



APPENDIX I

ENVIRONMENTAL MANAGEMENT PLAN (EMP)

DRAFT ENVIRONMENTAL MANAGEMENT PLAN
for
**THE DWAALBOOM 132KV SWITCHING STATION AND
ASSOCIATED SECONDARY INFRASTRUCTURE**

Reference Number: 12/12/20/1088

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Introduction

The following is a Draft Environmental Management Plan (EMP) to mitigate against the potential environmental impacts related to the proposed Dwaalboom 132kV switching station and its associated secondary infrastructure.

During its lifecycle, projects journey through four distinctive phases, as presented in Figure 1. The EMP deals with the planning, construction, operation and decommissioning phases.

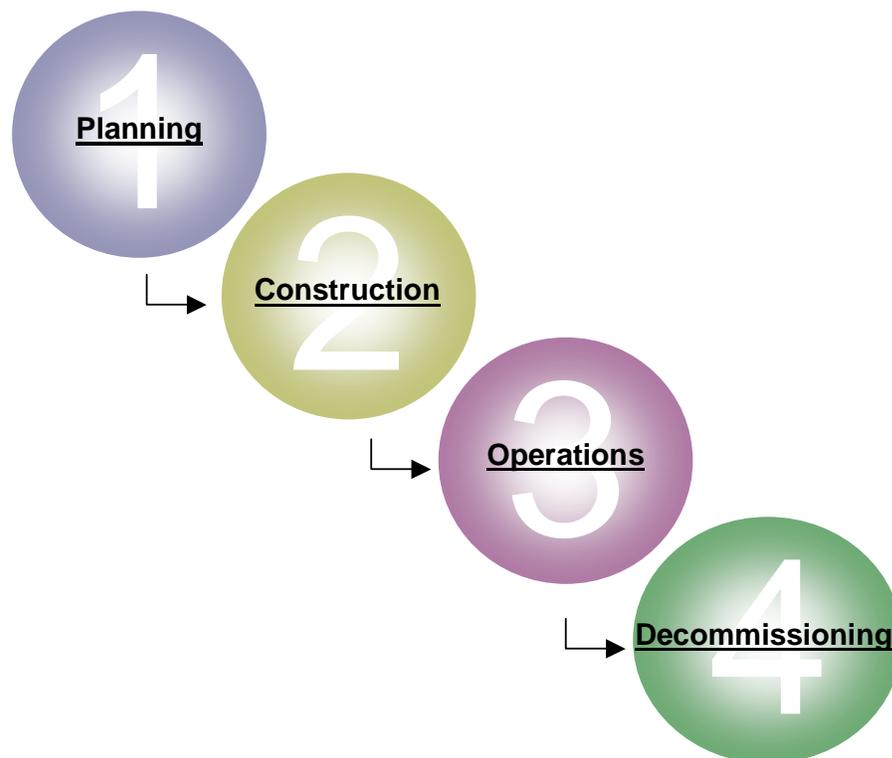


Figure 1: Four Phases of a Project Lifecycle

ENVIRONMENTAL ASSESSMENT PRACTITIONER

Nemai Consulting is an independent, specialist environmental, social development and Occupational Health and Safety (OHS) consultancy, which was founded in December 1999 by Ms D Naidoo. The company is 100% black female owned. The company is considered an emerging company, and it is directed by a team of experienced and capable environmental engineers, scientists, sociologists, psychologists, economists and analysts. These well-experienced professionals have worked both locally and internationally in their respective fields. The company combines its academic and professional expertise with excellent project management skills to ensure that the host of environmental, OHS and social challenges in both the private and public sectors are adequately addressed. The company has offices in Randburg (Gauteng), Rustenburg (North West Province), Durban (KwaZulu-Natal) and Empangeni (KwaZulu-Natal).

Selected examples of completed projects:

- Blanket environmental consultant to Johannesburg Water on all EIA applications for the 2003/2004 and 2004/2005 financial years;
- Advisor to Johannesburg Water on all EIA applications on water and sanitation projects for 2005/2006 financial year;
- Chemical processing plants at Sasol;
- Randfontein to Rustenburg water pipeline;
- Filling stations and tank installations;
- Northern Works Cemetery;
- Housing development in the Northern Cape;
- Bushkoppies Waste Water Treatment Plant;
- 1-Octene 3 Plant;
- Re-instatement of North Riding Dyke;
- Kwa Themba Landfill Closure;
- Mooi-Mngeni Transfer scheme fish-barrier EIA;
- Low cost housing development in Tshwane, including Shoshanguve, Olievenhoutbosch, Mamelodi and Mahube Valley; and
- Low cost housing development in Metsweding, including Ekangala, Kekana Gardens and Rethabiseng.

PROJECT ACTIVITIES

Eskom Holdings Limited appointed Nema Consulting to undertake the Scoping/EIA environmental process for the proposed construction of a switching station and its associated structures in the North West Province, just south of the Limpopo Province border.

The existing electricity network at Spitskop cannot supply 20MVA to Dwaalboom PPC during contingency conditions as the spare capacity of the 132kV supply-line is almost depleted. The construction of the switching station would ensure that the Dwaalboom PPC plant has sufficient supply for a 20MVA load irrespective of the loss of any 132kV line supply to the existing Dwaalboom substation by introducing parallel 132kV line feeds.

The purpose of the proposed switching stations is to ensure that the Dwaalboom PPC plant receives a constant supply of electricity during normal and 132kV line outages.

