

Final Environmental Management Programme

Proposed Decommissioning and re-construction of the Clewer filling station on Portion 16 of the Farm Schoongezicht 308 JS

June 2016

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1. Project Outline

Clewer Filling Station CC is planning to decommission the current filling station located on the Remainder of Portion 16 of the Farm Schoongezicht 308 JS and construct a new filling station and associated infrastructure on the existing footprint. The study area is located in Clewer, Witbank (Emalahleni) just south of the N1 – Matthews Phosa/R104 off-ramp and to the north of Collins Avenue. **Refer to Figure 1: Locality Map and Figure 2: Aerial Map of proposed Filling Station.**

The study area is approximately **0.6 ha** in extent and is situated within the municipal area of **Emalahleni** and within the **Nkangala District Municipality, Mpumalanga Province.**

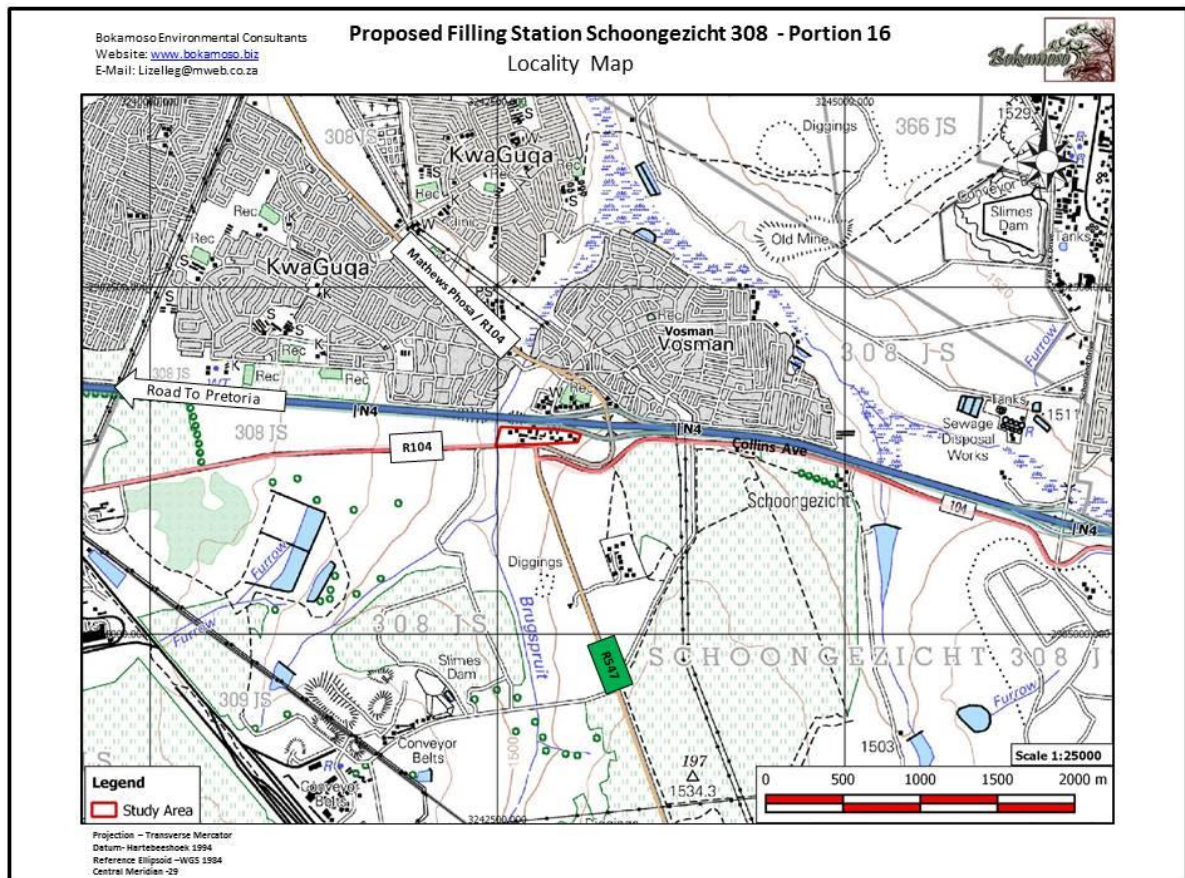


Figure 1: Locality Map

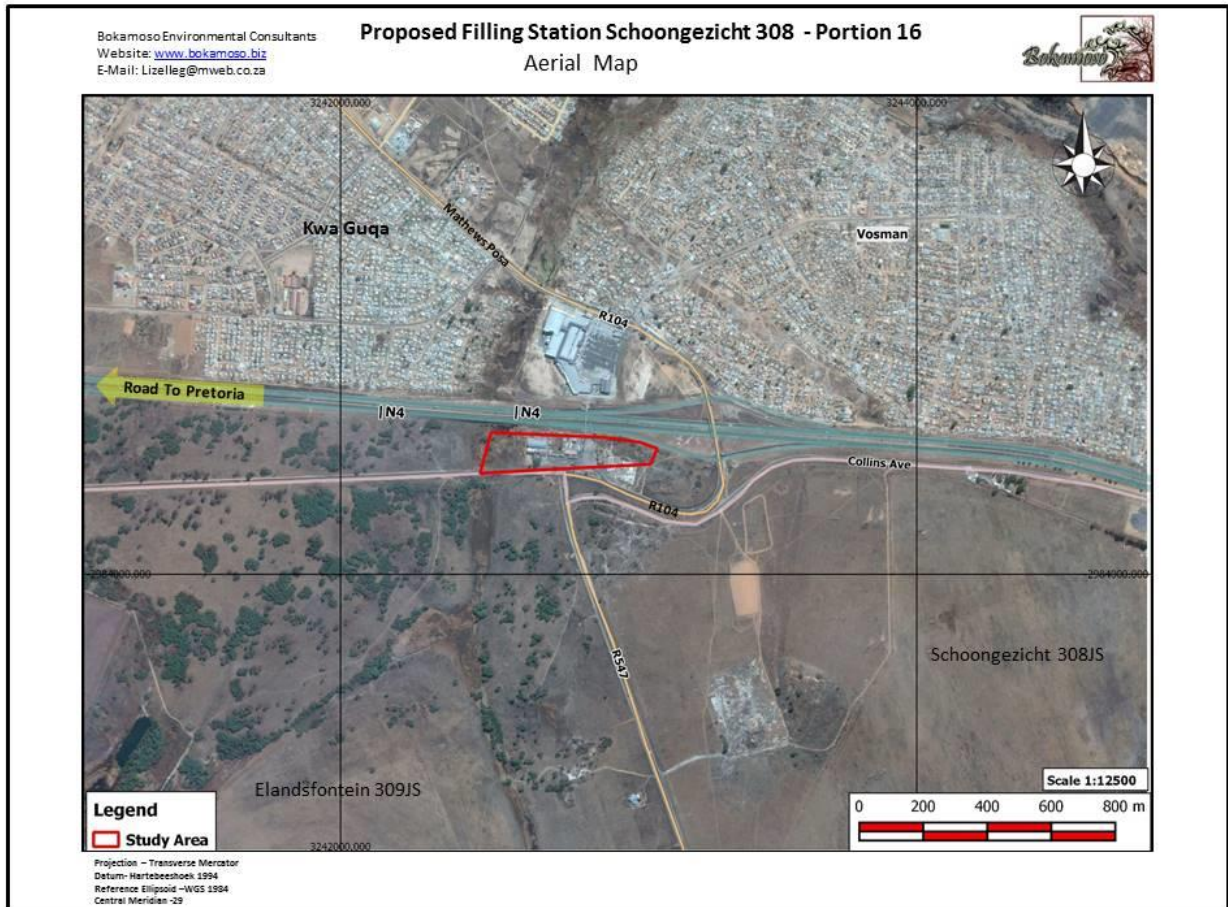


Figure 2: Aerial Map

The study area is strategically situated just south of the N1 – Matthews Phosa/R104 off-ramp and to the north of Collins Avenue. The immediate surrounding area consists of small scale holdings and agricultural ventures. Evraz Highveld Steel and Vanadium is located approximately 3 km south-west of the site. The Kwa Guqa settlement is located to the north and the Kwa Guqa Mall directly adjacent to the site across the N4 highway. A pedestrian bridge traverses the N4 connecting the site directly with the Kwa Guqa settlement (See Figure 3 and photographs below).

The proposed project will entail the decommissioning of the existing filling station and the construction of a new filling station, consisting of five Pump Islands (steel canopy covered) and five underground tanks each with a 23 000 litre capacity, as

well as a convenience store 200 m² in size. The existing filling station is dilapidated and no longer in use.

