

APP-001723
OPERATIONS OF VAN DYK PETROLEUM'S DIESEL
WHOLESALE FACILITY, GROOTFONTEIN
ENVIRONMENTAL MANAGEMENT PLAN



Assessed by:



Assessed for:




Aug 2020

Project:	OPERATIONS OF VAN DYK PETROLEUM'S DIESEL WHOLESALE FACILITY, GROOTFONTEIN: ENVIRONMENTAL MANAGEMENT PLAN	
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Report Approval	 André Faul Conservation Ecologist	

I, _____, acting as representative of Van Dyk Petroleum CC, hereby confirm that the project description contained in this report is a true reflection of the information which the Proponent provided to Geo Pollution Technologies. All material information in the possession of the Proponent that reasonably has or may have the potential of influencing any decision or the objectivity of this assessment is fairly represented in this report and the report is hereby approved.

Signed at Grootfontein on the 17 day of August, 2020.



 Van Dyk Petroleum CC

CC/2016/13058

 Business Registration/ID Number

EXECUTIVE SUMMARY

Van Dyk Petroleum CC requested Geo Pollution Technologies (Pty) Ltd to prepare an environmental management plan (EMP) for their existing diesel wholesale facility on erf 242, Maroela Street, Grootfontein. The facility operates under a wholesale licence issued by the Ministry of Mines and Energy and supplies diesel to farmers and businesses in the area. For this purposes, one aboveground 23 m³ steel tank, with concrete bunding, is present on site. Two small tanker trucks of the Proponent collect diesel from the tank for transport to clients. The tank in turn is filled with a large tanker truck, from a bulk fuel storage facility, as needed. Van Dyk Petroleum is also contracted by other members of the petroleum industry to transport fuel from the bulk fuel storage facilities in Walvis Bay, to various storage and retail facilities in northern Namibia. For this purpose the Proponent has a fleet of tanker trucks consisting of 17 trucks and 16 fuel tankers.

The Proponent services his truck fleet on the premises when required. Used mineral oil, drained from vehicles being serviced, is stored on site and periodically collected by authorized third party contractors. An additional three aboveground 23 m³ steel tanks, also inside suitable concrete bunding, are present on site. These were originally used as storage of contaminated fuel, but are now empty and no longer in use.

Potential environmental impacts and associated social impacts were identified and preventative / enhancement and mitigation measures are provided in the form of an EMP in this report. It includes all environmental, safety, health and socio-economic impacts associated with the facility.

The premises is zoned for industrial use and is surrounded mainly by industries of a similar nature. Due to the nature and location of the facility, limited impacts are expected on the surrounding environment. It is however recommended to regularly monitor environmental performance to ensure regulatory compliance and that corrective measures be taken if necessary. Operations of the facility play a positive role in contributing to a reliable supply of fuel to the local business community and agricultural industry.

The major concerns related to the operations of the facility are that of potential groundwater, surface water and soil contamination, health impacts, traffic and the possibility of fire. These will however be limited by adherence to relevant South African National Standards and Material Safety Data Sheet instructions. Furthermore, noise levels should meet the minimum requirements of the World Health Organisation. By appointing local contractors and employees, and by implementing educational programs, the positive socio-economic impacts can be maximised while mitigating any negative impacts.

The environmental management plan included in Section 7 of this document should be used as an on-site reference document during all phases of the facility. All monitoring and records kept should be included in a report to ensure compliance with the environmental management plan. Parties responsible for transgression of the environmental management plan should be held responsible for any rehabilitation that may need to be undertaken. A health, safety, environment and quality policy should be used in conjunction with the environmental management plan. Operators and responsible personnel must be taught the contents of these documents. Local or national regulations and guidelines must be adhered to and monitored regularly as outlined in the environmental management plan.

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1 BACKGROUND AND INTRODUCTION

Geo Pollution Technologies (Pty) Ltd was appointed by Van Dyk Petroleum CC (the Proponent) to prepare an environmental management plan (EMP) for the continued operations of their existing fuel wholesale facility on erf 242, Grootfontein, in the Otjozondjupa Region (Figure 1-1) as well as fuel transport for clients from Walvis Bay to northern Namibia. The facility has been in operation for many years and the Proponent intends to continue supplying diesel to customers. Together with daily operations, some maintenance and upgrades are performed on a regular basis to ensure that the facility remains compliant to industry standards. Operations of the facility include:

- ◆ Filling of the storage tank with fuel from road transport tankers.
- ◆ Dispensing of fuel to small tanker trucks for delivery to clients.
- ◆ Tank dips and fuel volume reconciliation.
- ◆ Fuel collection in Walvis Bay and transport to various storage and retail facilities in northern Namibia.
- ◆ General operational activities and maintenance procedures associated with the facility.
- ◆ Minor repairs and services to the Van Dyk Petroleum fleet of vehicles.