The switching station will consist of several structures, these include:

- The switching station;
- Terminal pylons – four pylons, known as terminal pylons would be required. Two pylons to supply power to the Spitskop – Segotishane 132 kV line and two pylons to take electricity out of the switching station and connect to the Spitskop – Segotishane line;
- Six bay double busbar;
- Auxiliary 132/22kV 10MVA transformer;
- An oil dam (approximately 400 litres);
- 15m x 15m control room;
- Communication mast;
- Dirt road for site access;
- A flood light in one corner; and
- A fence around the switching station.

Legislation

The legislation that was considered in the preparation of this report included the following:

National Environmental Management Act (Act 107 of 1998)

This EMP has been developed in accordance with Environmental Impact Assessment Regulation 34 published in Govt. Notice No. R385 in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998). The relevant regulations pertaining to Govt. Notice No. R385 are Govt. Notices No. R.386 and R.387.

All legislation relevant to the Scoping/EIA process has been followed. Part of the requirements of R.385 is the development of a draft EMP.

All requirements relevant to the construction and operation of a switching station and its associated features as determined in this Act should be followed.

National Environmental Management: Biodiversity Act (Act 10 of 2004)

All requirements relevant to the construction and operation of a switching station and its associated features as determined in the Biodiversity Act should be followed.

National Heritage Resources Act (Act 25 of 1999)

This Act is concerned with the determination of areas of special interest to the public. The presence of any heritage resources is not expected, however a clause has been included within this EMP that provides for the unexpected unearthing / excavation of heritage resources. This states that should any heritage resources be found while construction occurs then work must stop. A museum, preferably one with an archaeologist, must be contacted immediately so an investigation and evaluation of the finds can be made. Work in the area can only be resumed once the site has been completely investigated.

National Water Act (Act 36 of 1998)

Section 21 of the above Act is concerned with water licenses. This Section describes all aspects of water use requiring the responsible authorities consent. Although this Act was considered, due to the distance of any water bodies from the site, it was found to not be applicable.

National Forests Act (Act 73 of 1998)

This Act is concerned with the licensed removal of declared trees. A specialist Flora and Fauna study was commissioned to look at the study sites. Protected trees were found on all three sites, a permit is required from the Department of Water Affairs and Forestry (DWAF) for the removal of these trees.

National Veld and Forest Act (Act 101 of 1998)

Section 12 of this Act renders firebreaks compulsory to landowners from whose land a veldfire may start, burn or spread. If it is determined that any land acquired for the purpose of constructing the switching station may start, burn or spread a veldfire then it would be compulsory for Eskom to implement firebreaks.

Atmospheric Pollution Prevention Act (Act 101 of 1998)

This Act refers to controlling diesel emissions. If Eskom uses diesel vehicles, they must be regularly monitored for compliance with this Act.

Conservation of Agricultural Resources Act (Act 43 of 1983)

This Act refers to not using the vegetation of a watercourse within a floodline or within 10 horizontal meters outside a flood area that may result in the deterioration or damage to natural agricultural resources. This section of this legislation is not relevant as there are no watercourses in the vicinity of the sites.

This Act also requires that any declared invader species on Eskom land be controlled according to their declared invader status. The EMP has made provision for the removal of alien vegetation from the construction areas.

National Road Traffic Act (Act 83 of 1996)

This Act is relevant if Eskom intends to transport, load, off-load or package dangerous goods as listed in SANA Code of Practice 10228.

In addition to the above – mentioned legislation, the local by-laws should be taken into account during all project phases.

Explosives Act (Act 15 of 2003)

This Act is concerned with the control of explosives including the inspection of explosives used and the sites they are used at and the penalties of not complying with the Act. If blasting is required then Eskom must comply with this Act and any associated Regulations.

Guidelines

The following Eskom guidelines should be considered where applicable:

- “The Safe Use of Pesticides and Herbicides” during the operation of the switching station and associated structures (ESKASAAL0), Annexure 1; and
- “Transmission Servitudes Gates Standard” should be used during the construction and operation of the switching station (TGL41-338) Annexure 2.

Responsibilities of team members

The responsibility for enforcing the implementation of the EMP lies with Eskom Holdings Ltd.

Eskom Environmental Practitioner / Advisor (during feasibility stages & construction phases):

- To ensure that an un-biased, environmental impact assessment (EIA) with a thorough public participation is conducted for the proposed project. Such assessment to be in accordance to the latest legislation and acceptable to all interested and affected parties and to finally be approved by the relevant authority.;
- To secure an uncontested Environmental Authorisation;
- To project manage the independent Environmental Consultants throughout the EIA life cycle and to ensure that a practical Environmental Management Plan (EMP) for the construction phase of a project is compiled and approved by the relevant and appropriate government authorities;
- To ensure that all conditions as stipulated in the Environmental Authorisation are met; and
- To conduct spot audits during construction.

Servitude Negotiator:

- To negotiate servitude on private and public owned properties; and
- To identify landowner conditions & requirements.

Project Manager/ Site Manager:

- Represents and acts on behalf of Eskom Transmission regarding the administration of contracts;
- In consultation with the system Planning Engineer, determines the scope of work;
- To provide scheduling aspects of co-ordination and estimating;
- Ensure implementation of the project plan within cost, time and quality constraints;
- Ensure that implementation of EMP is executed as planned; and
- Keep the asset owner informed of progress made during the life cycle of the project.

