operation of the proposed service station will involve;

- Preparation of the site, including excavations.
- The installation of new fuel storage facilities.
- Installation of fuelling network pipelines and associated pumps.
- Transport of fuel supply with oil tankers.
- Off-loading of fuel into underground petroleum storage tanks
- The dispensing of fuel into vehicles.
- Erection of a building (including a convenience store, an office and sufficient parking facilities).

The Environmental Impact Assessment study report includes an impact assessment and their mitigation measures of all the three phases of the proposed project following:

- The field investigations (site assessment),
- Identifying and involving all stakeholders in the Environmental Impact Assessment process by expressing their views and concerns on the proposed project;
- Identify all potential significant adverse environmental and social impacts of the project and recommend mitigation measures to be well described in the Environmental Monitoring Plan (EMP);
- Coordination with the proponent, regarding the requirements of law of Namibia's Environmental Management Act (No. 7 of 2007) and Petroleum Products and Energy Act (Act No. 13 of 1990);

- To define the Terms of Reference for the Environmental Impact Assessment study.
- A review of the policy, and relevant legislations
- To provide overall assessment information of the social and biophysical environments of the affected areas by the proposed new Fuel Retail Facility.

DESCRIPTION OF THE PROPOSED ACTIVITY

Proposed location and land ownership

The proposed activity involves the construction of a Fuel Retail Facility on an undeveloped Erf 38 situated along the Okapya-Omagongati Main Road in Eheke Settlement, Ondangwa Rural Constituency, Oshana Region. The proposed Fuel Retail Facility will be owned by Fly Investments CC that is owned by Mr. Fillemon Ndengu. The proposed site covers the area of 2304m². The GPS coordinates of the location of the proposed project site are (17°55.525' S; 15°52.181' E).

Figure 1: Site Location

Description of the filling station

The specific design plans and layout are not available due to the fact that the entire project is still in the design phase however, the proposed fuel retail facility will be a typical in nature. Therefore, in accordance with the relevant SANS standards, the facility will have a canopied forecourt with three or four dispensing islands on which pumps for the dispensing of fuel from the underground storage tanks will be located. Furthermore, the suitable dispensing pumps and fuel network pipelines will also be constructed according to the Ministry of Mines and Energy specified standards for fuel retail facility.

The proposed fuel retail facility will consist of four underground storage tanks (fibre-reinforced resin coated steel tanks):

- Two 46,000-litre capacity underground fuel storage tanks for unleaded petrol
- Two 46,000-litre capacity underground fuel storage tank for 500ppm diesel
- Four pump islands
- Fire protection equipment as per project drawing plans
- Necessary fittings and other works as per the project drawing plans
- Canopied forecourt with dispensing pumps;
- In addition, current practice is to include facilities such as a convenience store and car wash in the overall filling station design.

Fuel from these tanks will be pumped through underground pipes, which will be laid to the forecourt area, where it will finally be dispensed into customers' vehicles. The installation of the fuel tanks and pipelines at the filling station will be in line with SABS Standards (SANS 10089: Parts 1-3). Furthermore, this project will fulfil the requirements of the Water Act and SABS 089:1999 that, 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. In addition, waste water from the carwash facility will drain through a separator before discharge to main sewer.

Description of the Proposed Construction of the Project

The project involves the construction of a filling station with:

- The four underground fuel tanks, each of 46 000 litres (46 cubic metre) capacity;
- Canopied forecourt with dispensing pumps;
- Convenience store with bakery section;
- Branded take away; and Car wash facility;
- Banking facilities and a pharmacy.

In addition to the above-mentioned facilities, the project also proposed to construct the following tourism related facilities as part of the development:

- Tourism Information Centre;
- Outlet and display for crafters;
- Parking space for cars and tour buses;
- Additional Shops; and
- Garden & play area.

Proposed Project Activities

The project will consist of three (3) phases, namely the construction, operational and possible decommissioning phase.

Activities during the Construction Phase

a) Site Office

The contractor shall construct a temporary site office to run and manage all activities during this phase.

b) Site clearance and fencing

This will involve clearance of the little vegetation that is currently found at the proposed site. The site will then be isolated for public safety and for the security of construction material and equipment.

c) Excavation

This will involve excavation of the ground for installation of the tanks and other substructures as per the engineering drawings. This will use appropriate excavation equipment. This process will generate waste in form of spoil soil and rock particles.

d) Installation of tanks, erection of pumps and backfilling

The underground fuel storage tanks and fuel pumps will then be installed as per the project design. The pits will then be backfilled with hard core and compacted soil.

e) Construction of superstructures

This will entail construction of superstructures including the convenient store which will comprise of toilets, a mini shop, display shop, office and other proposed elements.

f) Plumbing

Necessary plumbing for connection of fuel tanks and dispensers and for water supply to the project site will be done.

g) Installation of fire protection equipment

The appropriate firefighting equipment (carbon dioxide, dry powder, foam and bucket of sand) will then be installed.

h) Other fittings (builder's works)

These will include reinforced concrete beams, fuel dispenser shed, site lighting and other necessary fittings.

Activities during the operation and maintenance phase

- Filling of the tanks from road transport tankers.
- Dispensing of fuel into vehicle tanks and other containers.
- Maintenance activities will include facility cleaning, underground tanks and dispensers. routine checks and other necessary repairs

Activities at the decommissioning phase

- Careful removal of the fuel dispensers,
- Careful excavation and removal of the underground fuel storage tanks after emptying the fuel therein, appropriate treatment of any contaminated soil as necessary, backfilling of the excavations with suitable material such as pebbles or construction dug out soil, proper disposal of decommissioned facilities and other wastes using a licensed waste collector
- And landscaping at the project site – planting of grass and trees (or shrubs). The major emphasis here will be restoration of the affected environment,
- Proper disposal of dismantled material and protection of public health and safety.

