

**ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF KWAMBONAMBI SERVICE STATION WITH ASSOCIATED STRUCTURES, INCLUDING TRUCKSTOP, RETAIL SHOP, RESTAURANT AND BED & BREAKFAST ON ERF 1653 KWAMBONAMBI, UMFOLOZI LOCAL MUNICIPALITY, KWAZULU – NATAL**



**MONDLI**  
CONSULTING

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Proposed KwaMbonambi Service Station with associated structures, including Truckstop, retail shop, restaurant and bed & breakfast on Erf 1653

**ABSTRACT**

This is the draft Environmental Management Programme for the proposed development. It consists of recommended mitigation measures against the potential negative environmental impacts associated with the proposed development. Responsible parties and time frames for implementation of recommended measures are indicated within the EMPr.

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Prepared For

**Nzukaskeyi Trading (Pty) Ltd**

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**A. ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) WHO PREPARED THE ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr):**

1. An EMPr must comply with section 24N of the Act and include -

(a) Details of -

(i) the EAP who prepared the report:

Business Name of EAP	Mondli Consulting Services		
Physical Address	6 Joseph Avenue, New Era House, Suite 9, Durban North		
Postal Address	P O Box 22536, Glenashley		
Postal Code	4022		
Telephone	0826799841	Cell	0824187708
Email	mondlib@webmail.co.za mondlibee@gmail.com	Fax	031 5725647

(ii) The expertise of the EAP (including curriculum vitae)

Name of representative of the EAP	Education qualifications	Professional affiliations	Experience at environmental assessments (yrs)
BM Mthembu	Diploma in Nature Conservation Master's Degree (Environmental Studies Dissertation, Geography) Bachelor of Laws (LLB)	EAPASA registered EAP: No. 2018/168 in accordance with the prescribed criteria of Regulation 15(1) of section 24 H Registration Authority Regulation  Society of South African Geographers (Membership No. 28/09), confirmed to comply with the requirements set by South African Council for Natural Scientific Professions.	Has been involved in environmental and conservation field for over 20 yrs. Conducted EIAs for over 16 years including Strategic Env. Assessment.  Has been involved in the review and commenting on development projects impacting on the environment.
A Mhatu	Bachelor of Science Degree Ecology, Environment & Conservation and Geography	SACNASP Registered (Membership No. 125863).	Has over 6 years experience in conducting EIAs and EIA related work.

**B. A DETAILED DESCRIPTION OF THE ASPECTS OF THE ACTIVITY THAT ARE COVERED BY THE EMPr AS IDENTIFIED BY THE PROJECT DESCRIPTION;**

Nzukaskeyi Trading (Pty) Ltd is proposing the construction of KwaMbonambi Service Station which will include 4 parts/components namely; fuel service area, truckstop, retail centre/restaurants/ cash and carry and a motel/bed and breakfast and associated infrastructure.

The fuel service station:

- Fuel storage tanks [2 x 46 000 litres ULP], 1 x 46 000 litres diesel all underground with total storage capacity of 138 000l (138 cubic metres).
- Forecourt with fuel pumps and canopy.
- Convenience/quick shop that will also include a fast food outlet/restaurant, sitting space inside and outside and kid's play area, rest rooms, staff change rooms, office space, store rooms, ATM and other related facilities.
- Car wash
- Parking Bays

Truck Stop

- 60 truck bays
- Battery and workshop centre

Retail Outlet/Restaurants/Cash and Carry:

The retail centre will be one shop with different bays/shopping sections including the bakery, butchery, deli, bottle store, kiosk, fruit and vegetables section, coffee shop flowers and gifting as well as other facilities such as storage, kitchen facilities and delivery bays. The convenience outlet will have customer parking bays and a loading bay for deliveries.

Motel/Bed and Breakfast:

The motel/bed and breakfast will have 10 guest rooms.

Some of the facilities within the motel include ablution facilities, kitchen, conference/dining area, store room, Manager's office and parking bays

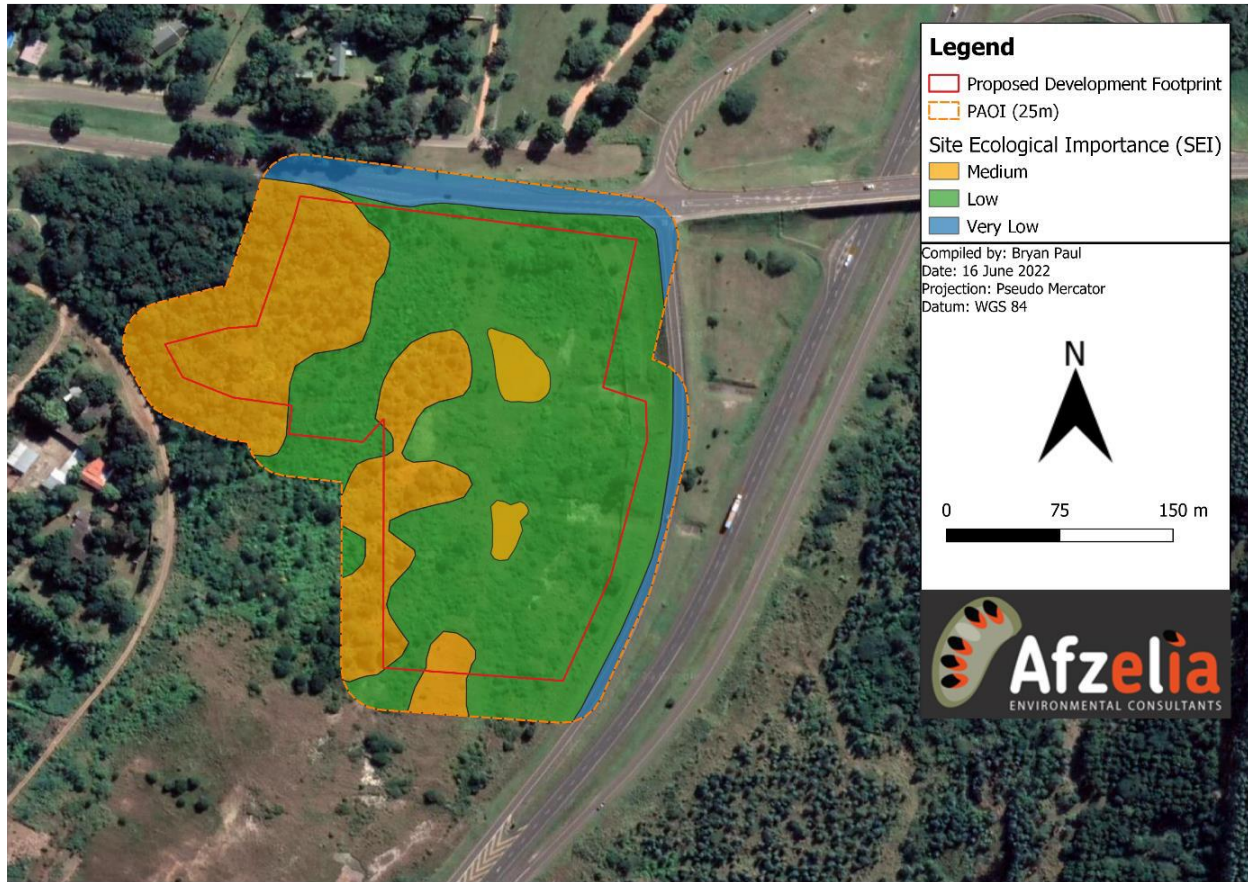
There will also be an entertainment area which will include the kitchen, bar, dining area, kid's indoor play area, ablution facilities and wash, rooms, male and female lockers and manager's office. There will also be a swimming pool that will be an outdoor swimming pool which will be part of the entertainment area.