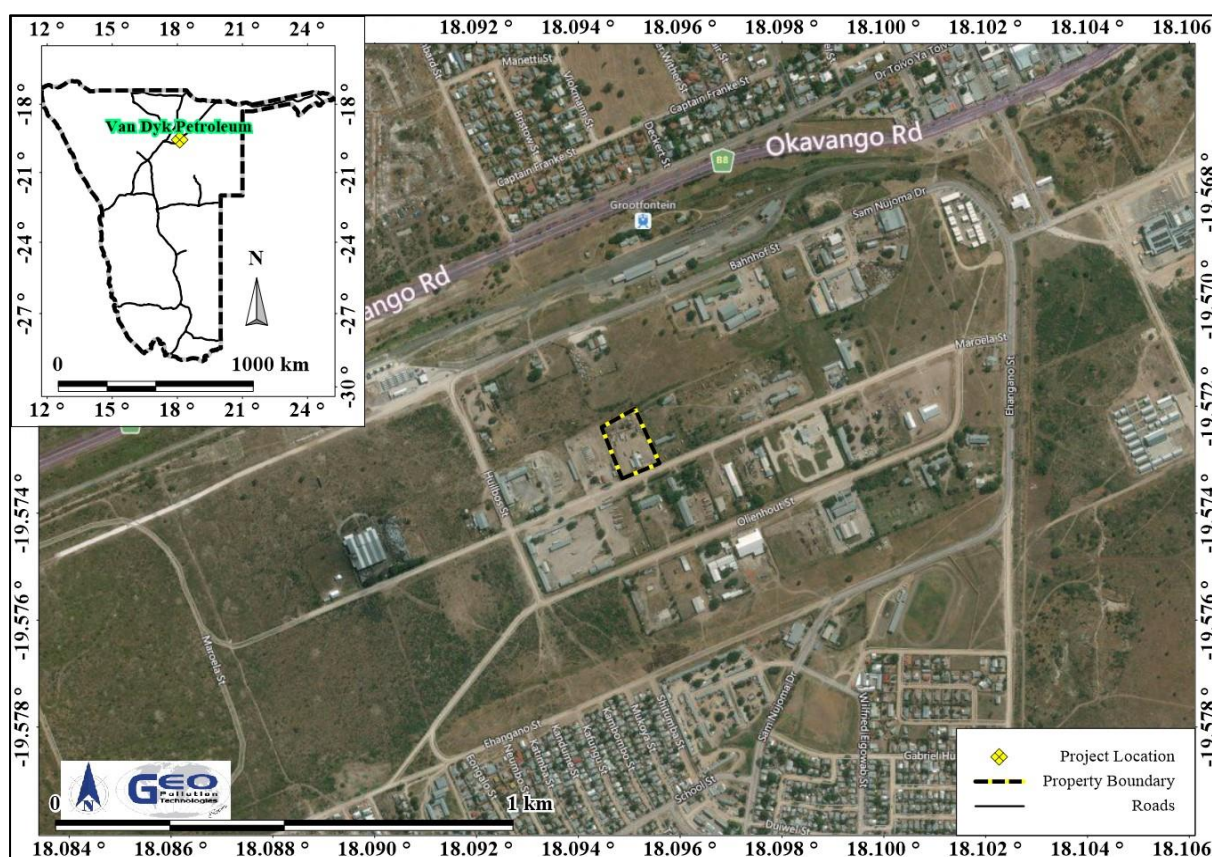


Figure 1-1. Project location

A brief risk assessment was undertaken to determine the potential impacts of the operational and possible decommissioning phases of the facility on the environment. The environment being defined in the Environmental Management Act as “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”.

The assessment was conducted to prepare an EMP in support of an application for an environmental clearance certificate in compliance with Namibia’s Environmental Management Act (Act No 7 of 2007) (EMA).

Project Justification – Local businesses and surrounding farmers require diesel fuel for their daily operations. Diesel is used in boilers, furnaces and for filling of trucks and tractors. Van Dyk Petroleum

fulfils an important role through the delivery of fuel directly to such clients, for whom it would be unpractical and time consuming to collect diesel in town with drums or bowsers.

Benefits of the fuel wholesale facility include:

- ◆ Reliable supply of fuel to role players in the fuel industry, local businesses and farmers.
- ◆ Employment, skills development and training.
- ◆ Increase in economic resilience in the area through support for diversified business activities and opportunities.

2 SCOPE

The scope of this assessment, in compliance with the requirements of EMA, is to:

1. Determine the potential environmental impacts emanating from the operational and possible decommissioning activities of the fuel retail facility.
2. Identify a range of management actions which could mitigate the potential adverse impacts to acceptable levels.
3. Provide sufficient information to the relevant competent authority and Ministry of Environment, Forestry and Tourism (MEFT) to make an informed decision regarding the operations and possible decommissioning of the facility.

3 METHODOLOGY

The following methods were used to investigate the potential impacts of the facility on the social and natural environment:

1. Baseline information about the site and its surroundings was obtained from existing secondary information.
2. Potential environmental impacts emanating from the operations and decommissioning of the facility were determined and possible enhancement measures were listed for positive impacts while mitigation/preventative measures were provided for negative impacts.
3. An environmental management plan was prepared to be submitted to the MEFT.

4 PROJECT DESCRIPTION

Van Dyk Petroleum stores and distributes fuel to local business in Grootfontein and to farmers in the area. Furthermore, fuel is also collected, transported and delivered, on behalf of members of the petroleum industry, to various bulk storage facilities and retail outlets in northern Namibia.

The Proponent's facility in Grootfontein has one steel aboveground storage tank (AST) for diesel, situated inside a concrete bund area (Table 4-1) (Photo 4-1). The tank has a capacity of 23 m³. Its filler point is situated on the tank and it has one dispensing pump for the filling of tanker trucks and refuelling the Proponent's own fleet of vehicles. Three additional 23 m³ steel tanks are located on the premises, also in an aboveground concrete bund area (Photo 4-6). These tanks were previously used to temporarily store contaminated fuel before it was transported to the bulk fuel storage facilities in Walvis Bay. The tanks are now however empty and no longer in use. Facilities for storage of used mineral oil are present on site (Photo 4-4) as well as a wash bay (Photo 4-5) for the Proponent's fleet of trucks. The fleet consist of 17 trucks with 16 fuel tanker trailers, as well as two smaller rigid fuel tanker trucks.

Buildings and infrastructure on site include offices, security (Photo 4-3) ablution facilities and a workshop (Photo 4-2). The wash bay has a concrete floor with catchment pits for wash water. The premises is paved with interlocks and is serviced with municipal water supply and sewers while obtaining electricity from the Central North Regional Electricity Distributor.

Operations of the facility entail receipt of diesel by means of tanker trucks for the filling of the diesel tank. The small rigid tanker trucks are then filled from the storage tank for transport and delivery of diesel to customers in the area. The larger tanker trucks are used to collect fuel in Walvis Bay, at the bulk fuel storage facilities, and then to transport such fuel to various depots, customer own collection

facilities and retail outlets in northern Namibia. Clients include Engen, Puma Energy, Vivo Energy and Total. Deliveries are made to approximately 220 outlets in northern Namibia. Tanker capacity vary depending on the type of fuel and can be up to 40,300 l 50 PPM diesel, 45,800 l unleaded petrol and mixed loads of up to 44,000 l.

Additional activities on site include servicing and washing of fleet vehicles. This results in some used mineral oil and oil filters, air filters, etc., which is considered as hazardous waste. These are temporarily stored on site and periodically collected by an authorised waste oil collection company, who in turn, cleans and recycle the oil and safely dispose of the filters. Daily activities include cleaning and maintenance of the site as well as administrative tasks. Fuel is dispensed to customers by pump attendants. Daily tank dips and fuel volume reconciliations are performed in order to detect any product losses and to ensure timely fuel delivery requests.

The facility directly employs nine employees on site as well as an additional 14 truck drivers for transport and delivery of fuel. Regular training is provided and a large proportion of staff have certified occupation health and safety training.

Table 4-1. Storage tank details

	T1	T2 (not in use)	T3 (not in use)	T4 (not in use)
Product	Diesel 50 ppm	Previously contaminated fuel, now empty	Previously contaminated fuel, now empty	Previously contaminated fuel, now empty
Capacity (m³)	23	23	23	23
Aboveground / Below ground	Aboveground	Aboveground	Aboveground	Aboveground
Material	Steel	Steel	Steel	Steel
Spill Control	Concrete Bund	Concrete Bund	Concrete Bund	Concrete Bund
Filler Point	On Tank	On Tank	On Tank	On Tank



Figure 4-1. Site layout



Photo 4-1. Diesel storage tank in bund area



Photo 4-2. Infrastructure on site



Photo 4-3. Security point



Photo 4-4. Used oil storage in bund area



Photo 4-5. Wash bay



Photo 4-6. Contaminated fuel tanks (not used)

5 ADMINISTRATIVE, LEGAL AND POLICY REQUIREMENTS

To protect the environment and achieve sustainable development, all projects, plans, programmes and policies deemed to have adverse impacts on the environment require an environmental assessment, as per the Namibian legislation. The legislation and standards provided in Table 5-1 to Table 5-4 govern the environmental assessment process in Namibia and/or are relevant to the facility.