There will be employment opportunities created by this development during all the phases of the project. Therefore, it is estimated that there will be 70 possible direct job opportunities associated with construction phase with 15-20 indirect jobs that could be generated during this phase of the development. Furthermore, there will be the creation of between 20 and 25 permanent jobs associated directly with the operation of the various development components. A further 10 to 15 indirect job opportunities are likely to be generated in other sectors such as servicing the development. However, it is to be expected that some of these indirect opportunities will take other people outside Eheke Settlement.

Need and Desirability of the Proposed Project

Eheke Settlement is situated about 30km west of Ondangwa by Road, apart from a Clinic, Settlement and Constituency office, there are no other notable developments in the settlement. The residents are forced to drive a long distance to Ondangwa and Ongwediva to access the basic amenities of fuel, food and other necessities. The proposed fuel retail facility will cut the consumers travelling distance to these far away towns and bring the basic services to the settlement.

This project will also promote tourism which is not only one of the largest contributors of economic growth in northern Namibia but the whole country at large. This will be done by allowing the local

craft traders to showcase and sell their goods on the service station ground to the travellers using the Okapya-Omagongati Main Road.

Given the reasons above, there is a need and desirability for the proposed fuel retail facility to be known as Gwakapiya Service Station to be established on Erf 38, Eheke Settlement, Ondangwa Rural Constituency, Oshana Region.

Timing of the activity

The proposed project is likely to take between 12 months depending on the statutory approvals from the authorities. The construction of the fuel retail facility is only expected to take 6 months.

BASELINE DATA

This section lists the most important environmental characteristics of the study area and provides a statement on the potential environmental impacts on each. The SANS 10089-3 (2010) standards for the Petroleum Industry are used for the baseline assessment (reported on in this section) and subsequent impact assessment (reported on in Section 8) to incorporate all required and related issues in the investigation.

Locality and Surrounding Land Use

The proposed fuel retail facility will be situated on Erf 38, Eheke Settlement in Ondangwa Rural Constituency, Oshana Region that is situated along the Okapya-Eheke-Omagogati Main Road. See Figure 1(Site Location). The project is on an undeveloped vacant land and there is no vegetation found on the land. Furthermore, and there are no nearby occupied sites on the surrounding area of the proposed site. All traditional homesteads that are in the area have been compensated by the Oshana Regional Council and will be relocated soon. The surrounding area is earmarked for business purposes by the Oshana Regional Council.

Climate and Temperatures

The table 1 below briefly describe the general climatic conditions experienced within the Oshana Region including the Eheke area, as deduced from the Atlas of Namibia, by Mendelsohn et al 2003. The rainy season is limited between the months of November and April whereby an average of 350-400 mm of rainfall is estimated per annum.

In addition, the Cuvelai has inconsistencies in rainfall timings which lead to great variation in the annual rainfall between 30-40 percent. Furthermore; Temperatures vary little across the Basin where the average is greater than 19ºC in most areas, especially during the summer months. The annual evaporation of the Basin is known to depend on the temperature, humidity, cloud cover, wind and solar radiation. The predominant wind in the area is expected to be in the easterly direction.

Table 1: Summary of general Climate Data

Average rainfall:	Rainfall in the area is averaged to be less than 350 mm-400 mm per year.
Variation in rainfall:	Variation in rainfall is averaged to be 30-40 % per year.
Average evaporation:	Evaporation in the area is averaged to be between 2800-3000 mm per year.
Precipitation:	The highest summer rains are experienced from October to April.
Water Deficit:	Water deficit in the area is averaged to be between 1501-1700mm per year.
Temperatures:	Temperatures in the area are averaged to be more than 19-20 °C per year.
Wind direction:	Wind directions in the area are predominantly easterly winds.

Geology, Topography and drainage

The Kalahari sand plateau in the north-east was originally deposited as longitudinal dunes in an east-westerly direction. These longitudinal dunes, with associated omuramba's, form the agro-ecological zone KAL 8 (de Pauw et al. 1998/99). The drainage to the north of the Mangetti (north-

east of Oshivello) is still in an east-westerly direction (the “Akadhulu” or “Akazulu”). These fossil dunes do not show a great difference in relief (compared to southern Kavango and north-eastern Grootfontein districts), probably because of erosion and thus a general flattening of the topography.

As these remnant dunes flatten out completely, the rivers “Akadhulu” and “Niipele” turn south towards the Etosha pan. Roughly 80 % of the study area, to the east of Onankali - Okankolo, falls within these fairly flat sand plains, as part of the KAL 3-3 (de Pauw et al. 1998/99). It consists of a sand drift plain with a general slope range of 0-2 % (i.e. flat), very low relative relief (< 10 m), with no preferred drainage orientation.

Drainage in the sand plateau is mainly vertical (downwards). This has resulted in the formation of numerous pans in the north-western parts of the country, spreading out up to Eenhana in the north (the KAL4 according to de Pauw et al. 1998/99). The vertical movement of water leads to increased mineralisation of the sands, thus forming finer textured, more fertile soils in these pans. Both the more fertile soils and the shallow ground water in these pans has resulted in the settling of people along these pans in the Oshana Region.

The literature review shows the results of the soil profile done at one of the above-mentioned pans, that a mini soil profile pit was dug at relevé 87138. The soil profile looked as follows:

Top: 1-2 cm bleached white sand (could be the deposit of erosion from further up).
A-Horizon: 30 cm deep, dark grey loamy sand.
B-Horizon: below 30 cm, yellow grey sandy loam, very sticky to the touch. (Strohbach 1999).
The broad-leafed savannah falls within growing period zone 3 (de Pauw et al.1998/99).