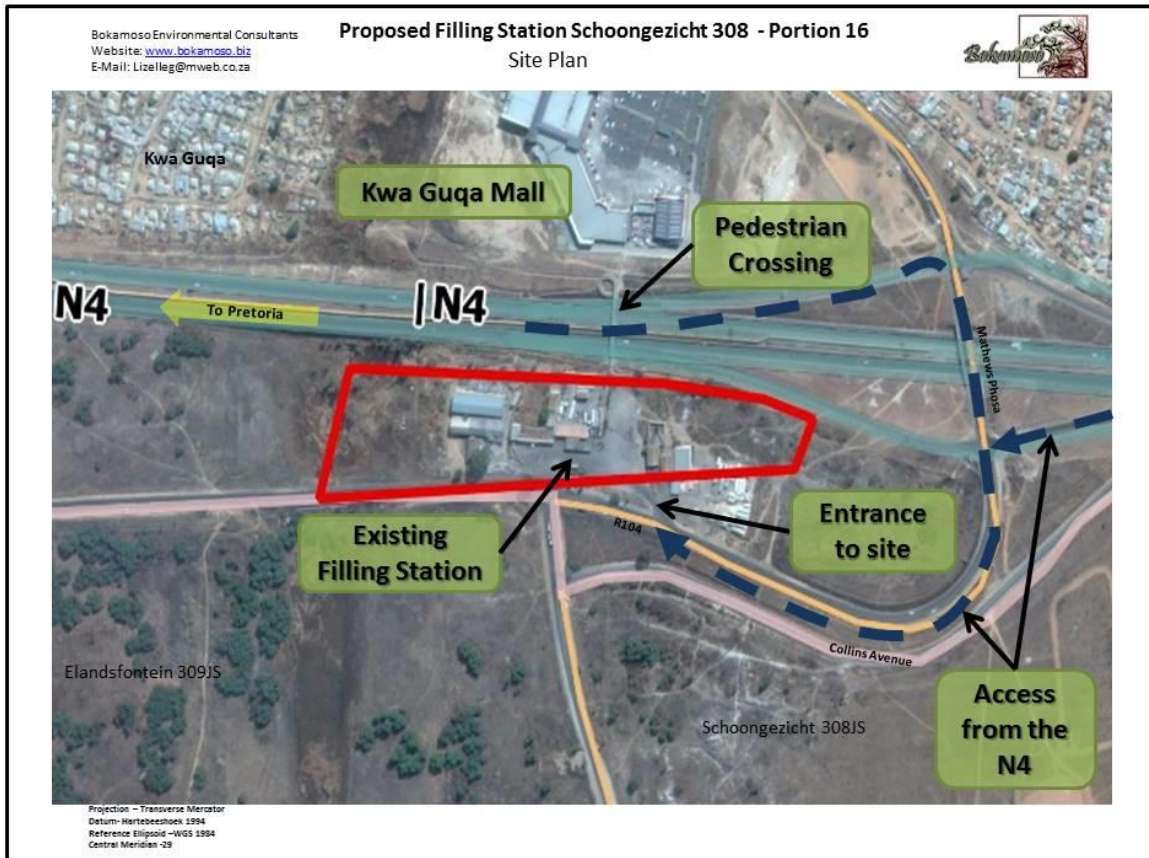


Figure 3: Site Plan

Timeframe for construction:

The proposed development will commence as soon as approval for the proposed development has been secured from the relevant authorities.

The EMPr will be a binding document for purposes of compliance.

2. Receiving Environment

Geology:

According to available geological maps the study area is underlain by sandstone and siltstone of the Vryheid Formation, Ecca Group, Karoo Supergroup. This was confirmed during the investigation by Johann van der Merwe. The investigation also indicated that the site is covered by colluvial sandy and gravelly soils. No outcrops were observed in the vicinity of the site during the investigation. **Refer to Appendix B of the Final Basic Assessment Report.**

Geotechnical Considerations and implications for the development:

- **Expansive soils**

The site soils are sandy and gravelly and are potentially "low" in the degree of expansiveness. A total surface heave value of less than 7 mm is predicted across the site should the moisture condition of the soils change from desiccate to saturated.

- **Compressive soils**

The upper in situ sandy and gravelly horizons materials are considered to be potentially compressible.

- **Excavation characteristics**

No problems should be experienced in excavating the site soils down to a depth of at least 3.0 m below surface across the property. The sidewalls of excavations in the coarse sandy soils will tend to become unstable after a while, upon drying out, causing a loss of cohesion and shear strength.

- **Foundations**

The site is underlain by potentially collapsible and compressible soils.

Ground Water and Soil chemistry - Considerations and implications for the development:

- **Ground water seepage**

Ground water seepage was encountered during the investigation and thus proper damp proofing precautions should be taken underneath structures, a subsurface drainage system should be considered in the forecourt area. The design of underground containers should take cognisance of the presence of a shallow water table which will hamper construction activities, causing sidewall instabilities of deep excavations.

- **Soil chemistry**

The site soils are considered to be potentially **highly chemically aggressive** with regards to underground ferrous metal pipes. Tanks and non-ferrous metal or plastic pipes or containers are therefore recommended for underground services.

The investigation shows that the groundwater is potentially **highly corrosive** towards steel and concrete.

- **Fuel Contamination**

Severe visual and olfactory evidence of **subsoil fuel contamination** was detected during the investigation. The design of the proposed underground tanks should take cognisance of the possible presence of a **perched water table** during the wet season. Any surface or subsurface contamination could cause serious damage to the underground water regime. A competent person should inspect the site during the “tank yank” and any contaminated soil should either be discarded in a proper fashion or be re-mediated on site. It is recommended that a **hydrogeological investigation** be carried out prior to the installation of new fuel tanks.

- **Earthworks**

It is evident that the blanketing fill and in situ sandy and gravelly soils should be suitable for use as fill underneath surface beds and for use as selected layers and lower subbase material. The quality of the imported fill is somewhat

variable and caution should be exercised during the selection and placement of construction material. Material for the construction of upper subbase layers will have to be imported and cognisance should be taken of the potentially collapsible nature of the upper soil horizons in the design of paved areas.

It is recommended that the excavations for foundations be inspected by a competent person during construction in order to verify that the exposed materials are not at variance with those described in the report. The placement of the fill must be controlled with suitable field tests to confirm that the required densities are achieved during compaction and that the quality of fill material is within specification.

Hydrology:

The study area is not affected by any rivers or wetlands

Fauna and flora:

The site is currently built up and the proposed filling station development will not exceed the current footprint. No sensitive fauna and flora were thus identified and the study area is not regarded as sensitive.

Cultural /Historical:

No cultural and historical features were identified on the study area.

Visual:

Due to the topography the proposed development will have some visual impact and it will be visible from the N4 Highway.

Noise:

- Noise impacts from normal construction works.
- The operational phase will not have a significant noise impact on the surrounding properties.

Dust:

- Dust could have an impact on the surrounding residences if the construction takes place during the dry and windy months. It is proposed that regular damping down of the study area be done if construction takes place during dry and windy months.

Light:

- The lights from the proposed development could have an impact on the surrounding residents.

3. EMPr Objectives and context

Objectives

The objectives of this programme are to:

- Identify the possible environmental impacts of the proposed activity;
- Develop measures to minimise, mitigate and manage these impacts;
- Meet the requirements of the Record of Decision of MDARDLEA and other Authorities; and
- Monitor the project.

EMPr context

This EMPr fits into the overall planning process of the project by carrying out the conditions of consent set out by the MDARDLEA. In addition, all mitigation measures recommended in the Basic Assessment Report are included in the EMPr.

This EMPr addresses the following four phases of the development:

- Pre-construction planning phase;
- Construction phase;
- Operational phase; and
- Decommissioning phase.

4. Monitoring

In order for the EMPr to be successfully implemented all the role players involved must have a clear understanding of their roles and responsibilities in the project.

These role players may include the Authorities (A), other Authorities (OA), Developer/proponent (D), Environmental Control Officer (ECO), Project Manager (PM), Contractors (C), Environmental Assessment Practitioner (EAP) and Environmental Site Officer (ESO). Landowners, Interested and Affected Parties and the relevant environmental and project specialists are also important role players.

4.1 Roles and responsibilities

Developer (D)

The developer is ultimately accountable for ensuring compliance with the EMPr and conditions contained in the RoD. The developer must appoint an independent Environmental Control Officer (ECO), for the duration of the pre-construction and construction phases, to ensure compliance with the requirements of this EMPr. The developer must ensure that the ECO is integrated as part of the project team.

Project Manager (PM)

The project Manager is responsible for the coordination of various activities and ensures compliance with this EMPr through delegation of the EMPr to the contractors and monitoring of performance as per the Environmental Control Officer's monthly reports.

Environmental Control Officer (ECO)

An independent Environmental Control Officer (ECO) shall be appointed, for the duration of the pre-construction and construction phase of the services and bulk infrastructure, by the developer to ensure compliance with the requirements of this EMPr.

Contact details of appointed ECO

ECO details will be available as soon as developer appointed a company.

- The Environmental Control Officer shall ensure that the contractor is aware of all the specifications pertaining to the project.
- Any damage to the environment must be repaired as soon as possible after consultation between the Environmental Control Officer, Consulting Engineer and Contractor.
- The Environmental Control Officer shall ensure that the developer staff and/or contractor are adhering to all stipulations of the EMPr.
- The Environmental Control Officer shall be responsible for monitoring the EMPr throughout the project by means of site visits and meetings. This should be documented as part of the site meeting minutes.
- The Environmental Control Officer shall be responsible for the environmental training program.

- The Environmental Control Officer shall ensure that all clean up and rehabilitation or any remedial action required, are completed prior to transfer of properties.
- A post construction environmental audit is to be conducted to ensure that all conditions in the EMPr have been adhered to.

Contractor (C):

The contractors shall be responsible for ensuring that all activities on site are undertaken in accordance with the environmental provisions detailed in this document and that sub-contractor and laborers are duly informed of their roles and responsibilities in this regard.

The contractor will be required, where specified to provide Method Statements setting out in detail how the management actions contained in the EMPr will be implemented.

The contractors will be responsible for the cost of rehabilitation of any environmental damage that may result from non-compliance with the environmental regulations.

Environmental Site Officer (ESO):

The ESO is appointed by the developer as his/her environmental representative to monitor, review and verify compliance with the EMPr by the contractor. The ESO is not an independent appointment but must be a member of the contractor's management team. The ESO must ensure that he/she is involved at all phases of the construction (from site clearance to rehabilitation).

Authority (A):

The authorities are the relevant environmental department that has issued the Environmental Authorisation. The authorities are responsible for ensuring that the

monitoring of the EMPr and other authorization documentation is carried out by means of reviewing audit reports submitted by the ECO and conducting regular site visits.

Other Authorities (OA):

Other authorities are those that may be involved in the approval process of the EMPr.

Environmental Assessment Practitioner (EAP):

According to section 1 of NEMA the definition of an Environmental Assessment Practitioner is "the individual responsible for the planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management programmes or any other appropriate environmental instruments through regulations".

4.2 Lines of Communication

The Environmental Control Officer in writing should immediately report any breach of the EMPr to the Project Manager. The Project Manager should then be responsible for rectifying the problem on-site after discussion with the contractor. Should this require additional cost, then the developer should be notified immediately before any additional steps are taken.

4.3 Reporting Procedures to the Developer

Any pollution incidents must be reported to the Environmental Control Officer immediately (within 12 hours). The Environmental Control Officer shall report to the Developer on a regular basis (site meetings).

