ENVIRONMENTAL CONSULTING

Royale Energy (Pty) Ltd

LIFECYCLE ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE PROPOSED ESTABLISHMENT OF A FUEL SERVICE STATION ON ERVEN 1685 & 1729, KRIEL, MPUMALANGA PROVINCE

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SEC REFERENCE NUMBER: 0170416

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IMPORTANT NOTE: ALL READERS TO PLEASE FAMILIARISE THEMSELVES WITH THE RELEVANT TERMINOLOGY CONTAINED IN THE GLOSSARY (APPENDIX A) PRIOR TO READING THIS DOCUMENT.

1. INTRODUCTION

1.1 Details of Environmental Assessment Practitioner and Project Description

This report was prepared by Jako Schonken and reviewed by Adrian Sillito. Adrian Sillito is a certified environmental assessment practitioner (CEAPSA), Professional Natural Scientist (Pr.Sci.Nat.) and a member of the International Association for Impact Assessment (IAIA). Adrian has twenty years' experience in the field of environmental management and impact assessment. Jako has an Environmental Management degree from CPUT and four years' experience in environmental management and impact assessment.

SEC has extensive experience in environmental assessment procedures and has completed several thousand environmental projects in most provinces of South Africa since 1998. This EMPr is also guided by cradle-to-grave knowledge of related activities from EIA through to construction phase and Environmental Control Officer experience.

The applicant, Royale Energy (Pty) Ltd, hereafter referred to as the Client, proposes to develop a service station on erven 1685 & 1729, Kriel, Mpumalanga Province, the location of which is presented in Figure 1 below;

Figure 1: Site locality plan

Image courtesy of Google Earth, 2016

The proposed development comprises of the following infrastructure:

- Four 30m^3 capacity underground storage tanks (UST's) for the storage of Diesel and Unleaded Petrol
- Five pump dispensers
- Fuel tank filler points
- Separator system (for surface runoff)
- Associated underground fuel and filler lines
- A forecourt canopy covering the forecourt area
- Convenience store

- ATM's

The current development proposal for which environmental authorisation is being sought is for the development of a service station with a development footprint of approximately 708 m^2 of the total property size of 9272 m² for Erf 1685 and 26 783 m² for Erf 1729, Kriel. Erf 1685 is in the process of being rezoned from Institutional to Business 1. Erf 1729 is zoned as Open Space and the Landowner is in the process of negotiation with the Municipality to acquire it.

The development is subject to the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014. As amended and as such is further subject to an Environmental Application process to the relevant authority. The Department of Agriculture, Rural Development, Land and Environmental Affairs ("DARDLEA") is the mandated authority that will ultimately make a decision on this application.

One of the requirements of the Basic Assessment process is that an Environmental Management Programme (EMP) that complies with the NEMA EIA Regulations is produced. This EMPr must address the environmental impacts associated with the decommissioning phase of the facility.

The EMPr should also adhere to the local authority by-law requirements as well as any other obligatory environmental and other legal requirements. These are detailed in Section 2 of this EMPr.

This EMPr is a practical and achievable programme to ensure that environmental risks and opportunities (i.e. opportunities to provide environmentally friendly alternatives) are identified and addressed during the decommissioning phase of the project life cycle.

Changes to this Environmental Management Programme can only occur with the written approval of the DARDLEA and an updated version should also be forwarded to all parties once the amended EMP has been approved by the DARDLEA.

It is understood that the client or any future development entity (where transfer of ownership occurs) will be fully responsible for this EMPr and its requirements including any environmental rehabilitation that may be needed. This is required in terms of Section 28 (Duty of Care and Remediation of Damage) of the National Environmental Management Act, (Act No. 107 of 1998), as amended.

1.2 Structure of this EMPr

Section 1 provides an introduction to the project.

Section 2 deals with the terms of reference for this EMPr as well as identifies environmental risks and opportunities.

Section 3 documents the environmental objectives, targets and measures for each environmental risk identified.

Section 4 deals with the implementation of the EMPr including the assignment of roles and responsibilities, visits by the ECO, documented procedures and handling of complaints related to the project.

Appendix A contains the Glossary.

Appendix B contains the generic Method Statement.

Appendix C contains relevant permits (outside of this NEMA application process) applicable to the proposed development.

Appendix D contains copies of diagrams required for reference in order to implement some of the recommended measures.

Appendix E contains a detailed copy of the recommended Roles and Responsibilities of the Environmental Control Officer (ECO).

2. TERMS OF REFERENCE

This EMPr was designed and produced in accordance with the National Environmental Management Act, Act No. 107 of 1998, as amended, and the Environmental Impact Assessment Regulations, 2014, as amended. This EMPr also includes the best practice provisions recommended in Section 3 the New South Wales (Australia) Environmental Management System Guidelines (2009) which are recognized as International Best Practice and based on the ISO 14001 system, as well as any applicable statutory environmental requirements

2.1. Environmental Impact Assessments

The proposed service station development is subject to a Basic Assessment Process in terms of the NEMA Environmental Impact Assessment Regulations (2014), as amended. This Lifecycle Environmental Programme (“EMP”) is an addendum to the Basic Assessment Report and is in compliance with the requirements of the Department of Agriculture, Rural Development, Land and Environmental Affairs (“DARDLEA”) and Appendix 4 of GN No. R. 326 of the NEMA EIA Regulations (2014), as amended.

2.2. Development Consent Conditions

Please refer to Appendix C. The relevant project team members are to populate this appendix with the applicable development approvals, including but not limited to (where appropriate): working hours, hoarding, lane closures, discharge permits, etc.

2.3. Statutory Obligations

The applicant should incorporate the following statutory requirements as part of any contract documentation related to the construction, operation and decommissioning (if required) of the proposed development:

- The National Environmental Management Act, Act 107 of 1998, as amended (NEMA).
- National Environmental Management: Biodiversity Act, Act 10 of 2004, as amended.
- National Water Act, Act 36 of 1998, as amended.
- National Heritage Resources Act, Act 25 of 1999, as amended.
- National Environmental Management Waste Act, Act 59 of 2008
- All relevant by laws of the Municipality
- Relevant SANS codes
- ISO 14001 Environmental Management System (EMS)
- National Building Regulations and Building Standards Act, 1977 (Act no. 107 of 1977)
- Any other relevant guidelines, permit requirements and/or legislation

2.4. Contract Obligations

It is understood that all contract documentation related to the construction, operation and decommissioning (if required) of the proposed activity will include the conditions of this EMPr. It is important to note that the contract obligations must include the recording of any complaints on the project in the environmental register (defined below). Further, it is incumbent on the ECO to keep an accurate audit trail showing compliance with the EMPr during the construction phase.

2.5. Environmental Risks

The following environmental risks have been identified based on the available information:

POTENTIAL IMPACT	EMPR REFERENCE
DESIGN	
Stormwater	Refer to Section 3.1
Soil and Ground Water Contamination	Refer to Section 3.1
Atmospheric Emissions	Refer to Section 3.1
Solid and Hazardous Waste Management	Refer to Section 3.1
PRE-CONSTRUCTION	
Bulk Services Identification	Refer to Section 3.2
Permits	Refer to Section 3.2
Site Boundaries	Refer to Section 3.2
“No-Go” Areas	Refer to Section 3.2
Training	Refer to Section 3.2
Site Layout	Refer to Section 3.2
Working Hours	Refer to Section 3.2
CONSTRUCTION PHASE	
Social Considerations	Refer to Section 3.3
Appropriate Machinery	Refer to Section 3.3
Construction Materials	Refer to Section 3.3
Waste Management	Refer to Section 3.3
Storm water	Refer to Section 3.3
Fire Safety	Refer to Section 3.3
Safety and First Aid	Refer to Section 3.3
Air Quality	Refer to Section 3.3
Water Quality	Refer to Section 3.3
Noise and Vibration	Refer to Section 3.3
Blasting/Drilling/Demolitions	Refer to Section 3.3
Light Pollution	Refer to Section 3.3
Traffic Control	Refer to Section 3.3
Visual	Refer to Section 3.3
POST CONSTRUCTION	
Final Site Clearance	Refer to Section 3.4
Rehabilitation	Refer to Section 3.4
OPERATIONAL PHASE	
Stormwater	Refer to Section 3.5
Waste Management	Refer to Section 3.5
Water Use Management	Refer to Section 3.5

POTENTIAL IMPACT	EMPR REFERENCE
Energy Management	Refer to Section 3.5
Emergency Management	Refer to Section 3.5
Vapour Emissions	Refer to Section 3.5
Soil and Ground Water Contamination	Refer to Section 3.5
Noise and Vibration	Refer to Section 3.5
DECOMMISSIONING PHASE	
Waste Management	Refer to Section 3.6
Noise Pollution	Refer to Section 3.6
Site Clearance	Refer to Section 3.6
Blasting/Drilling/Demolitions	Refer to Section 3.6
Air Quality	Refer to Section 3.6
Social Considerations	Refer to Section 3.6
Traffic Control	Refer to Section 3.6

2.6. Environmental Opportunities

It would be responsible of the applicant to implement the principles below to minimise environmental risks and maximise environmental opportunities as defined above.