Vegetation

This vegetation type is typical of the “Forest savanna and woodland (northern Kalahari)” (Giess 1971). This is described as a species-rich vegetation dominated by deciduous trees like Burkea africana, Terminalia sericea, Lonchcarpus nelsii, Baikiaea plurijuga, Pterocarpus angolensis, Ochna pulchra, Combretum species and Grewia species.

Typical trees are Terminalia sericea, Combretum collinum, Lonchocarpus nelsii, Burkea africana and Acacia fleckii and the shrubs Combretum engleri, Acacia ataxacantha, Bauhinia petersiana, Ozoroa schinzii, Grewia flava, G. flavescens and G. bicolor as well as Commiphora angolensis, C. africana and C. glandulosa. In KAL 8 (Omuramba-Dune association) north of King Kauluma school some Baikiaea plurijuga were encountered on a dune. Although this popular timber species had only a DBH of 20 cm (thus far from exploitable), some of these trees were found chopped down in this remote area.

The vegetation in this area is described as woodland dominated mainly by camelthon shrubs. The vegetation on site consists of short grass moderately scattered around the site. The project site is currently undeveloped but clearly shows; disturbances by animals and human activities, no much clearing of vegetation will occur. There are no protected species onsite that needs to be preserved and be made part of the development. No endangered species were observed on site; therefore, no threat to vegetation was identified. No wildlife was observed in the vicinity of the study area, only domestic animals mainly cattle, goats and donkey are present in the vicinity of the proposed project site.

Soils

The dominant soils in the Oshana Region are haplic Arenosols associated with ferralic Arenosols (sandy soils with a very poor nutrient-retaining capability). Strohbach
(1999) describes a mini soil profile pit at relevé 87126 as follows:
Top 5 cm: Humus enriched, bleached yellow-grey sand
Below 5 cm: Undifferentiated pure red sand

SOCIO-ECONOMIC ENVIRONMENT

Demographics

According to the 2011 National Population and Housing Census. Oshana Region has a population of 176 674, of which the vast majority (55 percent) lives in rural areas and thirteen percent (45%) live in urban areas. The Census also estimated that there are 96 559 females and 80 115 males.

The population density is 20.4 persons per km2 and the Human Poverty index (HPI) is 21% compared to National HPI of 24.7. Life expectancy is 61 years for females and 50 years in males. Most eighty-six (86%) of the households residing within the Oshana Region, speak Oshiwambo.

Economic activities

There has been immense commercial and industrial growth in Oshana Region. Various shopping malls, schools and other businesses have opened in the area and have improved both the economic and social stance of the Region. However, much of the economy of the Oshana region is still based on farming.

Education Profile

The Oshana Region is well placed with regards to academic rates in the whole of Namibia. According to (EMIS, 2012) there are 137 schools. The literacy rates for persons older than 15 years of the Region is 96% compared with that of Namibia which is 91,53%.

Employment Opportunities

By the year 2011, sixty-one percent (61%) of the population older than 15 years, were employed and thirty-nine percent (39%) unemployed. The population outside the labour force comprised of students, homemakers and retired or old age persons.

Incomes

Subsistence farming (33%) and labour migration are considered the primary livelihood sources of many households. The majority of the employed population are employed in the formal sector making Wages and Salaries 30% the second main source of income in the region. Pensions 19%, Non-farming business 10%, Cash Remittance 5% is the means of survival for the rest of the population.

Health Profile

In Namibia, the HIV prevalence rate in pregnant women age group 15 to 49 is estimated at 21.3% (UNDP, 2005). While the HIV prevalence rate in the Oshana Region stands at 15.9%. Ninety-four percent of the population in the region have access to safe drinking water, while 15 % have poor or no access to toilet facilities.

Immigration

The proposed facility will attract some immigrants to the settlement of Eheke for employment and business opportunities. This might cause discomfort to the local community currently residing in the area as they might feel left out from the benefits of the development in their own town.

Acquisition

Jobs emanating from the construction and operation of the proposed facility will be outsourced to small medium enterprises in the area.

Tourism

Oshana region includes the Etosha National Park, which is one of the major tourist attractions in Namibia and Southern Africa. Ondangwa town also has the only functioning airport in north central Namibia. Therefore, many tourists and business people travel through the National Park when travelling to northern Kunene, and Angola. There are various cultural, historical and craft-based enterprises in the communities, conservancies and community forests/ community gardens. Furthermore, most tourists that are looking to explore the areas between Etosha National Park and the large population centers of northern Namibia will use Eheke as a resting place.

Amenities

A number of amenities are offered to the residents of the Oshana Region more especially in Ondangwa Urban Constituency. However, there is a lack of amenities in the Eheke Settlement. The settlement relies on its big neighbor Ondangwa for most of the amenities needed. Thus, it is important for developments of this nature to be promoted in the settlement.

There is a school, clinic and government offices in the settlement.

ANALYSIS OF ALTERNATIVES

In terms of environmental impact assessment best practice, assessment of potential impacts from a proposed activity must include the assessment of alternatives. Assessment of alternatives is undertaken to identify the option that will minimise harm to the environment and may include site, technology and other alternatives, but must always include the option of not implementing the activity, known as the "no-go" alternative.

Locations

The proponent has the option of undertaking the proposed development in a different location other than the chosen site. This could also entail acquiring land elsewhere to carry out the development. The following reasons justify the use of the proposed site for the development:

- The land is allocated to Fillemon Ndengu who is the sole member of Fly Investments CC.
- The site is suitable for development of a petrol service station. This is simply because the land is undeveloped and strategically located at junction in the settlement along the Okapya-Eheke-Omagongati Road. Thus, it will greatly benefit all motorists travelling on that road as well as benefiting residents of Eheke Settlement and people from nearby towns.
- There is adequate space for the proposed development on the land.
- The proposed site is located at a suitable location that will avoid problems associated with traffic system.