**Area/Footprint**

The site on which the proposed development is located has a total area of 7.2174Ha and the footprint of the proposed development is 19 144m<sup>2</sup> (1.9144Ha).

These aspects therefore include removal of vegetation, soil erosion, pollution, stormwater management, soil contamination, alien plant invasion, ground water contamination and health and safety.

**C. A MAP AT AN APPROPRIATE SCALE WHICH SUPERIMPOSES THE PROPOSED ACTIVITY, ITS ASSOCIATED STRUCTURES, AND INFRASTRUCTRE ON THE ENVIRONMENTAL SENSITIVITIES OF THE PREFERRED SITE, INDICATING ANY AREAS THAT SHOULD BE AVOIDED, INCLUDING BUFFERES**



**Figure 1:** Map formulated through terrestrial biodiversity assessment by Afzelia which shows Site Ecological Importance Ratings for the site of the proposed development.

**D. A DESCRIPTION OF THE IMPACT MANAGEMENT OBJECTIVES, INCLUDING MANAGEMENT STATEMENTS, IDENTIFYING THE IMPACTS AND RISKS THAT NEED TO BE AVOIDED, MANAGED AND MITIGATED AS IDENTIFIED THROUGH THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS FOR ALL PHASES OF THE DEVELOPMENT**

Impact management objectives include ensuring that the development takes place in line with the Environmental Management Programme (EMPr), EIA Regulations and National Environmental Management Act (NEMA) No. 107 of 1998 as amended for all phases of the project. Impact management provides for the avoidance, reduction and/or rectification of potential negative impacts on the environment to ensure that the project is environmentally sustainable and its implementation does not result in unacceptable levels of loss of ecological integrity and biodiversity of the

affected area and surrounding environment. The impact management objectives for the proposed development will be focused on protection of the *Aristea torulosa* which is a plant species of conservation concern protected under the KZN Conservation Ordinance, management of impacts associated with storage and handling of fuel and management of potential impacts of the septic tank wastewater system to be used for the project.

The monitoring deals with conformance and non-conformance measured against the EMPr. Any non-compliance observed during the construction period will be followed by an immediate remedial intervention. The environmental audit and monitoring will primarily focus on evaluating the measure of compliance with statutory requirements within the project site. The Developer is primarily responsible for ensuring compliance to the EMPr and other requirements and standards applicable for the operational phase of the proposed development.

The identified impacts and risks will be managed and mitigated throughout the following phases of development:

**(i) Planning and design**

There are no significant impacts that are expected during this phase of the proposed development. However, it is important that the potential impacts for the construction and operational phases are well considered during the planning and design phase to ensure that where possible, the design and/or layout are altered to reduce impacts and necessary financial provisions are made for all mitigation and rehabilitation measures that need to be implemented throughout the different project phases. The most important factor to be considered and planned for during the planning and design phase is:

- **Transplanting of Species of Conservation Concern**

This will require planning as it needs to be implemented prior to the commencement of construction works including site establishment. A person with the necessary expertise needs to be consulted for this phase and will also be required to assist in marking of no go areas. Financial provision therefore also needs to be made for expertise and other resources needed.

- Alien Plant Species Plan, Rehabilitation Plan and Landscaping Plan all need to be in place prior to the commencement of any construction works and therefore need to be put in place and approved during the planning and design phase for consideration in pre-construction followed by implementation during construction and operation phase.

**(ii) Pre-construction activities**

**Vegetation Removal**

Vegetation clearance is considered as a pre-construction activity conducted for the preparation of the site for the actual construction works.

**Ablution Facilities**

Failure to provide ablution facilities prior to commencement of construction activities will lead to workers not having access to ablution facilities during the construction phase especially during the initial days/weeks of construction activities.

**Provision of clean drinking water**

Workers may be forced to consume water that is not clean or safe to drink if no plan is put in place to provide clean drinking water for the construction phase.

**Environmental Awareness**

Without the provision of environmental awareness training prior to the commencement of construction activities, workers will most likely be ignorant of environmental issues and act in ways that will cause environmental degradation including littering.

### **Vegetation Retention**

Vegetation will need to be retained during the construction phase to reduce disturbance of the project to the surrounding environment. The site and no-go areas will therefore need to be clearly marked out pre-construction.

### **Waste Management Plan**

Without a proper waste management plan being put in place, handling and disposal of waste during construction and operational phase will result in negative environmental impacts which will affect ecosystem functionality and can also affect human health.

## **(iii) Construction Activities**

- **Vegetation Removal**

Some vegetation will be removed when clearing space for construction of the structures for the proposed facility. This will result in disturbance of plant communities and habitat within the site pose threat to indigenous plant species and plant species of conservation concern.

- **Habitat Destruction**

Removal of vegetation within and around the site may affect bird species especially where such plants are trees although no bird species of conservation concern were observed on site. Other animal life may also be present within the site although not observed during site assessment and such animal life would be affected through removal of plant communities which provide them with habitat.

- **Soil Erosion**

Soil will be exposed to erosion as a result of vegetation removal and earthworks.

- **Pollution**

Littering by workers, failure to store waste accordingly on site and failure to dispose of waste in an area permitted to handle and dispose of such waste will result in pollution within the affected area.

- **Soil Contamination**

Failure to store hazardous substances such as fuel in the correct manner will most likely lead to such substances leaking/spilling resulting in soil contamination. Mixing of concrete on site without use of liners/mixing trays will also result in soil contamination.

- **Surface and Groundwater Contamination**

Contamination of surface runoff and soil with hazardous substances may lead to pollutants contaminating stormwater channels and groundwater.

- **Nuisance: Noise and dust**

Noise emissions from construction workers, vehicles and earthworks can be loud enough to be a nuisance for the surrounding community. Dust emissions will be as a result of use of the gravel road to access the site for the proposed development. Dust emissions from earthworks are expected to be low.

- **Spread of Alien Plants**

Removal of vegetation exposes soil which when left for an extended period of time can be invaded by alien plant species.

- **Visual Impact**

This impact can occur where the presence of the structures for the proposed development affect the sense of feel and general appearance of the area where the proposed development will be located.

- **Socio-Economic**

This is a positive impact that will occur as a result of the employment opportunities that will benefit the locals during the construction phase.

- **Health and Safety**

The different activities to be performed during the construction phase may pose health and safety risks for workers including tasks such as handling of potentially hazardous substances, operation of plant and vehicles, working at high height levels and working with electric wires and equipment.