Sustainable development can be summarised by an extract from the United Nations World Commission on Environment and Development and reads as follows:

"*Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs… As such it requires the promotion of values that encourage consumption standards that are within the bounds of the ecologically possible and to which all could reasonably aspire.*" (Our Common Future, WCED, 1987)[1].

The NEMA Principles state that sustainable development requires the consideration of all relevant factors including the following:

- *That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;*
- *that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;*
- *that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;*
- *that waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner;*
- *that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;*
- *that the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised;*
- *that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and*

- *that negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.*

In this regard, **sustainable alternatives for each aspect of the proposed development** that are technologically and environmentally superior to "standard" alternatives should be promoted at all times which will assist in meeting compliance with the above Principles. All recommendations relating to the above and as contained in this EMPr should therefore be implemented. These recommendations have been made by the various specialists consulted during the course of the EIA process, as well as by the EAP based on specialist knowledge of fuel storage activities and general environmental management during the course of construction phase activities.

3. ENVIRONMENTAL OBJECTIVES, TARGETS AND MEASURES

3.1. DESIGN PHASE IMPACTS

a) **Stormwater Runoff**

Objectives: To improve the quality and reduce the quantity of stormwater runoff on and off site at the design phase.

Targets: To comply with the Stormwater Specialist's findings and recommendations.

Measures:

- The removal of 40% of the average annual post-development total suspended solids by means of installing a Gravity (Oil/Grit) Seperator. This will be designed to remove suspended solids, oil, grease, debris and floatables from the stormwater runoff through gravitational settling and trapping of pollutants.
- Removal of gross litter by means of screening at entrances to underground conveyance systems
- Design of the site works shall ensure that the flow path is either in open concrete channels around the building footprint or in an underground gully inlet and pipe system which is connected to the Gravity Separator, prior to the stormwater being discharged into the external stormwater system
- Inlets to piped systems shall be fitted with a screen, or grating to prevent debris and refuse from entering the stormwater system. This should be done immediately upon installation of the piped system
- Rainwater runoff must be connected to infiltration galleries to trenches designed to maximise groundwater recharge
- Surplus runoff must be able to drain towards underground pipe systems
- All debris must be trapped on screens/gratings before entering the development's stormwater system
- The principle of overland flow should apply to the parking and forecourt areas where possible and should be designed and graded to avoid concentration of flow along and off the surface
- Where flow concentration is unavoidable, measures such as open concrete channels shall be incorporated, which should channel the stormwater to grid inlets and which in turn should discharge in the water quality volume through the Gravity Separator.

b) **Soil and Ground Water Contamination**

Objectives: To prevent the degradation of soil ecosystems and fresh water ecosystems (ground water and surface water), as well as health and safety risks for human receptors in the vicinity of a spill or leak at the site.

Targets: To comply with the Environmental Assessment Practitioner's recommendations (based on specialist knowledge) and with oil industry best-practice standards.

Timeframes: The measures as listed below must be incorporated into the design and the design finalised prior to commencement of construction.

Measures:

- A forecourt canopy for the fuel dispensing areas must be erected in order to prevent rain from falling directly onto the forecourt area. Surface runoff will therefore comprise wash water and minor spillages associated with dispensing operations.
- The forecourt beneath the canopy area must be sloped to a series of catch pits linked to the site separator system.
- Rainwater from the roof of the canopy will discharge into the storm water system.
- The facility must be designed in such a way as to ensure that no overland flow will be possible onto the fuel dispensing areas from adjacent property.
- All dispenser pumps must be located on pump islands surrounded by hardened surfaces, which will prevent downward migration of any free product and promote horizontal flow into the catch pits linked to the separator system.
- The filler points will be located inside containment manholes, which are surrounded by concrete hard standing. The containment manholes will contain any spillages from flexible fuel delivery pipe disconnection. The surface around the tank filler points must be sloped towards a catch pit linked to the separator so that any runoff or spillage from this area is contained within the separator system.
- Shear-off valves must be anchored below fuel dispensers, so that no spillage occurs if the dispenser is accidentally knocked over. There must also be breakaway couplings on the hoses in case a car pulls away from the pump dispenser while the nozzle is still in the filler.
- Automatic cut-off devices are built into both the underground storage tanks and the pump dispensers, to prevent tank overfills and spillages.
- The proposed installation must comply with SANS 1535 (relating to tank manufacture standards) and SANS 10089 Part 3 (relating to underground tanks and pipe installation standards).
- The underground storage tanks must comprise glass reinforced polyester (GRP) coated tanks. The outer coating is used to minimise the possibility of corrosive failure of the tank.
- Internationally approved non-corrosive pipe work systems must be installed. This is to limit the possibility of pipe failure due to corrosion; this being the most common cause of pipe failure before this system was introduced to the RSA.
- Any joints in the fuel lines must be located within containment manholes, which also occur where the pipe work enters the underground storage tanks and under the pump dispensers.
- Leak detectors must be installed at various positions on the fuel delivery system. Delivery lines are pressurised at all times, and leak detectors will immediately switch off the submersible pump in the underground storage tank should a leak be detected.
- Vent and filler lines must be sloped back to the underground storage tank so that fuel does not remain in the pipes.
- Observation wells must be installed in the sand fill surrounding the underground storage tanks for regular ground water monitoring purposes.

c) **Atmospheric Emissions**

Objectives: To minimise potential air quality impacts during construction and operational related activities.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to air quality.

Timeframes: The measures as listed below must be incorporated into the design and the design finalised prior to commencement of construction.

Measures:

- Design and operation requirements listed under Sub-Category 2.2. of the Minimum Emission Standards (Government Gazette No. 33064) for listed activities in terms of Section 21 of the National Environmental Management: Air Quality Act, No. 39 of 2004, which applies to the storage and handling of petroleum products, must be implemented.

d) **Solid and Hazardous Waste Management**

Objectives: To minimise the disposal to landfill of any general waste generated at the site and to minimise the potential health, safety and environmental risks associated with the incorrect disposal of hazardous waste.

Targets: To facilitate the efficient recycling of all recyclable waste generated at the site.

Timeframes: The measures as listed below must be incorporated into the design and the design finalised prior to commencement of construction.

Measures:

- Facilities must be incorporated in the design of the development to ensure that solid waste separation into the various categories can easily be handled on site and for loading and transport as appropriate to the relevant recycling entities.
- Service providers should also be contracted for containing, handling and removal to appropriate hazardous waste disposal sites for any spillages of hazardous materials etc.

3.2. PRE-CONSTRUCTION PHASE IMPACTS

a) Bulk Services Identification

Objectives: To minimise any possible damage to existing bulk services as a result of pre-construction and construction related activities.

Targets: To comply with any local authority by-laws regarding bulk services and to avoid additional costs and potential project delays due to damage to these services

Timeframes: Prior to commencement of construction.

Measures:

- If any bulk services are required to be relocated and/or rerouted, then the appropriate permits/approvals must be sought.
- The location of existing bulk services must be determined to prevent accidental damage to these facilities.

b) Permits

Objectives: To ensure that the necessary permits regarding any activities related to construction activities are in place prior to construction starting.

Targets: To ensure that the construction works can proceed without possible delays and/or legal repercussions during building works as a result of outstanding permits and/or non-compliance with permits.

Timeframes: Prior to commencement of construction.

Measures:

- The client shall issue a list of applicable permitting conditions together with the respective permits/authorisations to the ECO prior to the start of construction works.

c) Site Boundaries

Objectives: To ensure that site boundaries are agreed to by the ECO, Principal Agent and Contractor prior to the start of the site operations.

Targets: To contain construction activities to the development site/s and prevent unauthorised access (pedestrian or vehicular) and to demarcate potentially sensitive areas and/or vegetation.

Timeframes: Before commencement of construction, site boundaries must be established before any other construction activities may take place.

Measures:

- The Contractor must fence or demarcate the site boundaries at the very start of the project.
- Access to the site must be restricted to ensure that members of the public are not able to gain access other than via the designated, controlled access points.
- Any construction activities taking place prior to the above will constitute a serious violation of this EMPr and are liable to a fine as detailed within this EMPr.

d) **"No-Go" Areas**

Objectives: To minimise any potential impacts to identified sensitive areas on and around the site.

Targets: To prevent possible impacts to any identified sensitive areas on and adjacent to the site.

Timeframes: Before commencement of construction, sensitive areas must be demarcated before any other construction activities may take place.

Measures:

- Sensitive areas must be demarcated in conjunction with the ECO prior to any work starting on site.
- Should additional working space be required at a later date, this must be agreed between the Principal Agent, Contractor, and ECO.
- Method statements should be submitted and approved where risks to the "*No-Go*" areas may occur.
- Authorisation from the Principal Agent must only be given once the potential impacts have been assessed by the ECO.
- Any construction activities taking place prior to the above will constitute a serious violation of this EMPr and are liable to a fine as detailed within this EMPr.

e) **Training**

Objectives: To ensure that all staff working on site are adequately trained on the requirements of this EMPr and are legally compliant with relevant legislation.