The "No Project" Alternative

The No-Go Option is the option not to proceed with the activity, implying a continuation of the current situation/ status quo. That means no development is undertaken on the land and thus retains the original environment. Without the project the land would not be put to optimum use. From the socio-economic point of view, the no project option is the least preferred option due to the following factors:

- The need for a more modern fuel retail facility in the area will be there.
- Increasing number of motorists frequenting the area and the surrounding area will decrease due to the lack of fuel supply to motorists in the area.
- The fuel shortage problem in the area will not be solved.
- The local skills would remain underutilized.
- Reduced technology advancement at the settlement and interaction both at local, national and international levels.
- No employment opportunities will be created for the locals who would work on the project.
- Poverty will not be eradicated.

PUBLIC PARTICIPATION PROCESS (PPP)

This section provides details of Public Participation Process (PPP) undertaken in the compilation of this EIA scoping report. In terms of Section 26(1) (h) of the Environmental Assessment Regulations (2012), it is a requirement to provide details of the public participation process conducted in accordance with Section 32 of the Environmental Assessment Regulations as Public Participation forms an important component of any EIA.

The Ministry of Environment and Tourism defines the Environmental Assessment Regulations (2012) of the Environmental Management Act (2007), as a process in which potential interested and affected parties such as neighbouring landowners, local authorities, environmental groups, village councils and communities, to comment on the potential environmental impacts associated with the proposed project. Besides these legal requirements, the consultation of the public and other relevant stakeholders was undertaken to ensure that their voices are heard and taken into account during the decision-making process.

Aim for Public Participation Process (PPP)

The aim for the Public Participation Process is not limited to:

- Informing Interested and Affected Parties (I&APs) of the proposed project;
- Identifying issues, comments and concerns as raised by I&APs;

- Promoting transparency and an understanding of the project and its consequences;
- Serving as a structure for liaison and communication with I&APs; and
- Providing local knowledge and input in identifying potential environmental (biophysical and social) impacts and "hotspots" associated with the proposed development.

Compilation of stakeholder database

The first step in the Public Participation Process (PPP) is to identify key stakeholders. A stakeholder database was compiled and the target groups for this project were invited to the public meeting, these were and not limited to:

- Eheke Settlement Office,
- Eheke Settlement Residents
- Oshana Regional Council;
- Nored;
- Ondangwa Rural Constituency;
- General public

Background Information Document

This document provides a short summary of the project and the EIA process. A background information document (BID) was prepared and was ready to be distributed to Interested & Affected Parties. The background information document was circulated to the meeting attendants. See a copy of the BID in Appendix A

Notification of I&Aps

The requirements for the notification of potentially interested and affected parties of this application are set out in detail in section 32(2) (b) of the EA regulation. These requirements have been addressed and include:

- Forwarding letters to government authorities and other identified relevant stakeholders;
- Fixing a notice board at a place conspicuous to the public in Oshiwambo & English;
- Announcement of the public meeting through Oshiwambo National Radio Station
- Placing advertisements two local newspapers for two consecutive weeks.

Advertisement

The advertisement of the public participation and public meeting for the proposed project were placed in two local newspapers, the New Era and the Namibian (dated: 18 and 25 March 2022). Proof of advertisements are attached as Appendix B. The public meeting was also announced in NBC Oshiwambo Radio by the Councillor of Ondangwa Rural Constituency.

Public Meeting held on Site

In compliance with the EIA Regulations (2012), public (I&AP) and all stakeholders were notified as a requirement for EIA process. Therefore, to incorporate the varying needs of stakeholders and I&APs, as well as to ensure the relevant interactions between stakeholders and the EIA specialist team, the public was invited to the public meeting on a site opposite Erf 38, Eheke Settlement – as per the itinerary below:

Venue	Date	Time
Erf 38, Eheke Settlement	8 April 2022	10:00AM - 11:00AM

Public Officials from the Eheke Settlement Office, Ondangwa Rural Constituency Office and the General Public showed up for the meeting, see attendance register in Appendix C. The public interest on this project is huge as the public is looking forward to the development bringing much needed services closer to them. Letters for comments were sent to the identified key stakeholders for comments see a copy of the letter for comments in Appendix D.

Issues raised by interested and affected parties

Some of the comments from the public where for the proponent to include a bank, pharmacy and a gas dispensing facility on the proposed project. There were no objections to this project as the residents of Eheke Settlement are excited and cannot wait until the project is implemented.

ENVIRONMENTAL ASSESSMENT METHODOLOGY

An appraisal of the type of effect the proposed fuel retail facility would have on the environment; rate as either positive (beneficial on the environment), neutral (no impact on the environment), or negative (adverse impact on at a cost to the environment).

Table 2: Assessment and Rating of Severity

Rating	Description
1	Negligible / non-harmful / minimal deterioration (0 – 20%)
2	Minor / potentially harmful / measurable deterioration (20 – 40%)
3	Moderate / harmful / moderate deterioration (40 – 60%)
4	Significant / very harmful / substantial deterioration (60 – 80%)
5	Irreversible / permanent / death (80 – 100%)

Table 3: Assessment and Rating of Duration

Rating	Description
1	Less than 1 month / quickly reversible
2	Less than 1 year / quickly reversible
3	More than 1 year / reversible over time
4	More than 10 years/ reversible over time/ life of project or facility
5	Beyond life of project or facility/ permanent

Table 4: Assessment and Rating of Extent

Rating	Description
1	Within immediate area of the activity
2	Surrounding area within project boundary
3	Beyond project boundary
4	Regional/ Provincial
5	National/ International

Consequence is calculated as the average of the sum of the ratings of severity, duration and extent of the environmental impact.