4.4 Site Instruction Entries

The site instruction book entries will be used for the recording of general site instructions as they relate to the works on site. There should be issuing of stop work order for the purposes of immediately halting any activities of the contractor that may pose environmental risk.

4.5 ESA/ESO (Environmental Site Officer) Diary Entries

Each of these books must be available in duplicate, with copies for the Engineer and Environmental Site Officer. These books should be available to the authorities for inspection or on request. All spills are to be recorded in the ESA/Environmental Site Officer's diary.

4.6 Methods Statements

Methods Statements from the contractor will be required for specific sensitive actions on request of the authorities or ESA/ESO (Environmental Site Officer). All Method Statements will form part of the EMPr documentation and are subject to all terms and conditions contained within the EMPr document. For each instance wherein it is requested that the contractor submit a method statement to the satisfaction of ESA/ESO, the format should clearly indicate the following:

- What? – a brief description of the work to be undertaken;
- How?- a detailed description of the process of work, methods and materials;
- Where?- a description / sketch map of the locality of work; and
- When?- the sequencing of actions with due commencement dates and completion date estimate.

The contractor must submit the Method Statement before any particular construction activity is due to start. Work may not commence until the method statement has been approved by the ESA/ESO.

4.7 Record Keeping

All records related to the implementation of this Management Programme (e.g. site instruction book, ESA/ESO diary, Methods Statements etc.) must be kept together in an office where it is safe and can be retrieved easily. These records should be kept for two years at any time be available for scrutiny by any relevant authorities.

5. Legislation

5.1 The National Water Act, 1998 (Act No: 36 of 1998)

The purpose of this Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways that take into account, amongst other factors, the following:

- ❑ Meeting the basic human needs of present and future generations;
- ❑ Promoting equitable access to water;
- ❑ Promoting the efficient, sustainable and beneficial use of water in the public interest;
- ❑ Reducing and preventing pollution and degradation of water resources;
- ❑ Facilitating social and economic development; and
- ❑ Providing for the growing demand for water use.

Impact on proposed Development:

Not Significant – The study area is not affected by a 1:50 and 1:100 year flood line. A Section 21 WULA is not required.

5.2 Atmospheric Pollution Prevention Act (Act 45 of 1965)

The purpose of the Act is “To provide for the prevention of the pollution of the atmosphere, for the establishment of a National Air Pollution Advisory Committee, and for matters incidental thereto”.

The Atmospheric Pollution Prevention Act was traditionally administered by the Department of Health until 1995, when it was transferred to the jurisdiction of the Department of Environmental Affairs and Tourism. The Act controls four forms of air pollution:

- ❑ Part II Noxious or Offensive gases
- ❑ Part III Atmospheric Pollution by Smoke
- ❑ Part IV Dust Control
- ❑ Part V Air Pollution by Fumes Emitted by Vehicles

Impact on proposed Development:

Significant – Parts IV and V of the Act have relevance to the proposed development. It is not foreseen that the proposed filling station would contribute significantly in terms of pollution by smoke. Dust pollution could be a concern primarily during the construction phase of the proposed project. Dust control would be adequately minimised during this phase by way of water spraying and possible dust-nets, when working close to existing residential dwellings.

5.3 National Environmental Management Act (Act 107 of 1998)

The NEMA is primarily an enabling Act in that it provides for the development of environmental implementation plans and environmental management plans. The principles listed in the act serve as a general framework within which environmental management and implementation plans must be formulated.

The principles in essence state that environmental management must place people and their needs at the forefront of its concern and that development must be socially, environmentally and economically sustainable.

Impact on proposed Development:

Significant – The proposed filling station development is listed under the activities as regulated under NEMA.

5.4 The Municipal Systems Act (Act 32 of 2000)

This Act was introduced to provide for the core principles, mechanisms and processes that are necessary to enable municipalities to move progressively towards the social and economic upliftment of local communities, and ensure universal access to essential services that are affordable to all.

Impact on proposed Development:

Not Significant – The local municipality will provide the necessary services for the proposed development.

5.5 National Veld and Forest Fire Act, 1998 (Act No. 101, 1998)

The purpose of this Act is to prevent and combat veld, forest and mountain fires throughout the Republic. Furthermore the Act provides for a variety of institutions, methods and practices for achieving the prevention of fires.

Impact on proposed Development:

Significant – Fires of construction workers may only be lit in the designated site camp as indicated in assistance with the ECO. It is important that a site development camp be located on a part of the application site that is already disturbed. The camp should not be located in close proximity of natural veld grass areas or the drainage channel which connects to the surrounding open spaces in the direct vicinity.

5.6 National Environmental Management Act: Biodiversity Act (Act No. 10 of 2004)

The purpose of the Biodiversity Act is to provide for the management of South Africa's biodiversity within the Framework of the NEMA and the protection of species and ecosystems that warrant National protection. As part of the implementation strategy, the National Spatial Biodiversity Assessment was developed.

Impact on proposed Development:

Not significant – No red listed plant species were identified. The site is currently built up.

5.7 National Spatial Biodiversity assessment

The National Spatial Biodiversity Assessment (NSBA) classifies areas as worthy of protection based on its biophysical characteristics, which are ranked according to priority levels.

Impact on proposed Development:

Not significant – No red listed plant species were identified. The site is currently built up.

5.8 National Road Traffic Act, 1996 (Act No. 93 of 1996)

This Act provides for all road traffic matters which shall apply uniformly throughout the Republic and for matters connected therewith.

Not Significant – the proposed filling station development will comply with the National Road Traffic Act

5.9 Environmental Conservation Act: Noise Regulations, 1989 (Act no.73 of 1989)

The purpose of this Act is to provide measures and management relating Noise levels. This Act enables Noise levels to be acceptable to standards within a specific area and community.

Impact on proposed Development:

Significant – The proposed development may include some noisy activities.

6. Project activities

6.1 Pre-Construction Phase

Table 1: Impacts and Mitigation measures – Pre-construction Phase

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
General	Project contract	To make the EMPr enforceable under the general conditions of the contract.	The EMPr document must be included as part of the tender documentation for all contractor appointments	The EMPr is included as part of the tender documentation.	Developer	-
	Storm water design	To prevent and restrict erosion, siltation and groundwater pollution.	<p>1) A detailed Storm Water Management Plan must be approved by the Local Authority prior to commencement of construction activities. Must be implemented according to guidelines provided by the relevant Local Authority Departments.</p> <p>2) The storm water design for the proposed development must be designed to: Reduce and/ or prevent siltation, erosion and water pollution.</p> <p>3) Storm water runoff should not be concentrated as far as possible and sheet flow should be implemented.</p> <p>5) Energy dissipaters must be installed</p>	Compilation and approval of Storm water Management Plan.	Engineer Individual Developer	-

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>on the study area to break the speed of the water.</p> <p>6) Surface storm water generated as a result of the development must not be channeled directly into any natural drainage system or wetland.</p> <p>7) The Storm Water Management Plan should be designed in a way that aims to ensure that post development runoff does not exceed predevelopment values in:</p> <ul style="list-style-type: none"> - Peak discharge for any given storm; - Total volume of runoff for any given storm; - Frequency of runoff; and - Pollutant and debris concentrations reaching water courses. 			
			Stormwater management on site and around all fuel/oil bearing infrastructure should aim the fast and efficient disposal of water into the surrounding and existing drainage systems.	Compilation and approval of Storm Water Management Plan.	Engineer Individual Developer	
	Light pollution	To minimise light pollution	Street and security lighting must be designed in order not to spread light into the eyes of oncoming traffic on adjacent the N4 Platinum Highway.	Lightning effectively designed.	Architect	-

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			Internal streets and security lighting should also be designed not to disturb residents at night. Light beams must face downwards and not higher than a 45 degree angle from the ground.			
Climate	Extreme change in micro climate temperatures	To prevent the extreme change in micro climate temperatures.	Where open parking bays are involved, at least one indigenous tree for every two open parking bays shall be indicated on the Site Development Plan which shall be approved by the Local Authority and Design Review Committee, if any.	Landscape Development Plan complies	Landscape Architect	-
Fauna and flora	Floral biodiversity and ecological health	To ensure that the species introduced to the area, are compatible with the current and future quality of the ecological processes.	1) The Landscape Development Plan (LDP) for the proposed development shall be submitted to the local authority for approval. 2) The LDP should include all formal landscaping including proposed plant species, quantities, sizes and densities. At least 80% of the plant species on site should be indigenous or endemic species.	The Landscape Development Plan submitted to the local authority for approval.	Landscape Architect	-
Preparing Site Access	Environmental integrity	To avoid erosion and disturbance to	Designated routes shall be determined for the construction vehicles and designated areas for storage of equipment.	Access to site is erosion free. Minimum	Contractor	Continuous

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
		indigenous vegetation.	Clearly mark the site access point and routes on site to be used by construction vehicles and pedestrians. Provide an access map to all contractors whom in turn must provide copies to the construction workers. Instruct all drivers to use access point and determined route.	disturbance to surrounding vegetation. Vehicles make use of established access routes.		
	Waste storage	To control the temporary storage of waste.	Temporary waste storage points on site shall be determined. These storage points shall be accessible by waste removal trucks and these points should not be located in sensitive areas/areas highly visible from the properties of the surrounding land-owners/tenants/in areas where the wind direction will carry bad odours across the properties of adjacent tenants or landowners.		Contractor ESO	-
		Ensure waste storage area does not generate pollution.	Build a bund around waste storage area to stop overflow into storm water.		Contractor	-

6.2 Decommissioning Phase

Table 2: Impacts and Mitigation measures – Decommissioning Phase

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
Contractor's Camp	Loss of Vegetation and Topsoil.	To minimize damage to and loss of vegetation and retain quality of Topsoil.	1) Site to be established under supervision of ECO/ESO.	Minimal vegetation removed/damaged during site activities.	Contractor	Before any construction activity commences and as and when required
	Surface and ground water pollution.	To minimize pollution of surface and groundwater resources.	1) Sufficient and temporary facilities including ablution facilities must be provided for construction workers operating on the site. 2) A minimum of one chemical toilet shall be provided per 10 construction workers. The contractor shall keep the toilets in a clean, neat and hygienic condition. Toilets provided by the contractor must be easily accessible and a maximum of 50 m from the works area to ensure they are utilized. The contractor (who must use reputable toilet-servicing	Effluents managed Effectively. No pollution of water resources from site. Workforce use toilets provided.	Contractor ESO	As and when required