Timeframes: Before commencement of construction and also throughout the construction phase as required.

Targets: To ensure that the requirements of this EMPr are understood and implemented by all staff (as and when required) on site.
Measures:

- The ECO will provide for site contractor management training sessions (as required), who will in turn ensure that all staff working on site are familiar with the workings and requirements of this EMPr
- An interpreter should be provided as required.

f) **Construction phase site layout**

Objectives: To designate areas on site for various types of construction related activities.

Targets: To ensure an efficient and orderly layout that promotes safe access

Timeframes: Prior to commencement of construction.

Measures:

- The location of the Contractor's camp, toilet facilities and storage areas must be agreed to by the ECO, Principal Agent and Contractor prior to the commencement of work at the site.

- A sketch diagram of the above is required by the ECO.
- These areas must all be kept tidy, sanitary and in good condition throughout the project. Litter and waste accumulation can be a significant problem at the site and provision of adequate waste receptacles and use of these is a requirement.
- Any construction activities taking place prior to the above will constitute a serious violation of this EMPr and are liable to a fine as detailed within this EMPr.
- Soil erosion on site must be prevented at all times, namely pre, during and post construction.

g) **Working Hours**

Objectives: To designate working hours for construction related activities.

Targets: To ensure that the hours of operation shall be restricted to those stipulated by the local authority.

Timeframes: Working hours must be established prior to commencement of construction. Amendments to the working hours may only take place once the local authority and ECO have been notified in writing.

Measures:

- The contractor shall at all times ensure that working hours are restricted to those stipulated by the local authority.
- Modifications to the above may only take place through the local authority and the ECO must be notified in writing.

3.3. CONSTRUCTION PHASE IMPACTS

a) Social Considerations

Objective: To minimise social impacts (e.g. nuisance factors) related to the construction of the site through effective communications with abutting neighbours.

Timeframes: All abutting neighbours must be notified of the proposed construction prior to the commencement of construction. Other social considerations and measures must be implemented throughout the construction phase as and when required.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to site construction and demolition impacts.

Measures:

- All abutting neighbours (or as required) must be notified of the proposed construction phase activities at least two weeks before they commence.
- The Contractor must record and repair any damage that the construction works may cause to neighbouring properties.
- The ECO must be notified in writing of any incidents relating to the above.

b) Appropriate Machinery

Objectives: To minimise possible nuisance affects and environmental damage through the use of appropriate machinery during the construction works.

Timeframes: The appropriate use, handling, storage and maintenance of machinery must take place throughout the construction phase.

Targets: To ensure that impacts and damage to the environment are minimised via the responsible use of appropriate machinery on site.
Measures:

- The Contractor shall at all times carefully consider what machinery is appropriate to the task in the context of this EMPr while minimising the extent of environmental impact.
- Construction machinery must be located away from sensitive areas when parked for extended periods of time.
- A dedicated parking area must be defined with drip trays beneath any potentially leaking equipment and fuel/lubricant absorbing media (peat/moss type products) within these drip trays must be used to contain any spilled liquids.
- These materials must be replaced regularly to prevent over-saturation and potential spillage of free phase product. This material must be disposed of as hazardous waste and be collected by an approved Contractor/delivered to a suitable landfill site.
- Chain of custody documentation must be provided as proof of final end recipient.
- All spills are to be recorded in the Environmental Register, including any clean-up actions taken to remediate the spillage. Such actions are to be agreed with the ECO prior to taking place.

c) Construction Materials

Objectives: To minimise possible cumulative environmental damage through the unsustainable use of raw materials used for construction purposes

Timeframes: Recycling and related practices should be implemented throughout the construction phase.

Targets: To ensure that the use of construction materials is as far as practicably possible in accordance with the NEMA Principles for Sustainable Development.

Measures:

- The principle of “re-use and recycle” (i.e. try to use recycled construction materials) should be implemented as far as possible on site for all construction related activities.
- The provision of separate waste and recycling streams will assist in this regard.
- The Contractor shall at all times carefully consider the requirements of the NEMA Principles and take appropriate measures to implement such as far as practicably possible.

d) **Waste Management**

Objectives: To minimise possible environmental damage through inappropriate waste management on site or related to the site.

Timeframes: Effective Waste Management should be implemented throughout the construction phase. Collection of general, hazardous and recyclables should take place on a weekly basis.

Targets: To ensure that the handling of waste is in accordance with the statutory requirements of the local authority by-laws and the National Environmental Management Waste Act, Act 59 of 2008.

Measures:

1) Liquid Waste:
   - Liquid dispensing receptacles (e.g. lubricants, diesel, shutter oil etc.) must have drip trays beneath them/beneath the nozzle fixtures.
   - A spill management protocol must be produced by the Contractor and approved by the ECO prior to works commencing on site.
   - Material safety data sheets (MSDS) must be available on site where products are stored, so that in the event of an incident, the correct action can be taken.
   - Depending on the types of materials stored on site, suitable product recovery materials (such as Spillsorb or Drizit products) must be readily available.
   - A designated, bunded area is to be set aside for vehicle washing and maintenance (if required). Materials caught in this bunded area must be disposed of to a suitable waste site or as directed by the Principal Agent. Vehicles should ideally be washed at their storage yard as opposed to on site.
   - Cement contaminated water must be fed to a container, neutralised and suitably disposed of (e.g. sent to a suitable landfill site). In the latter case, chain of custody documentation must be provided to ensure a suitable end recipient. The latter must be kept with the environmental register.
   - The Contractor shall ensure that any wastewater generated during construction activities feeds to a suitable containment area such as a container or lined sedimentation pond prior to disposal. This pond or ponds must be allowed to dry out on a regular basis to allow for solid material removal. The wastewater must be disposed of in a suitable manner (possibly to the sewer system following local authority approval) and must not be directed to a storm water drain.

- Storm water must be managed in such a way that no overland flow is possible onto any area of the site which could contain potential contaminants (such as concrete mixing areas, material and hazardous storage areas from any adjacent area).

2) Solid Waste:
   - Waste must be categorised by the Contractor and disposed of in a suitable manner into separate waste streams (this includes general, hazardous and recyclable waste) only at authorised waste disposal facilities.
   - The Contractor must provide an adequate number of waste receptacles for general waste at points around the construction site as well as for hazardous and recyclable waste.
   - Good housekeeping must be maintained for the temporary storage of general waste.
   - Waste is to be collected either by the Municipality or via a licensed waste disposal Contractor.
   - The frequency of collections/emptying of waste receptacles will be of such a frequency that waste receptacles do not overflow.
   - Particular care shall be taken with the disposal of materials that could be wind-borne or waterborne to ensure that the release of these materials is minimised (the latter is a requirement for hazardous waste).
   - The use of netting covers or similar sealed containers must be implemented as and when required by the ECO.
   - Areas demarcated for specific activities including food consumption must have suitable waste receptacles provided.
   - Wherever possible separation of recyclable material must take place at source.
   - Bins to temporarily store recyclable material must be made available.
   - Good housekeeping must be maintained for the temporary storage of recyclable materials.
   - No dumping within the surrounding area is to be permitted.
   - No burning of solid waste is allowed.
   - All material used by the Contractor during the construction phase shall be managed in such a way that it does not cause pollution, or that it minimises pollution. In the event of a spillage, the Contractor should have suitably trained personnel who can correctly clean up any spillage in an efficient and environmentally sound manner.

3) Hazardous Waste:
   - Storage areas that contain hazardous substances must be covered and bunded with an approved impermeable liner or have some form of secondary containment.
   - The temporary storage of hazardous household material such as batteries, compact fluorescent lamps (CFL's) and chemicals must be provided for. The disposal thereof must be administered in a responsible manner.
   - The Contractor shall keep MSDS on-site for all potentially hazardous materials used.
   - Suitably trained personnel shall be available on the site during working hours so that in the event of human exposure to any hazardous materials that the correct first aid actions are taken. This training should also include environmental spill containment procedures
   - Spills in bunded areas must be cleaned up, removed and disposed of safely from the bunded area as soon after detection as possible to minimize pollution risk and reduced bunding capacity.
   - Chain of Custody documentation must be provided for any hazardous substances disposed of as proof of end recipient and disposal at an authorised hazardous waste disposal facility.

4) Cement/concrete mixing areas:

Cement powder has a high alkalinity, which can contaminate and dramatically affect both soil and groundwater. The following recommendations are made:

- Mixing areas must be defined on site and approved by the ECO.
- No mixing of cement is allowed on bare soil and a lined bund or bunded portable mixer must be used. The use of ready mix concrete must be considered.
- Cement bags must be disposed of in demarcated hazardous waste receptacles and the used bags disposed of via the hazardous substances waste stream.
- Excess or spilled concrete must be disposed of to a suitable landfill site, with chain of custody documentation provided.

