APP-001851

ENVIRONMENTAL MANAGEMENT PLAN (EMP)

PROPOSED UPGRADE AND CONTINUED OPERATION OF THE EXISTING SNYMAN TRANSPORT CONSUMER FUEL FACILITY IN WINDHOEK, KHOMAS REGION

Compiled by:

Matrix Consulting Services
P.O. Box 25824 Windhoek
Tel: +264-61 224197
Fax: +264-61 212165
info@matrixconsultingcc.com

August 2020

Compiled for:

IJ Snyman Transport (Pty) Ltd
P.O. Box 90800, Klein Windhoek
Tel: +264-61 255 341
Fax: +264-61 222 928
wg@snymantransport.com

TABLE OF CONTENTS

LIST OF FIGURES

APPENDICES

TEAM MEMBERS		
NAME	**POSITION**	**COMPANY**
M. Shippiki	Environmental Hydrogeologist	Matrix Consulting Services
D. Bille	Environmental Technician	Matrix Consulting Services

CLIENT:	**IJ Snyman Transport (Pty) Ltd** **P.O. Box 90800, Klein Windhoek**
ENVIRONMENTAL CONSULTANT	Matrix Consulting Services Mize Shippiki Principal Hydrogeologist / Environmental Practioner P.O. Box 25824 Windhoek Tel: +264-61 224197 Fax: +264-61 212165
REPORT STATUS:	**FINAL**

GLOSSARY OF TERMS

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

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

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

Environment – Is the complex of natural and anthropogenic factors and elements that are mutually interrelated and affect the ecological equilibrium and the quality of life. As defined in the Environmental Policy and Environmental Management Bill of Namibia - *"land, water and air; all organic and inorganic matter and living organisms as well as biological diversity; the interacting natural systems that include components referred to in sub-paragraphs, the human environment insofar as it represents archaeological, aesthetic, cultural, historic, economic, paleontological or social values".*

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

Consumer Fuel Facility - means a petrol or diesel installation, including any pump, storage tank and piping used in relation thereto, for the purpose of dispensing fuel into own or hired petrol or diesel consuming equipment or own or hired vehicles.

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

Proponent (or Developer) – The client (an individual or group), whom is responsible for the planning, funding and development of the project.

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

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

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

Contractor - For the purposes of this document, the term 'Contractor' refers to the main contractor(s) appointed to undertake the construction of the project, or portion of the construction of the project. The Contractor(s) are required to adhere to the EMP and are responsible for ensuring that all Sub-Contractors, suppliers and staff appointed by them also adhere to the conditions of the EMP.

Contractor's camp or construction camp - Means the area designated for all the Contractor's temporary offices, storage areas, plant parking areas, staff welfare facilities etc.

1. INTRODUCTION AND BACKGROUND

An Environmental Management Plan (EMP) has been commissioned by IJ Synman Transport (Pty) Ltd. for the proposed storage alterations and upgrade of the existing Snyman Transport consumer fuel installation, in Windhoek. VIVO Energy Namibia supplies fuel to the fuel facility.

Snyman Transport specializes in fast-moving consumer goods (FMCG) logistics and transport solutions in Namibia and most of southern Africa at large. The proposed upgrade of the fuel installation at the company's premises, will allow the company to operate its fleet more efficiently and effectively in the transport services. At the moment, the existing fuel facility is old and lacks sufficient fuel storage capacity to adequately meet the company's fuel demand.

This EMP is developed to outline measures to be implemented in order to minimise adverse environmental degradation associated with this development. The document serves as a guiding tool for the contractors and workforce on their roles and responsibilities concerning environmental management on site, and also provides an environmental monitoring framework for all project phases of the development. This environmental management plan aims to take a pro-active route by addressing potential problems before they occur. The EMP acts as a stand-alone document, which can be used during the various phases of the development.

In this report,

a) the **Contractor** (its sub-contractors) refers to construction personnel responsible for the *site upgrade activities* and/or *maintenance activities* at the project site.

b) the **Project Personnel** refers to the employees, staff and suppliers responsible for the *operations activities* of the project site.

The purpose of the EMP is to:

- ✓ Train employees and contractors with regard to environmental obligations.
- ✓ Promote and encourage good environmental management practices.
- ✓ Outline responsibilities and roles of the proponent and the contractor in managing the environment.
- ✓ Describe all monitoring procedures required to identify environmental impacts.
- ✓ Minimise disturbance of the natural environment.
- ✓ Develop waste management practices.
- ✓ Prevent all forms of pollution.
- ✓ Protect the natural environment.
- ✓ Prevent soil and water erosion.
- ✓ Comply with all applicable laws, regulations and standards for environmental protection.

The proposed upgrade; and continued operations of the consumer fuel facility entails:

- ✓ Demolish and removal of part of existing fuel infrastructure.
- ✓ Installation of new fuel storage tanks and associated vent pipes.
- ✓ Installation of associated reticulation pipelines, dispensing points and filler points.
- ✓ Installation of associated spill containment system and oil-water separator.
- ✓ Installation of associated electrical supply.
- ✓ Transport of fuel supply with road transport tanker trucks.
- ✓ The dispensing of fuel to vehicles, and suitable containers.

1.1. Locality and Land Use

The project site (22.40472°S; 17.07699°E) is situated on Portion 29 of Plot 49 in Brakwater, in Windhoek. See Figure 1. The fuel installation occupies an approximate land size of 650m2. The site

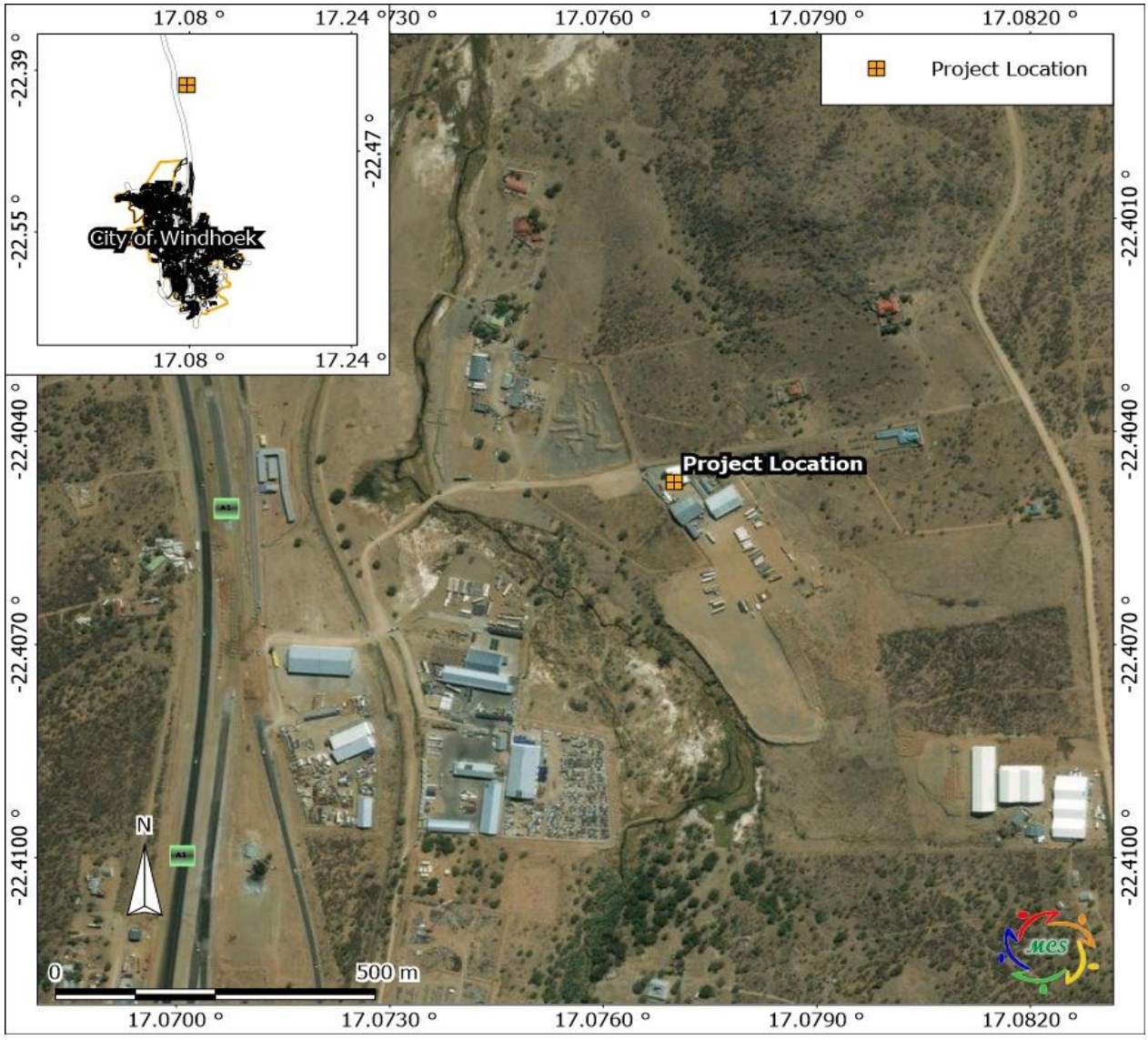

Figure 1. Project Location (22.40472°S; 17.07699°E)

The fuel installation is surrounded by various operations on company premises. Directly north and south of the premises is undeveloped land (open land). East of the site is CIC Dobra Warehouse and various other business properties. West of the site is undeveloped land, followed by Bart's Motor Workshop, Pronto Global Air & Ocean Flight, and Spare Centre Namibia. Land use in the area is classified as industrial.

Figure 2. Surrounding land use

2. LEGISLATIVE FRAMEWORK

I. The Namibian Constitution

The Namibian Constitution has a section on principles of state policy. These principles cannot be enforced by the courts in the same way as other sections of the Constitution. But they are intended to guide the Government in making laws which can be enforced.

The Constitution clearly indicates that the state shall actively promote and maintain the welfare of the people by adopting policies aimed at management of ecosystems, essential ecological processes and biological diversity of Namibia for the benefit of all Namibians, both present and future.

