DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

for

FOR THE CONSTRUCTION OF THE CONSTRUCTION OF GOURIKWA TO NARINA (BLANCO) 400KV TRANSMISSION LINE AND SUBSTATION UPGRADE

DEA Reference: 14/12/16/3/3/2/994

Submitted as part of the Final Environmental Impact Assessment Report

JULY 2017

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PROJECT DETAILS

DEA Reference No.	**:**	14/12/16/3/3/2/994
Title	**:**	The proposed construction of the Gourikwa-Blanco 400kV Power line and Substations upgrade.
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Client	**:**	Eskom Holdings SOC Ltd (Eskom Transmission)
Status	**:**	Draft Environmental Management Programme submitted as part of final EIA report
Revision	**:**	0
Date	**:**	July 2.017
Reviewed by:		Jubilee Bubala
Approved By:		Gesan Govender

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ACRONYMS & ABBREVIATIONS

DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DWS	Department of Water and Sanitation
EA	Environmental Authorisation

EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
ELO	Environmental Liaison Officer
EMPr	Environmental Management Programme
BGCMA	Breede Gouritz Catchment Management Agency
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECDEDEAT	Eastern Cape Department of Economic Development, Environmental Affairs & Tourism
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Report
EMPr	Environmental Management Programme
ESA	Ecological Support Area
EWT	Endangered Wildlife Trust
GN	Government Notice
ha	Hectares
HIA	Heritage Impact Assessment
HW	Heritage Western Cape
I&APs	Interested and Affected Parties
kV	Kilovolt
MTS	Main Transmission Substation
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act 107 of 1998 as amended in 2006
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
SA	South Africa
SAHRA	South African Heritage Resources Agency
SCC	Species of Special Concern
SIA	Social Impact Assessment
SKEP	Succulent Karoo Ecosystem Programme
SOC	State Owned Company
TNSP	Transmission Network Service Provider
ToR	Terms of Reference
VIA	Visual Impact Assessment
WCHRA	Western Cape Heritage Resources Agency
WULA	Water Use License Application

DEFINITIONS AND TERMINOLOGY

Alternatives: Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives may include location or site alternatives, activity alternatives, process (or technology) alternatives, temporal alternatives or the 'do nothing' alternative.

Cumulative impacts: Impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (e.g. discharges of nutrients and heated water to a river that combine to cause algal bloom and subsequent loss of dissolved oxygen that is greater than the additive impacts of each pollutant). Cumulative impacts can occur from the collective impacts of individual minor actions over a period and can include both direct and indirect impacts.

Direct impacts: Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (e.g. noise generated by operations on the site of the activity). These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.

Drainage line: A drainage line is a lower category or order of watercourse that does not have a clearly defined bed or bank. It carries water only during or immediately after periods of heavy rainfall i.e. non-perennial and riparian vegetation may or may not be present

'Do nothing' alternative: The 'do nothing' alternative is the option of not undertaking the proposed activity or any of its alternatives. The 'do nothing' alternative also provides the baseline against which the impacts of other alternatives must be compared.

Ecosystem: A dynamic system of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

Environment: the surroundings within which humans exist and that are made up of:

i. The land, water and atmosphere of the earth;
ii. Micro-organisms, plant and animal life;
iii. Any part or combination of (i) and (ii) and the interrelationships among and between them; and
iv. The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental impact: An action or series of actions that have an effect on the environment.

Environmental impact assessment: Environmental Impact Assessment (EIA), as defined in the NEMA EIA Regulations (2014) and in relation to an application to which scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of that application.

Environmental management: Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

Environmental management programme: A plan that organises and co-ordinates mitigation, rehabilitation and monitoring measures in order to guide the implementation of a proposal and its ongoing maintenance after implementation.

Expansion: means the modification, extension, alteration or upgrading of a facility, structure or infrastructure at which an activity takes place in such a manner that the capacity of the facility or the footprint of the activity is increased.

General waste: Waste which does not pose an immediate hazard or threat to health or to the environment' and includes the following waste flows: domestic waste, construction and demolition waste, business waste, inert waste.