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>company) shall be responsible for the cleaning, maintenance and servicing of the toilets. The contractor (using reputable toilet-servicing company) shall ensure that all toilets are cleaned and emptied before the builders' or other public holidays.</p> <p>3) No person is allowed to use any other area than chemical toilets.</p> <p>5) No chemical or waste water must be allowed to contaminate the run-off on site. This could possibly contaminate the drainage channel.</p> <p>6) Avoid the clearing of the site camp (of specific phase) or paved surfaces with soap. This could drain into the drainage channel on site and contaminate to open space system in the area.</p>			
		To minimize pollution of surface and groundwater resources due to spilling of materials.	<p>1) Drip trays and/ or lined earth bunds must be provided under vehicles and equipment, to contain spills of hazardous materials such as fuel, oil and cement.</p> <p>2) Repair and storage of vehicles</p>	No pollution of the environment	Contractor ESO	Daily

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>only within the demarcated site area.</p> <p>3) Spill kits must be available on site.</p> <p>4) Oils and chemicals must be confined to specific secured areas within the site camp. These areas must be bunded with adequate containment (at least 1.5 times the volume of the fuel) for potential spills or leaks.</p> <p>5) All spilled hazardous substances must be contained in impermeable containers for removal to a licensed hazardous waste site.</p> <p>6) No leaking vehicle shall be allowed on site. The mechanic/ the mechanic of the appointed contractor must supply the environmental officer with a letter of confirmation that the vehicles and equipment are leak proof.</p> <p>7) No bins containing organic solvents such as paints and thinners shall be cleaned on site, unless containers for liquid waste disposal are placed for this purpose on site.</p>			

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
		To minimize pollution of surface and Groundwater resources due to effluent.	No effluent (including effluent from any storage areas) may be discharged into any water surface or ground water resource.	No evidence of contaminated water resources.	Contractor ESO	Daily
			Groundwater monitoring boreholes should be installed on the groundwater down side.	Groundwater monitoring boreholes installed	Engineer Contractor	
		To minimize pollution of surface and Groundwater resources due leaking equipment.	Leak detection facilities must be installed around the storage tanks and vapour samples must be taken according to a six monthly monitoring programme.	Leak detection facilities installed	Engineer Contractor	
		To prevent ingress of contaminated water into the ground.	All surface areas utilized for the proposed storage tanks and peripheral infrastructure must be appropriately paved.	Areas paved	Contractor	
		To prevent spillages.	All pipes and connections to the proposed tanks must be provided with flexible coupling.	Flexible couplings provided	Contractor	
		To prevent spillages.	All fuel dispensers must include a shut-off valve.	Shut-off valve in fuel	Developer Contractor	

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
				dispensers.		
	Pollution of the environment	To prevent unhygienic usage on the site and pollution of the natural assets.	<p>1) Weather proof waste bins must be provided and emptied regularly.</p> <p>2) The contractor shall provide laborers to clean up the contractor's camp and construction site on a daily basis.</p> <p>3) Temporary waste storage points on the site should be determined. THESE AREAS SHALL BE PREDETERMINED AND LOCATED IN AREAS THAT IS ALREADY DISTURBED. These storage points should be accessible by waste removal trucks and these points should be located in already disturbed areas /areas not highly visible from the properties of the surrounding land-owners/ in areas where the wind direction will not carry bad odours across the properties of adjacent landowners. This site should comply with the following:</p> <ul style="list-style-type: none"> • Skips for the containment and disposal of waste that could cause soil and water pollution, i.e. paint, 	<p>No waste bins overflowing</p> <p>No litter or building waste lying in or around the site.</p>	Contractor ESO	Daily Weekly

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			lubricants, etc.;; <ul style="list-style-type: none"> • Small lightweight waste items should be contained in skips with lids to prevent wind littering; • Bunded areas for containment and holding of dry building waste. 4) No solid waste may be disposed of on the site. 5) No waste materials shall at any stage be disposed of in the open veld of adjacent properties. 6) The storage of solid waste on the site, until such time as it may be disposed of, must be in a manner acceptable to the local authority and DWA. 7) Cover any wastes that are likely to wash away or contaminate storm water.			
		Recycle material where possible and correctly dispose of unusable wastes.	1) Waste shall be separated into recyclable and non-recyclable waste, and shall be separated as follows: <ul style="list-style-type: none"> • General waste: including (but not limited to) construction rubble, • Reusable construction 	Sufficient containers available on site No visible signs of pollution	Contractor ESO	Daily Weekly

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>material.</p> <p>2) Recyclable waste shall preferably be deposited in separate bins.</p> <p>3) All solid waste including excess spoil (soil, rock, rubble etc) must be removed to a permitted waste disposal site on a weekly basis.</p> <p>4) No bins containing organic solvents such as paints and thinners shall be cleaned on site, unless containers for liquid waste disposal are placed for this purpose on site.</p> <p>5) Keep records of waste reuse, recycling and disposal for future reference. Provide information to ESO.</p>			
	Fauna and Flora	To ensure protection of existing fauna and flora.	<ul style="list-style-type: none"> ▪ Dumping of builder's rubble and other waste in the areas earmarked for exclusion must be prevented through fencing or other management measures. These areas must be properly managed throughout the lifespan of the project in terms of fire, eradication of exotics, entrance of vehicles, etc. to ensure continuous 	Existing fauna and flora protected	Contractor ESO	Continuously

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>biodiversity. All alien species must be eradicated from the study area.</p> <p>The removal of Category 1 Declared invaders from the property is mandatory and Category 2 Declared invaders must be controlled in terms of the Conservation of Agricultural Resources Act, 1983 and Section 28 of NEMA, 1998.</p> <p>An invasive control plan should be implemented every 3 months after construction.</p>			
		To protect the existing fauna and flora.	<p>1) Snaring and hunting of fauna by construction workers on or adjacent to the study area are strictly prohibited and offenders shall be prosecuted.</p> <p>2) Where possible, work should be restricted to one area at a time.</p> <p>3) Noise should be kept to a minimum and the development should be done in phases to allow faunal species to temporarily migrate into the conservation areas in the vicinity.</p>	No measurable signs of habitat destruction.	Contractor ESO	As and when required

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			4) The integrity of remaining wildlife should be upheld, and no trapping or hunting by construction personnel should be allowed on clumps and natural grassland areas to be retained and incorporated within the proposed development formal landscaping, must be marked and demarcated before any commencement of construction activities.			
	Increased fire risk to site and surrounding areas.	To decrease fire risk.	1) Fires shall only be permitted in specifically designated areas and under controlled circumstances. 2) Food vendors shall be allowed within specified areas. 3) Fire extinguishers to be provided in all vehicles and fire beaters must be available on site. 4) Emergency numbers/ contact details must be available on site, where applicable.	No open fires on site that have been left unattended.	Contractor	Monitor daily
Construction site	Geology and soils	To prevent the damaging of the existing soils and geology.	1) The top layer of all areas to be excavated for the purposes of construction shall be stripped and stockpiled in areas where this material will not be damaged, removed or compacted.	Excavated materials correctly stockpiled No signs of	Contractor	Monitor daily

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			2) All surfaces that are susceptible to erosion, shall be protected either by cladding with biodegradable material or with the top layer of soil being seeded with grass seed/planted with a suitable groundcover.	erosion		
		To prevent the loss of topsoil To prevent siltation & water pollution.	1) Stockpiling will only be done in designated places where it will not interfere with the natural drainage paths of the environment. 2) In order to minimize erosion and siltation and disturbance to existing vegetation, it is recommended that stockpiling be done/ equipment is stored in already disturbed/exposed areas. 3) Cover stockpiles and surround downhill sides with a sediment fence to stop materials washing away. 4) Remove vegetation only in areas designated during the planning stage and for the purpose of construction. 5) Rehabilitation/ landscaping to be done immediately after the involved works are completed	Excavated materials correctly stockpiled No visible signs of erosion and sedimentation Minimal invasive weed growth Vegetation only removed in designated areas	Contractor of Developer	Monitor daily

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>(will prevent erosion of the topsoil layer on site).</p> <p>6) All compacted areas should be ripped prior to them being rehabilitated/landscaped by the contractor.</p> <p>7) The top layer of all areas to be excavated must be stripped and stockpiled in areas where this material will not be damaged, removed or compacted. This stockpiled material should be used for the rehabilitation of the site and for landscaping purposes.</p> <p>8) Strip topsoil at start of works and store in stockpiles no more than 1,5 m high in designated materials storage area.</p> <p>9) During the laying of any cables, pipelines or infrastructure (on or adjacent to the site) topsoil shall be kept aside to cover the disturbed areas immediately after such activities are completed. Rehabilitation of these areas shall be done directly after infill of the trenches. No rocks shall be placed on the topsoil after re-</p>			

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			filling.			
	Erosion and siltation	To prevent erosion and siltation.	1) Mark out the areas to be excavated. 2) Large exposed areas during the decommissioning phase should be limited. Where possible areas earmarked for construction during later phases should remain covered with vegetation coverage until the actual construction phase. This will prevent unnecessary erosion and siltation in these areas. 3) Unnecessary clearing of flora resulting in exposed soil prone to erosive conditions should be avoided. 4) The eradication of alien vegetation should be followed up as soon as possible by replacement with indigenous vegetation to ensure quick and sufficient coverage of exposed areas. 5) Storm water outlets shall be correctly designed to prevent any possible soil erosion. 9) All surface run-offs shall be managed in such a way so as to	No erosion scars. No loss of topsoil. All damaged areas successfully rehabilitated.	Contractor ESO	Monitor daily