No work shall commence until permission is granted from the Environmental Advisor from Transmission Services and the Environmental Authorisation from the Department of Environmental Affairs and Tourism (DEAT) has been obtained. The Project Manager shall ensure that all conditions of the Environmental Authorisation are fulfilled before the Contractor occupies the site. The Grid shall be kept informed of all developments on construction at all

times. All the requirements from the Grid must be considered during the construction phase to ensure smooth transition.

Environmental Control Officer:

The Environmental Control Officer shall convey the contents of this document, the conditions of the Environmental Authorisation from DEAT as well as the Landowner conditions to the Contractor's site staff and discuss the contents in detail with Eskom's Project Manager and Contractor at a pre-construction meeting. This formal induction training is a requirement of ISO 14001 and shall be done with all main and sub-contractors. Record of the training date, people whom attended and discussion points shall be kept by the ECO. Included in the formal induction training is ensuring the Contractor, Site Agent, Construction Supervisor and Safety Officer are conversant with the mitigation measures, and to verify that the Contractor's employees have undergone induction on these measures.

The ECO shall monitor the execution of the mitigation measures and ensure the safeguarding of the environment.

The ECO shall make contact with the local Extension Officer of the Department of Agriculture and the Chairpersons of the Farmers Associations where the route traverses, as these contacts have valuable information about the area and the local farming community.

Landowners shall therefore be informed timeously of the construction programme, duration and all interference with their daily activities.

The contact numbers of the ECO and Contractor Environmental Control Officer (CECO) shall be made available to Landowners.

The ECO officer will report progress made on a monthly basis to the Project Manager and Land and Rights Environmental Impact Assessment Manager. These reports shall be available at all times, on site or in the project file and on request by auditors, DEAT and other Interested and Affected Parties (I&APs).

The ECO shall record all non-conformances and action plans to ensure that measures are put in place to remedy possible effect.

The ECO shall facilitate communication between I&APs, Eskom Holdings Ltd and the contractor.

Contractor:

- To provide all necessary supervision during the execution of the project. He/ She should be available on site all the time;
- To appoint a competent CECO;
- To implement the projects as per the approved project plan;

- To ensure that implementation is conducted in an environmentally acceptable manner;
- To fulfil all obligations as per the agreed contract;
- To comply with special conditions as stipulated by Landowners during the negotiation process; and
- To inform and educate all employees about the environmental risks associated with the different activities that should be avoided during the construction process and lessen significant impacts to the environment.

Eskom Environmental Practitioner (During Operational Stage):

- To implement and integrate environmental management systems by ensuring compliance to ISO 14000 & monitoring performance;
- Reports environmental incidents;
- Provides environmental training; and
- Ensures compliance to legislations and other legally binding documents.

Environmental Consultants:

- Investigate and produce assessment of impacts on the environment related to the project;
- Ensure the implementation of a thorough public participation process;
- Draft and submit Scoping and Environmental Impact Report (EIR) to relevant Government Departments; and
- Draft EMP and submit for approval to the relevant Government Departments.

Authorising Department:

To provide Environmental Authorisation on all applications lodged for the proposed Transmission lines, substations and related activities.

Mitigation measures

In the Draft EMP below, general mitigation measures are provided for the planning phase, while specific measures are listed to address the identified environmental impacts during the construction and operation stages of the project. General mitigation measures are provided for the decommissioning phase of the project lifecycle, more specific measures should be proposed before the switching station is decommissioned to take into account any changes that may have occurred to the surrounding environment.

Construction Phase:

The main construction activities will include the following:

- Site preparation;
- Earthworks (excavations, etc.);
- Switching station construction; and
- Site reinstatement and landscaping.

PROJECT PHASE: PLANNING

Environmental Consideration	Mitigation Measures	Responsible Party
EMP Induction	Introduce the ECO to the Project Team	Project Manager
	Training of the Contractor's employees on the EMP and Environmental Authorisation.	ECO
	Elucidation of environmental monitoring protocol to the Project Team by the ECO.	ECO
	All correspondence from ECO must be filed and kept onsite.	Project Manager
Construction Camp	In consultation with the ECO, establish a suitable site for a construction camp. The site office as well as parking areas for construction vehicles should be confined to disturbed areas, away from drainage lines.	Contractor; ECO
	Make provision for enough chemical toilets for all employees.	Project Manager; Contractor
Soil	Identify suitable site/burrow pit (if applicable) to obtain soil. All new borrow pits, or extensions to existing pits, require an Environmental Management Programme Report (EMPR) in terms of the Minerals Act (Act no. 50 of 1991).	Project Manager
Waste	Identify suitable landfill, which will accept the type of waste material to be generated.	Contractor
Social	Labour intensive methods must be used where feasible, cost effective and not time constraining.	Contractor
	Local labour should be employed, as far as possible.	Contractor
	Local suppliers must be used, as far as possible.	Contractor

PROJECT PHASE: CONSTRUCTION

Environmental Consideration	Environmental Impacts	Mitigation Measures	Timeframe	Responsible Party
<p>1) Soil</p>	<ul style="list-style-type: none"> • Topsoil will be stripped and stockpiled during the excavation. During the period of stockpiling the topsoil may be exposed to erosion. 	<ul style="list-style-type: none"> • In areas to be affected by construction activities, topsoil (minimum of 300mm of top layer) is to be stored and used for rehabilitation. • Careful excavation accompanied by appropriate construction methods and rehabilitation measures will help to prevent erosion. • Protect stockpiled topsoil by preventing compaction (vehicle movement), contamination and mixing with any other material. • Soil must be properly reinstated. • The Contractor must implement adequate erosion control measures for areas of fragile soils. • Institute wind and water erosion-control measures to prevent loss of topsoil. 	<ul style="list-style-type: none"> • Rehabilitation to be completed approximately 3 months after completion of the contract. • A continuous mitigation measure should be in place for the duration of construction. • A continuous mitigation measure, should be in place for the duration of construction. • All disturbed areas should be successfully reinstated within 3 months of completion of the contract. • A continuous mitigation measure that should be in place for the duration of construction. • Mitigation measures should be implemented within seven days of exposure, especially during the rainy season. 	<p>Contractor</p>