Habitat: The place in which a species or ecological community occurs naturally.

Hazardous waste: Waste that has the potential to cause a negative threat/impact to humans and/or the environment. It includes, but is not limited to, batteries, neon lights, fluorescent lights, printer cartridges, oil, paint, paint containers, oil filters, IT equipment etc.

Indirect impacts: Indirect or induced changes that may occur as a result of the activity (e.g. the reduction of water in a stream that supply water to a reservoir that supply water to the activity). These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.

Interested and affected party: Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups, and the public.

Maintenance: means actions performed to keep a structure or system functioning or in service on the same location, capacity and footprint.

Pollution: A change in the environment caused by substances (radio-active or other waves, noise, odours, dust or heat emitted from any activity, including the storage or treatment or waste or substances.

Rehabilitation- is defined as the return of a disturbed area to a state which approximates the state, as far as possible, which it was before disruption. Rehabilitation must aim to accelerate the natural succession processes so that the plant community develops in the desired way.

Reinstatement-is defined as the initial soil works that replaces soil levels back to the original state as far as possible. It may include an initial light temporary grassing.

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

Topsoil means that layer of soil covering the earth and which provides a suitable environment for the germination of seed, allows the penetration of water, is a source of micro-organisms, plant nutrients and in some cases seed, and of a depth of up to 0,3m. Topsoil (top 300mm as a minimum) must be temporarily stockpiled separately from subsoil or rocky material (the topsoil contains both the seedbed and nutrient supply necessary for plant

growth - if mixed with subsoil layers the usefulness of the topsoil for rehabilitation will be lost) Topsoil shall be stripped from all areas to be utilized during construction period and where permanent structures and access is required

Waste: As per National Environmental Management: Waste Act means-

a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or

b) disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act; or

c) any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette, but any waste or portion of waste, referred to in paragraphs (a) and (b), ceases to be a waste.

Wetland: land which is transitional between terrestrial and aquatic systems were where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstance support vegetation typically adapted to life in saturated soil.

Watercourse: as per the National Water Act means -

(a) a river or spring;

(b) a natural channel in which water flows regularly or intermittently;

(c) a wetland, lake or dam into which, or from which, water flows; and

(d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks

1. INTRODUCTION AND BACKGROUND

Envirolution Consulting (Pty) Ltd was appointed by Eskom Holdings SOC Limited to conduct the Environmental Impact Assessment (EIA) Process for the proposed construction of a 400kV Transmission Power line from the Gourikwa Substation to the Narina Substation and the associated upgrades of these Substations.

Four (4) technically feasible alternative Transmission power line development corridors ranging between 50-60 km have been identified for investigation within the study area during the EIA process as shown in Figure 1. A Corridor of 2 km in width was assessed for each alternative. The identified power line development corridors as proposed and the areas affected are described in more detail below.

Alternative 1: This corridor exits Gourikwa Substation in a north easterly direction and follows the R327 for approximately 8 km. It turns east and cuts across the mixed agricultural and natural landscape type, passing through the most eastern part of the Gondwana Private Game Reserve. It maintains a north-eastern direction, nearing the mountainous terrain of the Outeniqua Mountains, until reaching the Narina Substation (Alternative 5 was approved by DEA on 1 September 2016). The Blanco site is approximately 3-4 km west of the city of George and the very picturesque Outeniqua Pass (N9).

Alternative 2: This corridor starts in the same direction as Alternative 1 but turns east just south of the Gondwana Private Game Reserve. It follows an easterly direction, crossing the Hartebeeskuil Dam before turning north east as it reaches the R328 between Hartenbos and Brandwacht. It passes south of Botlierskop Private Game Reserve and crosses Wolwedans Dam before turning north and reaching the Narina Substation site.

Alternative 3: This corridor is a variation of Alternative 2 and exits the Gourikwa Substation in an easterly direction. It brushes past the western outskirts of Hartenbos before turning north and joining Alternative 2. A corridor of 2km in width was assessed for each route alternative.