Table 5: Determination of Consequence

Determination of Consequence (C)	(Severity + Duration + Extent) / 3

Table 6: Assessment and Rating of Frequency

Rating	Description
1	Less than once a year
2	Once in a year
3	Quarterly
4	Weekly
5	Daily

Table 7: Assessment and Rating of Probability

Rating	Description
1	Almost impossible
2	Unlikely
3	Probable
4	Highly likely
5	Definite

Likelihood

Likelihood considers the frequency of the activity together with the probability of the environmental impact associated with that activity occurring.

Table 8: Determination of Likelihood

Determination of Likelihood (L) =	(Frequency + Probability) / 2

Environmental Significance

Environmental significance is the product of the consequence and likelihood values.

Table 9: Determination of Environmental Significance

Rating	Description
L (1 - 4.9)	Low environmental significance
LM (5 - 9.9)	Low to medium environmental significance
M (10 - 14.99)	Medium environmental significance
MH (15 - 19.9)	Medium to high environmental significance
H (20 - 25)	High environmental significance. Likely to be a fatal flaw

Impacts Associated with Construction Phase

Potential effects on the environment and their mitigation measures during construction are:
Dust Pollution – These are expected to be site specific, short-termed and will most probably pose a negligible nuisance and health threat to those residing nearby. The construction of the proposed facility will have impact on the surrounding air quality as construction vehicle will be frequenting the site and surrounding areas.

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	2	2	3	2.33	5	3	4	Negative	6.33 (LM)
Mitigation measures: Dust may be generated during the construction/decommissioning phase and might be aggravated when strong winds occur therefore; dust suppression during the construction process is advised if dust becomes an issue. Vehicles travelling to and from the construction site must adhere to the speed limits so as to avoid producing excessive dust.									
Mitigated	1	2	2	1.66	5	2	3.5	Negative	5.16(LM)

Noise Impact – Noise pollution will be produced due to construction equipment and heavy machinery on site. Earthmoving equipment will be utilised during the construction phase and noise may thus be generated. Village properties nearby (<150m) the site may be impacted. During cconstruction, noise can interfere with student's learning and studying, might degrade social interactions, disrupt speech communication, can also lead to emotional distress or annoyance, or lead to physical health problems such as permanent loss of memory or a psychiatric disorder if in excessive noise pollution.

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	2	2	3	2.33	5	3	4	Negative	9.32 (LM)
Mitigation measures: Provide ear plugs and ear muffs to staff undertaking the noisy activity or working within close proximity thereof or alternatively, all construction workers should be equipped with ear protection equipment. Construction should be limited to working hours only (07H00- 19H00).									

Noise pollution should be addressed and mitigated at an early stage of construction phase.									
Mitigated	1	2	1	1.33	5	3	4	Negative	5.32 (LM)

Safety and Security – During the construction and decommissioning phase, earthmoving equipment will be used on site. This increases the possibility of injuries. Presence of equipment may encourage criminal activities (theft). In terms of safety, crime and prostitution are key factors that needs to be looked at. This is because new developments such as construction attracts people from nearby settlements looking for jobs as construction workers. Once the work is completed, they continue inhabiting the area and end up committing crimes such as prostitution and house break ins.

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	3	3	3	3	5	2	3.5	Negative	6.5 (LM)
Mitigation measures: The responsible contractor must ensure that all staff members are briefed about the potential risks of injuries on site. 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 discourages 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. Relevant safety signs should be clearly displayed. The contractor must ensure that there are emergency facilities such as first aid kits on the site, in order to help employees to save others in case of emergency or injuries;									

The proponent must appoint the Health Officer to train and brief all employees about the potential risks of injuries on site so that they will have the knowledge of helping themselves or others in case of injuries. For safety reasons children should also be kept from making the site a playground and their access should be prevented. The contractor is further advised to ensure that adequate emergency facilities, including first aid kits, are available on site.									
Mitigated	1	2	0	1	1	1	1	Negative	2 L

Impacts on Traffic – The site is situated along the Okapya-Eheke-Omagongati Main Road. Construction related activities are expected to have a minimal impact on the movement of traffic along the road. Accidents might occur if no qualified drivers employed to drive vehicles for the project.

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	3	2	3	2.66	5	5	5	Negative	7.66 (LM)
Mitigation measures: No diversion of traffic or closure of the road is expected. The responsible contractor must ensure that all drivers employed have valid driver's licenses for the vehicle types they employed for, and that they have experience in driving those vehicles. The contractor must ensure that there is always a supervisor on site to ensure that no driver operates a vehicle under the influence of alcohol or narcotics.									
Mitigated	1	2	2	1.66	5	3	4	Negative	5.66 (LM)

Generation of Waste- during this phase, construction waste is expected to be lying around if not properly handled or managed. This can be in a form of contaminated soil and building rubble.

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	4	3	2	3	5	5	5	Negative	8(LM)
Mitigation measures: Ensure that no excavated soil, refuse or building rubble generated on site are placed or dumped on surrounding properties or land. Contaminated waste in the form of soil, litter, building rubble and other material must be disposed of at an appropriate disposal site. Waste must be disposed of at an appropriately classified waste disposal site. Strictly, no burning of waste on the site or at the disposal site is allowed as it possess environmental and public health impacts; Waste handling procedures must be cleared with the Eheke Settlement Office and the construction contractor should be informed about this. To avoid contaminating the soil and underground ecosystem, no wastewater should be disposed on soil.									
Mitigated	1	5	1	2.33	5	2	3.5	Negative	5.83 (LM)

Groundwater Contamination – Leakages from equipment and machinery might occur during the construction phase that will lead to the contamination of the groundwater.