5) Ablution Facilities
   - Chemical toilet facilities are to be supplied and managed by the Contractor. These are to be located in a specific area agreed to by the ECO prior to placement and to be used by all personnel.
   - The number of chemical/portable toilets required on site (i.e. the ratio of persons working on site to number of toilets) must be determined in conjunction with the Local Municipality prior to works starting on site. This is typically one toilet per 15 workers.
   - These toilets are to be secured by at least four separate cables or guy ropes to ensure that they are not knocked over or blown over by the wind.

e) **Storm water**

Objectives: To minimise potential impacts arising out of improper management of storm water originating on site.

Timeframes: The need for Stormwater Management measures such as the establishment of detention ponds should where possible be identified prior to commencement of construction. Effective Stormwater Management practices should be implemented throughout the construction phase.

Targets: To ensure that storm water on site is managed according to the local authority by-laws and in accordance with any other statutory requirements and that no negative impacts occur to the storm water services around the site.

Measures:

- Storm water outfalls should be designed to reduce flow velocity and avoid downstream erosion.
- Soil erosion on site must be prevented at all times.
- If the storm water is of such a quality that suspended solids are present, then detention ponds for removal of suspended solids must be considered.
- During construction, all material excavated must be protected, screened or covered to prevent off site movement (primarily wind-blown soil or surface runoff) and the surplus material must be removed from site weekly to a licensed waste disposal site or re-used if appropriate.
- All storm water channels around the outside of the site should be inspected regularly to ensure that they are not blocked and/or obstructed to ensure their efficient operation.
- Storm water runoff must be controlled to ensure that on-site activities do not result in off-site pollution.

f) **Fire Safety**

Objectives: To prevent any potential impacts related to fires originating on site.

Timeframes: Training of the staff prior to the commencement of construction should include general fire management practices. Good fire management practices should be implemented throughout the construction phase.

Targets: To ensure compliance with the local fire department and local authority by-laws and any other statutory requirements relating to fire safety.

Measures:

- No fires will be allowed on site.
- Welding and cutting activities will only be permitted inside the working area and at dedicated locations.
- Adequate fire fighting equipment must be available on site and be in good working order.
- At least one person trained in fire safety and familiar with fire fighting equipment on site must be present on the site at all times.

g) **Safety and First Aid**

Objectives: To minimise any potential safety or health related incidents on site.

Timeframes: Training of the staff prior to the commencement of construction should include general health and safety considerations. Health and safety requirements and practices should be implemented throughout the construction phase.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to health and safety on a construction site.

Measures:

- All people working on site are responsible for their own safety on site. Contractors and Principal Agent/s shall at all times comply with the relevant statutory requirements including the Occupational Health and Safety Act, Act 85 of 1993.
- A comprehensive site specific first aid kit must be available on site at all times.
- At least one person trained in safety and first aid and familiar with the first aid equipment on site must be present on the site at all times.
- Emergency procedures must also be established prior to the start of construction operations on site and appended to this EMPr.

h) **Air Quality**

Objectives: To minimise potential air quality impacts during construction related activities.

Timeframes: Effective air quality management practices should be implemented throughout the construction phase.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to air quality.

Measures:

- Wind-blown dust and sand may generate considerable negative impacts (e.g. reduced visibility for vehicles travelling along adjacent roads and nuisance to neighbours/adjacent erven). The use of water bowsers and wetting down of loose soil areas, as well as the erection of shade netting screens to prevent off-site movement of dust is required and/or other appropriate action to minimise this impact.
- The use of straw stabilisation or mulching of exposed sandy areas may also be considered in consultation with the ECO.
- Best Practices (BP) for the suppression of fugitive dust stemming from the construction activity must be implemented and addressed. Please note that the use of potable water for dust suppression is not acceptable.

i) **Water Quality**

Objectives: To minimise any potential impacts on the groundwater quality at and off site through indirect impacts.

Timeframes: Effective water quality management practices must be implemented throughout the construction phase.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to water quality.

Measures:

- Site staff shall not be permitted to use any stream, river, open water body or natural water source adjacent to or within the designated site for the purposes of bathing, washing of clothing, or for any construction or related activities.
- Bowser water (or another source approved by the Principal Agent and ECO) should instead be used for all activities such as washing of equipment, dust suppression, concrete mixing, compaction, etc. with the latter taking place well outside any identified sensitive areas and within a demarcated area approved by the ECO.
- In particular, no potable water may be used for dust suppression purposes.
- Measures to control illegal dumping of construction waste must be implemented to prevent pollution to surface water run-off.
- Any event resulting in the spill or leak of product into the ground and/or water courses (e.g. that of hazardous substances used during the Construction or Operational phase) must be reported to all relevant authorities, including DARDLEA within 14 days. This requirement is in terms of Section 30 (10) of NEMA and Section 20 (3) of the National Water Act, No. 36 of 1998 (NWA) that pertain to the control of emergency incidents and should include the reporting, containment and clean-up procedure of such incident and the remediation of the affected area. All necessary documentation must be completed and submitted within the prescribed timeframes. Containment, clean-up and remediation must commence immediately in the case of NEMA S30 incidents.

j) **Noise and Vibration**

Objectives: To minimise any potential noise impacts related to the construction operations on site.

Timeframes: Effective noise mitigation measures must be implemented throughout the construction phase.

Targets: To ensure compliance with all legal requirements, including the local authority by-laws and any other statutory requirements relating to noise impacts.

Measures:

- Noise generation is likely to be one of the biggest impacts at the site during the construction phase. Every attempt must be made to reduce noise levels and maintain appropriate directional and intensity settings to ensure minimum nuisance by the noise source.
- The Contractor must use appropriate, modern equipment, which produces the least noise.
- Any unavoidably noisy equipment must be identified and located in an area where it has least impact.
- The use of noise shielding screens should be considered by the project team as and when required.
- The provisions of SABS 1200A Sub clause 4.1 regarding "built-up areas" shall apply to all areas within audible distance of residents whether in urban, peri-urban or rural areas.
- No amplified music shall be allowed on site. The use of radios, tape recorders, compact disc players, television sets etc. shall not be permitted unless the volume is kept sufficiently low as to avoid any intrusion on members of the public within range.
- The Contractor shall not use sound amplification equipment on site unless for the purposes of site safety and communications and in emergency situations.
- Construction activities shall be confined to the hours stipulated by the local authority.
- The Contractor will issue ear protection for any noise activities with a noise output of 85 dB or more.
- The Contractor must notify all adjacent property owners/occupants of the proposed development and that noise impacts above 85 dB may occur as a result of the above.
- No noise generating work is to be conducted outside of approved working hours unless in consultation with the local authority and advised to the adjacent property owners/occupants prior to works taking place.
- A complainant’s register must be kept on site specifying the date, time, nature of complaint, details of the complainant during the construction phase and the responses undertaken for amicable conclusion to problems.

k) **Drilling/Demolitions**

Objectives: To minimise impacts associated with drilling/demolition on site during construction.

Timeframes: Recommendations and mitigation measures must be implemented throughout the construction phase. Adjacent and affected parties must be given adequate notification and warning of blasting activities.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to drilling and/or demolitions in a built-up area and to minimise nuisance impacts.

Measures:

- The following recommendations will be implemented in addition to normal health and safety requirements as stipulated in the Occupational Health and Safety Act, Act 85 of 1993.
- These activities will only take place via a competent and appropriately qualified and legally compliant Contractor.
- The Contractor shall take all necessary precautions to prevent damage to special features and the general environment, which includes the prevention of any fly rock.
- Environmental damage caused by the above activities shall be repaired and/or rehabilitated at the Contractor's expense to the satisfaction of the ECO and Principal Agent.
- None of the above activities may be carried out on Sundays or Public Holidays without the approval of all relevant authorities.
- Careful sealing off of the site and surrounding area will be carried out to ensure that all personnel are removed from the site and its immediate surrounds.
- Adequate notification and warning of blasting activities must be provided to all adjacent and or affected parties.

l) **Light Pollution**

Objectives: To minimise light impacts associated with construction related activities.

Timeframes: Effective light pollutions measures must be implemented throughout the construction phase.

Targets: To ensure that light pollution is minimised such that no complaints are received from the public.

Measures:

- All legal requirements will be complied with to ensure that impacts are minimised.
- Any lighting required by the Contractor shall be aimed at the area to be lit on site and the over spillage must be kept to a minimum.

m) **Traffic Control**

Objectives: To ensure that traffic impacts as a result of the construction related activities are minimized.

Timeframes: Effective Traffic Control on the R547 Road and Groen Avenue must take place throughout the construction phase.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to construction traffic. To ensure that the impacts on current traffic flows in the vicinity of the site are minimised and that complaints relating to traffic associated with the site's activities are minimised.

Measures:

- Appropriate traffic routing and scheduling of construction related vehicles will be carried out in consultation with a competent traffic engineer.
- The contractor must provide a competent traffic marshal for situations where heavy construction traffic may impede normal traffic flows on any roads adjacent to the site.
- All vehicles will be legally compliant.
- All drivers will be competent and in possession of an appropriate valid driver's license.
- All vehicles travelling on site will adhere to the specified speed limits.
- The movement of all vehicles will be controlled such that they remain on designated routes.
- No member of the workforce will be permitted to drive a vehicle under the influence of alcohol or narcotic substances.

n) **Visual**

Objectives: To maximise the compatibility of the development with the surrounding landscape.