Dwaalboom 132kV Switching Station and Associated Secondary Infrastructure

Environmental Consideration	Environmental Impacts	Mitigation Measures	Timeframe	Responsible Party
		Topsoil should not be stored or dumped within any drainage lines.	<ul style="list-style-type: none"> A continuous mitigation measure, should be in place for the duration of construction. 	
1) Soil (cont)	<ul style="list-style-type: none"> During the construction phase the land may be polluted by contaminants such as fuel and and/or waste (domestic, construction material, human). 	<ul style="list-style-type: none"> Waste to be managed. Suitable waste receptacles (e.g. bins, skips) to be provided at the construction camp. Under no conditions may the surrounding areas be used for ablution purposes. Sufficient chemical toilets to be provided – 1 toilet per 20 workers. Chemical toilets to be placed at strategic points (With minimal visual impact). Vehicles to be serviced at construction camp, under controlled conditions. Drip-trays to be used for leaks. 	<ul style="list-style-type: none"> Waste receptacles will be put in place before construction starts, during the establishment of the construction camp. All waste to be disposed of at a registered landfill. Installation of these toilets should occur on the first day of the establishment of the construction camp. Chemical toilets to be serviced once per week. Vehicles should be regularly maintained, they should be serviced as often as practically possible. 	Contractor

Dwaalboom 132kV Switching Station and Associated Secondary Infrastructure

Environmental Consideration	Environmental Impacts	Mitigation Measures	Timeframe	Responsible Party
		<ul style="list-style-type: none"> • Elevated fuel storage tanks to be provided with impermeable floors and bund walls to prevent pollution from accidental spillages. Access for refuelling and the delivery of fuel is also to have impermeable flooring. The outflow of the bund-area to be supplied with an oil trap. The bund wall to be of sufficient height to allow for the containment of 110% of the tank(s) volume. Provide area with relevant warning signage (e.g. no smoking, open fires and fire extinguisher). • Prevent spillage from elevated fuel tanks during decanting. 	<ul style="list-style-type: none"> • Any fuel spillages should be cleaned up within 24 hours of the spillage occurring. The elevated fuel storage tanks should be in place by the time the construction camp has been established. Warning signs should be placed at the same time as the installation of the elevated fuel storage tank. • Any spillage that occurs should be cleaned up within 24 hours of the spillage occurring. 	
<p>2) Surface Water</p>	<ul style="list-style-type: none"> • Pollution of surface water through contaminated stormwater, disposal of waste, nearby ablution, discharge of wastewater 	<ul style="list-style-type: none"> • Divert stormwater through sediment traps and then divert all water with off-cut drains towards established contour ridges. • See mitigation measures under Soil (Construction phase), which relate to waste management. 	<ul style="list-style-type: none"> • The sediment trap should be in place before construction takes place. • See timeframes under Soil. 	<p>Contractor</p>

Dwaalboom 132kV Switching Station and Associated Secondary Infrastructure

Environmental Consideration	Environmental Impacts	Mitigation Measures	Timeframe	Responsible Party
<p>3) Groundwater</p>	<ul style="list-style-type: none"> Groundwater may be contaminated through the percolation of contaminants. 	<ul style="list-style-type: none"> Waste to be managed. Suitable waste receptacles (e.g. bins, skips) to be provided at the construction camp. Sufficient chemical toilets to be provided – 1 toilet per 20 workers. Chemical toilets to be placed at strategic points (away from any watercourse, with minimal visual impact). Vehicles to be serviced at construction camp, under controlled conditions. Drip-trays to be used for leaks. Elevated fuel storage tanks to be provided with impermeable floors and bund walls to prevent pollution during accidental spillages. The outflow of the bund-area to be supplied with an oil trap. The bund wall to be of sufficient height to allow for the containment of 110% of the tank(s) volume. Provide area with relevant warning signage (e.g. no smoking and open fires, fire extinguisher). 	<ul style="list-style-type: none"> Waste receptacles will be put in place before construction starts, during the establishment of the construction camp. Installation of these toilets should occur on the first day of the establishment of the construction camp. Chemical toilets to be serviced once per week. Vehicles must be regularly maintained, they should be serviced as often as practically possible. Any fuel spillages must be cleaned up within 24 hours of the spillage occurring. The elevated fuel storage tanks should be in place by the time the construction camp has been established. Warning signs should be placed at the same time as the installation of the elevated fuel storage tank. 	<p>Contractor</p>