Alternative 4 was proposed in the Scoping Reports as an alternative that combines sections of the above three alternative in order to avoid areas where the infrastructure is perceived to impact more negatively on the receiving environment than the others.

The project is needed to strengthen the existing transmission network so that it can evacuate the additional power generated at the Gourikwa power stations when they come on line. This will promote continuous power supply for the Western Cape region, particularly when there is a unit outage at Koeberg Nuclear Power Station.

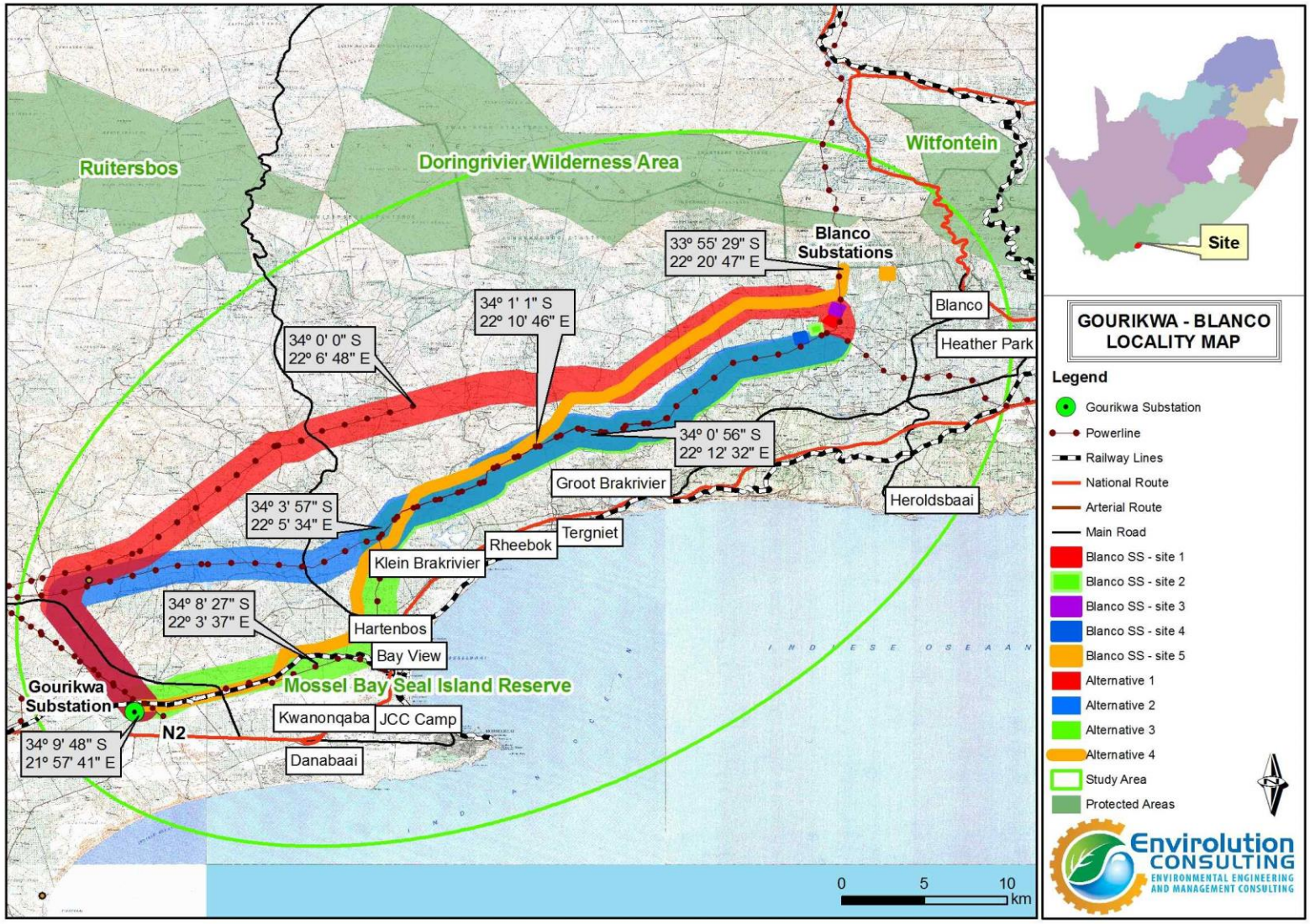

Figure 1. Study Area

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2. SUMMARY OF FINDINGS DURING THE EIA PHASE STUDY

The specialist findings of the EIA phase are summarised as follows:

Vegetation Assessment:

Almost all the vegetation types in the project area between the two distribution centres are listed as Critical Biodiversity Areas (CBAs) and threatened ecosystems. All four route alternatives cut across several Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESAs). Some sensitive systems are listed as threatened ecosystems. Alternatives 1 and 2 are the only two of the four alternatives that cut across the Swellendam Silcrete Fynbos. Alternative 1 is the only alternative that does not affect the South Outeniqua Sandstone Fynbos. The entire landscape has been transformed. Almost all areas, with arable soil, have been ploughed and subsequently the natural vegetation has been destroyed. Agricultural activities (crop and planted pasture production) have destroyed most of region's natural vegetation. Isolated pockets of natural vegetation (fynbos, renosterveld and riparian vegetation) remain in those areas unsuitable for crop production (rocky outcrops and steep slopes). This is the reason why most of the natural vegetation between Gourikwa and Narina distribution centres are listed as Critical Biodiversity areas (CBAs) and Ecological Support Areas (ESAs).

Fauna Assessment:

From a **faunal perspective it** is recommended that the Gourikwa - Blanco **Alternative 2 is the preferred** route option for the proposed power line. It must be noted that the Brandwagrivier Wetland System bird micro-habitats and the intact vegetation surrounding Wolwedans dam must be treated as "**No-go**" areas for roads or pylon hardstands and access/services roads along this alternative route. Should either Alternative 1 or 4 be chosen, bird diverters should be attached to the powerlines from Gondwana Private Game Reserve to the proposed Blanco Substation.

Avifauna Assessment:

From an avifaunal perspective it is recommended that the Gourikwa - Blanco Alternative 2 is the preferred route option for the proposed power line, providing the recommended mitigation measures are implemented. There are existing powerline infrastructures which mitigate many of the impacts associated with birds and powerlines. The existing service roads will result in less bird habitat being destroyed or fragmented during the construction phase of the project. Should alternative route option 1 be chosen, bird diverters should be attached to the powerlines from Gondwana Private Game Reserve to the proposed Blanco Substation. It is recommended that an avifaunal walkthrough of the final route option is done prior to construction to determine any sensitive areas that need to be avoided. All bird nest/roost sites encountered should be considered "No-Go" areas for any pylon hardstands or the construction of access roads. The power line should be constructed in close proximity to the existing power line as many birds will be aware of the existing infrastructure which may reduce collisions in low visibility conditions. All areas defined as having a medium avifaunal sensitivity must have bird diverters installed (spacing to be determined following ground-truthing).

Freshwater Resources Assessment:

According to the freshwater specialist, wetland areas within the study area consist largely of valley bottom wetlands that are associated with the rivers and are of similar ecological condition and importance. The habitat integrity of the rivers range from being moderately modified (upper reaches of the larger rivers as well as the smaller streams) to being in the seriously modified ecological state (lower reaches of the larger river systems). The riparian habitat of these rivers tends to be more impacted by the direct impact of the surrounding land use activities which has resulted in removal of the natural indigenous vegetation and the subsequent growth of invasive alien plants.

Although the upper reaches of the rivers in the study area are in general in a less modified ecological state, the **alternative corridor with the least potential** impact on the **freshwater features in the area** is likely to be the northern-most route (**Alternative 1**) as it would be more likely to be able to span the river valleys with little to no impact on the rivers and associated wetlands at the valley bottoms, while the southern corridors (Alternative 2 and Alternative 3) will need to cross the wide floodplains of the rivers. The alignment of the route within the corridor could also be determined to minimise the potential impact on the freshwater features within the study area. With mitigation, Alternative 1 is likely to have an impact of a very low significance to insignificant on the freshwater features while Alternative 2 is likely to have an impact of a very low impact. The Alternative 3 and 4 would have the largest potential impact on the freshwater features.