- **Traffic Impacts**

Movement of construction vehicles and plant to and from the site will add to existing traffic normally experienced around the site and lead to increased traffic especially where plant and heavy vehicles are concerned.

**(iv) Rehabilitation of the environment after construction**

- **Alien Plants**

Alien plants may continue to spread if areas that are not developed are not re-vegetated as part of the site rehabilitation.

- **Soil Erosion**

Soil erosion may occur where the site is not properly landscaped post-construction.

**(v) Where relevant, operation activities;**

Some of the impacts that can occur during the operation phase include:

- Adhoc clearing of vegetation during routine maintenance of the facility.
- Contamination of ground and surface water which can result from fuel storage, management of swimming pool and operation and management of septic tank system.
- Failing septic system would cause sludge to build-up, reducing the capacity of the tank and preventing the proper treatment of wastewater before it enters the drain field. Large volumes of disease-causing bacteria



and viruses accumulate in the ground. When rain pours, they all end up in surface and groundwater facilities that lead to water pollution and problems to the health of the general public.

- Illegal hunting and/or killing of local fauna.
- Harvesting of local indigenous fauna for medicinal use.
- Introduction of diseases through the failure to control pest animals.

**E. A DESCRIPTION OF PROPOSED IMPACT MANAGEMENT ACTIONS, IDENTIFYING THE MANNER IN WHICH THE IMPACT MANAGEMENT OUTCOMES CONTEMPLATED IN PARAGRAPH (D) WILL BE ACHIVED, AND MUST, WHERE APPLICABLE, INCLUDE ACTIONS TO-**

***(i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation***

1. Planning and Design Phase

The design and layout of the proposed development must be holistically considered and all amendments necessary must be made prior to the commencement of construction to ensure that the design and layout implemented will have the least negative impacts.

The project team must also ensure that sufficient resources are allocated for mitigation measures required in the different project phases to be implemented especially in terms of allocation of financial resources which can often be a limiting factor.

2. Pre-Construction Phase

**Ablution Facilities**

- Provision of ablution facilities must be planned in such that workers will have access to clean and safe ablution facilities from the first day of work.
- Establishment of long-drop toilets is strictly forbidden.

**Provision of clean drinking water**

- The provision of clean drinking water for workers must be provided for. This is generally the responsibility of the Contractor for the construction phase and therefore this must form part of the agreements between the Developer and Contractor.

**Environmental Awareness**

- Pre-construction environmental awareness must be conducted with the Contractor, Developer, ECO and EDTEA. This will include: -
  - Highlight of the conditions of the Environmental Authorization;
  - Explanation of the EMPr and mitigation measures contained therewith;
  - Explanation of responsibilities for the implementation of mitigation measures within the EMPr and
  - Signing of the EMPr by Contractor.

- All parties that will be part of the construction activities must be inducted prior to commencement of works.
- Environmental Inductions can also be made part of the toolbox talks once construction has commenced.
- The Approved EMPr must be kept on site at all times to ensure monitoring by organs of state with jurisdiction on site.

#### **Vegetation Retention**

- The site must be clearly marked out including working and no-go areas.
- Removal of vegetation must be limited to the necessary areas.
- An ECO must be appointed well before this point to be afforded sufficient time to notify EDTEA of the intended commencement of construction. Parallel to this, a specialist with the relevant knowledge and experience must be appointed to conduct the site search and rescue for transplanting of plant species of conservation concern and any other indigenous plant species which may require transplanting.

#### **Waste Management Plan**

A waste management plan for the operational phase must be drawn up with clear details on how all waste types will be handled and disposed of. Once approved, the Waste Management Plan must be adhered to and failure to follow procedures within this plan will constitute a non-compliance which is punishable through fines and may result in instruction to cease all activity on the site.

### 3. Construction Phase

#### • **Vegetation Removal**

- Vegetation removal must be minimized.
- The construction area must be demarcated and all areas beyond the demarcated area must be treated as no-go areas.
- The appointed ECO must be given the chance to mark indigenous vegetation on the site prior to the commencement of removal of vegetation on site.
- Where indigenous vegetation as marked needs to be removed, the correct procedure must be followed.
- All areas cleared for construction purposes must be re-vegetated with indigenous vegetation/grass upon completion of construction works with no areas to be left bare.

#### • **Soil Erosion**

- Soil erosion must be reduced by controlling the amount of space that is cleared of vegetation.
- Cleared areas must be developed as soon as possible and not left bare for extended periods of time.
- Stormwater management on site must be in such that the erosion potential of the stormwater is reduced or the stormwater is directed away from exposed surfaces.
- Areas where vegetation had been removed for construction purposes must be promptly re-vegetated once the work on that particular section has been completed. Vegetation used must be indigenous trees or grass.

#### • **Pollution**

- All workers must undergo environmental induction which must include best practice allowed on site such as waste disposal at the designated areas.
- All waste within the site must be stored in a designated waste storage area. Closed bins must be used for storage of general waste.
- Waste from the site must be regularly disposed of at the nearest landfill site and waybills/receipts must be kept as proof of safe waste disposal.
- Waste must not under any circumstances be left to accumulate on site.
- Waste on site may not be buried or burned.
- All disposal of construction waste must be approved by the ECO and Engineer and must in such a manner that it does not culminate in on-site or off-site environmental degradation.
  
- **Soil Contamination**
  - There must be designated storage areas for potentially hazardous substances which must be equipped with a fire extinguisher. All storage of potentially hazardous substances including paint must be in line with the provisions of Hazardous Substances Act (Act 15 of 1973).
  - A bunded area must be established where high amounts of fuel are to be stored on site and such bunded area must be able to store the full capacity of the storage container(s) placed on it.
  - A spill kit must be provided on site and used to clean up any minor spills that occur on the site. Such soil must be stored as hazardous waste and be disposed of as advised by the Appointed ECO.
  - Spills must be reported to the Department of Water and Sanitation, uMfolozi Local Municipality, King Cetshwayo District Municipality and KZN Department of Economic Development, Tourism and Environmental Affairs.
  - All vehicles must be kept in good working condition and any spills/leaks observed must be attended to immediately. Drip trays must temporarily be placed under vehicles observed to be leaking until such time that they are serviced if they cannot be fixed immediately.
  - Drip trays must be provided and used accordingly when dealing with fuel and other hazardous substances.
  - Concrete mixing must only take place on mixing trays or on impermeable liners.
  - Concrete trucks must not be washed out or cleaned on the site or other area near the site, unless such cleaning will not cause any environmental harm.
  
- **Nuisance: Noise and dust**
  - Noise Control Regulations (Regulations 154, 10 January 1992) of the Environmental Conservation Act (Act No. 73 of 1989) must be adhered to.
  - Noise levels on site must be kept as low as possible at all times throughout the construction phase.
  - Construction workers must not be allowed to play any loud music on the site.
  - Construction operations must be restricted to daylight period, Monday to Saturday, and must adhere to legally stipulated hours (7.00 – 18.00).
  - The residents near the site must be informed when the construction phase of the proposed development is about to commence.
  - All construction vehicles and plant must adhere to the recommended speed limits for the road used to get to the site.
  - Where necessary, a water cart must be used to spray water on the road to reduce dust.
  