Dwaalboom 132kV Switching Station and Associated Secondary Infrastructure

Environmental Consideration	Environmental Impacts	Mitigation Measures	Timeframe	Responsible Party
		<ul style="list-style-type: none"> Prevent spillage from elevated fuel tanks during decanting. Area where decanting from and refilling of fuel storage tanks also to have impermeable flooring. 	<ul style="list-style-type: none"> Any spillage that occurs must be cleaned up within 24 hours of the spillage occurring. A measure to be in place before construction begins. 	
4) Air	<ul style="list-style-type: none"> Emissions from construction vehicles. 	<ul style="list-style-type: none"> Vehicles to be properly maintained to avoid unnecessary emissions. Vehicles must be regularly serviced to ensure that no smoke is generated 	<ul style="list-style-type: none"> Vehicles general upkeep will be ongoing; any faults should be reported to the responsible party as soon as possible. Vehicles are to be serviced as often as practically possible to ensure they do not produce excessive smoke. <p>Emissions from construction vehicles will occur for the duration of construction.</p>	Contractor
4) Air (cont)	<ul style="list-style-type: none"> Bare patches may generate dust if used by vehicles or during windy periods. Air pollution can be caused by dust from construction activities 	<ul style="list-style-type: none"> Dust must be reduced by wetting down bare areas and stockpiled soil. Water used for this purpose must be used in quantities that must not result in the generation of run-off. 	<ul style="list-style-type: none"> This is ongoing throughout the construction phase. Dust suppression to be carried out at least once a day, in addition bare patches must be regularly wet whenever they become dry enough to produce dust. 	Contractor

Dwaalboom 132kV Switching Station and Associated Secondary Infrastructure

Environmental Consideration	Environmental Impacts	Mitigation Measures	Timeframe	Responsible Party
		<ul style="list-style-type: none"> • Construction vehicles must travel at low speeds to reduce the effect of dust. • Where extreme problems are experienced, as during blasting activities, watering down of the dust can be done. 	<ul style="list-style-type: none"> • This would be continuous throughout construction phase. The speed limit must be enforced at all times. • This should be done when necessary during the construction phase. 	
<p>5) Flora</p>	<p>Damage to vegetated areas surrounding the proposed development area.</p>	<ul style="list-style-type: none"> • Removal of vegetation must be restricted to within the work footprint. No protected tree species to be removed without a permit from DWAF. • Workers and machinery to remain inside construction footprint. • All labourers to be informed of disciplinary actions for the wilful damage to plants. • Indigenous trees should be used to replace any trees removed during construction. • No vegetation must be unnecessarily removed. 	<ul style="list-style-type: none"> • This restriction will occur for the duration of the construction phase. • To occur for the duration of construction. • To occur during induction with reminders every week. • All disturbed areas should be successfully rehabilitated within 3 months of completion of the contract. <p>Any removed vegetation should be successfully replaced with indigenous vegetation within 3 months of the completion of the contract.</p>	<p>Contractor; ECO; Rehabilitation Expert</p>

Dwaalboom 132kV Switching Station and Associated Secondary Infrastructure

Environmental Consideration	Environmental Impacts	Mitigation Measures	Timeframe	Responsible Party
		<ul style="list-style-type: none"> Proposed development activities should take into consideration the locality of the larger and well-established protected tree species and potentially incorporate these into the development. 	<ul style="list-style-type: none"> This consideration should be done before the removal of any vegetation. 	
6) Fauna	<ul style="list-style-type: none"> Damage to fauna (i.e. wilful damage). 	<ul style="list-style-type: none"> All labourers to be informed of disciplinary action for wilful damage to animals. 	<ul style="list-style-type: none"> Labourers will be informed during induction and be reminded once a week. 	Contractor; ECO
	<ul style="list-style-type: none"> Storing of domestic waste may lead to occurrence of pests, such as rodents, flies, etc. 	<ul style="list-style-type: none"> Waste to be managed. Suitable waste receptacles (e.g. bins, skips) to be provided at the construction camp. 	<ul style="list-style-type: none"> Waste receptacles will be put in place before construction starts, during the establishment of the construction camp. They must be emptied on a daily basis and the waste disposed of at a registered landfill. 	Contractor
	<ul style="list-style-type: none"> Disturbance to domestic animals, <u>including livestock</u>, from construction activities. <p><i>Comment: Although there are no residential properties surrounding the construction footprint, construction workers should still be discouraged from entering any private properties.</i></p>	<ul style="list-style-type: none"> No worker or contractor will enter any property without permission from the landowner. The owners or parties responsible for livestock found within the construction footprint should be requested to remove their livestock. If a party responsible for the livestock cannot be found then the livestock should be removed from the site in a manner that would not cause them undue 	<ul style="list-style-type: none"> To occur for the duration of construction. 	Contractor

Dwaalboom 132kV Switching Station and Associated Secondary Infrastructure

Environmental Consideration	Environmental Impacts	Mitigation Measures	Timeframe	Responsible Party
		stress.		
7) Aesthetics	<ul style="list-style-type: none"> Untidy construction site to pose a visual impact. 	<ul style="list-style-type: none"> Sound housekeeping and waste management measures (see waste mitigation measures) to be employed. Location of construction camp to be determined by ECO to minimise visual intrusion. Construction material to be stored in a neat and safe manner, in designated areas. The Stacking and Storage Supervisor, to be appointed in terms of regulation 26 (a) of the Construction Regulation (GNR. 1010 of 2003), must diligently execute his/her duties, as imposed by the aforesaid legislation. Waste should be restricted to storage in specifically designated areas, and removed daily. Damage to the natural environment (e.g. vegetation) 	<ul style="list-style-type: none"> These measures are to be implemented as soon as the construction camp is established. Housekeeping to be done at least once a day. The final location will be determined before the construction camp is established. This is ongoing throughout the process and requires constant supervision. This is ongoing throughout the construction process. Waste to be removed daily to a designated landfill for the duration of the project. For the duration of the project. 	Contractor; ECO