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			ensure erosion of soil does not occur. 10) Implementation of temporary storm water management measures that will help to reduce the speed of surface water.			
		To minimise pollution of soil, surface and groundwater.	1) Increased run-off during decommissioning must be managed using berms and other suitable structures as required to ensure flow velocities are reduced. 2) The contractor shall ensure that excessive quantities of sand, silt and silted water do not enter the storm water system.	No visible signs of erosion. No visible signs of pollution.	Contractor	Monitor daily
		To minimise damage to environment during wet periods.	Construction workers and construction vehicles and machinery must stay out of the soggy areas during the wet periods. Barrier tape should be used to demarcate the areas that are drenched with water and it should only be removed when the appointed Environmental Control Officer (ECO)/ site supervisor/ project manager/ main contractor regard the conditions in the affected areas as		Contractor	

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			favourable.			
	Fauna and flora	To protect the existing fauna and flora.	1) All exotic invaders and weeds must be eradicated on a continuous basis.		Contractor ESO / Design Review Committee	As and when required Every 6 months
Social	Noise impact		<ul style="list-style-type: none"> • Site workers must comply with the Provincial noise requirements as outlined. • Construction site yards, workshops, concrete batching plants, and other noisy fixed facilities should be located well away from noise sensitive areas. Once the proposed final layouts are made available by the contractor(s), the sites must be evaluated in detail and specific measures designed in to the system. • All construction vehicles, plant and equipment are to be kept in good repair. • Truck traffic should be routed away from noise sensitive areas, where possible. • Noisy operations should be 	No complaints from surrounding residents and I & AP.	Contractor	Monitored daily

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>combined so that they occur where possible at the same time.</p> <ul style="list-style-type: none"> • Decommissioning activities are to be contained to reasonable hours during the day and early evening. Night-time activities near noise sensitive areas should not be allowed. No construction should be allowed on weekends from 14h00 on Saturday afternoons to 06h00 the following Monday morning. • With regard to unavoidable very noisy decommissioning activities in the vicinity of noise sensitive areas, the contractor should liaise with local residents on how best to minimise impact, and the local population should be kept informed of the nature and duration of intended activities. Very noisy activities will need to be screened off specifically for those in the office and 			

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>apartment buildings before the structures are cladded.</p> <ul style="list-style-type: none"> As construction workers operate in a very noisy environment, it must be ensured that their working conditions comply with the requirements of the Occupational Health and Safety Act (Act No 85 of 1993). Where necessary ear protection gear should be worn. 			
	Dust impact	Minimise dust from the site.	<p>1) Dust pollution could occur during the decommissioning works, especially during the dry months. Regular and effective damping down of working areas (especially during the dry and windy periods) must be carried out to avoid dust pollution that will have a negative impact on the surrounding environment.</p> <p>2) When necessary, these working areas should be damped down in the mornings and afternoons.</p>	<p>No visible signs of dust pollution.</p> <p>No complaints from surrounding residents and I & AP.</p>	Contractor ESO	Monitored daily
	Heritage	To ensure	If decommissioning takes place	Archaeological	Contractor	Continuously

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
	Sites	protection of possible heritage sites.	and any archaeological sites are exposed, it should immediately be reported to a museum, preferably one at which an archaeologist is available, so that an investigation and evaluation of the finds can be made.	site protected if occurs.	Developer ESO	
	Safety and security	To ensure the safety and security of the public.	<p>1) Although regarded as a normal practice, it is important to erect proper signs indicating the operations of heavy vehicles in the vicinity of dangerous crossings and access roads or even in the development site if necessary.</p> <p>2) With the exception of the appointed security personnel, no other workers, friend or relatives will be allowed to sleep on the construction site (weekends included).</p> <p>3) Construction vehicles and activities to avoid peak hour traffic times.</p> <p>4) Presence of law enforcement officials at strategic places must be ensured.</p> <p>5) Following actions would assist in management of safety along the road</p>	No incidences reported	Contractor ECO	Monitored daily

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<ul style="list-style-type: none"> ▪ Adequate road marking ▪ Adequate roadside recovery areas ▪ Allowance for pedestrians and cyclists where necessary. ▪ Although regarded as a normal practice, it is important to erect proper signs indicating the danger of the excavation in and around the development site. Putting temporary fencing around excavations where possible. 			
	Influx of people from other areas	In order to limit the influx of people from other areas.	It is recommended that (where possible) only people from the local communities in and around the application site are employed.	People from local community employed.	Contractor	When required
		Installation of services.	Determine areas where services will be affected. Discuss possible disruptions with affected parties to determine most convenient times for service disruptions and warn affected parties well in advance (48 hours before the disruption) of dates	No complaints from I & AP	Contractor ESO	When required

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			that service disruptions will take place.			
	Visual impact	In order to minimise the visual impact.	1) The disturbed areas shall be rehabilitated immediately after the involved construction works are completed. 2) Shade cloth must be used to conceal and minimise the visual impact of the site camps and storage areas.	Visual impacts minimized	Contractor ESO	Monitor daily
			Advertisements and/or sign boards shall not be erected or displayed on the property without the approval of the municipality and SANRAL first being obtained in terms of municipal by-laws for outdoor advertising.	Visual impacts minimized	Contractor Manager	

Mitigation measures – Decommissioning:

- A Decommissioning Plan must be prepared for the decommissioning phase, stipulating the necessary management and monitoring for the specific decommissioning activity.
- Abandoned or broken underground tanks must be removed by experienced contractors.
- The likelihood of contaminated soil around the tanks is often high and this must be correctly removed and disposed of.

- Groundwater is at risk from contamination by defunct tanks and it is advised that monitoring of the groundwater should be undertaken if large quantities of fuel have been lost.
- The forecourt underground area as well as the area surrounding the USTs will be bunded / encased with an impermeable material. With decommissioning, soil contamination will be restricted to these two contained areas.
- Careful removal and proper disposal of any petroleum products, USTs and pipework will be necessary to avoid unnecessary contamination. Any hazardous waste must be disposed of at a recognized hazardous waste disposal facility.
- With closure of the site, it is recommended that a **contamination assessment** be undertaken to determine if any contamination has taken place, which will indicate whether any rectification and site rehabilitation will be needed. Considering the design of the facility (underground encasings) it will possible to restrict the contamination assessment to the two described areas.
- Any other legislative requirements at the time of decommissioning should be complied with.

6.3 Construction Phase

Table 3: Impacts and Mitigation measures – Construction Phase

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
Contractor's Camp	Loss of Vegetation and topsoil	To minimize damage to and loss of vegetation and retain	1) Site to be established under supervision of ECO/ESO.	Minimal vegetation removed/damaged during site	Contractor	Before any construction activity commences and as and when

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
		quality of Topsoil.		activities.		required
	Surface and ground water pollution	To minimize pollution of surface and groundwater resources.	<p>1) Sufficient and temporary facilities including ablution facilities must be provided for construction workers operating on the site.</p> <p>2) A minimum of one chemical toilet shall be provided per 10 construction workers. The contractor shall keep the toilets in a clean, neat and hygienic condition. Toilets provided by the contractor must be easily accessible and a maximum of 50m from the works area to ensure they are utilized. The contractor (who must use reputable toilet-servicing company) shall be responsible for the cleaning, maintenance and servicing of the toilets. The contractor (using reputable toilet-servicing company) shall ensure that all toilets are cleaned and emptied before the builders' or other public holidays.</p> <p>3) No person is allowed to use any</p>	<p>Effluents managed Effectively.</p> <p>No pollution of water resources from site.</p> <p>Workforce use toilets provided.</p>	Contractor ESO	As and when required

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>other area than chemical toilets.</p> <p>4) No French drain systems may be installed.</p> <p>5) No chemical or waste water must be allowed to contaminate the run-off on site. This could possibly contaminate the drainage channel.</p> <p>6) Avoid the clearing of the site camp (of specific phase) or paved surfaces with soap. This could drain into the drainage channel on site and contaminate to open space system in the area.</p>			
		<p>To minimize pollution of surface and groundwater resources due to spilling of materials.</p>	<p>1) Drip trays and/ or lined earth bunds must be provided under vehicles and equipment, to contain spills of hazardous materials such as fuel, oil and cement.</p> <p>2) Repair and storage of vehicles only within the demarcated site area.</p> <p>3) Spill kits must be available on site.</p> <p>4) Oils and chemicals must be confined to specific secured areas within the site camp. These</p>	<p>No pollution of the environment</p>	<p>Contractor ESO</p>	<p>Daily</p>

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>areas must be bunded with adequate containment (at least 1.5 times the volume of the fuel) for potential spills or leaks.</p> <p>5) All spilled hazardous substances must be contained in impermeable containers for removal to a licensed hazardous waste site.</p> <p>6) No leaking vehicle shall be allowed on site. The mechanic/ the mechanic of the appointed contractor must supply the environmental officer with a letter of confirmation that the vehicles and equipment are leak proof.</p> <p>7) No bins containing organic solvents such as paints and thinners shall be cleaned on site, unless containers for liquid waste disposal are placed for this purpose on site.</p>			
		To minimize pollution of surface and groundwater resources by cement.	The mixing of concrete shall only be done at specifically selected sites, as close as possible to the entrance, on mortar boards or similar structures to prevent run-off into drainage line, streams and natural vegetation.	No evidence of contaminated soil on the construction site.	Contractor ESO	Daily

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
		To minimize pollution of surface and Groundwater resources due to effluent.	No effluent (including effluent from any storage areas) may be discharged into any water surface or ground water resource.	No evidence of contaminated water resources.	Contractor ESO	Daily
			Groundwater monitoring boreholes should be installed on the groundwater down side.	Groundwater monitoring boreholes installed	Engineer Contractor	
		To minimize pollution of surface and Groundwater resources due leaking equipment.	Leak detection facilities must be installed around the storage tanks and vapour samples must be taken according to a six monthly monitoring programme.	Leak detection facilities installed	Engineer Contractor	
		To prevent ingress of contaminated water into the ground.	All surface areas utilized for the proposed storage tanks and peripheral infrastructure must be appropriately paved.	Areas paved	Contractor	
		To prevent spillages.	All pipes and connections to the proposed tanks must be provided with flexible coupling.	Flexible couplings provided	Contractor	
		To prevent spillages.	All fuel dispensers must include a shut-off valve.	Shut-off valve in fuel dispensers.	Developer Contractor	