II. Environmental Management Act No.7 of 2007

This Act provides a list of projects requiring an Environmental assessment. It aims to promote the sustainable management of the environment and the use of natural

resources and to provide for a process of assessment and control of activities which may have significant effects on the environment; and to provide for incidental matters.

The Act defines the term "*environment*" as an interconnected system of natural and human-made elements such as land, water and air; all living organisms and matter arising from nature, cultural, historical, artistic, economic and social heritage and values.

The Environmental Management Act has three main purposes:

(a) to make sure that people consider the impact of activities on the environment carefully and in good time

(b) to make sure that all interested or affected people have a chance to participate in environmental assessments

(c) to make sure that the findings of environmental assessments are considered before any decisions are made about activities which might affect the environment

Line Ministry: Ministry of Environment and Tourism

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

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

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

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

This act repealed the existing South African Water Act No.54 of 1956 which was used by Namibia. This Act ensures that Namibia's water resources are managed, developed, protected, conserved and used in ways which are consistent with fundamental principles depicted in section 3 of this Act. Part IX regulates the control and protection of groundwater resources. Part XI, titled Water Pollution Control, regulates discharge of effluent by permit.

Line Ministry: Ministry of Agriculture, Water Affairs and Forestry

V. Environmental Assessment Policy of Namibia (1995)

Environmental Assessments (EA's) seek to ensure that the environmental consequences of development projects and policies are considered, understood and incorporated into the planning process, and that the term ENVIRONMENT (in the context of IEM and EA's)

is broadly interpreted to include biophysical, social, economic, cultural, historical and political components.

All listed policies, programmes and projects, whether initiated by the government or private sector, should be subjected to the established EA procedures.

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

Line Ministry: Ministry of Environment and Tourism

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

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

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

The proposed improvements to be conducted on the Snyman Transport consumer fuel facility in Windhoek, only applies to Parts 2, 7 and 8 of the Bill.

Part 2 stipulates that no person shall discharge or cause to be discharged any pollutant to the air from a process except under and in accordance with the provisions of an air pollution licence issued under section 23. It further provides for procedures to be followed in licence application, fees to be paid and required terms of conditions for air pollution licences.

Part 7 states that any person who sells, stores, transports or uses any hazardous substances or products containing hazardous substances shall notify the competent authority, in accordance with sub-section (2), of the presence and quantity of those substances.

Part 8 calls for emergency preparedness by the person handling hazardous substances, through emergency response plans.

VIII. Atmospheric Pollution Prevention Ordinance of Namibia No. 11 of 1976

The Ordinance prohibits anyone from carrying on a scheduled process without a registration certificate in a controlled area. A certificate must be issued if it can be demonstrated that the best practical means are being adopted for preventing or reducing the escape into the atmosphere of noxious or offensive gases produced by the scheduled process. Best practice would be to notify the line Ministry about emissions but it is not a legal requirement.

Line Ministry: Ministry of Health and Social Services

IX. Hazardous Substances Ordinance No. 14 of 1974

The Ordinance applies to the manufacture, sale, use, disposal and dumping of hazardous substances, as well as their import and export and is administered by the Minister of Health and Social Welfare. Its primary purpose is to prevent hazardous substances from causing injury, ill-health or the death of human beings.

Line Ministry: Ministry of Health and Social Services

3. INSTALLATIONS AND RELATED ACTIVITIES

3.1. Existing Installation Specifications

The existing fuel infrastructure consists of 2 single-hose dispensing pumps fixed on separate concrete base islands. The site also consists of one 23m^3 diesel (50ppm) aboveground storage tank, which is contained in a tank farm. The forecourt and tank farm area is covered with concrete, whereas the surrounding areas are paved with interlocks. Spill containment, drainage system and an oil-water separator system is present at the site.

3.2. Proposed Upgrade Specifications

The total rebuild of the fuel facility will entail the removal of the existing tank and associated fuel pipelines. The existing separator system will also be removed and relocated. A new 83m^3 aboveground diesel (50ppm) tank with its associated tank farm, pump station and new off-loading bay will be constructed and. The supplier's guidelines for tank removal must be followed to reduce the risk of spillage and groundwater contamination. Detailed drawings of the site are contained in Appendix B.

The new tank will be a double walled perma- fuel storage tank, which will be constructed and installed according to the latest VIVO Energy standards. The tank will feed two

dispensing points with a new 80NB underground product pipeline. The new site will be configured in such a way as to allow safe and ease of traffic flow at the site.

The upgrade and fuel storage alterations at the facility will be constructed and operated according to relevant SANS standards (or better), with special emphasis on SANS 10089:1999, SANS 100131:1977, SANS 100131:1979, SANS 100131:1982, SANS 100131:1999.

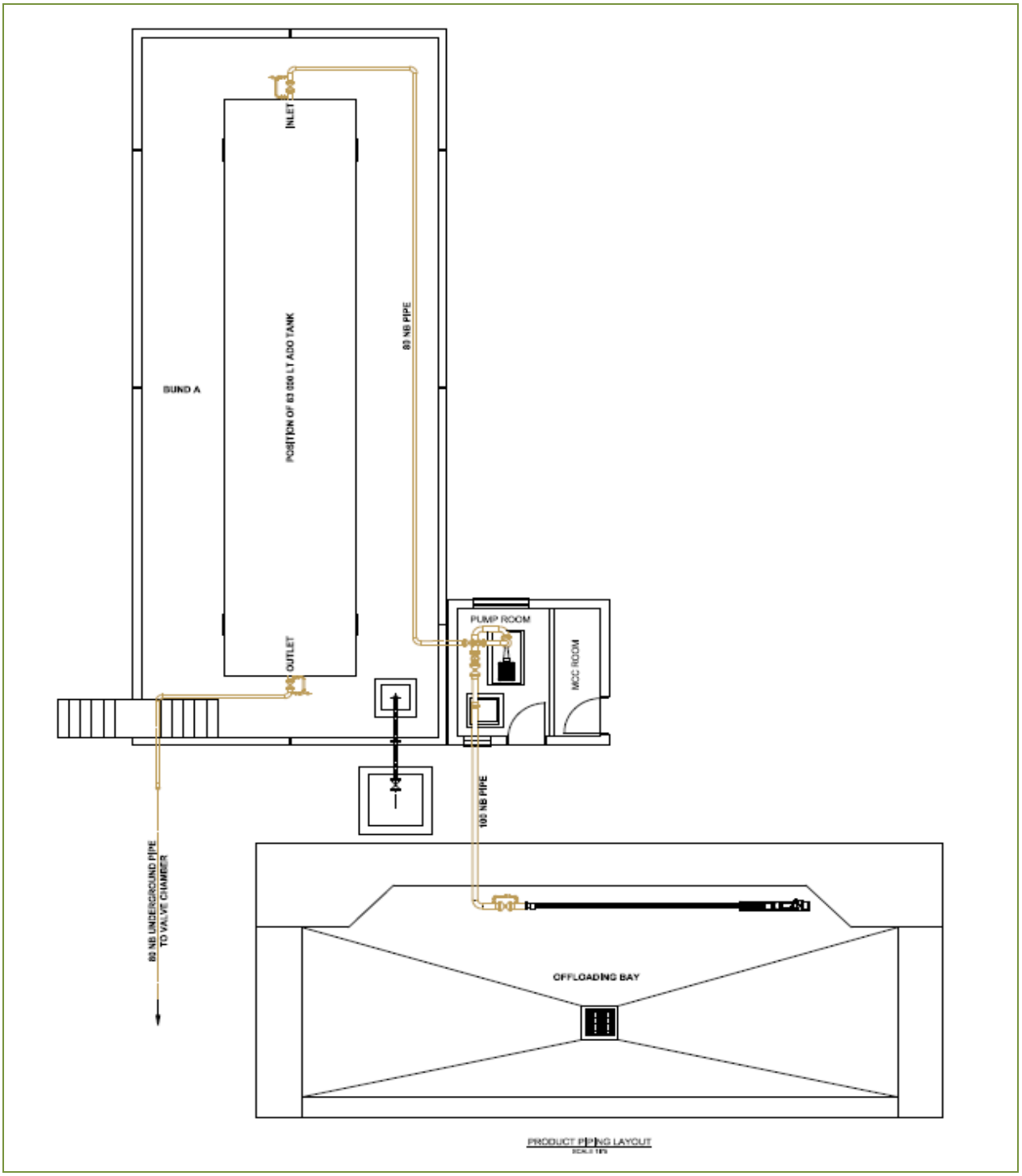

Figure 3. Proposed new site layout plan

4. RECEIVING ENVIRONMENT

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

4.1. Climate

Classification of climate:	Semi-arid area
Average rainfall:	Rainfall in the area is averaged to be between 300 mm-350 mm per year.
Variation in rainfall:	Variation in rainfall is averaged to be 30-50% per year.
Average evaporation:	Evaporation in the area is averaged to be between 3000-3200 mm per year.
Precipitation:	The highest summer rains are experienced in February. Irregular and unpredictable, high intensity, highly localised storm events between October and April does occur.
Water Deficit:	Water deficit in the area is averaged to be between 1701-1900 mm per year.
Temperatures:	The temperatures are highest on average in December, at around 23.9°C. The lowest average temperatures in the year occur in July, when it is around 10.4°C.
Wind direction:	Wind direction in the area is predominantly southerly, southeasterly and south-southeasterly.

The Brakwater area and its surroundings can be classified as a water deficit area with annual evaporations exceeding the mean annual rainfall by far. Groundwater in Windhoek is an important source of potable water for the City of Windhoek. The aridity of the region causes the water resource to be a scarce commodity and has to be conserved and protected from pollution at all cost.

4.2. Topography and Drainage

The site itself has a relatively flat topography, with a gentle slope towards the north. The landscape is classified as being in the Khomas Hochland Plateau region, which is characterized by rolling hills in the west with many summit heights equivalent reflecting older land surfaces.

The site is located within the catchment of the Klein Windhoek River, an ephemeral river, draining in a northerly direction. Local drainage is well developed and runoff takes place northwards from the project site, which in turn flows into the nearby Klein Windhoek River. The Klein Windhoek River is situated approximately 400m west of the site.