Table 5-1. Namibian law applicable to the fuel retail facility

Law	Key Aspects
The Namibian Constitution	<ul style="list-style-type: none"> ◆ Promote the welfare of people ◆ Incorporates a high level of environmental protection ◆ Incorporates international agreements as part of Namibian law

Law	Key Aspects
Environmental Management Act Act No. 7 of 2007, Government Notice No. 232 of 2007	<ul style="list-style-type: none"> ◆ Defines the environment ◆ Promote sustainable management of the environment and the use of natural resources ◆ Provide a process of assessment and control of activities with possible significant effects on the environment
Environmental Management Act Regulations Government Notice No. 28-30 of 2012	<ul style="list-style-type: none"> ◆ Commencement of the Environmental Management Act ◆ List activities that requires an environmental clearance certificate ◆ Provide Environmental Impact Assessment Regulations
Petroleum Products and Energy Act Act No. 13 of 1990, Government Notice No. 45 of 1990	<ul style="list-style-type: none"> ◆ Regulates petroleum industry ◆ Makes provision for impact assessment ◆ Petroleum Products Regulations (Government Notice No. 155 of 2000) <ul style="list-style-type: none"> ○ Prescribes South African National Standards (SANS) or equivalents for construction, operation and decommissioning of petroleum facilities (refer to Government Notice No. 21 of 2002) ◆ Used Mineral Oil Regulations (Government Notice No. 48 of 1991) <ul style="list-style-type: none"> ○ Regulations relating to the purchase, sale, supply, acquisition, possession, disposal, storage, transportation, recovery and re-refinement of used mineral oil
The Water Act Act No. 54 of 1956	<ul style="list-style-type: none"> ◆ Remains in force until the new Water Resources Management Act comes into force ◆ Defines the interests of the state in protecting water resources ◆ Controls water abstraction and the disposal of effluent ◆ Numerous amendments
Water Resources Management Act Act No. 11 of 2013	<ul style="list-style-type: none"> ◆ Provide for management, protection, development, use and conservation of water resources ◆ Prevention of water pollution and assignment of liability ◆ Not in force yet
Local Authorities Act Act No. 23 of 1992, Government Notice No. 116 of 1992	<ul style="list-style-type: none"> ◆ Define the powers, duties and functions of local authority councils ◆ Regulates discharges into sewers
Public Health Act Act No. 36 of 1919	<ul style="list-style-type: none"> ◆ Provides for the protection of health of all people
Public and Environmental Health Act Act No. 1 of 2015, Government Notice No. 86 of 2015	<ul style="list-style-type: none"> ◆ Provides a framework for a structured more uniform public and environmental health system, and for incidental matters ◆ Deals with Integrated Waste Management including waste collection disposal and recycling; waste generation and storage; and sanitation
Labour Act Act No 11 of 2007, Government Notice No. 236 of 2007	<ul style="list-style-type: none"> ◆ Provides for Labour Law and the protection and safety of employees ◆ Labour Act, 1992: Regulations relating to the health and safety of employees at work (Government Notice No. 156 of 1997)

Law	Key Aspects
Atmospheric Pollution Prevention Ordinance Ordinance No. 11 of 1976	<ul style="list-style-type: none"> ◆ Governs the control of noxious or offensive gases ◆ Prohibits scheduled process without a registration certificate in a controlled area ◆ Requires best practical means for preventing or reducing the escape into the atmosphere of noxious or offensive gases produced by the scheduled process
Hazardous Substances Ordinance Ordinance No. 14 of 1974	<ul style="list-style-type: none"> ◆ Applies to the manufacture, sale, use, disposal and dumping of hazardous substances as well as their import and export ◆ Aims to prevent hazardous substances from causing injury, ill-health or the death of human beings
Pollution Control and Waste Management Bill (draft document)	<ul style="list-style-type: none"> ◆ Not in force yet ◆ Provides for prevention and control of pollution and waste ◆ Provides for procedures to be followed for licence applications

Table 5-2. Municipal By-laws, Guidelines and Regulations

Municipal By-laws, Guidelines or Regulations	Key Aspects
Grootfontein Town Planning Scheme Scheme No. 10	<ul style="list-style-type: none"> ◆ Lists allowed, consent use and restricted activities on erven zoned for different land uses (residential, business, industrial, etc.)

Table 5-3. Relevant multilateral environmental agreements for Namibia and the development

Agreement	Key Aspects
Stockholm Declaration on the Human Environment, Stockholm 1972.	<ul style="list-style-type: none"> ◆ Recognizes the need for a common outlook and common principles to inspire and guide the people of the world in the preservation and enhancement of the human environment
1985 Vienna Convention for the Protection of the Ozone Layer	<ul style="list-style-type: none"> ◆ Aims to protect human health and the environment against adverse effects from modification of the Ozone Layer are considered ◆ Adopted to regulate levels of greenhouse gas concentration in the atmosphere
United Nations Framework Convention on Climate Change (UNFCCC)	<ul style="list-style-type: none"> ◆ The Convention recognises that developing countries should be accorded appropriate assistance to enable them to fulfil the terms of the Convention
Convention on Biological Diversity, Rio de Janeiro, 1992	<ul style="list-style-type: none"> ◆ Under article 14 of The Convention, EIAs must be conducted for projects that may negatively affect biological diversity

Table 5-4. Standards or Codes of Practise

Standard or Code	Key Aspects
South African National Standards (SANS)	<ul style="list-style-type: none"> ◆ The Petroleum Products and Energy Act prescribes SANS standards for the construction, operations and demolition of petroleum facilities ◆ SANS 10131 (2004): Above-ground storage tanks for petroleum products <ul style="list-style-type: none"> ○ Provide requirements for spill control infrastructure

The fuel retail facility is listed as an activity requiring an environmental clearance certificate as per the following points from Section 9 of Government Notice No. 29 of 2012:

Hazardous Substance Treatment, Handling and Storage

- ◆ 9.1 “The manufacturing, storage, handling or processing of a hazardous substance defined in the Hazardous Substances Ordinance, 1974.” (The facility store and handle hazardous substances in the form of fuel.)
- ◆ 9.2 “Any process or activity which requires a permit, licence or other form of authorisation, or the modification of or changes to existing facilities for any process or activity which requires an amendment of an existing permit, licence or authorisation or which requires a new permit, licence or authorisation in terms of a law governing the generation or release of emissions, pollution, effluent or waste.” (The facility store and handle hazardous substances in the form of fuel which is permitted by the Ministry of Mines and Energy.)
- ◆ 9.5 “Construction of filling stations or any other facility for the underground and aboveground storage of dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin.” (The facility stores diesel aboveground.)

6 ENVIRONMENTAL CHARACTERISTICS

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

6.1 LOCALITY AND SURROUNDING LAND USE

The facility (19.572758 °S; 018.094981 °E) is situated on erf 242, Maroela Street, Grootfontein. It is in the industrial area of Grootfontein and is surrounded by properties of similar nature. West of the site is the Vivo Energy bulk fuel storage facility which is currently vacant, east is Road Contractors Company, also vacant, north is a vacant plot and the southern property belongs to the Proponent.

6.2 CLIMATE

Grootfontein is situated in a sub-humid climatic region. Heavy rainfall in Grootfontein are mostly common between December and March, peaking mostly in January, whilst May to September had little or no rainfall. The average annual rainfall ranges between 550 to 600 mm/a, with a variation in rainfall of 30 to 40% and an average annual evaporation rate of between 3,000 and 3,200mm/a.