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	3	2	1	2	5	3	4	Negative	8 (M)
Mitigation measures:									

Chemicals used during construction e.g. paint and paint remover is also posing a risk. Care must be taken to avoid contamination of soil and groundwater. Proper toilet facilities should be installed at the construction site and at the camping site or alternative arrangements made. The contractor shall ensure that there is no spillage when the toilets are cleaned or during normal operation and that the contents are properly removed from site. Fuel (diesel and petrol) and oil containers shall be in good condition and placed in a bonded area or on plastic sheeting covered with sand (temporary bonding).									
Mitigated	1	2	1	1.33	5	3	4	Negative	5.32 (LM)

Health and Safety – Health and Safety Regulations pertaining to personal protective clothing, first aid kits being available on site, warning signs, etc. is important and should be adhered to. During construction phase, there is a possibility of injuries to occur if no measures are taken into consideration.

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	5	2	1	2.66	5	3	4	Negative	6.66 (LM)
Mitigation measures: During construction, earthmoving equipment will be used on site. This increases the possibility of injuries and the responsible contractor must ensure that all staff members are briefed about the potential risks of injuries on site. The contractor is further advised to ensure that adequate emergency facilities are available on site. All Health and Safety standards specified in the Labour Act should be complied with.									
Mitigated	1	1	1	1	2	1	1.5	Negative	2.5 (L)

Ecological Impacts

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	1	1	1	1	1	1	1	Negative	1 (L)
Mitigation measures: No known conservation worthy vegetation is located on the proposed facility.									
Mitigated	1	1	1	1	1	1	1	Negative	1 (L)

Increased Informal Settlement and Associated Problems

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	1	3	3	2.33	1	5	3	Negative	5.33 (LM)
Mitigation measures: Lack of proper housing may encourage informal settlements around the proposed site. Unskilled migrant workers are expected to choose cheaper housing options and thus opt for informal housing options. This can be mitigated by giving employment preference to locals that can proof normal residence in the area.									
Mitigated	1	2	2	1.66	1	1	1	Negative	2.66 (L)

Increased Spread of HIV/ AIDS and Covid-19 - migrant workers with HIV/AIDS and Covid-19 may affect local people leading to a high rate of HIV/AIDS and Covid-19 in Eheke Settlement.

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	5	5	5	5	5	5	5	Negative	10(M)
Mitigation measures: 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. See section 9 (Socio-economic Environment) for details on region statistics.									
Mitigated	1	2	3	2	0	2	1	Negative	3 (L)

Increased Influx to Eheke Settlement

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	1	3	2	2	5	3	4	POS/NEG	6(LM)
Mitigation measures: 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.									

Mitigated	1	2	3	2	5	3	4	POS/NEG	6.64 (LM)

Heritage Impacts – There are no known heritage areas or artefacts deemed to be impacted by the construction.

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	1	1	1	1	1	1	1	Negative	1 (L)
Mitigation measures: During construction, the contractor might come across archaeological features or objects that possess cultural values. If archaeological remains or objects with cultural values (e.g. Pottery, bones, shells, ancient clothing or weapons, ancient cutlery, graves etc) are uncovered at the exploration camp or surrounding, it should be cordoned off and the relevant authorities should be contacted immediately.									
Mitigated	1	1	1	1	1	1	1	Negative	1 (L)

Stimulation of Skills Transfer (Positive Impact)

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	1	2	1	1.33	5	3	4	Positive	5.32 (LM)
Mitigation measures: 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.									
Mitigated	1	2	1	1.33	5	3	4	Positive	5.32 (LM)

Employment Creation (Positive Impact)

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	1	2	2	1.66	2	5	3.5	Positive	5.16 (LM)
Mitigation measures: Various employment opportunities will be created during all phases of the development, ranging from highly skilled to unskilled. The development is expected to create more than 10 skilled and unskilled posts. Preference should be given to local residence and to Namibian Citizens. When recruiting, the responsible contractor should ensure gender equality is taken into consideration that both men and women are employed equally and treated equally. Equity, transparency, should be put into account when hiring and recruiting and that Public Participation i.e. Community Leaders or Community committees should also take part in the recruiting process for decision makings. In terms of human resource development and capacity building, the contractor must enforce training programs that skilled workers should always train unskilled workers when necessary, in order for them to enhance their performances and to gain more knowledge that they might demonstrate at other levels in future.									
Mitigated	1	2	5	2.66	3	5	4	Positive	6.66 (LM)

Cumulative Impacts

Possible cumulative impacts associated with the construction phase include increase in traffic into Eheke Settlement. Therefore, increase in emissions from these vehicles, decreasing the air quality around the proposed establishment. Wear and tear on the road, coupled with increased risk of road traffic incidences. These impacts will however be short lived.

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	1	2	2	1.66	5	3	4	Negative	6.64 (LM)
Mitigation measures:									
Mitigated	1	2	1	1.66	4	3	3.5	Negative	5.81 (LM)

As discussed in the different sections, impacts are expected to be low to medium, short lived and site specific. An Environmental Management Plan (EMP) will ensure that the impacts of the construction work are minimised and includes measures to reduce the identified impacts during construction of the facility while ensuring that vehicles and pedestrian traffic are suitably protected to avoid accidents and injuries. The appointed contractor should be made aware of the content and environmental requirements of this report so as to plan the construction phase accordingly.