- **Spread of Alien Plants**

- A consolidated Alien Plant Species Plan, Rehabilitation Plan and Landscaping Plan should be compiled to assist both the Contractor and Applicant in ensuring that no residual impacts take place which must be implemented throughout the project lifecycle.
- Where alien plant species are observed growing on cleared spaces, they must be mechanically removed.
- Exposed areas must be re-vegetated with indigenous plants upon completion of activities on the affected areas.
  
- **Visual Impact**
  - Vegetation around the site must not be disturbed.
  - Disturbance of the surrounding environment must be minimized.
  
- **Socio-Economic**
  - The ward councilor must be engaged for the appointment of locals.
  - The terms and conditions of employment must be clearly explained to those appointed including how much they will earn, when they will be paid and the payment method.
  - Use of local labour must be maximized as far as is allowed for within the budget for the development.
  - The Contractor along with the Developer must consider any possible form of certification for the workers to endorse the skills they displayed. Additionally, some of the workers may be sent to train for skills such as First Aid skill which they can use within the community but can also help with improving their employability.
  - Employee rights according to the Employment Act must be respected at all times.
  - Local companies must be considered for supply of materials and services required provided that they meet the requirements.
  
- **Health and Safety**
  - All requirements of the Occupational Health and Safety Act (Act No. 85 of 1993) must be complied with.
  - Only workers with the required licenses may be permitted to operate plant, machinery and vehicles.
  - All workers must be provided with the necessary Protective Clothing (PPE) for the tasks they are expected to complete and use of such PPE must be enforced.
  - Standard road safety measures must be followed by all plant and vehicle drivers.
  - Extra caution must be exercised in areas with high number of people especially around schools at times that the school children are arriving/leaving school.
  - Workers must at all times be provided with clean drinking water.
  - Clean and hygienic mobile toilets must be provided for workers throughout the construction phase. Such toilets must regularly be serviced by an approved service provider to ensure that they are clean and safe to use at all times.
  - Emergency procedures must be explained to all workers in case of occurrences such as a fire breakout.
  
- **Heritage Impact**

Where any heritage resources be uncovered during the construction phase, the measures below must be implemented.

- Amafa must be contacted if any heritage objects are identified during earthmoving activities, and all development must cease until further notice.
- Amafa must be contacted if any graves or heritage objects are identified during construction and the following procedure is to be followed:
  - Stop construction
  - Report finding to local police station
  - Report to Amafa to investigate
- Sources of all-natural materials (including topsoil, sands, natural gravels, crushed stone, asphalt etc) must be obtained in a sustainable manner and in compliance with the heritage legislation.
- No archaeological sites, nor artefacts, were noted in the study area, therefore no further mitigation is required.
- Chance Find Protocol has been inserted, should any Palaeontological Material be uncovered a Palaeontologist must be called in to investigate.

4. Rehabilitation of the environment after construction and where applicable post closure;

● **Alien Plants**

- Landscaping post-construction must include re-vegetation with indigenous grass/trees.
- The ECO must be consulted to ensure that no alien plant species are planted as part of the rehabilitation.

● **Soil Erosion**

- All surfaces disturbed must be stabilized and re-vegetated accordingly.
- Stormwater from the site must be channeled to avoid on-site and off-site erosion.

5. Operational Phase

- Installation, operation and maintenance of fuel storage tanks and septic tank wastewater system must be done according to applicable standards and guidelines to eliminate potential negative impacts.
- No-go areas should be sign posted and communicated to all staff.
- Routine maintenance should be conducted along the proposed boundary fence.
- All hazardous waste must be adequately stored and disposed of at suitable facility.
- No dumping of waste must be allowed at any point in time.
- All stormwater drains must comply with South Africa legislations to avoid water and soil contamination on the surrounding environment.

**F. THE METHOD OF MONITORING THE IMPLEMENTATION OF THE IMPACT MANAGEMENT ACTIONS CONTEMPLATED IN PARAGRAPH (E)**

1. Planning, Design and Pre-Construction Phase

During these phases, environmental issues will need to be considered for decision making and therefore reported on any planning/pre-construction meetings that are held in connection with the development.

An Environmental Control Officer must be appointed prior to the commencement of construction activities.

The ECO will be responsible for monitoring compliance to pre-construction measures and liaising with EDTEA with regards to the conditions of the EA for the Development.

**2. Construction Phase**

The appointed Environmental Control Officer must:-

- Conduct monthly site audits and monitor activities on site against what is set out in the EMPr and against conditions of the EA.
- Compile Environmental Compliance Reports which must be submitted to EDTEA.
- Findings of the audit conducted must be communicated with the project committee including the Contractor, Engineer and Developer. The ECO must within these reports highlight any non-compliances identified and actions to be taken to rectify the non-compliances and remedy the impacts of the non-compliance.

Monitoring must also be conducted by EDTEA who may visit the site whenever necessary to monitor compliance to the EMPr and EA.

The Contractor must appoint one of the workers to be responsible for the day to day monitoring of compliance to impact mitigation measures as contain within the EMPr. This is the person that will deal closely with the ECO and communicate any challenges faced in implementation of mitigation measures with the ECO.

The Contractor must obtain receipts/waybills for waste disposal and service of toilets. Such must be kept on file at all times for the ECO or officials to view upon request as proof of safe waste disposal and proof for safe and regular toilet servicing.

**G. THE FREQUENCY OF MONITORING THE IMPLEMNETATION OF THE IMPACT MANAGEMENT ACTIONS CONTEMPLATED IN PARAGRAPH (E)**

An on-site assessment/monitoring must be conducted every two weeks (twice a month) for the duration of the construction period. A single audit report for each month must be submitted to EDTEA as per contact details for their compliance and monitoring section.

Additionally, issues relating to environmental compliance must be discussed on the project meeting platform to ensure that the importance of compliance and environmental preservation is made clear to the team and that relevant parties are directed to take necessary action for on-site compliance.

**H. AN INDICATION OF PERSONS WHO WILL BE RESPONSIBLE FOR THE IMPLEMENTATION OF THE IMPACT MANAGEMENT ACTIONS**

- Appointed ECO (Environmental Control Officer) – overall responsibility of environmental reporting, training and awareness and the overseer of the implementation of the whole EMPr and Specialists recommendations.
- Contractor / Site Engineer or Builder – responsible for all engineering or building related work on site, and project implementation.
- Nzukaskeyi Trading (Developer) – ensure adherence to the EMPr.

- EDTEA (Compliance Section) – inspections.

**I. THE TIME PERIODS WITH WHICH THE IMPACT MANAGEMENT ACTIONS CONTEMPLATED IN PARAGRAPH (E) MUST BE IMPLEMENTED**

All the stipulated mitigation measures are relevant for compliance throughout the different phases.

For example: Mitigation measures for impacts related to construction activities must be implemented throughout the construction phase of the development.

The mitigation measures, responsibilities and time frames are indicated in the tables below for each of the different project phases.