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
	Pollution of the environment	To prevent unhygienic usage on the site and pollution of the natural assets.	<p>1) Weather proof waste bins must be provided and emptied regularly.</p> <p>2) The contractor shall provide laborers to clean up the contractor's camp and construction site on a daily basis.</p> <p>3) Temporary waste storage points on the site should be determined. THESE AREAS SHALL BE PREDETERMINED AND LOCATED IN AREAS THAT IS ALREADY DISTURBED. These storage points should be accessible by waste removal trucks and these points should be located in already disturbed areas /areas not highly visible from the properties of the surrounding land-owners/ in areas where the wind direction will not carry bad odours across the properties of adjacent landowners. This site should comply with the following:</p> <ul style="list-style-type: none"> • Skips for the containment and disposal of waste that could cause soil and water pollution, i.e. paint, lubricants, etc.; 	<p>No waste bins overflowing</p> <p>No litter or building waste lying in or around the site.</p>	Contractor ESO	Daily Weekly

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<ul style="list-style-type: none"> • Small lightweight waste items should be contained in skips with lids to prevent wind littering; • Bunded areas for containment and holding of dry building waste. <p>4) No solid waste may be disposed of on the site. 5) No waste materials shall at any stage be disposed of in the open veld of adjacent properties. 6) The storage of solid waste on the site, until such time as it may be disposed of, must be in a manner acceptable to the local authority and DWA. 7) Cover any wastes that are likely to wash away or contaminate storm water.</p>			
		<p>Recycle material where possible and correctly dispose of unusable wastes.</p>	<p>1) Waste shall be separated into recyclable and non-recyclable waste, and shall be separated as follows:</p> <ul style="list-style-type: none"> • General waste: including (but not limited to) construction rubble, • Reusable construction material. 	<p>Sufficient containers available on site</p> <p>No visible signs of pollution</p>	<p>Contractor ESO</p>	<p>Daily Weekly</p>

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>2) Recyclable waste shall preferably be deposited in separate bins.</p> <p>3) All solid waste including excess spoil (soil, rock, rubble etc) must be removed to a permitted waste disposal site on a weekly basis.</p> <p>4) No bins containing organic solvents such as paints and thinners shall be cleaned on site, unless containers for liquid waste disposal are placed for this purpose on site.</p> <p>5) Keep records of waste reuse, recycling and disposal for future reference. Provide information to ESO.</p>			
	Fauna and Flora	To ensure protection of existing fauna and flora.	<ul style="list-style-type: none"> ▪ Dumping of builder's rubble and other waste in the areas earmarked for exclusion must be prevented through fencing or other management measures. These areas must be properly managed throughout the lifespan of the project in terms of fire, eradication of exotics, entrance of vehicles, etc. to ensure continuous biodiversity. All alien species 	Existing fauna and flora protected	Contractor ESO	Continuously

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>must be eradicated from the study area.</p> <p>The removal of Category 1 Declared invaders from the property is mandatory and Category 2 Declared invaders must be controlled in terms of the Conservation of Agricultural Resources Act, 1983 and Section 28 of NEMA, 1998.</p> <p>An invasive control plan should be implemented every 3 months after construction.</p>			
		To protect the existing fauna and flora.	<p>1) Snaring and hunting of fauna by construction workers on or adjacent to the study area are strictly prohibited and offenders shall be prosecuted.</p> <p>2) Where possible, work should be restricted to one area at a time.</p> <p>3) Noise should be kept to a minimum and the development should be done in phases to allow faunal species to temporarily migrate into the conservation areas in the vicinity.</p> <p>4) The integrity of remaining</p>	No measurable signs of habitat destruction.	Contractor ESO	As and when required

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			wildlife should be upheld, and no trapping or hunting by construction personnel should be allowed on clumps and natural grassland areas to be retained and incorporated within the proposed development formal landscaping, must be marked and demarcated before any commencement of construction activities.			
	Increased fire risk to site and surrounding areas	To decrease fire risk.	<ol style="list-style-type: none"> 1) Fires shall only be permitted in specifically designated areas and under controlled circumstances. 2) Food vendors shall be allowed within specified areas. 3) Fire extinguishers to be provided in all vehicles and fire beaters must be available on site. 4) Emergency numbers/ contact details must be available on site, where applicable. 	No open fires on site that have been left unattended.	Contractor	Monitor daily
Construction site	Geology and soils	To prevent the damaging of the existing soils and geology.	<ol style="list-style-type: none"> 1) The top layer of all areas to be excavated for the purposes of construction shall be stripped and stockpiled in areas where this material will not be damaged, removed or compacted. 2) All surfaces that are susceptible 	<p>Excavated materials correctly stockpiled</p> <p>No signs of erosion</p>	Contractor	Monitor daily

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			to erosion, shall be protected either by cladding with biodegradable material or with the top layer of soil being seeded with grass seed/planted with a suitable groundcover.			
		To prevent the loss of topsoil To prevent siltation & water pollution.	<p>1) Stockpiling will only be done in designated places where it will not interfere with the natural drainage paths of the environment.</p> <p>2) In order to minimize erosion and siltation and disturbance to existing vegetation, it is recommended that stockpiling be done/ equipment is stored in already disturbed/exposed areas.</p> <p>3) Cover stockpiles and surround downhill sides with a sediment fence to stop materials washing away.</p> <p>4) Remove vegetation only in areas designated during the planning stage and for the purpose of construction.</p> <p>5) Rehabilitation/ landscaping to be done immediately after the involved works are completed (will prevent erosion of the topsoil</p>	<p>Excavated materials correctly stockpiled</p> <p>No visible signs of erosion and sedimentation</p> <p>Minimal invasive weed growth</p> <p>Vegetation only removed in designated areas</p>	Contractor of Developer	Monitor daily

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>layer on site).</p> <p>6) All compacted areas should be ripped prior to them being rehabilitated/landscaped by the contractor.</p> <p>7) The top layer of all areas to be excavated must be stripped and stockpiled in areas where this material will not be damaged, removed or compacted. This stockpiled material should be used for the rehabilitation of the site and for landscaping purposes.</p> <p>8) Strip topsoil at start of works and store in stockpiles no more than 1,5 m high in designated materials storage area.</p> <p>9) During the laying of any cables, pipelines or infrastructure (on or adjacent to the site) topsoil shall be kept aside to cover the disturbed areas immediately after such activities are completed. Rehabilitation of these areas shall be done directly after infill of the trenches. No rocks shall be placed on the topsoil after re-filling.</p>			

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
		To ensure stability of structures.	<ul style="list-style-type: none"> • The foundation recommendations supplied by the involved Geotechnical Engineers must be implemented; ▪ All foundations excavations should be inspected by an experienced engineer prior to casting of concrete. 			
		To ensure safety during blasting activities (if required).	<ul style="list-style-type: none"> • Blasting may only be done by specialists in the field and should be limited to localised areas. • Surrounding land-owners of properties in close proximity of blasting exercises must be informed/ warned (at least one week in advance) of blasting exercises that will take place on the study area. • Warning signs to warn site workers and members of the public of blasting exercises must be erected at strategic points on the study area and the area 	Mitigation measures in place Surrounding residents notified	Contractor Engineers ESO	When required

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>where the blasting exercises will take place must be fenced off with barrier tape The necessary precautions must be in place when blasting takes place.</p> <ul style="list-style-type: none"> Surrounding residents must be notified of any blasting activities. 			
	Erosion and siltation	To prevent erosion and siltation.	<p>6) Mark out the areas to be excavated.</p> <p>7) Large exposed areas during the construction phases should be limited. Where possible areas earmarked for construction during later phases should remain covered with vegetation coverage until the actual construction phase. This will prevent unnecessary erosion and siltation in these areas.</p> <p>8) Unnecessary clearing of flora resulting in exposed soil prone to erosive conditions should be avoided.</p> <p>9) The eradication of alien vegetation should be followed up as soon as possible by</p>	<p>No erosion scars.</p> <p>No loss of topsoil.</p> <p>All damaged areas successfully rehabilitated.</p>	Contractor ESO	Monitor daily

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			replacement with indigenous vegetation to ensure quick and sufficient coverage of exposed areas. 10) Storm water outlets shall be correctly designed to prevent any possible soil erosion. 9) All surface run-offs shall be managed in such a way so as to ensure erosion of soil does not occur. 10) Implementation of temporary storm water management measures that will help to reduce the speed of surface water.			
		To minimise pollution of soil, surface and groundwater.	1) Increased run-off during construction must be managed using berms and other suitable structures as required to ensure flow velocities are reduced. 2) The contractor shall ensure that excessive quantities of sand, silt and silted water do not enter the storm water system.	No visible signs of erosion. No visible signs of pollution.	Contractor	Monitor daily
		To minimise damage to environment during wet periods.	Construction workers and construction vehicles and machinery must stay out of the soggy areas during the wet periods. Barrier tape should be		Contractor	

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			used to demarcate the areas that are drenched with water and it should only be removed when the appointed Environmental Control Officer (ECO)/ site supervisor/ project manager/ main contractor regard the conditions in the affected areas as favourable.			
	Fauna and flora	To protect the existing fauna and flora.	1) All exotic invaders and weeds must be eradicated on a continuous basis.		Contractor ESO / Design Review Committee	As and when required Every 6 months
Social	Noise impact		<ul style="list-style-type: none"> Site workers must comply with the Provincial noise requirements as outlined. Construction site yards, workshops, concrete batching plants, and other noisy fixed facilities should be located well away from noise sensitive areas. Once the proposed final layouts are made available by the contractor(s), the sites must be evaluated in detail and specific measures designed in to the system. 	No complaints from surrounding residents and I & AP	Contractor	Monitored daily

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<ul style="list-style-type: none"> • All construction vehicles, plant and equipment are to be kept in good repair. • Truck traffic should be routed away from noise sensitive areas, where possible. • Noisy operations should be combined so that they occur where possible at the same time. • Blasting operations (if required) are to be strictly controlled with regard to the size of explosive charge in order to minimise noise and air blast, and timings of explosions. The number of blasts per day should be limited, blasting should be undertaken at the same times each day and no blasting should be allowed at night. • Construction activities are to be contained to reasonable hours during the day and early evening. Night-time activities near noise sensitive 			