Dwaalboom 132kV Switching Station and Associated Secondary Infrastructure

Environmental Consideration	Environmental Impacts	Mitigation Measures	Timeframe	Responsible Party
		<p>must be minimized (Please see Comment under soil).</p> <ul style="list-style-type: none"> Any complaints from interested groups regarding the appearance of the construction site must be recorded and addressed promptly. 	<ul style="list-style-type: none"> The complaint should be addressed within 24 hours of receipt of written notice of the complaint. 	
8) Noise	<ul style="list-style-type: none"> Increased noise during construction 	<ul style="list-style-type: none"> All machinery to be maintained to reduce noise levels. Labourers to be provided with hearing protection. No loud music allowed from the construction camp or anywhere else within the work footprint. Work must be restricted to the normal work hours, which are between 07h00 to 17h00. No work is allowed on the weekends or at night. If overnight of weekend work is required then the affected community must be informed of any after hour work. 	<ul style="list-style-type: none"> Machinery should be regularly maintained, they should be serviced whenever practically possible. Hearing protection should be provided before any use of heavy machinery. Ongoing throughout the construction process. Ongoing throughout the construction process. Ongoing throughout the construction process. To occur two days before the after hour work begins. 	Contractor
8)Noise (cont)	<ul style="list-style-type: none"> Increase in noise from the 	<ul style="list-style-type: none"> All direct I&APs to be informed 	<ul style="list-style-type: none"> To occur at least two weeks 	Contractor

Dwaalboom 132kV Switching Station and Associated Secondary Infrastructure

Environmental Consideration	Environmental Impacts	Mitigation Measures	Timeframe	Responsible Party
	<p>operation of the earth-moving vehicles as well as blasting.</p>	<p>of any noise factors.</p> <ul style="list-style-type: none"> Work must be restricted to the normal work hours, which are between 07h00 to 17h00. 	<p>before any anticipated noise factors.</p> <ul style="list-style-type: none"> Ongoing throughout the construction process. 	
<p>9) Traffic</p>	<ul style="list-style-type: none"> Disruption to traffic during construction. 	<ul style="list-style-type: none"> Relevant traffic authorities to be contacted for any anticipated disruptions. Compliance with the South African Road Traffic Signs Manual. All reasonable precautions must be taken during construction to avoid disruption to the traffic flow. Heavy vehicles and earthmoving equipment must preferably not travel on roads during peak hours. Necessary arrangements to be made to provide access to properties. Necessary safety measures to be implemented for working within/alongside roads. 	<ul style="list-style-type: none"> The relevant authorities should be notified in writing at least two weeks before any anticipated disruptions occur. Continuous throughout the construction process. 	<p>Contractor</p>

Dwaalboom 132kV Switching Station and Associated Secondary Infrastructure

Environmental Consideration	Environmental Impacts	Mitigation Measures	Timeframe	Responsible Party
10) Heritage Resources	<ul style="list-style-type: none"> Damage to heritage resources. 	<ul style="list-style-type: none"> All finds of human remains must be reported to the nearest police station. Should any historically significant finds (e.g. artefacts, human remains or sites of cultural or archaeological importance) be located, work must cease and a museum, preferably one with an archaeologist, must be contacted immediately so an investigation and evaluation of the finds can be made. Work in the area can only be resumed once the site has been completely investigated. Under no circumstances may any worker destroy or interfere with archaeological sites or finds. A fence at least 2m outside the extremities of the site must be erected to protect archaeological sites. 	<ul style="list-style-type: none"> This should be done immediately if any human remains are found. Written notice should be issued to the authorities as soon as any historically significant finds are located. The fence should be erected 24 hours after the discovery, subject to the availability of fencing material. 	Contractor
11) Socio Economic	<ul style="list-style-type: none"> Construction to be labour intensive to allow for job creation. 	<ul style="list-style-type: none"> Employment of local labourers will be written into the contract. 	<ul style="list-style-type: none"> The created jobs would only last for the duration of construction. 	Contractor

Dwaalboom 132kV Switching Station and Associated Secondary Infrastructure

Environmental Consideration	Environmental Impacts	Mitigation Measures	Timeframe	Responsible Party
	<ul style="list-style-type: none"> The labourers will be trained in construction activities; this will increase the skills base of the community. 			
12) Fuel and Chemicals	<ul style="list-style-type: none"> Environmental pollution from fuel 	<ul style="list-style-type: none"> Elevated fuel storage tanks to be provided with impermeable floors and bund walls to prevent pollution during accidental spillages. The outflow of the bunded area to be supplied with an oil trap. The bund wall to be of sufficient height to allow for the containment of 110% of the tank(s) volume. Provide area with relevant warning signage (e.g. no smoking and open fires, fire extinguisher). Prevent spillage from elevated fuel tanks during decanting. Prevent spillage from elevated fuel tanks during decanting. Area where decanting takes place also to have impermeable flooring. 	<ul style="list-style-type: none"> Any fuel spillages should be cleaned up within 24 hours of the spillage occurring. The elevated fuel storage tanks should be in place by the time the construction camp has been established. Warning signs should be placed at the same time as the installation of the elevated fuel storage tank. Any spillage that occurs should be cleaned up within 24 hours of the spillage occurring. A mitigation measure that should be in place before construction begins. 	Contractor