Care should be taken to avoid contamination of this water resource in the area, especially during rainy seasons, as water in this river is used for human and animal use in the area, and downstream of the site. Water in the river is also a source for aquifer recharge.

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

4.3. Hydrogeology

Metasedimentary rocks of the Swakop Group, which is part of the Damara Sequence, constitute the aquifer in the area. Geological lineaments and joints found in area form the major underground water conduits and hence determine the conditions of the aquifer. The geology underlying the study area is prone to plastic deformation rather than brittle, fracturing, exhibits significantly lower secondary porosity and permeability. Moreover host rock fracturing along fault planes results in better development of secondary porosity in quartzite compared to schistose terrain such that the aquifer reaches its maximum potential in this type of setting.

Although the study area was not mapped during vulnerability study of the Windhoek aquifer in 2000, the presence of sensitive geological structures present in the area might form preferential pathways to the underlying aquifer. In order to protect these groundwater resources, pollution to these structures should be avoided at all cost.

According to the City of Windhoek, Namwater and the Department of Water Affairs database (DWA), 1 borehole exist within a 1km radius of the site. Depth to water table is expected to be less than 30m below groundwater level (mbgl).

Groundwater belongs to the government of the Republic of Namibia; hence the area does fall within the Windhoek-Gobabis Subterranean Water Control Area, of Government Notice 189 of 6 February 1970. This means that Government controls groundwater usage in this area. To date, no known spillage and / or leakages is known (or reported) at the site.

4.3.1. Surface- and Groundwater use & users

Surface and groundwater are essentially one resource, physically connected by the hydrologic cycle. Streams interact with groundwater in three basic ways, i.e. *streams gain water from inflow of groundwater through the streambed, streams lose water by outflow through the streambed, or they do both depending upon the location along the stream.* It is the groundwater contribution that keeps streams flowing between precipitation events. As a result, proper management of the risks associated with aboveground storage tanks is essential in order to prevent surface and groundwater pollution. Preventative measures and strategies must form an integral part of the

Environmental Management Plan (EMP). Possible release of contamination on site will mainly be mitigated by the well designed concrete containment bundwall and other containment structures installed at the site. The bundwall is designed and installed to hold at least 110 percent of the volume of the tank.

The consultant recommends that regular visual inspections of the storage tank, dispensing pumps and pipes, tank farm and operational areas be adopted. It is important to always release clean water from containment as soon as possible after any rain episode. The longer the water stays contained in the tank farm, the greater the opportunity for it to become contaminated with fuel (e.g., from a nozzle). In addition, corrosion may begin on the tank's surface or supporting structure, compromising its integrity. And the volume of rainwater decreases containment capacity for petroleum in the event of a spill. Ideally, this water should be released from containment through an oil and water separator, which is a device that traps the oil and releases the water. The separator must be sized for the anticipated flow volume, and it must be cleaned periodically.

Personnel should be trained to identify and eliminate risks; to conduct routine inspections of fuel storage containers; to dispense fuel and operate pump shutoffs properly; to contain spills; and to conduct cleanup procedures, including the safe operation of equipment. Involve your employees in scheduled reviews of your operation, identifying steps you can take to minimize spills.

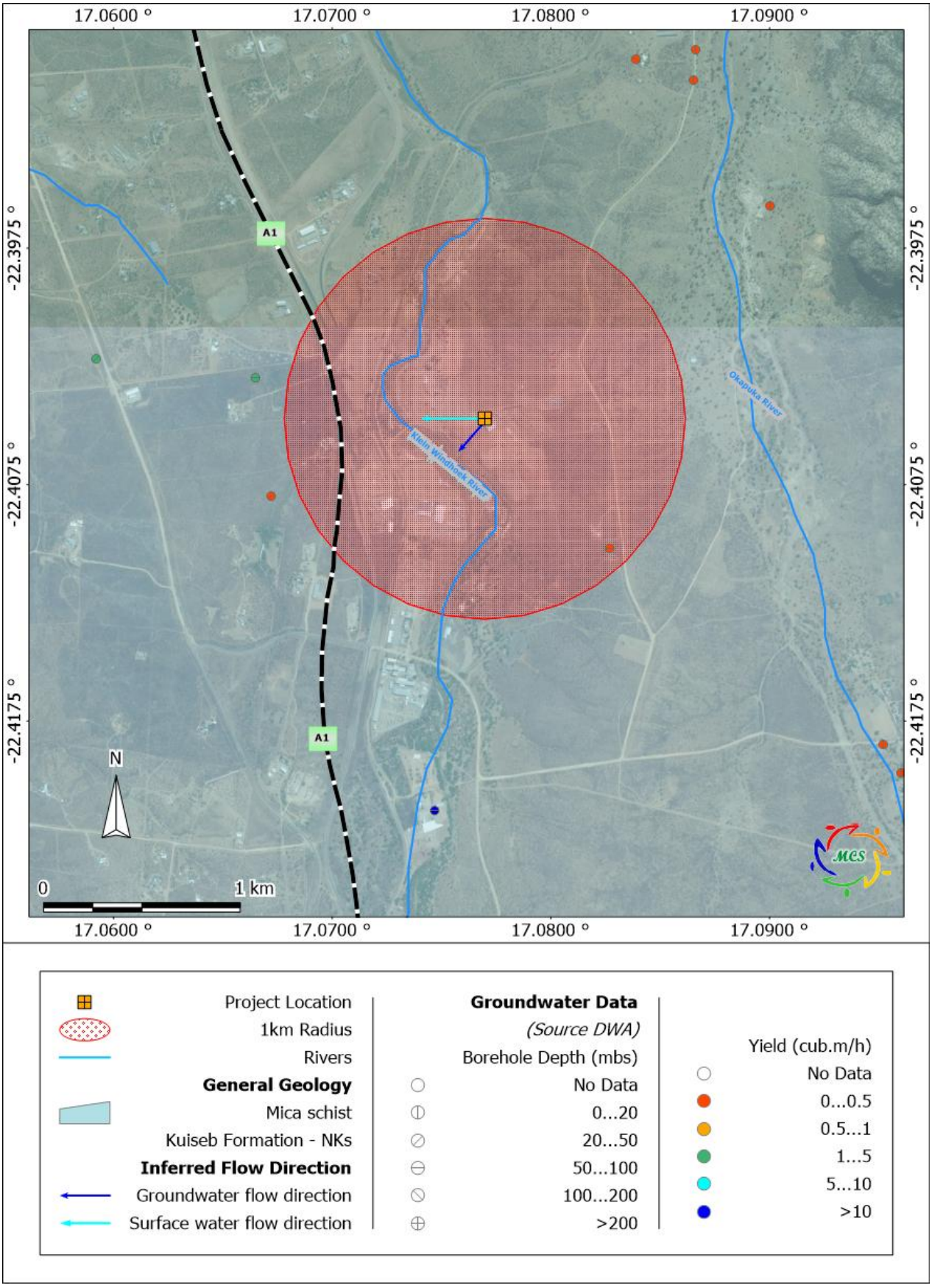

Figure 4. Hydrogeological map

According to City of Windhoek Environmental Structure Plan of 2004, an environmental assessment and mapping study was conducted to provide a strategic overview of the environmental aspects of Windhoek. As a result, control zones are based upon the following;

- ✓ The critical sensitivity of the southern Windhoek aquifer.
- ✓ The sensitivity of the catchment of the Goreangab Dam, and surface water resources, including rivers and streams throughout Windhoek.
- ✓ The sensitivity of the environment or a specific critical environmental component.
- ✓ The relative importance of the 'sense of place' or the specific character of Windhoek determined through resident participation, which includes topography and landscape quality as well as cultural / historical resources.
- ✓ The need to protect open space in Windhoek, which includes the river and aquatic systems, as well as the ridgelines, hills and mountains, and natural areas surrounding the city.
- ✓ The need to protect, manage and conserve sensitive natural vegetation cover.

The project site is considered to have a low environmental sensitivity status. See Figure 5 for the environmental sensitivity map