Timeframes: Visual screening where relevant should be erected prior to commencement of construction. Effective visual impact measures must be implemented throughout the construction phase.
Targets: To adhere to the visual specialist's recommendations in terms of the design of the site.

- Visual screening should be erected at strategic points around the proposed development site during construction to further minimize the visual impact and any potential nuisance impacts for motorists on the surrounding road network
- Measures to manage litter and dust should be in place at all times.
- Fires and burning of waste on site should not be allowed.
- Neatness and tidiness on site at all times must be implemented throughout the lifecycle of the project.

3.4. POST CONSTRUCTION IMPACTS

a) Final Site Clearing

Objectives: To clear construction related materials from the site

Timeframes: Site clearing and clean-up must take place prior to commencement of operation.

Targets: To ensure that the site is totally clear of all construction related equipment, machinery and materials.

Measures:

- The Contractor shall clear and clean the site and ensure that everything not forming part of the permanent works is removed from site before issuing the completion certificate or as otherwise agreed.
- All rubble and waste material is to be removed from the site to an approved disposal site.
- Burying or burning rubble or waste on the site is prohibited.
- The site is to be cleared of all litter.
- Surfaces are to be checked for waste products from activities such as concreting or asphalting and cleared in a manner approved by the Principal Agent.

b) Rehabilitation

Objectives: To rehabilitate any areas impacted by the construction activities.

Timeframes: Rehabilitation of areas identified, if any, should take place as soon as possible after completion of construction.

Targets: To ensure that full rehabilitation of identified areas is effected prior to operation of the site.

Measures:

- The Contractor shall be responsible for rehabilitating (vegetation planting etc. where applicable) all areas disturbed during construction to the satisfaction of the Principal Agent and ECO.
- Vegetation to be replanted shall be indigenous species only.
- All areas where temporary services were installed are to be rehabilitated to the satisfaction of the Principal Agent.

3.5. OPERATIONAL IMPACTS

a) Stormwater Management

Objectives: To improve the quality and reduce the quantity of stormwater runoff on and off site during the operational phase.

Targets: To comply with the Stormwater Specialist's findings and recommendations.

Measures:

- Removal of gross litter by means of screening at entrances to underground conveyance systems
- Inlets to piped systems shall ideally be fitted with a screen, or grating to prevent debris and refuse from entering the stormwater system.
- Rainwater runoff must be connected to infiltration galleries to trenches designed to maximise groundwater recharge
- Surplus runoff must be able to drain towards underground pipe systems
- All debris must be trapped on screens/gratings before entering the development's stormwater system
- The principle of overland flow should apply to the parking and forecourt areas where possible and should be graded to avoid concentration of flow along and off the surface

b) Waste Management

Objectives: To minimise the disposal to landfill of any general waste generated at the site and to minimise the potential health, safety and environmental risks associated with the incorrect disposal of hazardous waste.

Targets: To facilitate the efficient recycling of all recyclable waste generated at the site.

Timeframes: Effective waste management practices must be implemented throughout the operational phase. Collection of general, hazardous and recyclables should take place on a weekly basis.

Measures:

General Waste

- The Applicant should consider waste separation for each type of recyclable waste (separation-at-source has historically proven to be the most cost-efficient means of waste sorting for recycling purposes).
- The Applicant should choose a private waste collection contractor who is able to keep the recyclable and non-recyclable waste streams separate during transportation and ensure that the end users for the recycled materials are recognised recycling operations.
- In terms of waste minimisation, the Applicant should wherever possible encourage suppliers, such as the supplying oil company, to as far as possible utilise packaging materials which are recyclable and which are manufactured from recycled materials.
- Solid waste must only be disposed of to an authorised licensed landfill facility.
- The applicant must ensure that recycling takes place where possible and that there is separation of recyclable material at source.
- Bins to temporarily store recyclable material must be made available.

- Good housekeeping must be maintained for the temporary storage of recyclable materials
- Good housekeeping must be maintained for the temporary storage of general wastes
- The premises must be rodent proofed in accordance with the Government Rodent proofing regulations.

Hazardous Waste

- Adequate training of personnel operating the refuelling facilities must take place in order to ensure that incidents resulting in product spills etc. are minimised and that the correct actions are taken in the event of an incident.
- The temporary storage of hazardous household material such as batteries, compact fluorescent lamps (CFL's) and chemicals must be provided for. The disposal thereof must be administered in a responsible manner.
- In the event of such an emergency condition, a suitably trained and approved clean-up contractor must be appointed to clean up the spill or other such incident. Hazardous waste may be generated where absorbent materials are used to mop up a product spill. This will be suitably contained and handled by a specialist contractor using the correct personal protective equipment and hazardous waste temporary storage receptacles.
- Disposal of such waste at a suitable hazardous landfill site must take place, with chain-of-custody documentation provided by the contractor as proof of end recipient.

c) **Water Management**

Objectives: To minimise potable (e.g. drinking) water usage and to maximise the efficiency with which all water is used on site

Timeframes: An education program must be communicated to the tenant/owner prior to commencement of operation. Effective Water Management practices must be implemented throughout the operational phase.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to water efficiency.

Measures:

- Water efficiency technologies are to be implemented on all facilities on site with which the use of water (potable or non-potable) is associated.
- The above may include but is not limited to drip irrigation, dual flush toilets, waterless urinals and low flow taps.
- Xeriscaping (i.e. use of water conserving indigenous gardens) should be strongly encouraged.
- A tenant/owner education programme demonstrating the above should also be implemented in order to raise awareness as to the operational requirements of the development.
- No pollution of surface or groundwater resources may occur due to any activity on the site.
- All relevant sections and regulations of the National Water Act, 1998 (Act No. 36 of 1998) must be adhered to.
- No abstraction of surface water or ground water may take place without prior authorisation from the Department of Water Affairs, unless it is a Schedule 1 use or an Existing Lawful Use as defined in the National Water Act, 1998 (Act No. 36 of 1998).

- Storm water runoff must be controlled to ensure that on-site activities do not result in off-site pollution.
- Measures to control illegal dumping of construction waste must be implemented to prevent pollution of surface water run-off.

d) **Energy Management**

Objectives: To minimise energy usage and maximise the efficiency with which all energy (e.g. electricity) is used on site.

Timeframes: An education program must be communicated to the tenant/owner prior to commencement of operation. Effective Energy Saving practices must be implemented throughout the operational phase.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to energy efficiency.

Measures:

- Energy efficiency technologies are to be implemented on all facilities on site with which the use of electricity is associated.
- The above may include (as appropriate) but is not limited to solar hot water geysers, passive heating, cooling and ventilations systems, and energy efficient lighting and machinery for example.
- A tenant/owner education programme demonstrating the above should also be implemented in order to raise awareness as to the operational requirements of the development.

e) **Emergency Management**

Objectives: To ensure that an appropriate and efficient response is triggered in the event of an emergency situation arising. This should include incidents including medical, fire, security and environmental disaster scenarios on the site.

Timeframes: An emergency response plan must be designed and approved by the local authority and local emergency services prior to commencement of operation. An education program must be communicated to the tenant/owner prior to commencement of operation. General health and safety practices should be implemented throughout the operational phase.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to emergency response.

Measures:

- An Emergency Response Plan must be designed and implemented in conjunction with the local authority and the local emergency services
- All people working on site are responsible for their own safety on site. All contractors shall at all times be made aware of and comply with the relevant statutory requirements including the Occupational Health and Safety Act, Act 85 of 1993.
- A regular inspection (as per oil industry protocol) must be carried out by the site operator and should, amongst others, include a visual inspection of all fuel dispensing equipment on the site to check for wear or damage. Visual and olfactory checks for possible product leaks should also be carried out across the site (look for evidence of surface staining, dead vegetation, product odours etc.).

- Adequate training of staff using the facility to ensure that correct operating procedures are followed in the event of a spill or release of product or in the event of an emergency situation on the site.
- A tenant/owner awareness programme demonstrating the above should also be implemented.
- Fire fighting equipment on the site will be to Fire Department standards, with staff adequately trained in fire fighting procedures.

f) **Vapour Emissions**

Objectives: To minimize air quality and human health impacts associated with fuel vapour emissions, which are generated during fuel delivery, storage and dispensing activities.

Timeframes: An education program must be communicated to the tenant/owner prior to commencement of operation and the road tanker drivers must be provided with awareness training. Effective vapour mitigation measures and practices must be implemented throughout the operational phase.

Targets: To ensure compliance the recommendations of the EAP (based on specialist knowledge) and with oil industry best-practice standards.