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Environmental Consideration	Environmental Impacts	Mitigation Measures	Timeframe	Responsible Party
		<ul style="list-style-type: none"> In the event of a fuel spill in excess of 25l, the spill must be confined and mopped up using oil absorbent fibres. Specialist, Professional clean-up crews should perform cleaning of large spills. The clean-up operation will initially involve aeration of the soil. This activates bacteria in the soil that then partially digest the spilt fuel. Contaminated soil should then be removed to a depth of 0.5m below the saturated oil spill level. This soil must be disposed of at a registered landfill site. The efficacy of the clean up should be monitored to ensure that all of the spilt fuel is removed from the soil. 	<ul style="list-style-type: none"> Any spillage that occurs should be cleaned up within 24 hours of the spillage occurring. 	
13) Construction Material	<ul style="list-style-type: none"> Environmental pollution and untidy site. 	<ul style="list-style-type: none"> Proper storage facilities should be provided for the storage of oils, grease, fuels, chemicals and hazardous materials. 	<ul style="list-style-type: none"> These facilities should be provided for when the construction camp is being established. 	Contractor

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Environmental Consideration	Environmental Impacts	Mitigation Measures	Timeframe	Responsible Party
		<ul style="list-style-type: none"> • Construction material must be stored under a roof or inside a suitable container. The construction material must be mixed in designated areas, on impermeable surfaces. The batching plant must be bonded to prevent stormwater entry, and to contain dirty water. • Material must be stored in a safe and neat manner. • No dumping or storage of the construction waste within the drainage line. • Site offices and parking areas for construction vehicles should be confined to disturbed/ploughed areas. 	<ul style="list-style-type: none"> • Continuous throughout the project. 	
14) Occupational Health and Safety	<ul style="list-style-type: none"> • Risks of accidents and incidents. 	<ul style="list-style-type: none"> • All projects must be conducted in accordance with the Occupational Health and Safety Act (Act 85 of 1993). 	<ul style="list-style-type: none"> • Continuous throughout the project. 	Contractor; Safety Agent; Safety Officer; ECO

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Environmental Consideration	Environmental Impacts	Mitigation Measures	Timeframe	Responsible Party
		<ul style="list-style-type: none"> • The contact details of the Safety Officer/Representative should be provided to the ECO. • Safety induction must be expanded to include environmental risks and mitigation measures. • Fire prevention: <ul style="list-style-type: none"> • The Contractor must take all the necessary precautions to protect the materials on site and to avoid fires. • All waste bins must be kept away from fuel tank installations. • No waste material may be burnt. • Designated areas must be provided, where smoking can occur in a controlled environment. • A firebreak must be put 	<ul style="list-style-type: none"> • Before the establishment of the construction camp. • Induction should occur before construction takes place. Regular “tool talks” should be held to ensure workers are working according to their regulations. • Continuous throughout the project. 	

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Environmental Consideration	Environmental Impacts	Mitigation Measures	Timeframe	Responsible Party
		around the construction camp.	project.	
15) Rehabilitation	<ul style="list-style-type: none"> • Improper reinstatement and rehabilitation. 	<ul style="list-style-type: none"> • During reinstatement the remaining undeveloped section of the construction footprint must be returned to its original state (i.e. prior to construction) as far as is reasonably practical. • Reinstatement tasks must include (but is not restricted to) the following: <ol style="list-style-type: none"> 1) Any damage caused by construction-related activities must be repaired. 2) The site must be cleaned, and all construction-related material and waste must be removed from site. 3) All construction related residues must be cleaned. 	<ul style="list-style-type: none"> • All rehabilitation to be completed within 3 months of the completion of construction. <ol style="list-style-type: none"> 1) All damage is to be repaired within 4 months of the end of construction. 2) This should occur within two weeks after the end of construction. 3) This should occur within one week after the end of construction. 	Contractor; ECO; Rehabilitation expert

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Environmental Consideration	Environmental Impacts	Mitigation Measures	Timeframe	Responsible Party
		<p>4) Areas where spillages of liquid waste (e.g. paint, oil, fuel) occurred must be cleaned appropriately.</p> <p>5) Temporary buildings must be demolished and the concomitant material must be removed from site.</p> <p>6) All Category One weeds and other declared alien species must be removed.</p> <ul style="list-style-type: none"> • Site-specific rehabilitation measures need to be determined in consultation with the ECO. • No plants that are not indigenous to the area or exotic plant species, especially lawn grasses and other ground-covering plants should be used as soil-binding agents as they will interfere drastically with the nature of the area. • No possible pollutants or herbicides (to clear weeds in the switching station site) may be allowed to wash into the adjacent land and ultimately the natural drainage system of the 	<p>4) This must occur within 24 hours of the spillage event.</p> <p>5) This should occur within one month following the end of construction.</p> <p>6) This should occur within one month following the end of construction.</p> <ul style="list-style-type: none"> • This should be determined before construction begins with a follow up consultation both during construction and before the rehabilitation process starts. • Continuous throughout the project. • Continuous throughout the project. 	