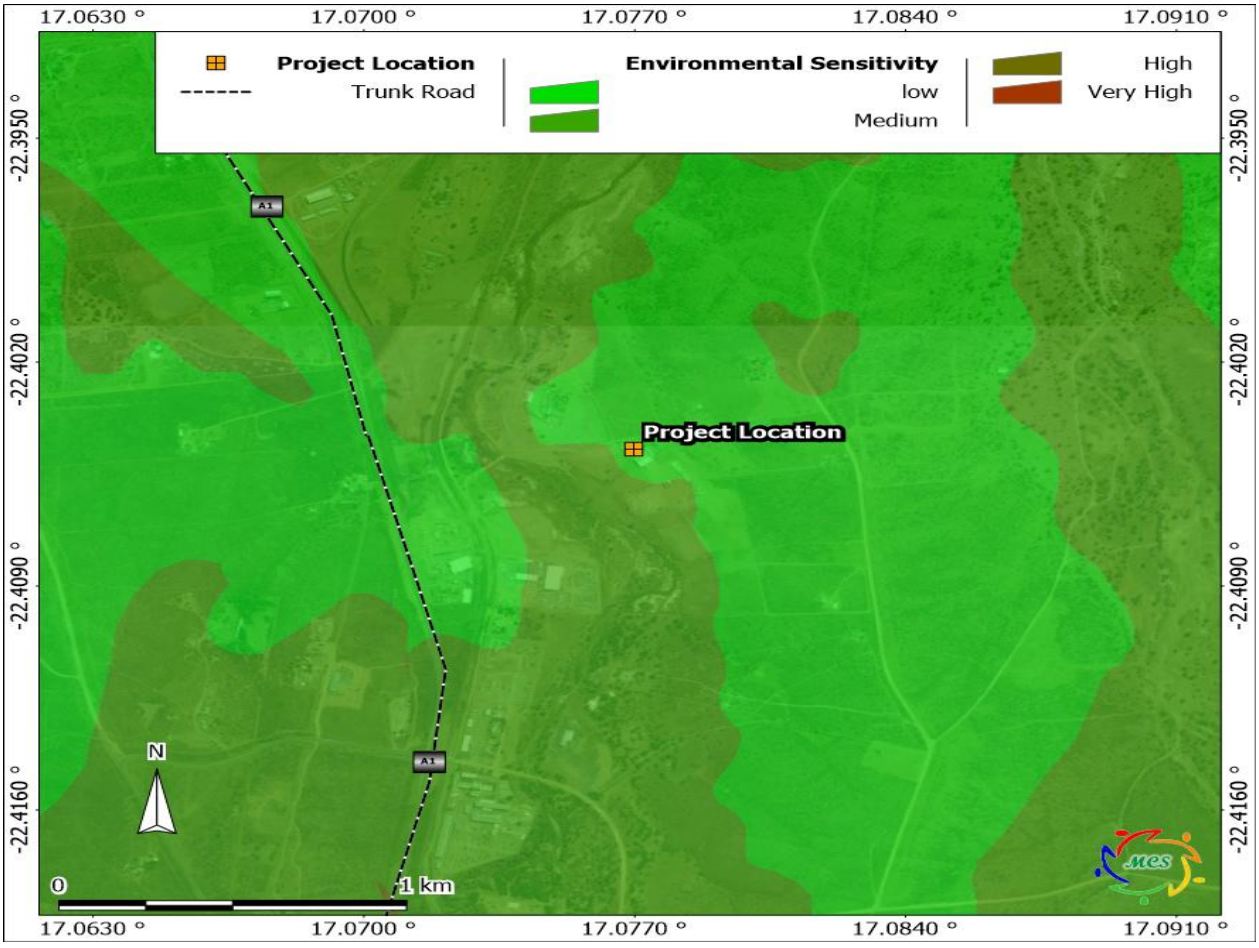

Figure 5. Environmental Sensitivity of the Project Area

5. ENVIRONMENTAL MANAGEMENT STRUCTURES

The Proponent and its contractor(s) will be responsible for environmental management on site during the site upgrade and operational period. For the purpose of this report,

- the Contractor (and its sub-contractors) refers to construction personnel responsible for the *site upgrade activities* and/or *maintenance activities* at the project site.
- the Project Personnel refers to the employees, staff and suppliers responsible for the *operations activities* of the project site.

A pre-construction meeting is recommended before work commences, in order to reach agreement on specific roles of the various parties and penalties for non-compliances with the EMP. In addition surrounding residents, tenants or land owners must be notified in advance of any potentially disturbing activities.

An independent environmental consultant will be appointed to act as the ECO; and conduct inspections of the upgrade activities; and EMP implementation throughout the duration of site upgrade. After each inspection, the ECO will produce a monitoring report that will be submitted to the environmental manager (and Ministry of Environment and Tourism (Department of Environmental Affairs) if required). Relevant sections of the minutes of site meetings will be attached to the monitoring report.

Roles, responsibility and authority shall be defined, documented and communicated in order to facilitate effective environmental management through implementation of the EMP.

5.1. Responsible Parties

The responsibility matrix table below will be assigned and completed before any work commences at the site.

Table 1. Responsibility Matrix

Function	Name / Mobile Number	Responsibility
Environmental Manager (EM)	**IJ Snyman Transport (Pty) Ltd** **Vivo Energy Namibia Ltd**	▪ Overall management of project and EMP implementation. ▪ Oversees site works, liaison with Contractor, ESO and ECO.
Environmental Control Officer (ECO)	**Matrix Consulting Services**	▪ Implementation of EMP and liaison between Snyman Transport, Vivo Energy Namibia, Department of Environmental Affairs (MET), local authority, Contractor and Landowners/stakeholders.
Environmental Site Officer (ESO)	To be appointed	▪ Interaction with ECO, landowners and labourers. ESO must understand the content of the EMP.
Contractor	To be appointed	▪ Implementation and compliance with recommendations and conditions of the EMP, Appoints dedicated person (ESO) to work with ECO

Management shall provide resources essential to the implementation and control of the EMP including: human resources, technology, and financial resources. The general roles and responsibilities of various parties during the upgrade phase of the project are outlined below.

5.1.1. Roles of the Environmental Manager (EM)

The EM (proponent's representative) will act as the employer's on-site implementing agent and has the responsibility to ensure that the Client's responsibilities are executed in compliance with the relevant legislations. Any on-site decisions regarding environmental management are ultimately the responsibility of the EM. The on-site EM shall assist the ECO where necessary and will have the following responsibilities in terms of the implementation of this EMP:

- ✓ Be fully knowledgeable with the contents of the Construction EMP;
- ✓ Review and authorise updates to the EMP.
- ✓ Ensure resource allocation for implementation of the EMP requirements.
- ✓ Ensure that environmental requirements are integrated into project plans, work method statements, tender and contract documents.
- ✓ Ensure necessary support to the ESO for implementation of the EMP.
- ✓ Undertake environmental system reviews, site inspections, audits and other verification activities to assure that the EMP implementation is at an optimal level.
- ✓ Participate in environmental performance verification activities to verify the level of compliance with the EMP in delivering the legal and environmental obligations.
- ✓ Assess the efficacy of the EMP and identify possible areas of improvement or amendment required within the EMP.
- ✓ Participate in incident investigations (as required).
- ✓ Initiate external audits (as required).

5.1.2. Roles of the Environmental Control officer (ECO)

The ECO for the site is an independent environmental consultant appointed by VIVO Energy Namibia Ltd to monitor and review the on-site environmental management and implementation of this EMP on the construction site.

The duties of the ECO:

- ✓ Ensure that all site upgrade and/or decommissioning activities on site are undertaken in accordance with the EMP;

- ✓ Undertake compliance audits against the EMP and conditions of the Environmental Authorisation (where required).
- ✓ Provide support and advice to the project team, contractor and all subcontractors in the implementation of environmental management procedures and corrective actions.
- ✓ Ensure that monitoring programs, which assess the performance of the EMP, are implemented.
- ✓ The ECO officer will submit all written instructions and verbal requests to the contractor and forward a copy to the proponent via the facility manager.
- ✓ Assist in the investigation of incidents and non-conformances and confirm in conjunction with the ESO that corrective and preventive action is taken and is effective.
- ✓ Assess the efficiency of the EMP and identify possible areas of improvement or amendment required within the EMP.
- ✓ Facilitate the amendment of the EMP in conjunction with the Environmental Manager (as required).
- ✓ Provide environmental training for key project personnel (in communication with Environmental Manager).
- ✓ Reviewing and approving method statements in consultation with the Environmental Manager.
- ✓ Prepare audit reports (and submit reports to the relevant authority as required).

5.1.3. Roles of the Environmental Site Officer (ESO)

The ESO is expected to administer and control all environmental matters relating to the upgrade activities of the consumer fuel facility. The ESO will conduct the following:

- ✓ Ensure that the latest EMP documents are on site and readily accessible as required.
- ✓ Monitor the contractor's activities for compliance with the various environmental requirements contained in this EMP.
- ✓ Identify areas of non-compliance and recommend measures to rectify them in consultation with the ECO and the EM as required.
- ✓ Ensure communication of EMP requirements to relevant project, contractor and sub-contractor personnel as required for EMP implementation.
- ✓ Perform ongoing environmental awareness training of the Contractor's site personnel.

- ✓ Ensure that environmental problems are remedied timeously and to the satisfaction of the ECO and the EM as required.
- ✓ Request the removal of people and/or equipment not complying with the specifications of EMP.
- ✓ Facilitate environmental induction of all project staff and either deliver or coordinate delivery of all such training that would be required for the effective implementation of the EMP.
- ✓ Set up activity based method statements prior to the start of relevant construction activities and submit these to the EM and the ECO as required.
- ✓ Maintain environmental incidents and stakeholder complaints register.
- ✓ Undertake environmental system reviews, site inspections, audits and other verification activities to assure that the EMP implementation is at an optimal level.
- ✓ Report significant incidents internally and externally as required by law and the conditions of authorisation.
- ✓ Investigate incidents and recommend corrective and preventative actions.

5.1.4. Roles of the Contractor

The contractor shall ensure that all construction staff, sub-contractors, suppliers, etc. are familiar with, understand and adhere to the EMP. Failure by any Contractor, Sub-contractor, Suppliers etc. to show adequate consideration to the environmental aspects of this contract shall be considered sufficient cause for the ECO to instruct the EM to have the employee removed from the site. The EM will also order the removal of equipment from the site that is causing continual environmental damage (e.g. leaking oils and grease, diesel and petrol fuels, and any other hazardous substance). Such measures will not replace any legal proceedings the Client may institute against the Contractor.

The EM shall order the contractor to suspend part or all of the works if the contractor and/or any sub-contractor, suppliers, etc., fail to comply with both the EMP and the construction procedures supplied by the Contractor. The suspension will be enforced until such time as the offending procedure or equipment is corrected and/or if required remedial measures are put in place.

By virtue of the environmental obligations delegated to the Contractor through the Contract Document, all workers (including subcontractors, suppliers, and service providers) appointed for the project would be responsible for:

- ✓ Ensuring adherence by providing adequate staff and provisions to meet the requirements of the EMP;

- ✓ Ensuring that Method Statements are submitted to the Environmental Manager for approval before any work is undertaken, and monitor compliance with the EMP and approved Environmental Method Statements;
- ✓ Ensuring that any instructions issued by the ESO and/or EM are adhered to;
- ✓ Ensuring the representation of a report at each site meeting, documenting all incidents that have occurred during the period before the site meeting;
- ✓ Undertake daily, weekly and monthly inspections of the work area(s);
- ✓ Ensuring that a register of all the transgressions issued by the ESO is kept in the site office;
- ✓ Ensuring that a register of all public complaints is maintained; and
- ✓ Ensure that all employees, including those of sub-contractors receive training before the commencement of construction in order that they can constructively contribute towards the success full implementation of the environmental requirements of the Contract;
- ✓ Report and record any environmental incidents caused by the Contractor or due to the Contractor's activities;
- ✓ obtain required corrective action within specified time frames and close out of environmental incidents;
- ✓ Provide weekly checklists to the EM and ESO.