Heritage Assessment:

With respect the potential impacts to **palaeontological resources**, the Baseline assessment produced by Almond (2015) notes: "A substantial proportion of proposed power-line sectors will cross formations that are conservatively regarded as moderate to high sensitivity". "In practice, however, the likelihood of significant **negative impacts** on fossil heritage on the ground is **low** over most sectors of these routes because the bedrocks here are often highly weathered, tectonically- deformed or covered by a substantial thickness of fossil-poor superficial deposits (scree, alluvium, soils, etc)".

Overall, the **heritage studies** found that there are **no anticipated fatal flaws** with regard to the construction of the powerline and Alternative 1 or 2 are considered acceptable from an archaeological perspective. Alternative 3 and 4 may have some impacts on heritage resources because of the relative proximity of the line to the coast, and the higher probability of encountering archaeological sites. Alternative 2, it is more sensitive from an historical archaeological perspective. **Alternative 1** is the **preferred option** because of the lower probability of encountering ruined historical farm buildings. However from a **cultural landscape** perspective, **Alternative 1 is acceptable** but not preferred.

Soil, Land use & Agricultural Potential Assessment:

The agricultural potential of the study area is intimately linked to the availability of rainfall and water and as such the areas south of and immediately north of the Outeniqua Mountains have a high potential – not based on soil properties but rather on water characteristics of the landscape. The climate in this area is conducive to the growing of a range of crops and contributes to the high agricultural potential and intensive agricultural activities.

All the route corridors to the south and immediately within the Outeniqua Mountain area suffer the same limitation in the eastern section in that it **traverses an area of high intensity agriculture**. Regarding agricultural impact, the EIA phase studies have confirmed that all alternatives cross agricultural land with grazing land, central pivot irrigation, fruit trees and/or planted dry lands. A large percentage of agricultural activities can still continue unhindered, but some economic losses could occur. The impacts of power line construction are high and pylon placement will have to be negotiated with landowners on a site-specific basis. In this regard there is no preference for any alignment as the specific alignment to be accepted will depend on the degree and success of negotiation with landowners and users.

Visual Assessment:

Regarding **Visual Impact**, The study area is predominantly rural with an extended farming community, with the exception of the coastal towns in the southern region and George on the eastern perimeter. Numerous tourist attractions are present in the western and central regions in the form of game reserves, offering luxury accommodation, and other outdoor activity areas such as hiking and horse riding. These tourist facilities rely on the scenic quality of the region and game drives are sometimes offered to experience the picturesque outdoors. Overall a medium viewer incidence is expected apart from the areas where major transport routes are crossed or near the coastal towns. Highly sensitive viewers and viewer groups occur all along the proposed routes. Concentrations of highly sensitive viewers and major tourist attractions have been identified at:

- Gondwana-, Hartenbos- and Botlierskop Game Reserve;
- Hartebeeskuil-, Klipheuwel- and Wolwedans Dams;
- Western outskirts of Hartenbos, Monte Christo Estate and Wolwedans; and
- All the tourist attractions and overnight facilities that are within the ZMVE;

It was found that the transmission line will impact on the visual quality of the visual resource by interfering with the prevailing natural semi-natural characters of the study area or interfering with the agricultural land uses. Although all routes have high impacts on both observers and the visual resource. **Alternative 1** is the **most preferred route**. The motivation is that the baseline environment is already impacted by the Proteus – Droërivier 400kV transmission line which lowers the sensitivity of the visual environment to some degree. One can argue that the project is more compatible with the baseline environment along Alternative 1, than the other two alternative routes. It is generally more acceptable to have two power lines of the same design and size, in one corridor and concentrating the impact in that corridor, than to spread the impact over a large area and thereby impacting on other landscapes that are free of transmission lines. Empirical research has indicated that two parallel running power lines are considered below the visual tolerance threshold in most cases, but three or more nears or exceeds the threshold, increasing cumulative impacts to unacceptable levels. This is especially relevant in landscapes with high scenic value or high tourist potential as can be found in parts of the study area.