Table 6-1. Summary Climate Data

Classification of climate	Savannah
Average annual rainfall (mm/a)	500-550
Variation in annual rainfall (%)	30-40
Average annual evaporation (mm/a)	3,000-3,200
Water deficit (mm/a)	1,501-1,700
Average annual temperatures (°C)	20-21

6.3 TOPOGRAPHY AND DRAINAGE

The area’s landscape, just southeast of the Karstveld, is dominated by limestone with little or no surface run-off and strong development of sinkholes, dolines and caves. The site falls within the Kalahari Sandveld which is dominated by pans in the area and is located within the catchment of the Omatako River, an ephemeral river, draining into the Okavango River. Local drainage takes place to the southeast.

6.4 GEOLOGY AND HYDROGEOLOGY

Surface geology consists out of calcrete, clay and sand. Subsurface geology mainly comprise of intrusive mafic rocks of Mokolian Age, Grootfontein Suite. The groundwater level is expected to

be less than 10 m below surface and to take place through primary porosity in the surface cover, while it is expected to flow along fractures, faults (secondary porosity) and other geological structures present within the underlying formations (hard rock formations). Groundwater is utilized in the area, with more than 68 boreholes known of within a 5 km radius (Department of Water Affairs).

This area falls within the Tsumeb-Otavi-Grootfontein Subterranean Water Control Area - Government Notice 1969 of 13 November 1970 and Proclamation 278 of 31 December 1976 (Extension). This means that Government controls groundwater usage in this area i.e. drilling of boreholes, cleaning or deepening of boreholes and rates of water abstraction.

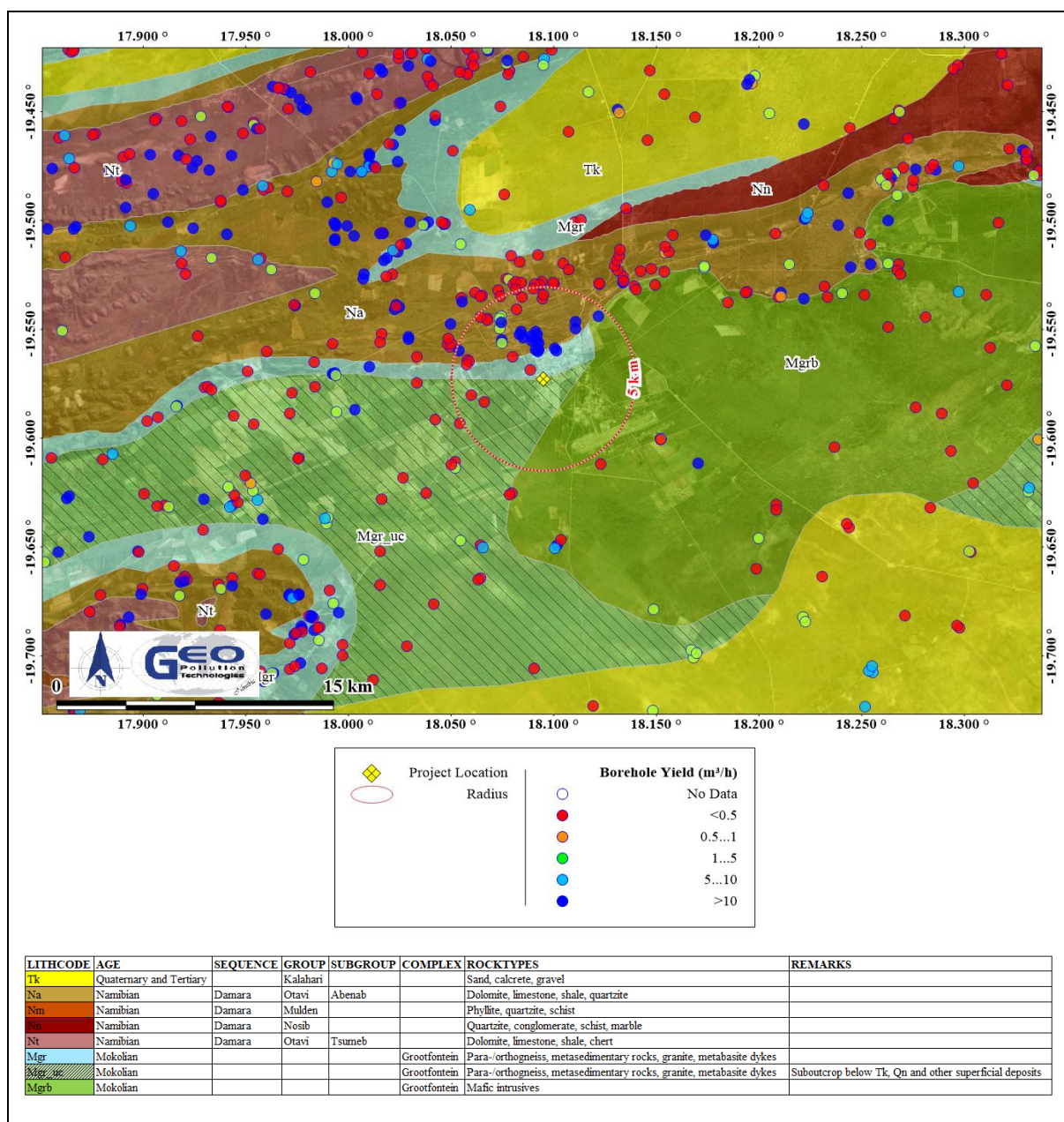


Figure 6-1. Hydrogeology map

6.5 PUBLIC WATER SUPPLY

The town of Grootfontein relies on groundwater, derived from a well field on the north-western side of the town. Water is supplied to residents and businesses by the local municipality.

6.6 FAUNA AND FLORA

The project location is situated in the Savanna Biome with a Karstveld vegetation type and woodland structure. Vegetation diversity is high when compared to south and western Namibia with a relatively high tree cover. High vegetation diversity is linked to high animal diversity, but for both the level of endemism is low. Some large trees were retained on the erf when it was developed, but otherwise it is devoid of vegetation.

6.7 DEMOGRAPHIC AND ECONOMIC CHARACTERISTICS

The project area falls within the Otjozondjupa Region with a population of 142,400 and a density of 1.4 people/km² (National Planning Commission, 2012). About 77.7% of the Otjozondjupa Region's population of 15 years and older is considered literate. In the same group of 15 years and above, 22.9% of the population has no form of formal education while only 47.7% has secondary education (National Statistics Agency, 2011). Unemployment in the Otjozondjupa Region is 37.2%.

At local scale the project area falls in the town Grootfontein which has a population of 16,400 and a density of 234 people/km².

7 ENVIRONMENTAL MANAGEMENT PLAN

The EMP provides management options to ensure impacts of the facility are minimised. An EMP is a tool used to take pro-active action by addressing potential problems before they occur. This should limit the corrective measures needed, although additional mitigation measures might be included if necessary. The environmental management measures are provided in the tables and descriptions below. These management measures should be adhered to during the various phases of the operations of the facility. All personnel taking part in the operations of the facility should be made aware of the contents in this section, so as to plan the operations accordingly and in an environmentally sound manner.