Measures:

- Awareness training of personnel at the site and for road tanker drivers delivering fuel to site.
- Development of site specific protocols with regard to delivery and use of products and use of the relevant SANS procedures.
- The careful location and elevation of the vent pipes to allow for the maximum dispersion of vapour.
- All staff using the facility must ensure that they are familiar with the current and future (2014) Ambient Air Quality Standards and that the mitigation measures as listed must be implemented to ensure that the plant operates within these standards.
- Design and operation requirements listed under Sub-Category 2.2. of the Minimum Emission Standards (Government Gazette No. 33064) for listed activities in terms of Section 21 of the National Environmental Management: Air Quality Act, No. 39 of 2004, which applies to the storage and handling of petroleum products, must be implemented.
- The utilisation of a Volatile Organic Compound (VOC) monitoring programme must be investigated

g) **Soil and Ground Water Contamination**

Objectives: To prevent the degradation of soil ecosystems and fresh water ecosystems (ground water and surface water), as well as health and safety risks for human receptors in the vicinity of a spill or leak at the site.

Timeframes: Inspection measures as listed below must take place at regular intervals. A spill emergency response plan must be compiled prior to operation. Spills and leaks must be reported to relevant authorities within 14 days.

Targets: To comply with the Environmental Assessment Practitioner’s recommendations (based on specialist knowledge) and with oil industry best-practice standards.

Measures:

- All containment manholes must be regularly inspected as part of the normal management procedures at the service station
- Continuous electronic monitoring (CEM) of product must be carried out. Should discrepancies occur an alarm will be triggered and site management will review the finding and take appropriate action to rectify the situation as required.
- Observation wells must be inspected regularly and water samples recovered during winter and summer for Macro chemistry and Hydrocarbon analysis.
- A spill emergency response plan must be compiled for the site and implemented in the event of an incidence.
- Spillages from any sources on-site must be controlled to prevent pollution of water resources.
- Any event resulting in the spill or leak of product into the ground and/or water courses (e.g. that of hazardous substances used during the Construction or Operational phase) must be reported to all relevant authorities, including DARDLEA within 14 days. This requirement is in terms of Section 30 (10) of NEMA and Section 20 (3) of the national Water Act, No. 36 of 1998 (NWA) that pertain to the control of emergency incidents and should include the reporting, containment and clean-up procedure of such incident and the remediation of the affected area. All necessary documentation must be completed and submitted within the prescribed timeframes. Containment, clean-up and remediation must commence immediately in the case of NEMA S30 incidents.
- Stock reconciliation must be done regularly to identify leaks.

h) **Noise and Vibration**

Objectives: To minimise any potential noise impacts related to the operations of the site.

Timeframes: Effective noise mitigation measures should be implemented throughout the operational phase.

Targets: To ensure compliance with all legal requirements, including the local authority by-laws and any other statutory requirements relating to noise impacts.

Measures:

- Every attempt must be made to reduce noise levels to ensure minimum nuisance by the noise source.
- The site operator must use appropriate, modern equipment, which produces the least noise.
- Any unavoidably noisy equipment must be identified and located in an area where it has least impact.
- Air compressors that will be used to inflate motor vehicle tyres must be located in a unit that will mitigate its noise impacts.
- The use of noise shielding screens should be considered by the project team as and when required. This would be applicable to items such as air conditioning units, compressors and refrigeration equipment.
- The provisions of SANS 1200 Sub clause 4.1 regarding "built-up areas" shall apply to all areas within audible distance of residents whether in urban, peri-urban or rural areas.
- No amplified music shall be allowed on site. The use of radios, tape recorders, compact disc players, television sets etc. shall not be permitted unless the volume is kept sufficiently low as to avoid any intrusion on members of the public within range.

- Any contractors working on the site shall not use sound amplification equipment on site unless for the purposes of site safety and communications and in emergency situations.
- No on-site noise generating work, such as routine maintenance and repairs, is to be conducted outside of approved working hours unless in consultation with the local authority and advised to the adjacent property owners/occupants prior to works taking place.
- During fuel delivery, the product is delivered into underground tanks (gravity-fed). During this time, the engine of the fuel delivery truck is to be switched off to avoid unnecessary noise during this process.

3.6. DECOMMISSIONING IMPACTS

a) Waste Management

Objectives: To minimise possible environmental damage through inappropriate waste management related to the site.

Timeframes: Effective Waste Management practices should be implemented throughout the decommissioning phase. Collection of general and hazardous waste and recyclables should take place on a weekly basis.

Targets: To ensure that the handling of waste is in accordance with the statutory requirements of the local authority by-laws and the National Integrated Waste Management Act.

Measures:

- Waste should be categorised by the Contractor and disposed of in a suitable manner into different waste streams (including general and hazardous waste).
- Wherever possible, recycling should be carried out.
- No dumping within the surrounding area is to be permitted.
- All waste which cannot be recycled must be disposed of at a permitted landfill site.

b) Noise Pollution

Objectives: To minimise any potential noise impacts related to the decommissioning of the site.

Timeframes: Effective noise mitigation measures should be implemented throughout the decommissioning phase.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to noise impacts.

Measures:

- The Contractor must use modern, appropriate equipment, which produces the least noise.
- Any unavoidably noisy equipment must be identified and located in an area where it has least impact.
- The use of noise shielding screens must be considered and the operation of such machinery restricted to when it is actually required.
- Noise generating work can only take place within the hours stipulated by the local authority

c) Site Clearance

Objectives: To clear all decommissioning phase related materials from the site or as required for site redevelopment.

Timeframes: All site clearance and clean-up activities should take place as soon as possible after completion of the decommissioning phase.

Targets: To ensure that the site is totally clear of all decommissioning related equipment, machinery and materials.

Measures:

- All surfaces which have been hardened due to operational activities must be ripped and imported materials thereon removed.
- All rubble must be removed from the site to an approved disposal site as approved by the Principal Agent. Burying rubble on the site is prohibited.
- The site is to be cleared of all litter.
- Fences, barriers and demarcations associated with the works must be removed from the site unless stipulated otherwise by the Principal Agent once the decommissioning phase has been completed.
- Surfaces must be checked for waste products from activities such as concreting or asphalting and cleared in a manner approved by the Principal Agent.
- The site must be fully rehabilitated and stabilised (for example, through hydroseeding).
- A meeting must be held on site between the Principal Agent, ECO and the Contractor to approve all remediation activities and ensure that the site has been restored to a condition approved by the Principal Agent.
- The Contractor/Principal Agent must arrange the cancellation and/or decommissioning and/or realignment of any bulk services as required and in conjunction with the local authority.

d) **Drilling/Demolitions**

Objectives: To minimise impacts associated with drilling/demolition on site during decommissioning.

Timeframes: Effective mitigation measures should take place throughout the decommissioning phase. Adjacent and affected parties should be given adequate notification and warning prior to blasting and demolition activities.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to drilling and/or demolitions in a built-up area.

Measures:

- The following recommendations will be implemented in addition to normal health and safety requirements as stipulated in the Occupational Health and Safety Act, Act 85 of 1993.
- These activities will only take place through a competent and appropriately qualified and legally compliant Contractor.
- The Contractor shall take all necessary precautions to prevent damage to special features and the general environment, which includes the prevention of any fly rock.
- Environmental damage caused by the above activities shall be repaired and/or rehabilitated at the Contractor’s expense to the satisfaction of the ECO and Principal Agent.
- None of the above activities may be carried out on Sundays or Public Holidays unless agreed to by all of the relevant parties.
- Careful sealing off of the site and surrounding area will be carried out to ensure that all personnel are removed from the site and its immediate surrounds.
- Adequate notification and warning must be provided prior to all blasting to all adjacent and affected parties.

e) **Air Quality**

Objectives: To minimise potential air quality impacts during decommissioning related activities.

Timeframes: Effective Air Quality measures must be implemented throughout the decommissioning phase.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to air quality.

Measures:

- Wind-blown dust and sand may generate considerable negative impacts (e.g. reduced visibility for vehicles travelling along adjacent roads and nuisance to neighbours/adjacent erven).
- The use of water bowsers and wetting down of loose soil areas, as well as the erection of shade netting screens to prevent off-site movement of dust is required.
- The use of straw stabilisation or mulching of exposed sandy areas must also be considered in consultation with the ECO.
- In particular, no potable water may be used for dust suppression purposes.
- Adequate measures must be taken to control the emissions of dust into the atmosphere in compliance of the area's by-laws.

f) **Social Considerations**

Objective: To minimise social impacts (e.g. nuisance factors) related to the decommissioning of the site through effective communications to abutting neighbours.

Timeframes: The abutting neighbours should be notified two week prior to the commencement of commissioning activities. Effective social impact mitigation measures should be implemented throughout decommissioning.
Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to site decommissioning and demolition impacts.

Measures:

- All abutting neighbours (or as required) must be notified of the proposed decommissioning activities, two weeks before they commence.
- The Contractor must repair any damage that the decommissioning works may have caused to neighbouring properties.

g) **Traffic Control**

Objectives: To ensure that traffic impacts as a result of the decommissioning related activities are minimized.
Timeframes: Effective traffic control measures must be implemented throughout the decommissioning phase.