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Pre- Construction Phase

Activity	Management / Mitigation	Responsibility	Frequency / Timing
<b>A1 - Legislation, permits, agreements and EA requirements</b>	All members of the project team must adhere to all environmental legislation relevant to the project.	Contractor/Developer and ECO	Pre-, during and post construction.
	<ol style="list-style-type: none"> <li>1. The EMPr must be kept on site at all times.</li> <li>2. All members of the project team must be provided with adequate environmental training.</li> <li>3. Any and all mitigation measures that must be set up prior construction must be implemented.</li> <li>4. Monitoring and control programmes must be put in place to manage alien invasive plants.</li> <li>5. The working area is to be clearly demarcated and all construction work is to be kept within the demarcated area.</li> </ol>	Contractor/Developer and ECO	Ongoing
<b>A2 - Access to site</b> <i>Sound environmental principles must be followed</i>	<b>A2.1 Routing</b>		
	a. Access route must be clearly marked and disturbance outside these areas is not permitted. Choice of access routes must take into account minimum disturbance to surrounding environment.	Contractor/Engineer and ECO	Prior to moving onto site and during construction
	b. The location of all underground services and servitudes must be identified and confirmed before construction commences (IF ANY).		
<b>A3 - Setting up the construction camp/Site</b> <i>Careful planning of the construction camp can ensure that time and costs associated with</i>	<b>A3.1 Layout &amp; Location</b>	Contractor/ECO and Engineer	Pre-Construction/Site Set Up
	a. If the Contractor chooses to locate the campsite on private land, he must get prior permission from both the Engineer and the landowner.		
	b. The size of the construction camp must be minimized (especially where vegetation/grassland has had to be cleared for the site camp).		



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<i>environmental management and rehabilitation are reduced.</i>	c. The construction camp must be properly fenced with a 1.8m high bonnox (or similar type) fence, secured and kept in a clean and orderly state at all times.	Contractor/ECO and Engineer	
	d. The position of the camp must be ratified by the Engineer and the ECO.	Contractor/ECO and Engineer	
	e. The Contractor must attend to the drainage of the campsite to avoid sheet erosion and / or standing water.	Contractor/ECO and Engineer	
<b>A3.2 Ablutions</b>			
	a. Temporary chemical toilets must be provided by a company approved by the Contractor.	Contractor/ECO and Engineer	During set-up and On-going
	b. The construction of a “long-drop” is forbidden.		
	c. A toilet must be placed close to working areas at all times during the construction phase for easy access of workers.		
<b>A3.3 Provision for Camp Waste Disposal</b>			
	a. Bins and / or skips must be provided at convenient intervals for the disposal of waste within the camp. The bins must be covered. Bins should have liner bags for efficient and safe disposal of waste.	Contractor/ECO and Engineer	During site set-up and on-going
	b. Bins/waste receptacles used must be covered to ensure that they are wind and scavenger proof. The excavation and use of rubbish pits is forbidden. Burning of waste is also forbidden.		
	c. Recycling and the provision of separate waste receptacles for different types of waste should be encouraged. Where possible, plastics, paper, glass and cans should be separated from other domestic waste for recycling. If waste is to be recycled, appropriately labelled waste receptacles must be made available.		
	d. Any potentially hazardous containers must be punctured or disabled prior to disposal.		

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<p><b>A4 – Education of site staff on general and environmental conduct</b></p> <p><i>These points need to be made clear to all staff on site before the project begins</i></p>	<p><b>A4. 1 – Education</b></p>		
	<p>a. The Contractor must ensure that all site personnel have a basic level of environmental awareness training. Environmental awareness posters must be used on site. The Contractor must submit a proposal for this training to the ECO for approval. Topics to be covered must include:</p> <ol style="list-style-type: none"> <li>1. What is meant by “environment”;</li> <li>2. Why the environment needs to be protected and conserved;</li> <li>3. How construction activities can impact the environment;</li> <li>4. What can be done to mitigate against such impacts;</li> <li>5. Awareness of emergency and spills response provisions;</li> <li>6. Social responsibility during construction e.g. being considerate to local residents.</li> </ol> <p>It is the contractor’s responsibility to provide the site foreman with environmental training and to ensure that the foreman has sufficient understanding to pass this information onto the construction staff.</p>	<p>Contractor/ECO and Engineer</p>	<p>During staff induction and on-going</p>
	<p>b. Staff operating equipment shall be adequately trained and sensitized to any potential hazards associated with their tasks</p>	<p>Contractor/ECO and Engineer</p>	<p>During staff induction, followed by on-going monitoring</p>
	<p>c. The Engineer / ECO must be on hand to explain more difficult / technical issues and to answer questions which may be raised.</p>		
	<p>d. The use of pictures and real-life examples is encouraged as these tend to be more easily remembered.</p>		
	<p>e. No operator shall be permitted to operate critical items of mechanical equipment without having been trained by the Contractor and certified competent by the Project Management.</p>		
	<p>f. All employees must undergo the necessary safety training.</p>		

	<p><b>A4.2 – Worker conduct on site</b></p>	<p>Contractor/ECO and Engineer</p>	<p>During staff induction, followed by on-going monitoring</p>
	<p>a. A general regard for the social and ecological well-being of the site and adjacent areas is expected of the site staff. Workers need to be made aware of the following rules:</p> <ul style="list-style-type: none"> <li>a. No alcohol / drugs to be present on site, no vehicles or machinery are to be operated whilst under the influence of alcohol or drugs.</li> <li>b. Prevent excessive noise to minimize disturbances to local residents.</li> <li>c. No firearms allowed on site or in vehicles transporting staff to / from the site (unless used by security personnel).</li> <li>d. Bringing pets onto site is forbidden.</li> <li>e. Construction staff are to make use of facilities provided for them, as opposed to ad-hoc alternatives (e.g. fires for cooking, the use of surrounding bush as a toilet facility is strictly forbidden). No fires to be permitted on site. The use of gas-operated cookers for preparation of food on site must be encouraged.</li> <li>f. Trespassing on private / commercial properties adjoining the site is forbidden.</li> <li>g. Only <b>pre-approved</b> security staff and workers shall be permitted to live on the construction site.</li> <li>h. No worker may be forced to do work that is potentially dangerous or for what he / she is not trained to do.</li> <li>i. The staff conduct rules are described in a separate table of Rules (Section F of the EMP). This is aimed at providing staff with the basic information regarding worker conduct on site)</li> </ul>		