6. IMPLEMENTATION AND MONITORING

6.1. Site Upgrade / Construction Activities

6.1.1. Environmental Awareness Training

IJ Snyman Transport (Pty) Ltd / Vivo Energy Namibia Ltd. have the responsibility to ensure that all persons involved in the project are aware of, and are familiar with, the environmental requirements for the project. All project personnel, including contractors and sub-contractors are required to receive training of a type and level of detail that is appropriate for the environmental aspects of their work.

Training shall be held during normal working hours, preferably on site. A copy of the register shall be handed to the ECO. As a minimum, all personnel are required to complete the training requirements stipulated in Table 2 below.

Table 2. Environmental Awareness Requirements

Environmental Awareness Training and Induction Requirements		
Awareness Requirement		**Frequency**
Site Induction - the purpose of the induction is to ensure that, as a minimum, all on-site personnel understand the EMP in terms of:		**Site upgrade (Construction) and Operational Activities**: prior to commencement of work by staff and / or contractors.
	Key issues relating to the project.	
	Relevant conditions of the Environmental Authorisation.	
	Location and protection of environmentally sensitive areas (if any).	
	Waste management and minimisation.	
	Minimising potential impacts to air, noise and water quality.	
	Surface and groundwater contamination.	
	Spill control measures.	
	Environmental Emergency Plan.	
	Incident reporting procedures.	
	Roles and responsibility relating to environmental management.	
Pre-Start Meeting – Pre-start meetings should be undertaken prior to commencement of a new activity in order to discuss the planned work and operational aspects of the tasks. Health, safety and environmental issues and controls should be discussed and understood.		**Site upgrade (Construction) and Operational Activities**: As required.

All senior and supervisory staff members shall familiarise themselves with the full contents of the EMP. They shall know and understand the specifications of the EMP and be able to assist other staff members in matters relating to the EMP.

6.1.2. Contractor's Method Statements

The EMP provides the overall project strategy for management of environmental issues; however the Contractor's Method Statement (CMS) will address environmental management issues at the site level. This shall also address environmental issues that are specific to an activity and/or site. CMS's should be produced for all major construction and maintenance activities at the facility, and must typically provide detailed descriptions of items including, but not necessarily limited to:

- ✓ Nature, timing and location of activities;
- ✓ Procedural requirements and steps;

- ✓ Management responsibilities;
- ✓ Material and equipment requirements;
- ✓ Transportation of equipment to and from site;
- ✓ Develop methods for moving equipment/material while on site;
- ✓ How and where material will be stored;
- ✓ Emergency response approaches, particularly related to spill containment and clean-up;
- ✓ Response to compliance/non-conformance with the requirements of the EMP; and;
- ✓ Any other information deemed necessary by the EM/ECO.

The contractor shall not commence the activity until the Method Statement has been approved and shall, except in the case of emergency activities, allow an agreed period of time for approval of the Method Statement by the ECO and EM.

The ECO and EM may require changes to a Method Statement if the proposal does not comply with the specification or if, in the reasonable opinion of the ECO and EM, the proposal may result in, or carries a greater than reasonable risk of, damage to the environment in excess of that permitted specifications.

Approved Method Statements shall be readily available on the site and shall be communicated to all relevant personnel. The contractor shall carry out works in accordance with the approved Method Statement. Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the contract.

Based on the specifications in this EMP, the following Method Statements should be developed as a minimum requirement (but not limited to these):

- ✓ Site clearing;
- ✓ Site layout and establishment;
- ✓ Hazardous substances;
- ✓ Cement and concrete batching (for each operation)
- ✓ Traffic accommodation;
- ✓ Solid waste control system;
- ✓ Wastewater control system;
- ✓ Fire control and emergency procedures.

6.2. Site Establishment and Construction

6.2.1. Demarcation of the Project Site

The site will be properly demarcated and/or temporarily fenced off as agreed with the EM. The method of demarcation shall be determined by the contractor and agreed to by the EM prior to any work being undertaken. The contractor shall maintain the demarcation line and ensure that materials used for site upgrade do not blow on or move outside the site and environs, or pose a threat to people. The boundaries of the site shall be demarcated prior to any work commencing on the site. The site boundary demarcation fence shall be removed when all construction work is completed.

The contractor shall ensure that all his plant, labour and materials remain within the boundaries of the site, unless otherwise agreed in writing with EM. Failure to do so may result in the EM requiring the contractor to fence the boundaries of the site with wire mesh at his own expense to the satisfaction of the EM and the local town. It will be the responsibility of the contractor to decide on an appropriate system of protective fencing for the site.

The contractor shall be responsible to ensure that building materials such as sand is not blown away and take the necessary precautions to prevent sand from being blown by the wind.

6.2.2. Movement of Construction Personnel and Equipment

The contractor shall ensure that all construction personnel and equipment remain within the demarcated construction site at all times. Where construction personnel and/or equipment wish to move outside the boundaries of the site other than normal access to the road for loading and access purposes, the contractor shall obtain written permission from the EM and/or ESO.

6.2.3. Location of Construction Camp

The construction camp including temporary stockpile sites, storage and work areas required by the contractor, sub-contractors and suppliers shall be positioned in demarcated areas as approved by the EM.

6.2.4. Ablution Facilities

The site is equipped with existing toilet facilities for use during the site upgrade works. Where additional ablution facilities are required, the contractor shall provide the necessary portable toilets for its personnel. The sitting of these toilets shall be agreed with the EM. The toilets shall be secured to prevent them from blowing over, and the doors shall be properly lockable to prevent toilet paper from being blown out. Toilets shall be properly cleaned, emptied and serviced regularly.

The contractor shall ensure that any waste from the toilets is not spilled on the ground at any time. Should there be spillage of chemicals and/or waste, the EM shall require the contractor to place the toilets on solid base or containment structures

with sumps. Abluting anywhere other than in the toilets shall not be permitted. The contractor shall be responsible for cleaning up any waste deposited by personnel.

6.2.5. Stockpiling, Handling, and Storage of Building Materials

The Contractor shall ensure that stockpiles and storage yards are demarcated in areas that are already disturbed or where they will cause minimal disturbance. The Contractor / ESO shall indicate which activities are to take place in which areas within the site (e.g. mixing of cement, stockpiling of materials etc). These activities must be limited to single sites only. All the necessary handling and safety equipment required for the safe use of petrochemicals and oils shall be provided by the Contractor to, and used or worn by the staff whose duty it is to manage and maintain the Contractor's and his subcontractor's and supplier's plant, machinery and equipment.

6.2.6. Excavation, Backfilling and Trenching

The contractor shall ensure that all excavations and trenches are not to be left open for more than 5 days, thus it is recommended that excavations should be opened and closed the same day. Warning signs should be erected around the excavated areas to clearly demarcate the area against access. In addition, soil that was/has been removed shall be used to backfill areas where required and excavated material shall be stockpiled along the trench within the working servitude.

6.2.7. Erosion Control

The Contractor shall protect all areas susceptible to erosion and shall take measures, to the approval of the ECO. The Contractor shall not allow erosion to develop on a large scale before effecting repairs and all erosion damage shall be repaired as soon as possible.

6.2.8. Noise

The Contractor shall ensure that neighbouring properties / adjacent land is kept informed of the need and extent of noisy disruptive processes. The use of radios and other such equipment by workers must be controlled and noise levels kept to a level that does not disturb neighbouring land.

6.2.9. Dust

The Contractor shall take precautions to limit the production of dust and damage caused by dust. Dust suppression measures shall be agreed upon in consultation with the ECO. The following measures must be implemented to minimise dust impacts:

- ✓ During high wind conditions the Contractor must make the decision to cease works until the wind has calmed down; and

- ✓ Cover any stockpiles with a suitable material, such as plastic or shade-cloth, to minimise windblown dust.

6.3. Material Handling and Storage

6.3.1. Servicing and Re-fuelling of Construction Equipment

All maintenance and repair works shall be conducted in areas designated for this purpose (i.e. spill containment structures). The ground under the servicing and refuelling areas must be protected against pollution caused by spills or leakages from any point source.

The Contractor may only change oil or lubricant at agreed and designated locations, except if there is a breakdown or emergency repair, and then any accidental spillages must be cleaned up / removed immediately. Construction vehicles are to be maintained in an acceptable state of repair.

No vehicles or equipment with leaks or causing spills will be permitted to operate at any of the site. These shall be ordered off-site for maintenance or repairs.

6.3.2. Chemical, Harmful and Hazardous Materials

All project personnel and contractors shall comply with all relevant national and local legislation with regard to storage, transport, use and disposal of chemical, harmful and hazardous substances and materials. The contractor shall obtain the advice of the manufacturer with regard to the safe handling of such substances and materials.

The contractor shall provide the ESO and EM with a list of all chemical, harmful and hazardous substances and materials on site, together with storage, handling and disposal procedures for these materials.

The contractor shall ensure that information on all chemical, harmful and hazardous substances are available to all personnel on site. The contractor shall furthermore be responsible for the training and education of all its personnel on site who will be handling the material about its proper use, handling and disposal. A dangerous material datasheet should be available on site. The contractor shall submit method statements detailing the substances / materials to be used, together with the storage, handling and disposal procedures of the materials.

6.4. Waste Management

Waste will be generated in the form of rubble, cement bags, pipe and electrical wire cuttings. Contaminated soil due to oil leakages, lubricants and grease from the construction equipment and machinery shall also be generated during the site upgrade activities. All hazardous waste generated at the site shall be stored in enclosed, bunded areas, the location of which shall be determined on site in conjunction with the EM. The bunded areas shall be clearly marked. Such waste shall be disposed offsite at an appropriate waste disposal site.

Proponent / Contractor shall institute a waste control and removal system for the site. The Contractor shall not dispose of any waste or construction debris by burning, or by burying. All waste shall be disposed off site at an approved waste disposal site in Windhoek.

Where necessary, the Contractor shall supply waste bins/skips at the site. The bins shall be secured in such a manner as to prevent their contents blowing out. The Contractor shall ensure that all personnel immediately deposit all waste in the waste bins for removal by the Contractor. Waste shall be properly contained in a scavenger, water and wind-proof containers until disposed of at an approved waste disposal site. Bins shall be emptied and waste removed at least once a week from the site. The bins shall not be used for any purposes other than waste collection.

All hydrocarbon contaminated soils must be removed from the site and disposed off at the Kupferberg hazardous waste disposal site.