Targets: To ensure compliance with the local authority by-laws and any other statutory requirements relating to the above. To ensure that the impacts on current traffic flows in the

vicinity of the site are minimised and that complaints relating to traffic associated with the site's activities are minimised.

Measures:

- Appropriate traffic routing and scheduling of decommissioning related vehicles will be carried out in consultation with a competent traffic engineer.
- The contractor must provide a traffic marshal for situations where heavy construction traffic may impede normal traffic flows on any roads adjacent to the site.
- All vehicles will be legally compliant.
- All drivers will be competent and in possession of an appropriate valid driver's license.
- All vehicles travelling on site will adhere to the specified speed limits.
- The movement of all vehicles will be controlled such that they remain on designated routes.
- No member of the workforce will be permitted to drive a vehicle under the influence of alcohol or narcotic substances.

4. IMPLEMENTATION OF THE EMPR

4.1. Roles and Responsibilities

(a) Environmental register - an environmental register must be provided by the Principal Agent and kept on-site at all times as well as being freely accessible to all project team members. The register will provide a record of all actual environmental incidents that occur as a result of the on site activity. This may include information related to such aspects as spillages, dust generation and complaints from adjacent neighbours and any other environmental incidents. It must also contain information relating to action taken/mitigation measures employed. Any party on-site may complete the register; however, it is envisaged that the Principal Agent, Contractor and ECO will be the main contributors. The Principal Agent must ensure that the Contractor implements recommendations made by the ECO within an agreed and reasonable time frame.

(b) Environmental Control Officer ("ECO") – the ECO must be appointed prior to commencement of operations. The ECO will advise the Principal Agent and Contractor of any environmentally related issues during the construction and bulk landscaping phases of the development. The role of the ECO is defined more fully in Appendix E

- The responsibilities of the ECO will include *monitoring* of compliance with the EMPr by the Contractor.

- The ECO has the authority to recommend the cessation of works or any portion of construction related activity to the Principal Agent. This will be triggered if in his/her opinion the activity has caused or will imminently cause significant damage and/or harm to the environment or is in contravention of the relevant environmental legislation/permits/authorisations applicable to the site and/or activity/ies.

- If the Contractor fails to show adequate consideration to the EMPr or the recommendations of the ECO, then the ECO may recommend to the Principal Agent, that the Contractor's representative or any employee/s responsible for not showing adequate consideration to the EMPr are removed from the site. Alternatively, the ECO may recommend that all work on site be suspended until the matter is remedied. All costs will be carried by the Contractor.

- Should modifications to this document be required, these must be agreed to by all parties concerned

(c) The Client – the client is responsible for employing the Principal Agent, Contractor and Engineer for the duration of the construction contract. They in turn will employ the ECO. The client will also ensure, as a signatory to the EMPr, that the Principal Agent and Contractor fulfil their obligations in terms of this EMPr.

(d) The Principal Agent – the Principal Agent is appointed by the client and is responsible to the client for ensuring that the construction contract is carried out to completion on time, in budget and that the Contractor fulfils their obligations in terms of the EMP. The Principal Agent and ECO are expected to develop a close working relationship and to communicate frequently. The Principal Agent must be recognised as the senior authority on site and all communications and instructions between the ECO and the Contractor must occur via the Principal Agent. The

Principal Agent is also responsible for deducting environmental penalties from the Contractor. The Principal Agent must ensure that the Contractor has a copy of this EMP and all approved Method Statements and that the Contractor is familiar with the relevant documentation.

(e) The Contractor – the Contractor will adhere to the conditions of this EMPr and ensure that all of its sub-Contractors, employees, suppliers, agents and so forth, for whom the Contractor is fully responsible for their actions on site, are fully aware of this EMPr, its requirements and the consequences of any breach of the requirements of this EMPr. The Contractor is fully responsible for *implementing* the EMPr. The Contractor will ensure that works on site are conducted in an environmentally responsible manner and in accordance with the requirements of this EMPr.

(f) Council Representative – will be an appropriately qualified environmental officer of the Local Munic pality (Emalahleni). This representative will monitor compliance of this EMPr by the client through the ECO.

(g) Problematic Issues – should problematic issues arise, as identified by the ECO, the ECO has the authority to call a special meeting with the Principal Agent to address and rectify the matter.

4.2. Frequency of Visits by the ECO

a) The frequency of visits by the ECO must be agreed with the Principal Agent, but as an initial starting point, it is recommended that the ECO as a minimum visit the site once per week, up until construction work is complete or as required.
b) The ECO should conduct on-going Basic Environmental Awareness Training sessions with the Contractor's representative prior to any work taking place. The Contractors are required to provide a facility and interpreter (if required).
c) An initial meeting with the ECO, local authority representative, Principal Agent and Contractor must be held to familiarise each of the parties with each other, the site, the EMPr and to confirm communication methods.
d) The frequency of subsequent meetings and ECO visits must be agreed, depending on the performance of the Contractor. If required, the Principal Agent may introduce some form of penalty system if compliance with the EMPr proves problematic.
e) A brief summary of the findings and any recommendations made by the ECO per visit should be emailed to all parties including the Principal Agent and Contractor. This report should also include photographs for additional information.

4.3. Documented procedures

Method Statements (a template for these purposes is appended to this EMPr) will be required for activities that may result in significant impacts according to the ECO.

These must address the following aspects:

- 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 of the location of the work (if applicable)
- When – the sequencing of actions with commencement and completion date estimates

All Method Statements (MS) must be in place at least 5 working days prior to the relevant construction activities taking place and must be approved by the ECO and Principal Agent

prior to being implemented. The following MS must as a minimum be made available to address the following construction related impacts:

- Erosion Management
- Waste Management
- Traffic Management
- “No-Go” Areas Management

4.4. Handling of Complaints Related to the Project

All forms of complaint must be forwarded to the site Principal Agent and ECO in writing. These must be entered into the environmental register and all responses and actions taken to address these must also be recorded. All issues raised must be addressed. It is important that the complainant feels that their concerns have been listened to and that appropriate action (within reason) has been taken to address these.

4.5. Conduct of Employees on Site

The following restrictions will be placed on all staff operating on the site in general:

- Adherence to relevant health and safety standards and municipal by-laws;
- Use of appropriate Personal Protective Equipment (PPE) at all times;
- No alcohol or illegal substance use may occur on site;
- No illegal disposal of rubble;
- No littering of the site or surrounding areas;
- No collection of firewood;
- No interference with any fauna or flora;
- No use of toilet facilities other than the chemical toilets provided on site;
- No lighting of open fires; and
- No burning of any waste on site.

4.6. Matters Pertaining to Non-Conformance on Site

“Non-conformances” would occur when there are deviations from any of the construction requirements of this EMPr. This may also include non-compliance with the relevant environmental regulations.

The Contractor is responsible for reporting non-conformance with the EMPr, to the ECO. The applicant and Contractor, in consultation with the ECO must, thereafter, undertake the following activities:

- Investigate and identify the cause of non-conformance;
- Report matters of non-conformance to the local municipality (within a suitable timeframe, dependant on the severity of the incident);
- Implement suitable corrective action as well as prevent recurrence of the problem.

- Assign responsibility for corrective and preventative action.

- Any corrective action taken to eliminate the cause/s of non-conformance shall be appropriate to the magnitude of the problems and commensurate with the environmental impact encountered.

Records

The Contractor must maintain and update the environmental register at all times regarding non-conformance issues. The record shall specifically contain and list the instances of non-conformances found in the EMPr, the date of their occurrence, date of corrective action, and date of completion of preventive action. In addition, matters of non-conformance and corrective action must be included within the audit reports. Records must be legible, identifiable, protected and easily retrieved for review.

Fine and Penalties relating to non-conformance/contraventions

The Contractor must comply with the environmental requirements of the construction phase requirements of this EMPr on an on-going basis and any failure on his part to do so will entitle the ECO and Principal Agent to impose a fine subject to the details set out below. Money from fines/penalties will be managed and allocated at the discretion of the Principal Agent.

1) Spot fines

Spot fines will be issued per incident in addition to any remedial costs incurred as a result of non-conformance with the EMPr, at the discretion of the Principal Agent and ECO. The ECO may *recommend* the imposition of fines and penalties but the Principal Agent will be responsible for imposing such fines or penalties against the account of the Contractor. Fines may be imposed on the Contractor for contraventions of the EMPr by individuals or operators employed by the Contractor and/or any sub-Contractors. The Principal Agent will inform the Contractor of the EMPr contravention and the amount of the fine. These monies will be recovered by the Principal Agent from the Contractor.

Failure by the Contractor to pay fines imposed by the Principal Agent within 14 days of the fine being imposed may result in a “Stop Works” order being issued by the Principal Agent until the matter is resolved. Any costs incurred as a result of the “Stop Works” order will be for the account of the Contractor.