The objectives of the EMP are:

- ◆ to include all components of operations, maintenance and possible decommissioning of the facility,
- ◆ to prescribe the best practicable control methods to lessen the environmental impacts associated with the facility,
- ◆ to monitor and audit the performance of operational personnel in applying such controls; and
- ◆ to ensure that appropriate environmental training is provided to responsible operational personnel.

Various potential and definite impacts will emanate from the operations, maintenance and possible future decommissioning phases. The majority of these impacts can be mitigated or prevented. The impacts with prevention and mitigation measures are listed below. Impacts related to the operational phase are expected to mostly be of medium to low significance and can mostly be mitigated to have a low significance. The extent of impacts are mostly site specific to local and are not of a permanent nature. Due to the nature of the surrounding areas, cumulative impacts are possible and include groundwater contamination and traffic impacts.

7.1.1 Planning

During the phases of planning for continued operations and possible future decommissioning of the facility, it is the responsibility of Proponent to ensure they are, and remain, compliant with all legal requirements. The Proponent must also ensure that all required management measures are in place prior to, and during all phases, to ensure potential impacts and risks are minimised. The following actions are recommended for the planning phase and should continue during various other phases of the project:

- ◆ Ensure that all necessary permits from the various ministries, local authorities and any other bodies that governs the operations of the facility are in place and remains valid. This includes the petroleum products licence.
- ◆ Ensure all appointed contractors and employees enter into an agreement which includes the EMP. Ensure that the contents of the EMP are understood by the contractors, sub-contractors, employees and all personnel present or who will be present on site.
- ◆ Make provisions to have a health, safety and environmental (HSE) coordinator to implement the EMP and oversee occupational health and safety as well as general environmental related compliance at the site.
- ◆ Have the following emergency plans, equipment and personnel on site, where reasonable, to deal with all potential emergencies:
 - EMP, risk management, mitigation, emergency response plan and HSE manuals
 - Adequate protection and indemnity insurance cover for incidents;
 - Comply with the provisions of all relevant safety standards;
 - Procedures, equipment and materials required for emergencies.
- ◆ If one has not already been established, establish and maintain a fund for future restoration of the project site should project activities cease and the site is decommissioned and environmental restoration or pollution remediation is required.
- ◆ Establish and/or maintain a bi-annual reporting system to report on aspects of operations, maintenance and decommissioning as outlined in the EMP.
- ◆ Submit bi-annual reports to the MEFT to allow for environmental clearance certificate renewal after three years. This is a requirement by MEFT.
- ◆ Appoint a specialist environmental consultant to update the EMP and apply for renewal of the environmental clearance certificate prior to expiry.

7.1.2 Revenue Generation and Employment

Continued operations and maintenance of the facility and the transport of fuel relies on employment. Skilled and unskilled labourers are employed or contracted for various tasks of operations and maintenance. Unskilled labour may be sourced locally while it is expected that skilled contractors within Namibia will be used for specialised work. The presence of the facility therefore contributes to employment creation in the skilled and unskilled labour sector. Retailing of fuel contributes to revenue generation which is paid to the national treasury while also contributing to the local economy in terms of increased spending power of employees as well as the sourcing of goods and services.

Desired Outcome: Contribution to national treasury and provision of employment to local Namibians.

Actions

Mitigation:

- ◆ The Proponent must employ local Namibians where possible.
- ◆ If the skills exist locally, employees must first be sourced from the town, then the region and then nationally.
- ◆ Deviations from this practice must be justified.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ Bi-annual summary report based on employee records.

7.1.3 Skills, Technology and Development

During operations of the facility, training is provided to a portion of the workforce to be able to perform their duties according to the required standards. Skills are transferred to an unskilled workforce for general tasks. Development of people and technology are key to economic development of the town, region and nationally.

Desired Outcome: To see an increase in skills of local Namibians, as well as development and technology advancements in the fuel industry.

Actions

Mitigation:

- ◆ If the skills exist locally, contractors and employees must first be sourced from the town, region, and then nationally. Deviations from this practice must be justified.
- ◆ Skills development and improvement programs to be made available as identified during performance assessments.
- ◆ Employees to be informed about parameters and requirements for references upon employment.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ Record should be kept of training provided.
- ◆ Ensure that all training is certified or managerial reference provided (proof provided to the employees) inclusive of training attendance, completion and implementation.
- ◆ Bi-annual summary reports on all training conducted.

7.1.4 Demographic Profile and Community Health

The facility relies on labour for operations. The scale of the project is limited and it is not foreseen that it has or will in future create a change in the demographic profile of the local community. Exposure to factors such as communicable disease like HIV/AIDS as well as alcoholism / drug abuse are often associated with the trucking industry. Spills and leaks may present risks to members of the public especially if groundwater is polluted.

Desired Outcome: To prevent the in-migration and growth in informal settlements and to prevent the spread of diseases such as HIV/AIDS.

Actions:

Prevention:

- ◆ Employ only local people from the area, deviations from this practice should be justified appropriately.
- ◆ Adhere to all municipal by-laws relating to environmental health which includes, but is not limited to, sand and grease traps for the various facilities and sanitation requirements.

Mitigation:

- ◆ Educational programmes for employees on HIV/AIDs and general upliftment of employees' social status.
- ◆ Appointment of reputable contractors.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ Facility inspection sheet for all areas which may present environmental health risks, kept on file.
- ◆ Bi-annual summary report based on educational programmes and training conducted.
- ◆ Bi-annual report and review of employee demographics.

7.1.5 Fuel Supply

The facility contributes to ensuring a reliable and convenient supply of fuel to various towns and the local businesses and farming community.

Desired Outcome: Ensure a secure fuel supply remains available.

Actions

Mitigation:

- ◆ Ensure compliance to the petroleum regulations of Namibia.
- ◆ Proper management to ensure constant supply.
- ◆ Record supply problems and take corrective actions.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ Record supply problems and corrective actions taken and compile a bi-annual summary report.

7.1.6 Traffic

The presence of the facility and their operations increase traffic flow through the delivery and distribution of fuel. Smaller tanker trucks are filled from the storage tank for transport and delivery of diesel to customers in the area. Larger tanker trucks transport fuel from Walvis Bay to northern Namibia. This may increase the risk of incidents and accidents especially during the fuel deliveries.

Desired Outcome: Minimum impact on traffic and no transport or traffic related incidents.

Actions

Prevention:

- ◆ Properly trained and licenced truck drivers.
- ◆ Erect clear signage regarding access and exit points at the facility.

Mitigation:

- ◆ Tanker trucks collecting and delivering fuel should not be allowed to obstruct any traffic.
- ◆ If any traffic impacts are expected, traffic management should be performed to prevent these.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ Any complaints received regarding traffic issues should be recorded together with action taken to prevent impacts from repeating itself.
- ◆ A report should be compiled every 6 months of all incidents reported, complaints received, and action taken.

7.1.7 Health, Safety and Security

Activities associated with the operational phase are reliant on human labour and therefore will expose them to health and safety risks. Handling of hazardous chemicals (inhalation and carcinogenic effect of some petroleum products), will pose the main risks to employees. Security risks will be related to unauthorized entry, theft and sabotage.