In addition, Alternative 1 is the route that impacts on the least number of sensitive landscape features and steers clear of the least number of tourist attractions. Without drastic mitigation measures, the impact on the visual resource and sensitive observers remain high. Alternative 2 is more preferred over Alternative 3. Alternative 3 passes within 1 km of an urban area and the increased viewer incidence makes it less preferable than Alternative 2. Both these alternatives will have significant cumulative impacts due to the existing 2x132kV distribution lines in the same corridor. A significant increase in visual dominance of electrical infrastructure can be expected. Three power lines in one corridor are expected to exceed the visual tolerance threshold. The factor that adds weight to this statement is that each line will consist of a different type of tower that causes major visual incoherence and clutter.

Social Impact Assessment

According to the social impact assessment study that was undertaken, Alternatives 1 and 2 were of concern due to economic loss it will cause from disruption of pivot farming and on the specialised berry farm, losses and disruption in farming, and possible displacement of workers from accommodation. It was found that there was a concentration of pivot irrigation infrastructure in a relatively small proportion of Alternative 1, located south east of Jonkersberg. **If the alignment can avoid this area**, **Alternative 1 is feasible**. As the line can be placed anywhere within a width of 2 km; it is assumed

that workers' homes can be avoided. Individual farms with specific needs such as the berry farm will need specific attention so as to avoid significant economic losses. Alternative 2 had a lower concentration of pivot farming and was therefore regarded as more favourable than Alternative 1. Alternative 1, however, has the potential to cause the least visual intrusion (as assessed by the Visual Impact Assessment specialist).Regarding Alternative 3, the negative visual intrusion of towers and lines would be a concern, and the possible negative impact on property values. In this regard, Alternative 2 was therefore considered to be most favourable from a social perspective.

Socio-Economic & Tourism Impact Assessment

The impact of the construction of the transmission lines on the **economy** includes the impact of the construction cost, the operational expenditure and the impact on the broader economy by allowing the power to strengthen the existing grid and limit the impact of power outages in the area. Capital expenditure data could not be obtained to quantify any impacts, but a number of expenditure categories are discussed. A number of components will have to be imported from other provinces into this region, like steel structures, cables, hardware, insulators and cement. This will generate economic activity and employment opportunities in those provinces. A local procurement policy can be considered by Eskom (where possible and if not already standard practice) on activities like site clearance and assembling to maximize the economic and job creation impact on the local municipalities.

From a pure **economic** point of view, with cost savings in mind **Alternative 1 can be recommended** given that this is the option that is shorter with the least number of bends. However, there is only a small marginal difference in cost given only 2km difference. From a **tourism** point of view, **Alternative 4 is recommended** given that this option will have the least amount of negative impact on tourism activities. Alternative 4 also seems to have the relative smallest impact on agricultural activities, although there are still a large number of farmers that will be impacted on. It will be important to work with the farmers to determine the best place for pylons and the lines and with game lodges to minimise the visual impact of these proposed lines and pylons.

Traffic Impact Assessment

According to the traffic specialist findings, construction **traffic** and the post construction traffic would be low without any significant impact on the existing traffic flows on the N2 or provincial roads. It will also have a negligible impact on the pavement structures. Furthermore, the impact of the traffic on the provincial gravel access roads will also be negligible with respect to service levels. When looking at the impact significance of the various phases, it can be concluded that all impacts will have a "Low" significance. According to the significance rating scale, a low significance can be defined as: "where this (low) impact would not have a direct influence on the decision to develop in the area" From an accessibility and traffic perspective **all alternatives are viable** although a route that is located in closer proximity to the National and larger Provincial roads would be preferable to handle freight vehicles. After construction, the generated site traffic would be limited to maintenance support, with only a few light vehicles accessing the site at regular inspection intervals.