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>areas should not be allowed. No construction should be allowed on weekends from 14h00 on Saturday afternoons to 06h00 the following Monday morning.</p> <ul style="list-style-type: none"> • With regard to unavoidable very noisy construction activities in the vicinity of noise sensitive areas, the contractor should liaise with local residents on how best to minimise impact, and the local population should be kept informed of the nature and duration of intended activities. Very noisy activities will need to be screened off specifically for those in the office and apartment buildings before the structures are cladded. • As construction workers operate in a very noisy environment, it must be ensured that their working conditions comply with the requirements of the 			

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			Occupational Health and Safety Act (Act No 85 of 1993). Where necessary ear protection gear should be worn.			
	Dust impact	Minimise dust from the site.	1) Dust pollution could occur during the construction works, especially during the dry months. Regular and effective damping down of working areas (especially during the dry and windy periods) must be carried out to avoid dust pollution that will have a negative impact on the surrounding environment. 2) When necessary, these working areas should be damped down in the mornings and afternoons.	No visible signs of dust pollution. No complaints from surrounding residents and I & AP.	Contractor ESO	Monitored daily
	Heritage Sites	To ensure protection of possible heritage sites.	If construction takes place and any archaeological sites are exposed, it should immediately be reported to a museum, preferably one at which an archaeologist is available, so that an investigation and evaluation of the finds can be made.	Archaeological site protected if occurs.	Contractor Developer ESO	Continuously

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
	Safety and security	To ensure the safety and security of the public.	<p>1) Although regarded as a normal practice, it is important to erect proper signs indicating the operations of heavy vehicles in the vicinity of dangerous crossings and access roads or even in the development site if necessary.</p> <p>2) With the exception of the appointed security personnel, no other workers, friend or relatives will be allowed to sleep on the construction site (weekends included).</p> <p>3) Construction vehicles and activities to avoid peak hour traffic times.</p> <p>4) Presence of law enforcement officials at strategic places must be ensured.</p> <p>5) Following actions would assist in management of safety along the road</p> <ul style="list-style-type: none"> ▪ Adequate road marking ▪ Adequate roadside recovery areas ▪ Allowance for pedestrians and cyclists where necessary. ▪ Although regarded as a 	No incidences reported	Contractor ECO	Monitored daily

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			normal practice, it is important to erect proper signs indicating the danger of the excavation in and around the development site. Putting temporary fencing around excavations where possible.			
	Influx of people from other areas	In order to limit the influx of people from other areas.	It is recommended that (where possible) only people from the local communities in and around the application site are employed.	People from local community employed.	Contractor	When required
		Installation of services.	Determine areas where services will be upgraded and relocated well in advance. Discuss possible disruptions with affected parties to determine most convenient times for service disruptions and warn affected parties well in advance (48 hours before the disruption) of dates that service disruptions will take place.	No complaints from I & AP	Contractor ESO	When required
	Visual impact	In order to minimise the visual impact.	1) The disturbed areas shall be rehabilitated immediately after the involved construction works are completed.	Visual impacts minimized	Contractor ESO	Monitor daily

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			2) Shade cloth must be used to conceal and minimise the visual impact of the site camps and storage areas.			
			Advertisements and/or sign boards shall not be erected or displayed on the property without the approval of the municipality and SANRAL first being obtained in terms of municipal by-laws for outdoor advertising.	Visual impacts minimized	Contractor Manager	
	Vegetation	Landscaping	<p>1) When planting trees, care should be taken to avoid the incorrect positioning of trees and other plants, to prevent the roots of trees planted in close proximity to the line of water-bearing services from causing leaking in, or malfunctioning of the services.</p> <p>2) The proposed planting materials for the areas to be landscaped should preferably be endemic and indigenous.</p> <p>3) All new trees and shrubs to be planted on the study area shall be inspected for pests and diseases prior to them being planted.</p>	Landscaping done according to Landscape Development Plan	Landscape architect Contractor	When required

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>4) The inspection shall be carried out by the maintenance contractor at the property of the supplier and not on the study area.</p> <p>5) All trees to be planted shall be in 20L containers with a height of approximately 1,8 metres and a main stem diameter of approximately 300 mm.</p>			
		Loss of plants	<p>1) Aerate compacted soil and check and correct pH for soils affected by construction activities.</p> <p>2) Make sure plant material will be matured enough and hardened off ready for planting. Water in plants immediately as planting proceeds.</p> <p>3) Apply mulch to conserve moisture</p> <p>4) Plant according to the layout and planting techniques specified by the Landscape Architect in the Landscape Development plans for the site.</p>	Landscaping done according to Landscape Development Plan	Landscape architect Contractor	When required
		Spread of weeds	Ensure that materials used for mulching and topsoil/ fertilisers	Weed growth controlled	Landscape architect	When required

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			are certified weed free. Collect certifications where available. Control weed growth that appears during construction.		Contractor	
		To ensure rehabilitation of the site.	1) Compacted soils shall be ripped at least 200mm. 2) All clumps and rocks larger than 30mm diameter shall be removed from the soil to be rehabilitated. 3) The soil shall be leveled before seeding. 4) Hydro-seed the soil with Potch mixture or plant with suitable indigenous ground covering as specified). 5) Watering shall take place at least once per day for the first 14 days until germination of seeds have taken place. 6) Thereafter watering should take place at least for 20 minutes every 4 days until grass have hardened off.	Grass have hardened off	Landscape architect Contractor	Once a day Then every 4 days

6.4 Operational Phase

Table 4: Impacts and Mitigation measures – Operational Phase

TYPE	Environment al risk or issue	Objective or requirement	Mitigation measure	Responsibil ity	Frequency of Action
SITE CLEAN UP AND PREPARED FOR USE	Storm water pollution	Do not allow any materials to wash into the storm water system.	Remove erosion and sediment controls only if all bare soil is sealed, covered or re-vegetated. Sweep roadways clean and remove all debris from kerb and gutter areas. Do not wash into drains.	Contractor	-
		Minimise waste	Decontaminate and collect waste in storage area ready for off-site recycling or disposal. Arrange for final collection and removal of excess and waste materials.	Contractor	-
ESTABLISHIN G PLANTS	Slow or no re- vegetation to stabilise soil; loss or degradation of habitat	To ensure re-vegetation to stabilize soil.	Agreed schedule for regular follow-up watering, weed control, mulch supplements and amenity pruning, if needed. Replace all plant failures within three month period after planting.	Contractor	To be agreed
MATERIALS FAILURE	Structural damage. Loss of site materials.		Inspect all structures monthly to detect any cracking or structural problems. Confirm with designer if there are design problems. Rectify with materials to match, or other agreed solution.	Contractor	-
DRAINAGE FAILURE	On-site and downstream drainage pollution or	Storm Water Management Plan	Inspect all site drainage works and repair any failures. Confer with design engineer and to correct site problems.	Contractor	-

TYPE	Environment al risk or issue	Objective or requirement	Mitigation measure	Responsibil ity	Frequency of Action
	flooding				
SITE AUDIT	Eventual project failure	Successful project establishment.	Routinely audit the works and adjust maintenance schedule accordingly.	Contractor	-
GENERAL			Open fires and smoking during maintenance works are strictly prohibited.	Contractor	-
GEOLOGY	Erosion of topsoil	Prevent topsoil erosion.	Due to loose topsoil, the soil must be covered by means of re-seeding and vegetation with suitable ground covering.	Engineer / Contractor /	Once off
		To ensure effective stormwater management.	<ul style="list-style-type: none"> Stormwater throughout the site should be managed to accommodate the higher quantities of run off; Sheet flow should be encouraged as far as possible, and channels should be designed to sufficiently address the problem of erosion; and Bio-swale system could be implemented to filter water from paved areas and especially from roads and parking areas to sufficiently clean water of heavy metals and other hazardous materials in stormwater on a natural manner. This will further provide an opportunity for water to infiltrate the soil, break the energy of stormwater and keep the water on site for longer. 	Owner / Manager	
	Fauna and Flora	To ensure protection of	An invasive control plan should be implemented every 3 months after	Owner/ Manager	Every 3 months

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Responsibility	Frequency of Action
		existing fauna and flora.	construction.		
		Visual impact	Advertisements and/or sign boards shall not be erected or displayed on the property without the approval of the municipality and SANRAL first being obtained in terms of municipal by-laws for outdoor advertising.		
Social	Job opportunities	To limit influx of people and ensure job opportunities for local community.	In order to limit the influx of people from other areas, it is recommended that 70 – 80 % of job opportunities be offered to the local communities in and around Kwa Guqa.		
	Noise		<ul style="list-style-type: none"> • In general the design process of the new Development is to consider, <i>inter alia</i>, the following aspects: <ol style="list-style-type: none"> a) The position and orientation of buildings on the site. b) The enclosure of noisy plant activities in buildings where possible and practical. c) The design of the buildings to minimise the transmission of noise from the inside to the outdoors. d) The insulation of particularly noisy plant and equipment. • Buildings should be placed and orientated in such a manner that, as far as is 		

TYPE	Environment al risk or issue	Objective or requirement	Mitigation measure	Responsibil ity	Frequency of Action
			<p>practicable, noise sensitive areas are shielded from and/or that noise is not channelled towards these areas.</p> <ul style="list-style-type: none"> • Where possible, certain component buildings planned for the Development should be used as noise barriers. • The design, placement and orientation of the extractor fans for the ventilation of the buildings must take the noise impact aspect into consideration. Equipment with the best noise rating should be used. Roof mounted fans may further require attenuators and need to be screened from noise sensitive areas. • High quality air-conditioning equipment should be installed. Equipment with the best noise rating should be used. • Where required, high quality refrigeration compressors should be installed. Equipment with the best noise rating should be used. Outside building installation should be acoustically encapsulated. • All mechanical equipment is to be well maintained. • Music sound emission levels from speakers planned in the Place of Refreshment facility of the proposed development are to be maintained at reasonable levels. The setting of the levels and quality of sound is 		