6.5. Cement and Concrete Operations

The contractor is advised that cement and concrete are regarded as materials that are potentially damaging to the natural environment on account of the very high pH of the material, and the chemicals contained therein. The contractor shall ensure that all operations that involve the use of cement and concrete are carefully controlled. Concrete mixing shall only take place in agreed specific areas on site.

Water and slurry from concrete mixing operations shall be contained to prevent pollution of the ground surrounding the mixing points. Old cement bags shall be placed in wind and spill proof containers as soon as they are empty. The contractor shall not allow closed, open or empty bags to lie around the site.

Where exposed aggregate finishes are specified the contractor shall collect all cement-laden water and store it in conservancy tanks for disposal off site at an approved disposal site.

All visible remains of excess concrete shall be physically removed immediately and disposed of as waste. Washing the visible signs into the ground is not acceptable. All excess aggregate shall also be removed.

All excess concrete shall be removed from site on completion of concrete works and disposed of. Washing of the excess into the ground is not allowed. No cement or concrete laden water will be permitted to be drained directly into any surface water source.

6.6. Waste Water Treatment

6.6.1. Discharge of Construction Water

Construction water in this report, refers to all water affected by construction activities. The Contractor shall construct and operate the necessary collection facilities to prevent pollution. The Contractor shall dispose of collected waste water in a manner agreed with the ECO. Care should be taken at all times not to contaminate the nearby Klein Windhoek River.

6.6.2. Prevention of Soil, Surface-and Groundwater Pollution

The Contractor shall take all reasonable precautions to prevent the pollution of the surface and groundwater resources in the area, as a result of his activities. Such pollution could result from the release, accidental or otherwise, of chemicals, oils, fuels, sewage and waste products, etc.

The Contractor shall obtain oil absorbent pads, booms and spill kits, or similar products or materials to soak up oil, petrol and diesel. These materials shall be readily available for use wherever construction equipment is working. This should also be available at work stations where fuel and lubricants is handled, stored, equipment is filled and serviced. The Contractor shall ensure that he is familiar with the correct use and disposal of any materials designed to soak up petroleum products. Environmental friendly methods will be used during construction e.g.

- ✓ cement batching on boards, no wash water allowed to run off,
- ✓ paint washing in containers to be removed to licensed site,
- ✓ use of environmental friendly paints with low toxicity,
- ✓ use sand filters for paint brush washing and contain cement bags,
- ✓ waste water from paints with potential high environmental impact must be disposed of in accordance with an agreed method with the EM.

The Contractor shall ensure that no oil, petrol, diesel, etc. is discharged onto the ground. Pumps and other machinery requiring oil, diesel, etc. that is to remain in one position for longer than two days shall be placed on drip trays or other similar suitable containment structures. These containment structures shall be watertight and shall be emptied regularly and the contaminated water disposed off-site at a facility capable of handling such waste liquid. Drip trays shall be cleaned before any possible rain events that may result in the drip trays overflowing and before long weekends and holidays.

The Contractor shall remove all oil, petrol, diesel-soaked soil immediately and shall dispose of it as hazardous waste.

6.7. Site Clean Up and Rehabilitation

6.7.1. Site Clean Up

The Contractor shall ensure that all waste, temporary structures, equipment, materials and facilities used during the site upgrade activities are removed upon completion of the project. The Contractor shall clear and clean the construction site to the satisfaction of the ECO and EM upon completion of the project.

6.7.2. Rehabilitation

The Contractor must ensure that all temporary structures, materials, waste and facilities used for construction activities are removed upon completion of the project. The project site should be fully rehabilitated (i.e. clear and clean area) including all disturbed areas and protect them from erosion.

Due to the land use of the project location and the fact that the project location is already build-up, very little vegetation is present at the site. However, if deemed necessary, revegetation of disturbed construction areas shall take place as soon as possible after the construction activities.

6.8. Emergency Procedures

6.8.1. Fire and Safety Management

All electrical installations, wiring and systems at the project location must be approved by a qualified electrician who will issue a Certificate of Compliance before commencement of operations of the consumer fuel facility.

Proper handling, storage, use and disposal of any hazardous waste (e.g. hydrocarbons, paint, batteries, radioactive waste etc) should be conducted. 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.

No uncontrolled fire, whether for cooking, heating or any other purpose, is to be made at the site during all phases. The proponent and contractor shall take all reasonable measures and active steps to avoid increasing the risk of fire through activities on site and prevent the accidental occurrence or spread of fire; and shall ensure that there is sufficient fire-fighting equipment on site at all times. This equipment shall include fire extinguishers. The Contractor should be prepared for such events.

The following measures will be followed to reduce the intensity of fires during the site upgrade activities and operational phase:

- ✓ Ensure construction / maintenance personnel to perform construction activities carefully (e.g. some machines create sparks)
- ✓ Restrict smoking to designated areas,
- ✓ Provide fire extinguishers,

- ✓ Restrict fires to designated areas,
- ✓ Emergency response plan related to fuel storage,
- ✓ Emergency fire plan for visitors and staff.

6.8.2. Accidents on Site

The Contractor shall comply with the Occupational Health and Safety Act and any other national, regional or local regulations with regard to safety on site. The Contractor shall ensure that contact details of the local medical services are available to the relevant construction personnel prior to commencing work.

6.8.3. Emergency Advisory Procedures

The Contractor shall ensure that there is an emergency advisory procedure on site before commencing any operations that may cause damage to the environment. The Contractor shall also ensure that site staffs are familiar with all emergency procedures to be followed.

The Contractor shall ensure that lists of all emergency telephone numbers/contact people are kept up to date, and that all numbers and names are posted at the construction site at all times.

6.9. Compliance Monitoring

6.9.1. Procedures

The Contractor shall comply with the environmental specifications and requirements on an ongoing basis and any failure on his part to do so will entitle the ESO and to impose a penalty. In the event of non-compliance the following recommended process shall be followed:

- ✓ The ESO shall issue a notice of non-compliance to the Contractor, stating the nature and magnitude of the contravention. A copy shall be provided to the EM.
- ✓ The Contractor shall act to correct the non-conformance within 24 hours of receipt of the notice, or within a period that may be specified within the notice.
- ✓ The Contractor shall provide the ESO with a written statement describing the actions to be taken to discontinue the non-conformance, the actions taken to mitigate its effects and the expected results of the actions. A copy shall be provided to the EM.
- ✓ In the case of non-compliance giving rise to physical environmental damage or destruction, the ESO shall be entitled to undertake or to cause to be undertaken such remedial works as may be required to make good such damage and to recover from the Contractor the full costs incurred in doing so.

- ✓ The EM shall at all times have the right to stop work and/or certain activities on site in the case of non-compliance or failure to implement remediation measures.

6.9.2. Environmental Monitoring

Periodic inspections of the project site will be performed by the ECO. These will consist of formal reviews of conformance against policies and procedures stated in this document. Inspections will occur as required. Supervisors in all work areas will conduct performance and compliance reviews, using the EMP as guideline to ensure compliance.

6.9.3. EMP Administration

Copies of this EMP shall be kept at the project site and should be distributed to all senior staff members, including those of the contractors.

6.9.4. EMP Amendments

The EMP amendments can only be made with the approval of the EM and ECO, and if required ultimately by the DEA. Amendments to the EMP should be liaised to all employees and contractors.

6.9.5. Non-Compliance

Problems may occur in carrying out mitigation measures or monitoring procedures that could result in non-compliance of the EMP. The responsible personnel should encourage staff to comply with the EMP, and address acts of non-compliance and penalties.

The ESO is responsible for reporting non-conformance with the EMP, to the ECO. The ESO, in consultation with the ECO must, thereafter, undertake the following activities:

- ✓ Investigate and identify the cause of non-conformance.
- ✓ Implement suitable corrective action as well as prevent recurrence of the incident.
- ✓ Assign responsibility for corrective and preventative action.
- ✓ Any corrective action taken to eliminate the causes of non-conformance shall be appropriate to the magnitude of the problems and commensurate with the environmental impact encountered.

6.9.6. Environmental Register

An environmental register should be kept on site in which incidents related to actual impacts are recorded. This will include information related to incidents as spillages, dust generation and complaints from adjacent properties. It should also contain

information relating to actions taken. Any party on site may complete the register, however, it is envisaged that the ECO, ESO and the contractor(s) will be the main contributors, and who will also be the main parties involved in suggesting mitigation measures.

6.9.7. Site Management

Areas outside the designated working zone shall be considered “no go” areas. The offloading zones must be clearly demarcated when offloading goods to enhance safety around the project location.

6.9.8. Access Routes and Work Sites

Vehicular movement, construction vehicles and equipment will access the construction site from the service road leading to the plot. Work sites shall be clearly demarcated and road signs erected were needed. The general public should not have unauthorised or uncontrolled access to the construction site during site upgrade activities.

Vehicle access will be limited to a single entrance (where necessary) to facilitate control. The entrance will be manned during the operation hours, but will be locked during non-operational hours to prevent unauthorised entry.

A notice board, in two languages or more, must be erected at the entrance and must state the most pertinent site health and safety issues, the operator/responsible person and emergency telephone numbers. Suitable signs must also be erected on the approach roads and on-site, to direct drivers and to control speed.

Furthermore, on-going controls, such as fencing and policing, must be implemented.

6.9.9. Staff Management

The Contractor must ensure that their employees have suitable personal protective equipment and properly trained in fire fighting and first aid. Training records must be kept for future references.