Cumulative Impact Assessment:

Significant cumulative impacts that could result from the proposed line and other power line in the area include:

- Avifauna: Additional power line adds to the already existing power lines in the area and therefore increases the risk of bird collisions and deaths, further fragment natural habitats along the route option
- Vegetation: The loss of unprotected vegetation types on a cumulative basis from the broad area may impact the countries' ability to meet its conservation targets. The area is not included within a National Protected Areas Expansion Strategy focus area, and falls outside any threatened and or endangered ecosystem type / vegetation type. Although the vegetation type in the study area are classified as Least Threatened, it is poorly protected and certain habitats or communities may be subsequently affected.
- Visual intrusion and change of character of the area; and
- destruction of heritage artefacts.

The proposed line is in general proposed along routes where there are already power lines in place. Provided the new lines are constructed close to these lines such that the associated access roads can be shared, the cumulative impacts are likely to be low. Considering the findings of the specialist assessments undertaken for the project, **cumulative impacts** range from a **low to moderate significance** (on a landscape level in this region of the George and Mossel bay). The use of the EMPr and mitigation measures would assist in mitigating these negative impacts to an acceptable level.

3. PURPOSE AND OBJECTIVES OF THE EMPr

3.1 Aims and objectives the EMPr

It is understood that any development can pose various risks to the environment as well as the residents or businesses in the surrounding area. These possible risks should be taken into account during the planning phase of the development. An Environmental Management Programme (EMPr) is required for the proposed project as per the National Environmental Management Act (Act No. 107 of 1998) (NEMA) EIA Regulations, 2014. The implementation of this EMPr, through the appointed contractor, remains the responsibility of the applicant, Eskom.

The purpose of this EMPr is to formulate mitigatory measures that should be made binding to all contractors during construction of the proposed development, as well as measures that should be implemented during the operational phase. The point of departure for this EMPr is to take a pro-active route by addressing potential problems before they occur. The EMPr will also provide management responses that will ensure that the impacts of the development are minimised. This should limit corrective measures needed during the construction and operational phases of the development. Additional mitigation will be included throughout the project's various phases as necessary. This EMPr is, therefore, a stand-alone document, which must be used on site during each phase of the development (planning, construction and operational phases).

This document should be flexible so as to allow the contractor and developer to conform to the management commitments without being prescriptive. The management commitments prove that the anticipated risks on the environment will be minimised if they are adhered to consistently. The onus set out in the EMPr rests with the developer, main contractors and subcontractors, which promotes responsibility and commitment. Any parties responsible for transgression of the underlying management measures outlined in this document will be held responsible of non-compliances and will be dealt with accordingly.

3.2 Implementation of the EMP:

USE BY THE AUTHORITY
After initial review by the authority, the authority would only need to review the breaching comments provided by the independent consultant or environmental assessment practitioner (EAP).

USE BY THE ECO
The EMP will assist with providing consistency in managing and monitoring environmental impacts across all phases of the development

The ECO may mark various items as non-applicable during the construction due to the phase of construction not requiring that specific mitigation.

The EMP is a dynamic document and the ECO may amend clauses to benefit the environment, provide adequate reasonable reasons can be provided, after consultation with project manager. The objectives of each item are important. Each objective has a list of actions that are relevant to achieving the objective; however there may be alternative actions that may be applicable to achieve the objective.

USE BY THE MANAGEMENT.
The project EMP will assist with managing and setting standards for construction sites. With the use of a common set of standards across all construction projects, tend analysis can be more appropriately monitored, which intern enables better planning and monitoring of existing work and setting of new targets.

This EMPr has been based on the findings of the on site assessment undertaken by Envirolution and the specialist studies. All the environmental specifications and the procedures discussed this EMPr were also developed in accordance with the relevant legislation applicable to the development.