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<p><b>A.5 Cultural Environment</b></p>	<p><b>A.5.1 Protection of Cultural Environment</b></p>		
	<p>Prior to the commencement of construction, all the staff needs to know what possible archaeological or historical objective of value may look like, and to notify the Engineer / Contractor should such an item be uncovered.</p> <p>If any artefacts or graves are uncovered during construction, all work on site is to cease and AMAFA as well as the ECO is to be notified for comment. Construction may only commence once approval by AMAFA is granted.</p>	<p>ECO / PM / C</p>	<p>During site set up and on-going.</p>
<p><b>A.6 Flora and Fauna of Conservation Concern</b></p>	<p><b>A.6.1 Search and Rescue</b></p>		
	<p>a. A single protected plant species of conservation concern (<i>Aristea torulosa</i>) was observed within the site/project footprint. A permit (Ezemvelo KZN Wildlife) must be received before construction commences on site for removal and transplanting of individuals of this plant species.</p>	<p>ECO/ Appointed Specialist /C</p>	<p>Prior to clearance of vegetation</p>
	<p>b. A suitably qualified horticultural specialist must be appointed for the conduction of the transplanting of plant species of conservation concern.</p>		
	<p>c. A search and rescue must also be conducted for faunal (animal) species of conservation concern of the site prior to the commencement of site clearance/vegetation removal.</p>		
	<p>d. No plant species (SCC or common) should be harvested or removed from site without approval from the ECO or Applicant in writing.</p>		
	<p>e. If any protected species die during the translocation process, specimen loss must be offset at a ratio of 1:3.</p>		
	<p>f. Environmental awareness training must be conducted by the ECO before any new staff commence with work on site. This must include the adequate identification of the following species:</p> <ul style="list-style-type: none"> <li>• <i>Circaetus fasciolatus</i>;</li> </ul>	<p>ECO</p>	<p>Ongoing</p>

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	<ul style="list-style-type: none"> <li>• <i>Kinixys natalensis</i>;</li> <li>• <i>Doratogonus zuluensis</i> (when clearing secondary thicket habitat); and</li> <li>• Sensitive species 7</li> </ul>		
	<p>g. Any recorded sightings of these species must immediately be reported to the ECO immediately (especially if breeding or nesting nearby). Any nesting activities recorded within the development footprint must result in the immediate cessation of construction activities until instructed to commence again by the ECO and when safe to do so again.</p>		
	<p>h. Any recorded mortalities of the aforementioned species should be report to the CA and construction should be halted pending an investigation.</p>		

**Construction Phase**

Activity	Management / Mitigation	Responsibility	Frequency / Timing
<b>Vegetation Removal</b>	<ul style="list-style-type: none"> <li>• Vegetation removal must be minimized.</li> <li>• The construction area must be demarcated and all areas beyond the demarcated area must be treated as no-go areas. No clearance of vegetation must be allowed to take place outside of the construction footprint.</li> <li>• The appointed ECO must be given the chance to mark indigenous vegetation on the site prior to the commencement of removal of vegetation on site.</li> <li>• Where indigenous vegetation as marked needs to be removed, the correct procedure must be followed.</li> <li>• All areas cleared for construction purposes must be re-vegetated with indigenous vegetation/grass upon completion of construction works with no areas to be left bare.</li> </ul>	Contractor/Developer and ECO	Pre-, during and post construction.
<b>Fauna Protection</b>	<ul style="list-style-type: none"> <li>• Any excavations or holes must be checked regularly for fauna that may have either occupied the area or may fallen in accidentally. The design of deep excavations should consider nearby fauna (especially reptiles).</li> <li>• Any lighting must not point outwards toward any natural habitat and should be focus downwards or towards the development.</li> <li>• No killing of fauna must be tolerated.</li> <li>• Should any fauna species of conservation concern be observed during the construction phase, the Competent Authority must be informed and construction works must cease until such a time that investigation is conducted and concluded.</li> <li>• Any recorded mortalities of the aforementioned species should be report to the CA and construction should be halted pending an investigation.</li> </ul>	ECO/Contractor	Construction Phase and Ongoing

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<p><b>Soil Erosion</b></p>	<ul style="list-style-type: none"> <li>• Soil erosion must be reduced by controlling the amount of space that is cleared of vegetation.</li> <li>• Cleared areas must be developed as soon as possible and not left bare for extended periods of time. The Contractor must at all times be aware of the weather forecast for the area and as such all clearing activities must be postponed when high rainfall is expected.</li> <li>• Topsoil monitoring (depth and soil testing) must take place prior to soil stripping and backfilling. The ECO must determine if the quality of soil is satisfactory, prior to backfilling.</li> <li>• Topsoil must be sequentially removed in accordance with the requirements on site.</li> <li>• All topsoil must be adequately stored:             <ul style="list-style-type: none"> <li>○ On a Flat surface;</li> <li>○ Below two metres;</li> <li>○ Suitably covered if stored for prolonged periods of time.</li> <li>○ Separate from sub-soil and other stockpiles.</li> <li>○ Not near watercourses</li> </ul> </li> <li>• Stormwater management on site must be in such that the erosion potential of the stormwater is reduced or the stormwater is directed away from exposed surfaces.</li> <li>• All temporary embankments that are considered sensitive to erosion must be adequately retained and supported (sandbags, fascine work, retaining blocks etc.).</li> <li>• Silt traps must be used to control silt from being washed off site and into the surrounding watercourse or natural habitat.</li> <li>• Areas where vegetation had been removed for construction purposes must be promptly re-vegetated once the work on that particular section has been completed. Vegetation used must be indigenous trees or grass.</li> </ul>	<p>Contractor/Engineer and ECO</p>	<p>Throughout the Construction Phase</p>
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	<ul style="list-style-type: none"> <li>• If re-vegetation of exposed surfaces cannot be established immediately due to phasing issues, temporary erosion and sediment control measures must be maintained until such a time that re-vegetation can commence.</li> <li>• All temporary erosion and sediment control measures must be monitored for the duration of the construction phase and repaired immediately when damaged. All temporary erosion and sediment control structures must only be removed once vegetation cover has successfully recolonised the affected areas.</li> <li>• After every rainfall event, the contractor must check the site for erosion damage and rehabilitate this damage immediately. Erosion rills and gullies must be filled-in with appropriate material and silt fences or fascine work must be established along the gully for additional protection until vegetation has re-colonised the rehabilitated area.</li> </ul>		
<p><b>Pollution</b></p>	<ul style="list-style-type: none"> <li>• All workers must undergo environmental induction which must include best practice allowed on site such as waste disposal at the designated areas.</li> <li>• All waste within the site must be stored in a designated waste storage area. Closed bins must be used for storage of general waste.</li> <li>• Waste from the site must be regularly disposed of at the nearest landfill site and waybills/receipts must be kept as proof of safe waste disposal.</li> <li>• Waste must not under any circumstances be left to accumulate on site.</li> <li>• Waste on site may not be buried or burned.</li> <li>• All disposal of construction waste must be approved by the ECO and Engineer and must in such a manner that is does not culminate in on-site or off-site environmental.</li> </ul>	<p>Contractor/Engineer and ECO</p>	<p>Throughout the Construction Phase</p>