Desired Outcome: To prevent injury, health impacts and theft.

Actions

Prevention:

- ◆ Clearly label dangerous and restricted areas as well as dangerous equipment and products.
- ◆ Equipment that will be locked away on site must be placed in a way that does not encourage criminal activities (e.g. theft).
- ◆ Provide all employees with required and adequate personal protective equipment (PPE).
- ◆ Ensure that all personnel receive adequate training on operation of equipment/handling of hazardous substances.
- ◆ All health and safety standards specified in the Labour Act should be complied with.
- ◆ Implementation of maintenance register for all equipment and fuel / hazardous substance storage areas.
- ◆ Selected personnel should be trained in first aid and a first aid kit must be available on site. The contact details of all emergency services must be readily available.
- ◆ Implement and maintain an integrated health and safety management system, to act as a monitoring and mitigating tool, which includes: colour coding of pipes, operational, safe work and medical procedures, permits to work, emergency response plans, housekeeping rules, MSDS's and signage requirements (PPE, flammable etc.).
- ◆ Security procedures and proper security measures must be in place to protect workers and clients.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ Any incidents must be recorded with action taken to prevent future occurrences.
- ◆ A report should be compiled every 6 months of all incidents reported. The report should contain dates when training were conducted and when safety equipment and structures were inspected and maintained.

7.1.8 Fire

Operational activities may increase the risk of the occurrence of fires. Unleaded petrol is extremely flammable and being a static accumulator may ignite if handled incorrectly.

Desired Outcome: To prevent property damage, possible injury and impacts caused by uncontrolled fires.

Actions:

Prevention:

- ◆ Ensure all chemicals are stored according to MSDS and SANS instructions.
- ◆ Maintain regular site, mechanical and electrical inspections and maintenance.
- ◆ Clean all spills/leaks immediately.
- ◆ 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).
- ◆ Follow SANS standards for operations and maintenance of the facility and the transport of fuel. This includes proper earthing of vehicles and equipment during deliveries.
- ◆ A holistic fire protection and prevention plan is needed. This plan must include an emergency response plan, firefighting plan and spill recovery plan.
- ◆ Maintain firefighting equipment and promote good housekeeping.
- ◆ Personnel training (firefighting, fire prevention and responsible housekeeping practices).

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ A register of all incidents must be maintained on a daily basis. This should include measures taken to ensure that such incidents do not repeat themselves.
- ◆ A report should be compiled every 6 months of all incidents reported. The report should contain dates when fire drills were conducted and when fire equipment was tested and training given.

7.1.9 Noise

Noise pollution may be generated due to heavy and light motor vehicles accessing the site to offload fuel or refuel. The facility is situated in an industrial area and no significant noise impact is expected on neighbours.

Desired Outcome: To prevent any nuisance and hearing loss due to noise generated.

Actions

Prevention:

- ◆ Follow World Health Organization (WHO) guidelines on maximum noise levels (Guidelines for Community Noise, 1999) to prevent hearing impairment and a nuisance at nearby receptors.
- ◆ All machinery must be regularly serviced to ensure minimal noise production.

Mitigation:

- ◆ Hearing protectors as standard PPE for workers in situations with elevated noise levels.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ WHO guidelines
- ◆ Maintain a complaints register.
- ◆ Bi-annual report on complaints and actions taken to address complaints and prevent future occurrences.

7.1.10 Waste production

Waste is produced during the operational phase. Waste includes hazardous waste associated with the handling of hydrocarbon products and servicing of vehicles. Maintenance waste may include building rubble and discarded equipment contaminated by hydrocarbon products. Contaminated soil and water is considered as hazardous waste. Domestic waste will be generated by the facility and related operations. Waste presents a contamination risk and when not removed regularly may become a fire hazard.

Desired Outcome: To reduce the amount of waste produced and prevent pollution and littering.

Actions

Prevention:

- ◆ Waste reduction measures should be implemented and all waste that can be re-used/recycled must be kept separate.
- ◆ Ensure adequate waste storage facilities are available.
- ◆ Ensure waste cannot be blown away by wind.
- ◆ Prevent scavenging (human and non-human) of stored waste.

Mitigation:

- ◆ Waste should be disposed of regularly and at appropriately classified disposal facilities, this includes hazardous material (empty chemical containers, contaminated rugs, paper water and soil).
- ◆ See the MSDS available from suppliers for disposal of contaminated products and empty containers.
- ◆ Liaise with the town council regarding waste and handling of hazardous waste.

Responsible Body:

- ◆ Proponent
- ◆ Contractors

Data Sources and Monitoring:

- ◆ A register of hazardous waste disposal should be kept. This should include type of waste, volume as well as disposal method/facility.
- ◆ Any complaints received regarding waste should be recorded with notes on action taken.
- ◆ All information and reporting to be included in a bi-annual report.

7.1.11 Ecosystem and Biodiversity Impact

The site has previously been developed and is mostly devoid of vegetation. The nature of the operational activities is such that the probability of creating a habitat for flora and fauna to establish is low. Ecosystem or biodiversity impacts are mostly associated with pollution of the environment.

Desired Outcome: To avoid pollution of, and impacts on, the ecological environment.

Actions.

Prevention:

- ◆ Educate all contracted and permanent employees on the value of biodiversity.

Mitigation:

- ◆ Contain construction material and activities on site.
- ◆ Report any extraordinary animal sightings to the MEFT.
- ◆ Mitigation measures related to waste handling and the prevention of groundwater, surface water and soil contamination should limit ecosystem and biodiversity impacts.
- ◆ Avoid scavenging of waste by fauna.
- ◆ The establishment of habitats and nesting sites at the facility should be avoided where possible.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ Any ecologically significant events or sightings to be included in a bi-annual report.

7.1.12 Groundwater, Surface Water and Soil Contamination

Operations entails the storage and handling of various hydrocarbons (such as fuels and lubricants). Such material may contaminate surface water, soil and groundwater. Contamination may either result from failing storage facilities and reticulation, or spills and leaks associated with fuel handling such as overfills and spills.

Desired Outcome: To prevent the contamination of water and soil.

Actions

Prevention:

- ◆ All vehicles should be maintained to be in a good working condition during operations and any leaks repaired without delay.
- ◆ Fuel volume changes, due to temperature differences between collection and delivery points, should be considered and overfilling of tankers avoided.
- ◆ Employ spill control such as impermeable surfaces, drip trays and spill clean-up kits during fuel transport, during operations and when servicing / repairs of vehicles and equipment are needed.
- ◆ Spill control structures and procedures must be in place according to SANS standards or better. This include bunding around the tank and surfaces such as concrete slabs with regularly maintained seals between slabs and spill catchment pits where refuelling occurs.
- ◆ Any valves on the bunding around the tanks must at all times be closed and only opened to release rainwater when it is ascertained that no hydrocarbons are present, or where a sump with an underflow arrangement is present, it should be opened to release only water and not hydrocarbon products.
- ◆ The procedures followed to prevent environmental damage during service and maintenance, and compliance with these procedures, must be audited and corrections made where necessary.
- ◆ Proper training of operators must be conducted on a regular basis (fuel handling, spill detection, spill control).