7. MANAGEMENT OF ENVIRONMENTAL ASPECTS DURING PRE-CONSTRUCTION ACTIVITIES

Pre-construction phase	
Description	▪ Compliance Requirements ▪ Public Consultation ▪ Environmental Awareness ▪ Health and safety Aspects
Proposed Mitigation Measures	✚ Develop an environmental management plan (EMP) to comply with the requirements of the Environmental Management Act (2007) and its regulations of 2012. ✚ Identify and address all environmental and social issues. ✚ Ensure that all persons involved in the project are aware of, and are familiar with, the environmental requirements for the project. ✚ Ensure that all contractors, sub-contractors, suppliers, etc. are familiar with, understand and adhere to the EMP. ✚ A pre-construction meeting is recommended in order to reach agreement on specific roles of the various parties and penalties for non-compliances with the EMP. ✚ Inform I&APs and key stakeholders about the proposed development and identify issues and concerns of key I&Aps with regards to the proposed development. ✚ Develop and implement environmental emergency preparedness procedures. ✚ Establish personnel protection standards and mandatory safety practices and procedures for the development. ✚ Establish the lines of communication among contractors and subcontractors involved in work operations for safety and health matters. ✚ Conduct HIV/AIDS Awareness Programme for all operations of the development for not less than 90% of workers. ✚ Provide and maintain condom dispenser and maintain HIV/AIDS awareness posters. ✚ Provide information regarding the voluntary testing of construction workers and counselling, support and care.
Proposed Monitoring	Record of environmental compliance (ECC). Record of approved site-specific EMP for project site. Record of awareness training and attendance register. Record of health and safety plan.
Responsible Party	Proponent / ECO

8. MANAGEMENT OF ENVIRONMENTAL ASPECTS DURING CONSTRUCTION AND OPERATIONAL PHASES

This section will look at the potential environmental impacts, which may arise during the site upgrade (i.e. construction) and operational phase of the Snyman Transport consumer

fuel facility. The impacts associated with maintenance activities and possible site decommissioning is similar to construction activities.

Groundwater

Site upgrade (construction)/Decommissioning phase	
Description	Groundwater contamination can be caused by leakages and spills of petroleum products (i.e. oil leakages, hydrocarbon fuel, lubricants and grease) from machinery and heavy-duty vehicles during construction and decommissioning phase. Care must be taken to avoid contamination of soil and groundwater.
Proposed Mitigation Measures	➢ Prevent spillages of any chemicals and petroleum products (i.e. oils, lubricants, petrol and diesel). Use drip trays, linings or concrete floors when evidence of leaks are observed on vehicles or equipment. ➢ No major servicing and maintenance of vehicles and/or equipment should be conducted at the site. ➢ All fuelling, storage and chemical handling should be conducted on surfaces provided for this purpose. Drip trays, linings or concrete floors must be used when removing oil from machinery. ➢ Spillage control procedures must be in place according to relevant SANS standards or better. Waste water collection systems should be connected to these systems. ➢ Existing ablution facilities at the site should be used. No urinating outside these designated facilities shall be allowed. ➢ Should portable ablution facilities be necessary, adequate containment systems should be erected for these facilities. ➢ Waste should properly be contained to avoid any leakages and/or spillages, and should regularly be disposed off at a suitable sewage disposal site. Run-off from these toilets due to overflows should be avoided at all cost. ➢ Proper environmental awareness and remedial response training of operators must be conducted on a regular basis.
Proposed Monitoring	Regular visual inspection.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	Groundwater quality could be impacted through leachate of oil leakages, hydrocarbon fuel, lubricants and grease from trucks and vehicles frequenting the facility. Spillages may also occur during fuel delivery to the above ground storage tanks from road transport tanker trucks. Care must be taken to avoid contamination of soil and groundwater.
Proposed Mitigation Measures	▪ All operational surfaces and fuel storage facilities must be installed with spill containment areas as per the relevant SANS standards (or better). Special emphasis is placed on SANS 10089:1999, SANS 100131:1977, SANS 100131:1979, SANS 100131:1982, SANS 100131:1999. ▪ Proper monitoring of the product levels must take place to eliminate overfilling. ▪ All operational surfaces at the facility must be installed with spill containment areas. ▪ Ensure that any petroleum products, such as grease, waste oils and lubricants are contained in containment structures (e.g. plastic liners, drip trays etc.). ▪ Avoid discharge of pollutants (such as cement, concrete, lime, chemicals, contaminated waste water or leachate) into stormwater channels and water courses. ▪ Equipment and materials to deal with spill cleanup must be readily available on site and staff must be trained as to how to use the equipment and briefed about reporting procedures. ▪ Develop and implement a groundwater monitoring system and programme, with the aim of monitoring possible contamination to the water resources. ▪ Groundwater monitoring boreholes installed should be sampled and analysed periodically. ▪ Regular tank and pipeline tightness inspections are advised to eliminate the risk of impact on the environment due to leakage. ▪ The condition of the fuel reticulation system will have to be checked regularly and repaired to prevent leakages;
Proposed Monitoring	Regular visual inspection.
Responsible Party	Proponent / Contractors.

Surface Water

Site upgrade (construction)/Decommissioning phase	
Description	Drainage in the area is well developed and run-off takes place to the southwest. The relief of the nearby streams and waterways in the area remain relevant, and contribute well to the drainage of surface run-off in the area. Contaminants in the form of oil leakages, diesel, lubricants and grease from the construction vehicles, machinery and equipment may occur during the construction phase. Oil spills are known to form a film on water surfaces causing physical damage to organisms. Oxygen transfer could be impaired. Care must be taken to avoid contamination of soil and any surface water bodies in the area.
Proposed Mitigation Measures	➢ Any spillage of hazardous substances including fuel, oil, paint or cleaning solvent must be cleaned up and disposed off at the designated disposal facility. ➢ Use drip trays, linings or concrete floors when evidence of leaks are observed on construction vehicles or equipment. ➢ Prevent discharge of any pollutants, such as cements, concrete, lime, chemicals, and hydrocarbons into nearby water ways and courses. ➢ Contain contaminated water from batching operations and allow sediments to settle before being disposed of as waste water. ➢ Stabilise cleared areas as soon as possible to prevent and control surface erosion. ➢ Existing ablution facilities at the site should be used. No urinating outside these designated facilities will be allowed. ➢ Properly secure all temporary / portable toilets (if any) to the ground to prevent them toppling due to wind or any other cause. ➢ Maintain toilets in a hygienic state and remove waste to a licensed disposal facility. ➢ Proper environmental awareness and remedial response training of operators must be conducted on a regular basis. ➢ An emergency plan should be in place on how to deal with spillages and leakages during construction activities.
Proposed Monitoring	Regular visual inspection. Surface water quality monitoring in cases of evident pollution.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	Spillages might occur during fuel delivery to the aboveground storage tank from road transport tanker trucks. This may also occur during filling of vehicles. Spillages and/or leakages of various possible contaminants might occur due to failure of reticulation pipelines or storage tanks. Contaminated soil might pose a risk to surface water.
Proposed Mitigation Measures	↓ Proper containment mechanisms installed should be able to contain any spillages that might occur during the operation of the facility. ↓ All spills should be cleaned up as soon as possible. ↓ The presence of an emergency response plan and suitable equipment is advised, so as to react to any spillage or leakages properly and efficiently. ↓ Ensure all stormwater drains or channels are clear of litter or obstructing material. ↓ Remove all excess sedimentation, rubble and any other waste material present in the waterway and dispose of in a suitable manner to ensure proper drainage runoff.
Proposed Monitoring	Regular visual inspection. Surface water monitoring sampling for hydrocarbon pollution.
Responsible Party	Proponent / Contractors.

Air Quality (Dust Pollution)

Site upgrade (construction)/Decommissioning phase	
Description	Dust may be produced during the construction and decommissioning phase; and might be worsened when strong winds occur. These are expected to be site specific and could potentially pose a slight nuisance to the neighbouring properties. Possible air pollution in the form of emissions from construction vehicles and equipment could also deteriorate air quality in the area.
Proposed Mitigation Measures	↓ It must be ensured that all vehicles entering the site and machinery used in construction activities are in good working order to prevent unnecessary emissions. ↓ Encourage reduction of engine idling at the project site. ↓ Excavation, handling and transport of materials must be avoided under high wind conditions. ↓ Dust suppression measures (e.g. dampening with water) may be required from time to time, should dust become a nuisance.
Proposed Monitoring	Regular visual inspection.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	Air quality around the site could be impacted by exhaust fumes from the vehicles accessing the facility. Hydrocarbon vapours will be released during delivery and dispensing, as liquid displaces the gaseous mixture in the tanks. In terms of fuel storage tanks, the vapours will be released through vent pipes on the tanks.
Proposed Mitigation Measures	▪ Vehicle idling time shall be minimised by putting up educative signs. ▪ All venting systems and procedures have to be designed according to SANS standards (SANS 1929:2011) and placed in a sensible manner. ▪ Vent pipes should be placed in such a manner as to prevent impact on potential receptors. Use vapour recovery equipment and techniques to avoid air pollution and minimise fuel loss.
Proposed Monitoring	It is recommended that regular air quality monitoring be conducted at the facility. A complaints register regarding emissions/smell should be kept and acted on if it becomes a regular complaint.
Responsible Body	Proponent / Contractors.

Health and Safety

Site upgrade (construction)/Decommissioning phase	
Description	Safety issues could arise from the construction vehicles, earthmoving equipment and tools that will be used on site during the construction phase. This increases the possibility of injuries and the contractor must ensure that all staff members are made aware of the potential risks of injuries on site.
Proposed Mitigation Measures	▪ Equipment and machinery operators should be equipped with ear protection equipment. ▪ Operations should be strictly between 07H00 to 19H00. First aid and safety awareness training for contractors. ▪ Ensure the general safety and security at all times by providing day and night security guards and adequate lighting within and around the premises. ▪ The construction staff must be properly trained on safety and health issues of the project. ▪ Workers should be fully equipped with personal protective equipment gear. ▪ The site must be clearly demarked and fenced off to prevent unauthorised persons from accessing the site, who could get injured on site.
Proposed Monitoring	Safety procedures evaluation. Health and safety incident monitoring.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	The operations of the fuel consumer facility can cause health and safety risks to workers on site. Occupational exposures are normally related to inhalation of fuel vapours and physical contact with fuels.
Proposed Mitigation Measures	➢ Ensure the general safety and security at all times by providing day and night security guards and adequate lighting within and around the premises. ➢ Operators must be properly trained on safety and health issues of the project. ➢ Well stocked first aid box which is readily available and accessible should be provided within premises. ➢ Signs such as 'NO SMOKING' must be prominently displayed in parts where inflammable materials are stored on the premises. ➢ Workers should be fully equipped with personal protective equipment gear.
Proposed Monitoring	Regular inspection and incident monitoring report evaluation.
Responsible Body	Proponent / Contractors.