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Environmental Consideration	Environmental Impacts	Mitigation Measures	Timeframe	Responsible Party
		area.		
16) Waste	<ul style="list-style-type: none"> Inadequate waste management 	<ul style="list-style-type: none"> Littering on site and the surrounding areas is prohibited. Clearly marked litterbins must be provided on site. All bins must be cleaned of litter regularly. All domestic waste will be removed from site and disposed of at a registered landfill. The contractor must install and maintain mobile chemical toilets at work sites. 	<ul style="list-style-type: none"> This is continuous throughout the project. General housekeeping to be carried out on a daily basis. Waste receptacles will be put in place before construction starts, during the establishment of the construction camp. Waste receptacles to be emptied on a daily basis. Litter to be removed daily to a designated landfill for the duration of the project. Domestic waste to be removed daily to a designated landfill for the duration of the project. Installation of these toilets should occur on the first day of the establishment of the construction camp. Chemical toilets to be serviced once per week. The chemical toilets will be removed at 	Contractor

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Environmental Consideration	Environmental Impacts	Mitigation Measures	Timeframe	Responsible Party
		<ul style="list-style-type: none"> • All vehicles must be serviced in a designated area within the Contractors' camp. • All chemical spills must be contained and cleaned up by the supplier or professional pollution control personnel. 	<p>least one week after the construction camp has been dismantled.</p> <ul style="list-style-type: none"> • Vehicles should be regularly maintained, they should be serviced whenever practically possible. • All chemical spills should be cleaned up within 24 hours of the event. 	

PROJECT PHASE: OPERATION

Where applicable, the mitigation measures for the construction phase will be carried forward to the operations phase. In addition, the following specific measures will also apply:

Environmental Consideration	Environmental Impacts	Mitigation Measures	Responsible Party
1) Soil	Pollutants such as fuel and oil spillages from maintenance vehicles may affect the soil.	The maintenance vehicles and any other vehicles used must be serviced regularly in order to prevent spillages.	Client.
2) Surface Water	Pollution of surface water from vehicle leakages.	Refer to the mitigation measure under "Soil".	None.
	Surface water runoff.	Pack the ground around the structure with rock and stone, particularly around roofed areas, this would allow the water to better disperse and stabilise the flow rates.	Client.
3) Groundwater	May be contaminated through the percolation of spilt fuel or oil.	This would be the same as Soil.	None.
4) Air	Impact from vehicles using the road.	This would be the same as Soil.	Public

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Environmental Consideration	Environmental Impacts	Mitigation Measures	Responsible Party
5) Flora	Removal of flora.	<p>No flora is to be removed without written permission from the landowner and bearing in mind all legislation pertaining to flora.</p> <p>Removed trees will be replaced with indigenous plants that are aesthetically pleasing, which are representative of the floral species particular.</p>	Client.
	Impact from herbicides	<p>Herbicides used for clearing the servitudes and maintenance of the substation must be used by registered and competent users under strictly controlled conditions. The herbicides used must be registered and only used at the recommended dosage.</p>	

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Environmental Consideration	Environmental Impacts	Mitigation Measures	Responsible Party
6) Fauna	Removal of fauna Impact from pesticides	No fauna is to be removed without written permission from the landowner and bearing in mind all legislation pertaining to fauna. Pesticides used for clearing the servitudes and maintenance of the switching station may only be used by registered and competent users under strictly controlled conditions. The pesticides used must be registered and only used at the recommended dosage.	
7) Aesthetics	The presence of the switching station may cause a visual impact	There are no mitigation measures for the impact caused by the switching station.	
8) Noise	No new impact is foreseen.	None required.	
9) Waste	Waste created by maintenance crews	Littering is forbidden, all waste to be removed from the site when leaving.	Client

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Environmental Consideration	Environmental Impacts	Mitigation Measures		Responsible Party
10) General		<ul style="list-style-type: none"> • The relevant mitigation measures proposed for the construction phase should be carried forward to operation, where potential environmental impacts may still occur. • Special conditions relating to operations, as stipulated in the environmental authorisation, need to be adhered to. • The client must perform appropriate maintenance functions, as required. Responsible parties must be competent in the necessary maintenance tasks. • Feedback must be provided to the ECO and project proponent on a frequent basis. 	<p>Continuous throughout the construction and operation phase.</p>	Client

PROJECT PHASE: DECOMMISSIONING

The removal of the switching station may cause a greater impact to the environment than simply decommissioning the switching station and not removing it and any associated structures. An environmental study is recommended for when the switching station is decommissioned, to determine at that time what the exact impacts of its removal from the environment would be.

The table below gives broad Environmental Impacts and Mitigation Measures; the study recommended above should be used to complete a detailed decommissioning plan.

Environmental Consideration	Environmental Impacts	Mitigation Measures	Responsible Party
1) Soil	Pollutants such as fuel and oil spillages from vehicles may affect the soil.	<ul style="list-style-type: none"> The maintenance vehicles and any other vehicles used must be serviced regularly in order to prevent spillages. 	Contractor.
2) Equipment and materials removal	Increased dust from exposed areas. Increased soil erosion. Colonisation of the exposed land by invasive weeds.	<ul style="list-style-type: none"> Holes where the foundations were removed should be refilled with native soil. All areas of disturbed ground should be re-vegetated. 	Contractor.

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Environmental Consideration	Environmental Impacts	Mitigation Measures	Responsible Party
3) Social	Labour	<ul style="list-style-type: none"> • Labour intensive methods must be used where feasible, cost effective and not time constraining. • Local labour should be employed. • Local suppliers should be employed, as far as possible. 	Contractor.
	Public information	<ul style="list-style-type: none"> • The public should be informed of the decommissioning of the switching station and be provided with an opportunity to comment on the planned decommissioning. 	
	Site access	<ul style="list-style-type: none"> • If decommissioning includes the demolition of buildings then site access by members of the public should be strictly controlled. Fencing should be provided around open trenches and other hazards to prevent injuries. 	

Conclusion

The Contractor can use the Planning, Operation and Decommissioning section of this document as a standalone document. The mitigation measures contained in the Planning, Operation and Decommissioning sections address the potential negative impacts that may be associated with the project. If the suggested mitigation measures are followed then no significant impacts should remain.