TYPE	Environment al risk or issue	Objective or requirement	Mitigation measure	Responsibil ity	Frequency of Action
			<p>subject to the design and size of the room/space involved and needs to be established when the design of the proposed development is finalised.(only if applicable).</p> <ul style="list-style-type: none"> The delivery times for trucks should be limited to the hours of between 07h00 and 20h00 on weekdays and between 08h00 and 14h00 on Saturdays (only if applicable). 		
	<p>Safety Water pollution</p>	<p>To ensure safety and minimise water pollution.</p>	<p>An Emergency Plan must be implemented:</p> <p><u>Insert the site plan showing the following:</u></p> <ul style="list-style-type: none"> - All petroleum pump and tank positions with product identification - All petroleum filler points and vents - Position of tanker during petroleum deliveries showing nearest drain(s) down slope of activity - Position of LPG cylinder delivery vehicle when offloading cylinders - All LPG installations and storage facilities - Position and type of fire fighting equipment - Position of emergency stop - Location of sand buckets/container - Evacuation routes - Safe assembly area 		

TYPE	Environment al risk or issue	Objective or requirement	Mitigation measure	Responsibil ity	Frequency of Action
			<ul style="list-style-type: none"> • Emergency Telephone Numbers • Fire <u>Guide – Fire (forecourt)</u> <ul style="list-style-type: none"> - Stop all refuelling - Activate the emergency shut-off switch - Notify site manager or supervisor - Manager/supervisor to alert the fire emergency services - Evacuate the forecourt & building of customers & staff to the safe assembly area - Attempt to extinguish the fire using the dry chemical powder fire extinguishers if it's safe to do so - Prevent access to forecourt by closing driveways - If required, manager to appoint staff member to notify adjacent property owners - Clear vehicles from the forecourt if it's safe to do so - If at night, leave the canopy lights on - Assist the fire emergency services when they arrive - Manager/Supervisor to notify the Engen Customer Service Centre 		

TYPE	Environment al risk or issue	Objective or requirement	Mitigation measure	Responsibil ity	Frequency of Action
			<p><u>Guide – Fire (building general)</u></p> <ul style="list-style-type: none"> - Stop all refuelling - Activate the emergency shut-off switch - Notify site manager or supervisor - Manager/supervisor to alert the fire emergency services - Attempt to extinguish the fire using fire extinguishers or hose reel if it's safe to do so - Isolate electrical supply at the distribution board to all equipment in the immediate area - Evacuate the building of customers & staff to the safe assembly area - Close all doors and windows in the immediate vicinity of the fire - Alert the fire emergency services if the fire is too large to handle - If necessary, clear vehicles from the forecourt if it's safe to do so - Assist the fire emergency services when they arrive <p>• <u>Petroleum Spill</u></p> <p><u>Guide – Minor spill (less than 35 litres)</u></p> <ul style="list-style-type: none"> - Switch off pumps either at the distribution board or the emergency stop button depending on the product & the quantity - Ensure that customers whose vehicles are 		

TYPE	Environment al risk or issue	Objective or requirement	Mitigation measure	Responsibil ity	Frequency of Action
			<p>in the vicinity of the spill do not start their vehicles</p> <ul style="list-style-type: none"> - Eliminate any source of ignition in the immediate area - Keep customers away from the area - Contain the spill by throwing sand around the product to create a barrier to prevent movement towards drains. Do not hose the fuel off the forecourt & down any drain - If persons have been splashed with fuel, spray water onto them & then remove clothing - Apply spill adsorbent material to the spill to recover product - Place the saturated adsorbent & any soil that may have been contaminated into an empty container such as a drum - Notify the Customer Service Centre <p><u>Guide – Major spill (more than 35 litres)</u></p> <ul style="list-style-type: none"> - Switch off all pumps on the forecourt using the emergency stop button or trip the mains switch (especially if a large spill of petrol is involved or flowing towards the building with a lot of vapours in the air). If at night leave the canopy lights on. - Try to stop the flow of product by closing valves on the installation or by assisting the tanker driver to close the outlet valve on 		

TYPE	Environment al risk or issue	Objective or requirement	Mitigation measure	Responsibil ity	Frequency of Action
			<p>his trailer</p> <ul style="list-style-type: none"> - Notify the fire emergency services & the traffic department - Evacuate all persons from the forecourt as well as the buildings to the safe assembly area - No vehicles may be allowed to enter or leave the site. - Prevent customers from starting their vehicles - Stop all workshop activities - Eliminate all sources of ignition in the immediate area - Try to contain the spill by using sand or create barriers around drains that are down slope of the spill. Use neoprene gloves for protection - Place fire extinguishers so that they may be accessible in the event the spill catches fire - Assist emergency services personnel as may be required - Notify the authorities such as municipal water pollution officers, Department of Water and Sanitation or local water catchment management agencies as appropriate <p>• LPG</p>		

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Responsibility	Frequency of Action
			<p>Guide – LPG leak</p> <ul style="list-style-type: none"> - Evacuate persons to a safe area upwind of the immediate area - Isolate all electrics in the vicinity of the leak taking into account wind direction & possible vapour cloud drift - Eliminate all sources of ignition in the immediate area - Contact the fire emergency services - If the source of the leak has been identified as a cylinder valve, try to turn off the valve or carry it to a safe, well-ventilated outdoor location. Wear gloves as PPE when doing this so as to prevent freeze burns - Using the fire hose, water spray the leak to disperse the gas until no more vapour is escaping - If the source of the leak is at the filling installation, contact the supplier immediately - Report any incident classified as reportable (section 24, OHS Act) to the statutory authority <p>Guide – LPG fire</p> <ul style="list-style-type: none"> - Evacuate persons to a safe area upwind of the immediate area - Isolate all electricity in the vicinity 		

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Responsibility	Frequency of Action
			<ul style="list-style-type: none"> - In the case of a valve fire, only extinguish fire using a dry chemical powder fire extinguisher if the valve can be closed (take care as valve may be hot) - Contact the fire emergency services - Cool all cylinders that the fire could affect if the initial fire cannot be extinguished. - Await assistance from the fire emergency services <p>• Serious Injury</p> <p>Guide – Injured persons</p> <ul style="list-style-type: none"> - Move the injured only if they are in danger of further injury - Switch off any equipment/machinery that caused the injury - First Aider to render assistance and stabilise injured - Contact the medical services for assistance if required - Report any injury classified as reportable (section 24, OHS Act) or fatality to the statutory authority <p>• Robbery</p> <p>Guide – Robbery</p> <ul style="list-style-type: none"> - Remain calm 		

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Responsibility	Frequency of Action
			<ul style="list-style-type: none"> - Obey instructions and co-operate with assailants - Activate the security alarm (silent) - Lock the doors so that the assailants cannot return - Contact the SA Police Services, Murder & Robbery Unit - Write down any details of the assailant, mode & direction of travel - Keep witnesses on the premises or obtain their contact details 		
		To prevent water pollution.	A Spill response kit comprising of absorbent fibres and associated waste containers should be available on site. All materials for clearing of surface spillages should be stored in a container and moved on a regular basis by an approved contractor to a hazardous waste disposal site.		
		To prevent water pollution.	All surface areas utilized for the proposed storage tanks and peripheral infrastructure must be appropriately paved to prevent ingress of contaminated water into the ground.	Contractor Manager	
		To prevent water pollution	A complete waste handling and separation procedure for the operational phase should be implemented due to the handling, storing and disposal of hazardous chemicals. An oil/water separator should be installed on site, which will allow for the processing and separation of	Contractor Manager	

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Responsibility	Frequency of Action
			insoluble fuel hydrocarbons and the storm and wash down water of the current dispensing area. Only processed water will be allowed and directed to the local sewage system. Under no circumstances may processed water be directed to the stormwater system.		
		To prevent pollution and ensure safety.	All fuel dispensers must include a shut-off valve. All materials and installations shall comply with the relevant standards and regulations as imposed by the South African Bureau of Standards (SABS) and the Occupational Health and Safety Act (Act 85 of 1993).	Contractor Manager	

7. Procedures for environmental incidents

7.1 Leakages & spills

- Identify source of problem.
- Stop goods leaking, if safe to do so.
- Contain spilt material, using spills kit or sand.
- Notify Environmental Control Officer.
- Remove spilt material and place in sealed container for disposal (if possible).
- Environmental Control Officer to follow Incident Management Plan.

7.2 Failure of erosion/sediment control devices

- Prevent further escape of sediment.
- Contain escaped material using silt fence, hay bales, pipes, etc.
- Notify ECO.
- Repair or replace failed device as appropriate.
- Dig/scrape up escaped material; take care not to damage vegetation.
- Remove escaped material from site.
- ECO to follow Incident Management Plan.
- Monitor for effectiveness until re-establishment.

7.3 Bank/slope failure

- Stabilize toe of slope to prevent sediment escape using aggregate bags, silt fence, logs, hay bales, pipes, etc.
- Notify ECO.
- ECO to follow Incident Management Plan.
- Divert water upslope from failed fence.
- Protect area from further collapse as appropriate.
- Restore as advised by ECO.
- Monitor for effectiveness until stabilized.

7.4 Discovery of rare or endangered species

- Stop work.
- Notify ECO.
- If a plant is found, mark location of plants.
- If an animal, mark location where sighted.
- ECO to identify or arrange for identification of species and or the relocation of the species if possible.
- If confirmed significant, ECO to liaise with Endangered Wildlife Trust.
- Recommence work when cleared by ECO.

7.5 Discovery of archeological or heritage items

- Stop work.
- Do not further disturb the area.
- Notify ECO.
- ECO to arrange appraisal of specimen.
- If confirmed significant, ECO to liaise with National, Cultural and History Museum.
- Recommence work when cleared by ECO.

8 EMPr review

The Site supervisor is responsible for ensuring the work crew is complying with procedures, and for informing the work crew of any changes. The site supervisor is responsible for ensuring the work crew is aware of changes that may have been implemented by MDAEDLEA before starting any works.

If the contractor cannot comply with any of the activities as described above, they should inform the ECO with reasons within 7 working days.