Mitigation:

- ◆ Any spillage of more than 200 l must be reported to the Ministry of Mines and Energy.
- ◆ Spill clean-up means must be readily available on site as per the relevant MSDS and all spills must be cleaned up immediately.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ Daily tank inspections to detect product loss due to leaks as soon as possible.
- ◆ A report should be compiled bi-annually of all spills or leakages reported. The report should contain the following information: date and duration of spill, product spilled, volume of spill, remedial action taken, comparison of pre-exposure baseline data (previous pollution conditions survey results) with post remediation data (e.g. soil / groundwater hydrocarbon concentrations) and a copy of documentation in which spill was reported to Ministry of Mines and Energy.

7.1.13 Visual Impact

This is an impact that not only affects the aesthetic appearance, but also the integrity of the facility. Being in an industrial area, the visual impact on residential areas are minimal. However, the general upkeep and maintenance of the facility will not only reduce any negative visual impacts, but also ensure the longevity of the structures and buildings.

Desired Outcome: To minimise aesthetic impacts associated with the facility and prevent lighting from being a visual disturbance.

Actions

Mitigation:

- ◆ Regular waste disposal, good housekeeping and routine maintenance on infrastructure will ensure that the longevity of structures are maximised and a low visual impact is maintained.
- ◆ Lighting should be directed towards the facility and away from residents where possible.
- ◆ Minimum lighting necessary for operations to be used at night. The installation of auto-dimming lights when no movement is detected are desirable.

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ A report should be compiled every 6 months of all complaints received and actions taken.

7.1.14 Cumulative Impact

Possible cumulative impacts associated with the operational phase include increased traffic noise in the area.

Desired Outcome: To minimise all cumulative impacts associated with the facility.

Actions

Mitigation:

- ◆ Addressing each of the individual impacts as discussed and recommended in the EMP would reduce the cumulative impact.
- ◆ Reviewing biannual and annual reports for any new or re-occurring impacts or problems would aid in identifying cumulative impacts and help in planning if the existing mitigations are insufficient

Responsible Body:

- ◆ Proponent

Data Sources and Monitoring:

- ◆ Annual summary report based on all other impacts must be created to give an overall assessment of the impact of the operational phase.

7.2 DECOMMISSIONING AND REHABILITATION

Decommissioning is not foreseen during the validity of the environmental clearance certificate. Decommissioning was however assessed. Should decommissioning occur at any stage, rehabilitation of the area may be required. Decommissioning will entail the complete removal of all infrastructure including buildings and underground infrastructure. Any pollution present on the site must be remediated. A soil conditions survey should be conducted to detect any hydrocarbon pollution and to implement remediation measures. The impacts associated with this phase include noise and waste production as structures are dismantled. Noise must be kept within WHO standards and waste should be contained and disposed of at an appropriately classified and approved waste facility and not dumped in the surrounding areas. Future land use after decommissioning should be assessed prior to decommissioning and rehabilitation initiated if the land will not be used for similar future purposes. The EMP for the facility will have to be reviewed at the time of decommissioning to cater for changes made to the site and to implement guidelines and mitigation measures.

7.3 ENVIRONMENTAL MANAGEMENT SYSTEM

The Proponent could implement an Environmental Management System (EMS) for their operations. An EMS is an internationally recognized and certified management system that will ensure ongoing incorporation of environmental constraints. At the heart of an EMS is the concept of continual improvement of environmental performance with resulting increases in operational efficiency, financial savings and reduction in environmental, health and safety risks. An effective EMS would need to include the following elements:

- ◆ A stated environmental policy which sets the desired level of environmental performance;
- ◆ An environmental legal register;
- ◆ An institutional structure which sets out the responsibility, authority, lines of communication and resources needed to implement the EMS;
- ◆ Identification of environmental, safety and health training needs;
- ◆ An environmental program(s) stipulating environmental objectives and targets to be met, and work instructions and controls to be applied in order to achieve compliance with the environmental policy; and
- ◆ Periodic (internal and external) audits and reviews of environmental performance and the effectiveness of the EMS.
- ◆ The EMP.

8 CONCLUSION

The fuel facility and its related fuel transport and delivery operations have a positive impact on the various sectors operational in northern Namibia. In addition to reliable and convenient fuel supply to fuel retail outlets, businesses and farmers, the proponent contributes to employment, skills transfer and training which in turn develops the local workforce.

Negative impacts can successfully be mitigated. SANS standards relating to the petroleum industry and prescribed by Namibian law must be followed during all operations of the fuel retail facility. Noise pollution should at all times meet the prescribed WHO and municipal requirements to prevent hearing loss and not to cause a nuisance. Fire prevention should be adequate, and health and safety regulations should be adhered to in accordance with the regulations pertaining to relevant laws and internationally accepted standards of operation. Any waste produced must be removed from site and disposed of at an appropriate facility or re-used or recycled where possible. Hazardous waste must be disposed of at an approved hazardous waste disposal site. Spill containment infrastructure is key in preventing pollution of the environment and includes drip trays and suitably surfaced areas where fuel is handled.

The EMP should be used as an on-site reference document for the operations of the facility. Parties responsible for transgressing of the EMP should be held responsible for any rehabilitation that may need to be undertaken. The Proponent could use an in-house Health, Safety, Security and Environment Management System in conjunction with the EMP. All operational personnel must be taught the contents of these documents.

Should the Directorate of Environmental Affairs (DEA) of the MEFT find that the impacts and related mitigation measures, which have been proposed in this report, are acceptable, an environmental clearance certificate may be granted to the Proponent. The environmental clearance certificate issued, based on this document, will render it a legally binding document which should be adhered to.

9 REFERENCES

Digital Atlas of Namibia Unpublished Report. Ministry of Environment & Tourism

Directorate of Environmental Affairs, 2008. Procedures and Guidelines for Environmental Impact Assessment (EIA) and Environmental Management Plans (EMP), Directorate of Environmental Affairs, Ministry of Environment and Tourism, Windhoek.

Namibia Statistics Agency. Namibia 2011 Population and Housing Census Main Report.

National Planning Commission, 2012. Namibia 2011 Population and Housing Census – Preliminary Results.