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<p><b>Soil Contamination</b></p>	<ul style="list-style-type: none"> <li>• There must be designated storage areas for potentially hazardous substances which must be equipped with a fire extinguisher. All storage of potentially hazardous substances including paint must be in line with the provisions of Hazardous Substances Act (Act 15 of 1973).</li> <li>• A bunded area must be established where high amounts of fuel are to be stored on site and such bunded area must be able to store the full capacity of the storage container(s) placed on it.</li> <li>• A spill kit must be provided on site and used to clean up any minor spills that occur on the site. Such soil must be stored as hazardous waste and be disposed of as advised by the Appointed ECO.</li> <li>• Spills must be reported to the Department of Human Settlements, Water and Sanitation, uMfolozi Local Municipality, King Cetshwayo District Municipality and KZN Department of Economic Development, Tourism and Environmental Affairs.</li> <li>• All vehicles must be kept in good working condition and any spills/leaks observed must be attended to immediately. Drip trays must temporarily be placed under vehicles observed to be leaking until such time that they are serviced if they cannot be fixed immediately.</li> <li>• Drip trays must be provided and used accordingly when dealing with fuel and other hazardous substances.</li> <li>• Concrete mixing must only take place on mixing trays or on impermeable liners.</li> <li>• Concrete trucks must not be washed out or cleaned on the site or other area near the site, unless such cleaning will not cause any environmental harm.</li> </ul>	<p>Contractor/ECO and Engineer</p>	<p>During site set up and on going</p>
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<p><b>Nuisance: Noise and Dust</b></p>	<ul style="list-style-type: none"> <li>• Noise Control Regulations (Regulations 154, 10 January 1992) of the Environmental Conservation Act (Act No. 73 Of 1989) must be adhered to.</li> <li>• Noise levels on site must be kept as low as possible at all times throughout the construction phase.</li> <li>• Construction workers must not be allowed to play any loud music on the site.</li> <li>• Construction operations must be restricted to daylight period, Monday to Saturday, and must adhere to legally stipulated hours (7.00 – 18.00).</li> <li>• The residents near the site must be informed when the construction phase of the proposed development is about to commence.</li> <li>• All construction vehicles and plant must adhere to the recommended speed limits for the road used to get to the site.</li> <li>• Where necessary, a water cart must be used to spray water on the road to reduce dust</li> </ul>		
<p><b>Spread of Alien Plants</b></p>	<ul style="list-style-type: none"> <li>• An Alien Plant Eradication plan must be drawn up and implemented throughout the construction phase.</li> <li>• Where alien plant species are observed growing on cleared spaces, they must be mechanically removed.</li> <li>• Exposed areas must be re-vegetated with indigenous plants upon completion of activities on the affected areas.</li> </ul>	<p>Contractor/Engineer and ECO</p>	<p>Throughout the Construction Phase</p>
<p><b>Visual Impacts</b></p>	<ul style="list-style-type: none"> <li>• Vegetation around the site must not be disturbed.</li> <li>• Disturbance of the surrounding environment must be minimized.</li> <li>• The paint colours chosen must not result in overall change of the feel of the area</li> </ul>	<p>Contractor/Engineer and ECO</p>	<p>Throughout the Construction Phase</p>

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<p><b>Socio-Economic</b></p>	<ul style="list-style-type: none"> <li>• The local leadership including the ward councilor must be engaged for the appointment of locals.</li> <li>• The terms and conditions of employment must be clearly explained to those appointed including how much they will earn, when they will be paid and the payment method.</li> <li>• Use of local labour must be maximized as far as is allowed for within the budget for the development.</li> <li>• The Contractor along with the Developer must consider any possible form of certification for the workers to endorse the skills they displayed. Additionally, some of the workers may be sent to train for skills such as First Aid skill which they can use within the community but can also help with improving their employability.</li> <li>• Employee rights according to the Employment Act must be respected at all times.</li> </ul>	<p>Contractor/Engineer and Developer</p>	<p>Throughout the Construction Phase and for the duration of the project activity</p>
<p><b>Health and Safety</b></p>	<ul style="list-style-type: none"> <li>• All requirements of the Occupational Health and Safety Act (Act No. 85 of 1993) must be complied with.</li> <li>• All necessary signage must be displayed within and around the site.</li> <li>• Only workers with the required licenses may be permitted to operate plant, machinery and vehicles.</li> <li>• All workers must be provided with the necessary Protective Clothing (PPE) for the tasks they are expected to complete and use of such PPE must be enforced.</li> <li>• Standard road safety measures must be followed by all plant and vehicle drivers.</li> <li>• Extra caution must be exercised in areas with high number of people especially around schools at times that the school children are arriving/leaving school.</li> <li>• Workers must at all times be provided with clean drinking water.</li> </ul>	<p>Contractor/Engineer/Health and Safety Officer and ECO</p>	<p>Throughout the Construction Phase</p>

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	<ul style="list-style-type: none"> <li>• Clean and hygienic mobile toilets must be provided for workers throughout the construction phase. Such toilets must regularly be serviced by an approved service provider to ensure that they are clean and safe to use at all times.</li> <li>• Emergency procedures must be explained to all workers in case of occurrences such as a fire breakout.</li> </ul>		
<p><b>Heritage Impact</b></p>	<p>Where any heritage resources be uncovered during the construction phase, the measures below must be implemented.</p> <ul style="list-style-type: none"> <li>• Amafa must be contacted if any heritage objects are identified during earthmoving activities, and all development must cease until further notice.</li> <li>• Amafa must be contacted if any graves or heritage objects are identified during construction and the following procedure is to be followed:             <ul style="list-style-type: none"> <li>▪ Stop construction</li> <li>▪ Report finding to local police station</li> <li>▪ Report to Amafa to investigate</li> </ul> </li> <li>• Sources of all-natural materials (including topsoil, sands, natural gravels, crushed stone, asphalt etc) must be obtained in a sustainable manner and in compliance with the heritage legislation.</li> <li>• No archaeological sites, nor artefacts, were noted in the study area, therefore no further mitigation is required.</li> </ul> <p>Chance Find Protocol has been inserted, should any Palaeontological Material be uncovered a Palaeontologist must be called in to investigate.</p>	<p>Contractor/Engineer and ECO</p>	<p>Throughout the Construction Phase</p>

**Operation Phase**

Activity	Management / Mitigation	Responsibility	Frequency / Timing
<b>Operation of septic tanks</b>	<ul style="list-style-type: none"> <li>• Applicable standards and guidelines such as SABS 0400-1990 and SANS10400 must be complied with in the construction and operation of the septic tank system.</li> <li>• Time and effort must be invested in the proper maintenance of the septic system.</li> <li>• Inspection and pumping should be done regularly and natural treatments must be applied when necessary.</li> </ul>	Developer	Construction and throughout operation phase