Impacts Associated with Operational Phase

Specific impacts identified, associated with the operational phase are:

Spillage

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	2	5	2	3	4	4	4	Negative	7 (LM)
Mitigation measures: Spillages might occur during delivery to the storage tanks. Risks of such an impact can be lowered through proper training of staff and the installation of suitable containment structures. Spillages occurring at the filler point and dispensing (i.e. offloading) area must be contained and cleaned up.									

Any water containing waste (wastewater) generated as a result of the spillage and associated clean up, must be disposed of safely and in accordance with environmental legislation. No product must be allowed to be discharged into municipal storm water / sewer system and or surrounding environment.									
Mitigated	1	0	1	0.66	0	2	1	Negative	1.66 (L)

Overfilling of Storage Tanks

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	2	3	2	2.33	4	4	4	Negative	6.33 (LM)
Mitigation measures: Overfilling of the tanks may also take place and proper monitoring of the product levels in the tanks must take place to eliminate overfilling. The Underground Storage Tanks must be fitted with an overfill protection device.									
Mitigated	1	0	1	0.66	0	1	0.5	Negative	1.16 (L)

Overfilling of Vehicles

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	3	3	1	2.33	5	5	5	Negative	7.33 (LM)
Mitigation measures:									

The operators must be well trained and must focus on filling the vehicle to avoid the overfilling. This impact can also be reduced by the installation of spill containment areas around the pumps.									
Mitigated	1	1	1	1	2	2	2	Negative	3 (L)

Fire and Explosion Hazard

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. Therefore, an integrated fire prevention plan should be drafted before "start-up" of the facility. Special note must be taken of the regulations stipulated in sections 47 and 48 of the Petroleum Products and Energy Act, 1990 (Act No. 13 of 1990).

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	5	5	2	4	2	3	2.5	Negative	6.5 (LM)
Mitigation measures: All personnel have to be sensitised about responsible fire protection measures and The Emergency Response Plan should be implemented and should address the potential spills and workers should be trained on the actions that are to be taken if such an events are to occur; Regular inspections should be carried out to inspect and test, firefighting equipment and pollution control measures at the fuel storage facility. 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.									

Experience has shown that the best chance to rapidly put out a major fire is in the first 5 minutes. It is important to recognise that a responsive fire prevention plan does not solely include the availability of firefighting equipment, but more importantly, it involves premeditated measures and activities to prevent, curb and avoid conditions that may result in fires. It must be assured that sufficient water is available for firefighting purposes.									
Mitigated	1	0	1	0.66	0	2	1	Negative	1.66(L)

Damage to Pipelines and Tanks- Damages to pipelines and tanks may occur due to vehicle movements and excavations. Leakage of the damaged structure is most likely to follow.

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	2	1	1	1.33	1	1	1	Negative	1.33 (L)
Mitigation measures: Due to vehicle collision and damage during excavations. This can be mitigated through careful designs, warning signs and sensible operations in the area. Utility clearance investigations should be conducted before any excavation commences on the site.									
Mitigated	1	1	1	1	1	1	1	Negative	1 (L)

Surface Water Contamination – Surface runoff from the site is expected to flow in a South-Easterly direction. It is highly unlikely that contaminated surface runoff from the site will reach any surface water bodies like Oshanas which is way far from the site as there is no surface body like in a 500m radius.

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance

Unmitigated	4	5	5	4.66	5	3	4	Negative	8.66 (LM)
Mitigation measures: Proper containment mechanisms installed such as oil/water separators should be able to contain any spillages that might occur during the operation of the facility. In case of accidental spill, it must be all employee's responsibility to ensure that all accidental surface spills of oil or fuel is contained on-site and transferred to the oil/water separator Littering of empty tin oil containers can also cause spillage, therefore the contractor must ensure handling and storage of all petrol/ oil equipment are properly managed in an approved manner.									
Mitigated	1	1	1	1	1	2	1.5	Negative	1.5 (L)

Groundwater Contamination

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	3	5	3	3.66	1	3	2	Negative	7.32 (M)
Mitigation measures: Due to leakage and spillage, the risk of groundwater pollution can be lowered through proper training of staff and the installation of suitable containment structures. Overfilling of the tanks may also take place and proper monitoring of the product levels in the tanks must take place to eliminate overfilling. Regular tank and pipeline tightness inspections are advised to eliminate the risk of impact on the environment due to leakage.									
Mitigated	1	1	1	1	1	2	1.5	Negative	1.5 (L)

Increased Noise Pollution

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	3	5	2	3.33	5	5	5	Negative	8.33 (LM)
Mitigation measures: More vehicles are expected to frequent the site, but the impact is expected to be minimal. Sound volumes should be kept low if public address systems are used on the site.									
Mitigated	1	1	1	1	2	1	1.5	Negative	2.5 (L)

Air Quality- In terms of air quality, hydrocarbon vapours will normally be released during delivery as liquid displaces the gaseous mixture in the tanks.

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	5	5	4	4.66	5	5	5	Negative	9.66 (LM)
Mitigation measures: In terms of air quality, hydrocarbon vapours will normally be released during delivery as liquid displaces the gaseous mixture in the tanks. This 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. All venting systems and procedures have to be designed according to SANS standards and placed in a sensible manner.									
Mitigated	1	0	1	0.66	0	2	1	Negative	1.66 (L)

Health Impacts- The operations of the retail facility can cause serious health and safety risks to workers on site. Occupational exposures are normally related to dermal contact with fuels and inhalation of fuel vapours during handling of such products.