Appendix A: Wholesale Licence

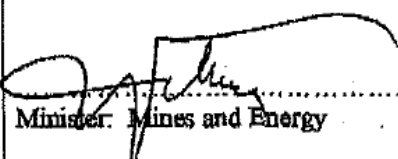
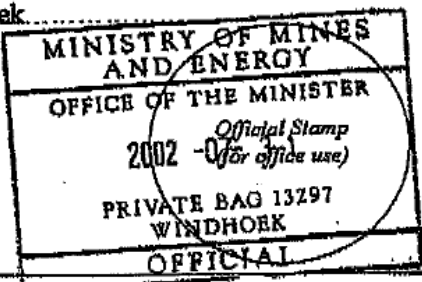


MINISTRY OF MINES AND ENERGY

**PETROLEUM PRODUCTS AND ENERGY ACT, 1990
PETROLEUM PRODUCTS REGULATIONS (2000)**

WHOLESALE LICENCE

[Regulation 12(4)]

WHOLESALE LICENCE		Licence No. W/14/2002
Name of licence-holder	Jaco N van Dyk	
Address of licence-holder	Physical Address	Postal address
	C/o Rundu and Katima Mulilo Highway, Rundu	Box 283 Rundu
Location of storage facilities (if necessary attach separate page)	S 19° 45' 30" / E 17° 56' 00"	
Conditions applicable to licence <i>See next page for general and special conditions applicable to licence.</i>		
Date of issue of licence	31 July 2002	
Issued by the Minister of Mines and Energy in terms of regulation 12(4), on ...31 July 2002... atWindhoek.....		
 Minister: Mines and Energy		

Appendix B: Supporting Documentation

Occupational Health and Safety Training

OSH-Med Medical Investments cc
 Head Office
 West Care Medical Centre
 PO Box 22088, Windhoek
 Tel: +264-61-302 932



Course Registration / Summary

Occupational Safety & Health - Emergency Medical Care - First Aid - Industrial Fire Fighting

Client: VDP - Transport
 Course: Health & Safety - Supervisor
 Date: 18/02/2019 till 20/02/2019
 Facilitator: Jessica Beukes Sign: Beukes
 Assessor: Jessica Beukes Sign: Beukes

Training Facility:
 Windhoek - Centre:
 Ondangwa - Centre:
 Walvis Bay - Centre:
 Other / Detail: Greatfontein VDP Transport venue

No.	Name	Surname	Identity No.	Day 1	Day 2	Day 3	Day 4	Day 5	Company	L	ID copy	Booking Date	Processor
1	Willems H.J.	Goetzee	841021028	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>			VDP				
2	Edmund	Opperman	8702220015	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>							
3	Hanus	Philo	8007100018	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>							
4	IMMANUEL	GRÖSBE	55058505006	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>							
5	MATHIAS	BEUK	9007100017	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>							
6	Frikke-Tielma	Engelbrecht	8602190010	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>							
7	Francois	Poolman	8108291008	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>			VDP				
8	MARIN	MURONGA	7706010280	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>							
9	NICOLAUS	YHUMBA H	6105250008	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>							
10	Francois	Engelbrecht											
11													
12													
13													
14													
15													
16													

Waste Management Policy



PROCEDURE WASTE REDUCTION PROGRAM

Van Dyk Petroleum is committed in the protection of the environment and therefore introduces a Waste Reduction Program.

The goal is to decrease the amount of material and liquid waste that goes to the landfills and dumpsites by committing to at least two actions:

- All plastic, glass and paper is separated in three bins that are marked accordingly. These bins will be removed on a weekly basis by the local authority, whereby a receipt will be issued for the removal of the waste.
- Used oil filters and oil rags are been disposed off in separate bin marked accordingly, whereas used oils is stored in a bonded tank. All the oil, filters and other contaminated waste will be collected by Oiltech CC Namibia. Oiltech will issue a safe disposal certificate to Van Dyk Petroleum to ensure the oil is disposed of according to legislation. Oiltech will collect, crush and dispose of any used oil filters from the premises of Van Dyk Petroleum.

All documentation regarding the collection of all waste generated by Van Dyk Petroleum will be filled named **Waste Control**.

LIST OF WASTE GENERATED AT VAN DYK PETROLEUM PREMISES

1. TYRES
2. ENGINE OIL
3. OIL FILTERS
4. SCRAP METAL
5. OIL RUGS

A handwritten signature in black ink, appearing to be 'C. de V.' or similar, written over a horizontal line.

Manager

A handwritten date '04/6/2020' in black ink, written over a horizontal line.

Date

Municipal Fitness Certificate

Grootfontein



Municipality

FITNESS/REGISTRATION CERTIFICATE NO.150/2019

VAN DYK PETROLEUM CC

Is hereby registered to conduct business as a

PETROLEUM DEPOT

In accordance with the Local Authority Act 1992 as amended
and the General Health Regulations 1969 (GN 121 of 1969)
under the following conditions:

***Requirements of the General Health Regulations, GN 121 of 14 October 1969,
as amended, must be complied with and maintained.***

Name of Owner: JN VAN DYK
Name of Manager: MJ SWARTZ
Business Address: P. O. BOX 119
GROOTFONTEIN
NAMIBIA

Street Address: MAROELA STREET
Erf: 242 GROOTFONTEIN
INDUSTRIAL 1 ZONE

Receipt No:	Date of Registration:	Expiry Date:
61502	3 APRIL 2019	31 March 2020

ENVIRONMENTAL HEALTH PRACTITIONER



Please Note: This certificate does not exempt the holder of obtaining a permit or any other document, which may be required by law imposed by other Ministries. Any alteration of this document without the approval of the Registration Authority constitutes a criminal offence.

Appendix C: Consultant's Curriculum Vitae

ENVIRONMENTAL SCIENTIST**André Faul**

André entered the environmental assessment profession at the beginning of 2013 and since then has worked on more than 130 Environmental Impact Assessments including assessments of the petroleum industry, harbour expansions, irrigation schemes, township establishment and power generation and transmission. André's post graduate studies focussed on zoological and ecological sciences and he holds a M.Sc. in Conservation Ecology and a Ph.D. in Medical Bioscience. His expertise is in ecotoxicological related studies focussing specifically on endocrine disrupting chemicals. His Ph.D. thesis title was The Assessment of Namibian Water Resources for Endocrine Disruptors. Before joining the environmental assessment profession he worked for 12 years in the Environmental Section of the Department of Biological Sciences at the University of Namibia, first as laboratory technician and then as lecturer in biological and ecological sciences.

CURRICULUM VITAE ANDRÉ FAUL

Name of Firm	:	Geo Pollution Technologies (Pty) Ltd.
Name of Staff	:	ANDRÉ FAUL
Profession	:	Environmental Scientist
Years' Experience	:	18
Nationality	:	Namibian
Position	:	Environmental Scientist
Specialisation	:	Environmental Toxicology
Languages	:	Afrikaans – speaking, reading, writing – excellent English – speaking, reading, writing – excellent

EDUCATION AND PROFESSIONAL STATUS:

B.Sc. Zoology	:	University of Stellenbosch, 1999
B.Sc. (Hons.) Zoology	:	University of Stellenbosch, 2000
M.Sc. (Conservation Ecology)	:	University of Stellenbosch, 2005
Ph.D. (Medical Bioscience)	:	University of the Western Cape, 2018

First Aid Class A	EMTSS, 2017
Basic Fire Fighting	EMTSS, 2017

PROFESSIONAL SOCIETY AFFILIATION:

Environmental Assessment Professionals of Namibia (Practitioner and Committee Member)

AREAS OF EXPERTISE:

Knowledge and expertise in:

- ◆ Water Sampling, Extractions and Analysis
- ◆ Biomonitoring and Bioassays
- ◆ Biodiversity Assessment
- ◆ Toxicology
- ◆ Restoration Ecology

EMPLOYMENT:

2013-Date	:	Geo Pollution Technologies – Environmental Scientist
2005-2012	:	Lecturer, University of Namibia
2001-2004	:	Laboratory Technician, University of Namibia

PUBLICATIONS:

Publications:	5
Contract Reports	+130
Research Reports & Manuals:	5
Conference Presentations:	1