Noise Pollution

Site upgrade (construction)/Decommissioning phase	
Description	Although noise pollution already exists at the site due to vehicular movement along the Nordlands Street; and vehicles frequenting the site. Construction vehicles and equipment will be utilised during the construction phase and noise would be generated. It is expected that the noise generated will not have a significant impact on any third parties.
Proposed Mitigation Measures	➢ Sensitize construction vehicle drivers and machinery operators to switch off engines of vehicles or machinery not being used. ➢ Ensure engines of construction machinery are fitted with mufflers. ➢ Equipment and machinery operators should be equipped with ear protection equipment. ➢ Audio equipment (if any) should not be played at levels considered intrusive by others. ➢ Operations should be strictly between 07H00 to 19H00.
Proposed Monitoring	Strict operational times. Regular inspection.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	Noise pollution may be generated by vehicles, trucks and people frequenting the site.
Proposed Mitigation Measures	➢ Delivery of fuel products by heavy-duty tankers should be limited to normal working hours (07h00 to 19h00). ➢ Loud music from vehicles fuelling up should be restricted. ➢ Maintain the grievance mechanism to capture public perceptions and complaints with regard to noise impacts, track investigation actions and introduce corrective measures for continuous improvement.
Proposed Monitoring	Strict delivery and collection times. Observation of on-site noise levels by the ESO and ECO.
Responsible Body	Proponent / Contractors.

Waste Generation

Site upgrade (construction)/Decommissioning phase	
Description	This can be in a form of rock cuttings, building rubble, pipe cuttings, electrical cuttings, oil spills or leakages of petroleum products might occur during the construction phase.
Proposed Mitigation Measures	➢ Ensure that no excavated soil, refuse or building rubble generated on site are placed, dumped or deposited on adjacent/surrounding properties or land. ➢ Ensure that sufficient weather- proof bins / containers are present on site for the disposal of waste. ➢ The Contractor shall institute a waste control and removal system for the site. All waste shall be disposed off site at an approved landfill site. ➢ No disposal of /or burying of waste on site should be conducted. No waste should be burned on site. ➢ Hazardous waste storage is to be clearly marked to indicate the presence of hazardous substances, and the protocols associated with handling of such hazardous wastes shall be known by all relevant staff members. ➢ Existing ablution facilities at the site shall be used by the contractor during this phase. No urinating outside these designated facilities. ➢ Waste must be disposed off at a suitable waste disposal site. Clear dumping area with the Windhoek Town Council.
Proposed Monitoring	Regular inspection and housekeeping procedure monitoring. Observation of site appearance by the ESO and ECO.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	Waste such as contaminated soil, litter, empty cans of engine oil will be generated during the operational phase.
Proposed Mitigation Measures	➢ Contaminated soil must be removed and disposed off at a suitable waste disposal site. ➢ Waste bins must be available at the fuel consumer facility at all times. Waste must be appropriately collected and disposed off at an approved appropriate waste disposal site. ➢ Oil-water separator effluent originating from storm water runoff, tank bottoms and washing activities should be separated before disposal of the water. ➢ Regular monitoring of the oil-water separator outflow must be conducted. Water containing soaps and other detergents must not enter the oil water / separator as it will place the hydrocarbons in suspension, rendering the oil water separator ineffective. ➢ Care should be taken when handling contaminated material. The cradle to grave principal should be kept in mind during waste disposal. ➢ Any non-biodegradable hazardous material (i.e. oil cans and containers etc.) generated should be properly stored in containment structures, collected and transported to the nearest approved hazardous waste disposal facility.
Proposed Monitoring	Regular visual inspection. Containment area inspections and monitoring of the oil/water separators.
Responsible Body	Proponent / Contractors.

Traffic

Site upgrade (construction)/Decommissioning phase	
Description	The site is situated in Nordlands Street, in Windhoek. Construction related activities are expected to have a minimal impact on the movement of traffic along this road. However, slow traffic frequenting the construction site may become a nuisance to motorists accessing neighbouring properties.
Proposed Mitigation Measures	➢ It is recommended that if the need arises for traffic diversion road closure, the contractor should liaise with the relevant authorities. ➢ Speed limit and construction site warning signs must be erected to minimise accidents. ➢ Construction vehicles must be tagged with reflective signs or tapes to maximise visibility of the vehicles and avoid accidents.

Proposed Mitigation Measures	▪ Where feasible, Construction vehicles should not travel to and from the site during peak times (07h00 to 08h00 and 16h30 to 18h30), to minimise impacts on traffic. ▪ Construction vehicles should not be allowed to obstruct the road, hence no stopping in the road, wholly or partially, but rather pull off the road or park on the roadside.
Proposed Monitoring	Observations of the traffic flow along Nordlands Street.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	Traffic around the Service station
Proposed Mitigation Measures	▪ Delivery of fuel products by heavy-duty tankers should be limited to normal working hours (07h00 to 19h00).
Proposed Monitoring	Strict delivery times monitoring. Observation of traffic by the ESO and ECO.
Responsible Body	Proponent / Contractors.

Ecological impacts

Site upgrade (construction)/Decommissioning phase	
Description	The site is within an urban setting and entirely build-up. No known conservation worthy vegetation exists at the project site.
Proposed Mitigation Measures	▪ Disturbance of areas outside the designated working zone is not allowed. ▪ No vegetation should be removed outside the designated project area.
Proposed Monitoring	Regular site inspection.
Responsible Party	Proponent / Contractors.

Operational phase	
Description	The proposed facility operations will have minimal impacts the fauna and flora.
Proposed Mitigation Measures	▪ The operational activities would not exceed the demarcated area of the fuel consumer facility.
Proposed Monitoring	Regular site inspection.
Responsible Body	Proponent / Contractors.

Overfilling of tank and vehicles

Operational phase	
Description	Overfilling of company vehicles, trucks and equipment; and fuel storage tank may take place.
Proposed Mitigation Measures	➢ This impact can be reduced by the installation of spill containment areas around the pumps and through proper training of the operators. ➢ Proper monitoring of the product levels in the tanks must take place to eliminate overfilling. ➢ Proper training of the operators on site is vital.
Proposed Monitoring	Regular inspection of the level of fuel in tank.
Responsible Body	Proponent / Contractors.

Visual / Nuisance Impacts

Site upgrade (construction)/Decommissioning phase	
Description	Aesthetics and inconvenience caused to person trying to access/exit the site, and surrounding areas.
Proposed Mitigation Measures	➢ Contractor should maintain tidiness on site at all times. Take cognition when parking vehicles and placing equipment. ➢ Construction workers should be attentive to the importance of not littering. Littering is unsightly and has a negative visual impact. ➢ Sufficient waste bins must be provided onsite and must be emptied regularly. ➢ Any building rubble generated should not be allowed to accumulate onsite, but must at regular intervals be removed to a suitable landfill disposal site or to other construction sites where it may be used as fill.
Proposed Monitoring	Regular visual site inspection.
Responsible Party	Proponent / Contractors.

Spillages

Maintanance / Operational phase	
Description	Spillages are bound to occur during delivery of diesel fuel to the aboveground tank; and during dispensing of diesel to construction vehicles and equipment.
Proposed Mitigation Measures	▪ All operational surfaces and the fuel storage facility must be installed with spill containment areas as per the relevant SANS standards (or better). Special emphasis is placed on SANS 10089:1999, SANS 100131:1977, SANS 100131:1979, SANS 100131:1982, SANS 100131:1999. ▪ Risk of impact from this can be lowered through proper training of staff. ▪ All fuel delivery and dispensing operations should be conducted on provided spill containment areas around the dispensing points and tank farm. ▪ Staff must be provided with emergency response procedures which they should be familiar with. ▪ The storage tank should be kept in the tank containment farm provided throughout the duration of the installation. ▪ Regular inspection of the storage tank and farm, reticulation pipelines, dispensing pumps and the entire fuel system should be conducted. ▪ Staff should at all times be aware of the precautions associated with the handling of petroleum / chemical products as described in the relevant Material Safety Data Sheets. The general response to a fuel spill at the consumer facility must be: ▪ Switch off all pump(s) using the automatic pump cut-off. Switches should be located within easy reach of the console attendant and be clearly marked. Cut-offs at the fuse board is not acceptable; ▪ If spillage is outside the bund wall containment, use all appropriate measures necessary to contain the spill; ▪ Use booms or a sand/soil dam to prevent the spill from entering stormwater drains. Use the absorbents in the spill kit to soak up as much fuel as possible; ▪ Report any spillage more than 200 litres to the relevant authorities and remediation instituted (refer to section 49 of the Petroleum Products and Energy Act, 1990 (Act No. 13 of 1990)). ▪ Call the local Fire Brigade if a major spill occurs; ▪ Keep the public away from the spill;
Proposed Monitoring	Regular visual inspection of the entire fuel system.
Responsible Party	Proponent / Contractors.

Fire and explosion hazard

Operational phase	
Description	Hydrocarbons are volatile under certain conditions and their vapours in specific concentrations and conditions are flammable.
Proposed Mitigation Measures	▪ There should be sufficient water available for fire fighting purposes. ▪ Ensure that all fire-fighting devices are in good working order and they are serviced. ▪ All personnel have to be trained about responsible fire protection measures and good housekeeping such as the removal of flammable materials on site.
Proposed Monitoring	Regular inspections should be carried out to inspect and test fire fighting equipment.
Responsible Body	Proponent / Contractors.

9. CONCLUSIONS

If the above-mentioned management recommendations are properly implemented, it is anticipated that most of the adverse impacts on the environment can be mitigated. An appointed environmental control officer will need to monitor or audit the site throughout the site upgrade and operations to ensure that the EMP is fully implemented and complied with.

The EMP should be used as an on-site tool during all phases of the proposed project. Regular environmental audits should be carried out throughout all phases to ensure compliance of the EMP and environmental regulations of Namibia. Parties responsible for non-conformances of the EMP will be held responsible for any rehabilitation that may need to be undertaken.

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

Matrix Consulting Services

M. Shippiki
Hydrogeologist / Environmental Practitioner
September 2020