The following spot fines are recommended for contraventions (plus any rehabilitation costs if applicable):

a. Any individual/s littering on site: R50 on first offence and R250 on further offences.

b. Any individual/s burning waste on site: R250 on first offence and R1 000 on further offences.

c. Any individual/s dumping waste on site: R250 on first offence and R1 000 on further offences.

d. Any violation of a Method Statement: R250 for first offence and R1 500 on further offences.

e. Any individual causing avoidable disturbance to fauna and flora on site: R250 on first offence and R1 000 on further offences.

2) Penalty fines
Penalty fines will be implemented where the Contractor repeatedly fails to comply with the specifications of this EMP the Contractor will be liable to pay a penalty fine over and above any other contractual consequence.

The following penalty fines (per repeat offence) are recommended for transgressions:

a. On-going littering on site: R2 500 plus any rehabilitation costs, if applicable.

b. On-going dumping of any waste on site: R10 000 plus any rehabilitation costs, if applicable.

c. On-going burning of any waste on site: R10 000 plus any rehabilitation costs, if applicable.

d. On-going transgression of a Method Statement: R10 000 plus any rehabilitation costs, if applicable.

e. On-going disturbance to Fauna and Flora on site: R5 000 plus any rehabilitation costs, if applicable.

3) Other fines

a. Any individual/s causing damage to identified sensitive natural areas: R5 000 plus any rehabilitation costs.

b. Any individual/s causing damage to identified sensitive heritage areas: R5 000 plus any rehabilitation costs.

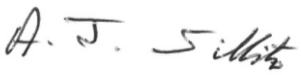
c. Any individual/s causing irreparable damage to the environment: R10 000.

d. Injuring or killing of any wildlife: R5 000 plus any rehabilitation costs, if applicable.

The above recommended fines are applicable and relevant to the construction phase of this EMPr and as such do not exempt the client from other legal obligations such as *Section 24(h)* National Environmental Management Second Amendment Act, Act No. 107 of 1998, which states that it is "*an offence for any person to contravene conditions applicable to any environmental authorization granted for a listed activity. A person convicted of an offence is liable to a fine not exceeding R5 million or to imprisonment for a period not exceeding ten years, or to both such fine and such imprisonment"*

An Environmental Management Plan constitutes a *Condition* applicable to an *Environmental Authorisation* and any transgression would thus trigger *Section 24(h)* of the above-mentioned Act. The exact penalty and fines will be decided on, subsequent to consultation with DARDLEA and the local municipality.

All staff working on-site must be made aware of the penalties and fines associated with non-conformance. The Principal Agent will be responsible for ensuring that the penalty system is maintained and enforced. Should disputes arise between the client, Engineer, Contractor or ECO with respect to the above then the matter will be referred to arbitration.



A J SILLITO
Pr. Sci. Nat., CEAPSA

APPENDIX A
GLOSSARY

TERMS USED IN THIS *EMPr*

The terms used include the following and those defined in AS/NZS ISO 14001:2004 and AS/NZS ISO 9000:2000.

The term '**client**' means the owner of the asset to be procured or project product, and representative of the end users of the asset.

The term '**construction**' means all organised activities concerned with demolition, building, landscaping, maintenance, civil engineering, process engineering, heavy engineering and mining.

The term '**consultant**' means a professional person or organisation that contracts with a customer to provide design, management or other services.

The term '**contractor**' means an organisation that contracts with a Principal to carry out the work under the contract, including construction and related services, to deliver an asset or construction product.

The term '**design**' means the process (and product) of converting a brief into design details ready for documentation, including concept design and design development, and then documentation or detailing of the technical and other requirements for the project in a written form that details the project product sufficiently for it to be constructed or otherwise provided.

The term '**environmental opportunity**' means a potential for beneficial environmental impacts (such as an improvement in air or water quality through environmentally friendly technology alternatives).

The term '**environmental risk**' means a potential for adverse environmental impacts (such as pollution of a water source during construction activities).

The term '**management**' means the planning and interactive controlling of human and material resources to achieve time, cost, quality, performance, functional and scope requirements. It involves the anticipation of changes due to changing circumstances and the making of other changes to minimise adverse effects.

The term '**procurement**' means the collection of activities performed by and for an agency to acquire services and products, including assets, beginning with the identification/detailing of service requirements and concluding with the acceptance (and where applicable, disposal) of the services and products.

The term '**project**' means an undertaking with a defined beginning and objective by which completion is identified. Project delivery may be completed using one contract or a number of contracts.

The term '**service provider**' means a contractor, subcontractor, supplier, consultant (including an agency) and sub-consultant (contracting with a consultant), and their service providers, that contract with a customer to carrying out assets construction, provide other products (including goods) and/or provide services.

The term '**subcontractor**' means an organisation that contracts with a contractor as the customer to carry out construction and related services, and/or provide other products.

The term '**supplier**' means an organisation that contracts with a contractor/Principal to supply a product and/or service

APPENDIX B
GENERIC METHOD STATEMENT

METHOD STATEMENT FOR THE:

. . . . . .

This method statement is to be completed by the Contractor (in consultation with the Principal Agent and ECO) at least 5 working days prior to the proposed commencement date of the said work and represents a binding agreement to the Method Statement by all site Contractors and sub-Contractors involved in the work for which the Method Statement is submitted.

DATE OF SUBMISSION:……

LEAD CONTRACTOR:……

OTHER CONTRACTORS AND/OR SUB-CONTRACTORS:……

A) Describe in detail ***what*** work is to be undertaken?

b) Describe in detail ***where*** on the site the works are to be undertaken and the ***extent***? Provide sketch plan and grid block reference.

B) ***When*** will the works start and what is the anticipated finishing date of these works?

C) How are the works to be undertaken?

1) Lead supervisor/ foreman name and contact details: 2) Number of personnel: 3) Construction activities: 4) Plant and machinery to be used: 5) Materials to be stored (specify hazardous materials): 6) Other:

e) What ***environmental impacts are anticipated and what precautions*** are proposed to prevent these impacts? (refer to the relevant sections of the EMP for guidance and provide a general camp layout)

Camp site demarcation:
Toilet facilities:

Litter:
Security:
Plant/machinery (operation, servicing, management, storage, refuelling etc.):
Emergencies and fire:
Hazardous materials (handling, management, storage etc.):
Have all personnel involved been through an environmental induction course?
Petrochemical spill remediation and containment measures:
Other:

DECLARATIONS BY PARTIES

1) CONTRACTOR

I UNDERSTAND THE CONTENTS OF THE METHOD STATEMENT AND THE SCOPE OF THE WORKS REQUIRED OF ME. I FURTHER UNDERSTAND THAT THE METHOD STATEMENT MAY BE AMENDED ON APPLICATION TO THE ABOVE SIGNATORIES, AND THAT THE ENVIRONMENTAL CONTROL OFFICER WILL AUDIT MY COMPLIANCE WITH THE CONTENTS OF THIS METHOD STATEMENT.

_____ (PRINT NAME)

_____ (SIGNED) DATED: _____

2) ENVIRONMENTAL CONTROL OFFICER (ECO)

THE WORK DESCRIBED IN THIS METHOD STATEMENT, IF CARRIED OUT ACCORDING TO THE METHODOLOGY DESCRIBED, IS SATISFACTORILY MITIGATED TO PREVENT AVOIDABLE ENVIRONMENTAL HARM.

_____ (PRINT NAME)

_____ (SIGNED) DATED: _____

3) PRINCIPAL AGENT

THE WORK DESCRIBED IN THIS METHOD STATEMENT, IF CARRIED OUT ACCORDING TO THE METHODOLOGY DESCRIBED, IS SATISFACTORILY MITIGATED TO PREVENT AVOIDABLE ENVIRONMENTAL HARM.

_____ (PRINT NAME)

_____ (SIGNED) DATED: _____

APPENDIX C
RELEVANT PERMITS
(to be provided by the contractor)

APPENDIX D
DIAGRAMS

APPENDIX E
ROLE OF THE ECO

DUTIES OF THE ECO

1. The identification of potential environmental impacts, prior to the onset of the project.
2. Ensuring that the EMPr conditions are adhered to at all times and taking action (via the engineer) where the specifications are not being followed.
3. Ensuring that environmental impacts are kept to a minimum.
4. Reviewing and approving method statements in consultation with the Principal Agent.
5. Advising the engineer and contractor on environmental issues and assisting in developing environmentally responsible solutions to problems.
6. Reporting to the client and Principal Agent on a regular basis and advising of any environmental impacts.
7. Attending site meetings (when necessary) and giving a report back on the environmental issues at these meetings and other meetings that may be called regarding environmental matters.
8. Inspecting the site and surrounding areas regularly.
9. Establishing and monitoring an on-going environmental awareness program in conjunction with the contractor.
10. Requesting the removal of person(s) and/or equipment not complying with the specifications.
11. Keeping both a written and photographic record of progress on site from an environmental perspective, and an ad hoc record of all incidents or events on site with environmental ramifications. These records should be dated and accurately catalogued.
12. Undertaking continual internal review of the EMPr and submitting a report at the end of the project.
13. The ECO will submit all written instructions and verbal requests to the contractor via the engineer.