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<p><b>Operation of Fuel Station and associated facilities</b></p>	<ul style="list-style-type: none"> <li>• SANS 10089-3 must be adhered to with regards to installation, modification, and decommissioning of underground storage tanks, pumps/dispensers and pipework.</li> <li>• The leak detection system will be accordingly installed. Other applicable standards may include but not be limited to:             <ul style="list-style-type: none"> <li>○ SANS 10400 TT 53 (Section 1-6)</li> <li>○ SANS 10131</li> <li>○ SANS 10108</li> <li>○ SANS 11535</li> </ul> </li> <li>• The UST is to be inspected before installation for damage and repair to be done according to SABS 1535 (Class – reinforced polyester coated steel tanks, including jacketed tanks, for the underground storage of hydrocarbons and oxygenated solvents and intended for burial horizontally).</li> <li>• SANS 10089 Parts 2 &amp; 3 which requires:             <ul style="list-style-type: none"> <li>○ The installation of a leak detection system including observation and monitoring wells situated around the tank to facilitate early warning that a leak has arisen.</li> <li>○ The provision of a plastic sheet below the tank that slopes towards an observation well.</li> <li>○ Installation of leak detectors on pressure systems.</li> </ul> </li> <li>• The UGST must be dipped daily and reconciled against volume to check for loses due to leakage.</li> <li>• The tanks and product lines must be pressure tested prior to commissioning.</li> <li>• The plastic sheet below the tanks will be installed as a preventative measure in case of a leak.</li> <li>• Contain spill by using PEAT and SORB cushion (PEAT and SORB are environmentally friendly oil absorbent products / fine material suitable for most spills).</li> <li>• Most petroleum companies have well-established procedure to follow in the event of a spill (oil, fuel or other), like acting immediately on receiving information, which includes:             <ul style="list-style-type: none"> <li>○ The time date and location of the spill.</li> <li>○ Estimation of the volume of product involved in litres.</li> <li>○ The type of product involved.</li> <li>○ Any other pertinent information</li> </ul> </li> </ul>	<p>Developer</p>	<p>Construction and throughout operation phase</p>
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	<ul style="list-style-type: none"><li>• The tank pit must be lined with a heavy-duty HDPE liner and only free draining granular fill must be used to backfill this excavation.</li><li>• The base of the tank pit must be V-shaped and graded to a sump to allow collection of any hydrocarbon product leaking from filler and dip point manholes.</li><li>• Tank pit monitoring wells must be installed down into the base of the tank pit within the liner to check for any hydrocarbon leaks or subsoil spillage.</li><li>• A concrete cover slab must be cast over the tank pit area to protect the UGST's. This slab must be dish shaped to capture any surface fuel spillage and contaminated run-off.</li><li>• The stormwater generated on the forecourt area, tank pit area and fuel fillers must be captured in a grid drain linked to a sealed separator system, to prevent contamination from accidental spillages overflowing, as this might migrate into the down gradient streamline.</li><li>• The separator system must be monitored and cleared regularly to prevent free-phase hydrocarbon liquids from discharging off site.</li><li>• Runoff from the fuel forecourt and car wash must be collected into the separator system and not be discharged into the natural stormwater channel or surrounding environment.</li><li>• A plan will be submitted to uMfolozi Local Municipality for approval prior to construction commencing relating to management of water, sediments and stormwater in relation to the storage tanks and pipe work. This will be lodged together with building plans for proper alignment with existing municipal stormwater plans approved by municipal engineers.</li></ul>		
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<p><b>Health and Safety Impacts</b></p>	<ul style="list-style-type: none"> <li>• Fire extinguishers must be made available according to the standards taking into consideration the size of the development in terms of the number of and positioning of the fire extinguishers.</li> <li>• Emergency evacuation procedures must be known to all employees.</li> <li>• Where possible the facilities must be equipped with a sprinkler system in case of a fire incident.</li> <li>• Each of the buildings must be equipped with a first aid equipment that is sufficient for the number of employees/occupants according to the Occupational Health and Safety Act and associated guidelines.</li> <li>• All components of the development involved in selling food items must adhere to applicable safety standards for food storage and preparation.</li> </ul>	<p>Developer</p>	<p>Throughout the Operational Phase</p>
<p><b>Groundwater Contamination</b></p>	<ul style="list-style-type: none"> <li>• The sewer system and underground fuel storage tanks must be monitored for leaks and should any leaks be picked up; they must be urgently attended to.</li> <li>• Waste disposal must take place accordingly through municipal waste disposal or other method. Waste must not in any case be buried or burned or disposed of on the surrounding environment or in any manner that may be harmful to the environment.</li> </ul>	<p>Contractor/Engineer and ECO</p>	<p>Throughout the Operational Phase</p>



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<p><b>Fragmentation and ecological disturbance impacts</b></p>	<ul style="list-style-type: none"> <li>Controlling both the direct and indirect impacts of the proposed development will be key in ensuring the sustainability of this development.</li> <li>Mitigating noise and light impacts will be difficult to enforce during the operation of the site, however lighting design to avoid casting light onto areas beyond the site may be implemented. Edge impacts and alien plant infestation impacts can be quite easily controlled through maintenance activities.</li> <li>Edge effects whilst unavoidable should be carefully controlled by applying mitigation techniques early, and loss of ecosystem function should be controlled by careful monitoring and avoidance of any activities from taking place outside of the proposed development footprint.</li> </ul>	<p>Developer/Engineer</p>	<p>Construction and Operation Phase</p>
<p><b>Erosion and Stormwater Management</b></p>	<ul style="list-style-type: none"> <li>All stormwater from hardened areas (roof and paved areas) should be collected and discharged in a carefully controlled manner according to the engineer's specifications.</li> <li>Under no circumstances should water be allowed to discharge onto the ground near the foundations. It is further recommended that concrete aprons be constructed around the perimeter of the structures if there no rigid or flexible pavement.</li> <li>In an event where stormwater cannot be discharged into a municipal system, a soakpit system should be considered. However, a percolation test should be undertaken to assess the permeability of the subsoil. The soakpit volume should be calculated as follows, 40m<sup>2</sup> of hardened area of the site equals to 1m<sup>3</sup> of the soakpit volume. It is important to locate stormwater soakpit on the downslope side of the site and at least 3m from the sides of any building, in order to ensure that there is no flow of subsurface water towards the foundations.</li> <li>The material beneath the positions of the concrete aprons should be ripped (~150mm) and re-compacted to at least 93% Mod AASHTO.</li> </ul>	<p>Developer</p>	<p>Construction and Operation Phase</p>

### **Decommissioning Phase**

The activity is not expected to have a decommissioning phase. However, upon completion of the construction phase:

The ECO must inform EDTEA of the upcoming completion of the construction phase.

A final site assessment must be conducted to ensure that:

- All rubble and any other waste has been removed from the site and properly disposed of.
- All disturbed areas have been re-vegetated accordingly.
- All areas which may have been contaminated have been cleared of contaminants and all other possible contaminants which will not be used for the operation phase have been removed from the site.
- All temporary services which had been commissioned for the purpose of the construction phase must be decommissioned without any harm to the environment.
- A final report must be submitted to EDTEA on rehabilitation measures implemented and recommendation on whether any further action is required.

EDTEA will need to be informed of the intended commencement of the operational phase as set out in the EA issued for the project.

### **J. CONCLUSION**

According to the National Environmental Management Act, 1998 everyone must take reasonable measures to ensure that they do not pollute the environment. In this regard the reasonable measures will include informing and educating employees about environmental risks of their activities and instil a sense of environmental consciousness.

It is therefore, crucial that all recommendations are adopted and effected to the letter during all phases of this development as part of the mitigation measures. It must also be kept in mind that the Environmental Management Programme is a live document, that need adjustment as the need arise, as long as such changes are in the interest of the environment.