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	5	5	4	4.66	5	5	5	Negative	9.66 (LM)
Mitigation measures: For the reason stated above, adequate measures must be brought in place to ensure safety of staff on site, and includes: Proper training of operators; First aid treatment; Medical assistance; Emergency treatment; Prevention of inhalation of fumes; Protective clothing, footwear, gloves and belts; safety goggles and shields; Manuals and training regarding the correct handling of materials and packages should be in place and updated as new or updated material safety data sheets becomes available; and Monitoring should be carried out on a regular basis, including accident reports.									
Mitigated	1	1	1	1	2	2	2	Negative	3 (L)

Generation of Waste

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	3	5	3	3.66	5	5	5	Negative	8.66 (LM)
Mitigation measures: All general waste should only be collected by the waste disposal Licensed contractor authorized by the Local Authority which is Eheke Settlement Office Waste minimization policy. Bioremediation of contaminated soil. Waste in the form of contaminated soil due to spillages might occur, but should be prevented through the use of containment areas as provided. Tank sludge and spill clean - up materials should be managed via re-processing for product recovery or as a waste at a facility licensed to handle this type of material in an environmentally sound manner. 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. Care should be taken when handling contaminated material. 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. The cradle to grave principal should be kept in mind during waste disposal. The work environment should be kept clean, thus good house-keeping should be maintained.									
Mitigated	1	2	2	1.66	1	3	2	Negative	3.32 (L)

Economic Impacts (Positive Impact)

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	1	1	5	2.33	2	3	2.5	Positive	4.8 (LM)
Mitigation measures: Creation of new employment opportunities. This is deemed to be a positive impact. It is not clear how many new, permanent employment positions will be created but it is expected to be about 20 or more people. It is recommended to put local people at forefront when hiring or recruiting people, therefore unskilled people from the local community should be employed and semi-skilled from the region so that unskilled workers can be trained by semi-skilled for them to learn and be able to compete with others in future. Equity, transparency, should be put into account when hiring and recruiting and that Public Participation i.e. Community Leaders or Community committees should also take part in the recruiting process for decision makings.									
Mitigated	1	2	3	2	2	5	3.5	Positive	5.5(LM)

Stimulation of Economic Development (Positive Impact)

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	1	5	5	3.66	5	3	4	Positive	7.66 (LM)
Mitigation measures: The development of the new modern fuel facility in Eheke is expected to enhance the economic development around the Eheke Settlement. The construction of the fuel retail facility with a convenience store and other needed services are expected to boost development confidence of the area.									

Employment should be given to people from Eheke for them to boost the development of Eheke Settlment.									
Mitigated	1	5	4	3.33	5	5	5	Positive	8.33 (LM)

Cumulative Impacts

Possible cumulative impacts associated with the operational phase include increase in traffic frequenting the fuel retail facility. Therefore, increase in emissions from these vehicles, decreasing the air quality around the proposed establishment and the nearby business properties. Wear and tear of gravel road coupled with increased risk of road traffic incidences from the service station into the main road.

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	2	4	3	3	5	3	4	Negative	7(LM)
Mitigation measures:									
Mitigated	2	3	3	2.66	5	3	4	Negative	6.66 (LM)

Heritage Impacts – There are no known heritage areas or artefacts deemed to be impacted by the operational phase.

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	1	1	1	1	1	1	1	Negative	1 (L)
Mitigation measures:									
Mitigated	1	1	1	1	1	1	1	Negative	1 (L)

Ecological Impacts

	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood	Status	Confidence/ Significance
Unmitigated	1	1	1	1	1	1	1	Negative	1 (L)
Mitigation measures: No known conservation worthy vegetation is present on the proposed facility. Limited impact on the flora can be expected, as very little vegetation exists at the site.									
Mitigated	1	1	1	1	1	1	1	Negative	1 (L)

Impacts Associated with Decommissioning Phase

At this point, it is difficult to visualise and assess the decommissioning phase, although the procedures for decommissioning phase should be the same as for the construction phase however, there will be possible pollution from the fuel in the storage and dispensing equipment. Furthermore, during the decommissioning phase, an Environmental Impact Assessment (EIA) will be required and the disposal of decommissioned equipment and hazardous contaminated materials should be disposed following the disposal of hazardous materials.

During the decommissioning phase, all the storage facilities to be removed should be drained properly following guidelines for tank removal in order to reduce the risk of fuel spillage and groundwater contamination. Furthermore, all the rubble and waste that will be created during this phase should be disposed of at an approved waste facility and not dumped in the surrounding areas. These should be done in accordance with Eheke Settlement (Oshana Regional Council's) waste management regulations and guidelines.

CONCLUSION

Fly Investments CC proposes to construct and operate a fuel retail facility outlet to be known as Gwakapiya Service Station on Erf 38, Eheke Settlement, in Ondangwa Rural Constituency in the Oshana Region. Nghivelwa Planning Consultants has conducted an Environmental Impact Assessment (EIA) and prepared an Environmental Management Plan (EMP) for the construction, operation and decommissioning phases of the proposed Gwakapiya Service Station.

Potential environmental issues associated with the proposed activities have been identified. A number of potential impacts were assessed and mitigation measures are provided. The area is generally suitable for the fuel retail facility. All environmental risks can be minimised and managed through implementing preventative measures and sound management systems.

REFERENCES

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.

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.

Education Management Information System Education Statistics (2011) Environmental Management Act guideline of Namibia. Oshikoto Regional Poverty Profile (2007).

Mandelsohn J., Jarvis A., Roberts C. And Robertson T. (2013), A Profile and Atlas of the Cuvelai-Etosha Basin, RAISON, Namibia.

Miller R.McG. (2008). Geology of Namibia.

SANS 100131:1982: The storage and Handling of Liquid fuel. Part 111: Bulk flash-point fuel storage and allied facilities at large consumer installations.

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

Ben J. Strohbach. (2000). Vegetation degradation trends in the northern Oshikoto Region.