3.3 Project Team

This draft Environmental Management Programme was compiled by:

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- Cheda Sheila Bolingo, the principle author of this Basic Assessment holds an Honours Bachelor degree in Environmental Management and 6 years of experience in the consulting field. Her key focus areas are on strategic environmental assessment and advice on environmental impact assessments; public participation; environmental management programmes, and mapping through ArcGIS for variety of environmental projects. She is currently involved in several diverse projects across the country.
- Gesan Govender, the project manager and Environmental Assessment Practitioner (EAP) responsible for this project, is a registered Professional Natural Scientist and holds an Honours degree in Botany. He has over 15 years of experience within the field of environmental management. His key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management solutions and mitigation/risk minimising measures; and strategy and guideline development. He is currently responsible for the project management of EIA's for several diverse projects across the country.

Inputs to compile this EMPr was received from the following specialists:

Table 1: Project Specialists

Discipline	Organisation	Contact Person & Details
Public Participation & Facilitation	3E Consulting	**Samuel M Scott** Mobile: +27 (0)835862906 sam.scott@vodamail.co.za
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Traffic Impact	Blue Science	**Hermanus Steyn** Tel: +27 21 5269454 Hermanus.Steyn@aurecongroup.com

4. KEY LEGISLATION APPLICABLE TO THIS PROJECT

The following legislation and guidelines have informed the scope and content of this EMPr:

- National Environmental Management Act (NEMA) (Act No 107 of 1998)
- Environmental Impact Assessment (EIA) Regulations, published under sections 24 (5) of the NEMA (GNR R982, GNR 983, GNR 984 and GNR 985 in Government Gazette 38282 of 4 December 2014)
- Guidelines published in terms of the NEMA EIA Regulations, in particular:
  - Companion to the National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) Regulations of 2010 (Draft Guideline; DEA, 2010)
  - Public Participation in the EIA Process (DEA, 2010)

Several other Acts, standards, or guidelines have also informed the project process and the scope of issues addressed and assessed in the EIA Report. A review of legislative requirements applicable to the proposed project is provided in the **table 2** below:

Table 2: Relevant legislative and permitting requirements applicable to the proposed project

Legislation	Applicable Requirements	Relevant Authority
National Environmental Management Act (Act No 107 of 1998)	The EIA Regulations have been promulgated in terms of Chapter 5 of the Act. Listed activities which may not commence without an environmental authorisation are identified within these Regulations. In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation. In terms of GN R982, R983, R984 and R985 of December 2014, a Scoping and EIA Process is required to be undertaken for the proposed project *The final EIA report is to be submitted to the DEA and Provincial Environmental Departments in support of the application for authorisation.*	Department of Environmental Affairs (DEA) Western Cape Department of Environmental Affairs and Development Planning
National Environmental Management Act (Act No 107 of 1998)	In terms of the Duty of Care Provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with this project is avoided, stopped or minimised. In terms of NEMA, it has become the legal duty of a project proponent to consider a project holistically, and to consider the cumulative effect of a variety of impacts. *While no permitting or licensing requirements arise directly by*	DEA

Legislation	Applicable Requirements	Relevant Authority
	virtue of the proposed project, this section will find application during the EIA phase and will continue to apply throughout the life cycle of the project.	
National Water Act (Act No 36 of 1998)	The development also triggers activities that require a Water Use License (WUL) because it crosses several water courses. Therefore, before construction activities may take place, the activity will require a Water Use License as per requirement in the National Water Act (Act No.36 of 1998) (NWA) under Section 21 Water Uses. In terms of the NWA, this development requires a Water Use License for the following water uses: • Section 21(c) impeding or diverting the flow of water in a watercourse and; • Section 21 (i) altering the bed, banks, course or characteristics of a watercourse. The purpose of the EIA Regulations is "to regulate the procedures and criteria as contemplated in Chapter 5 of the National Environmental Management Act relating to the submission, processing and consideration of, and decision on applications for environmental authorisation for the commencement of activities in order to avoid detrimental impacts on the environment, or where it cannot be avoided, ensure mitigation and management of impacts to acceptable levels, and to optimise positive environmental impacts, and for matters pertaining thereto". *A water use license (WUL) is required in terms of Section 21(c) and 21 (i) of the National Water Act. If wetlands or drainage lines are impacted on, or the regulated area of a watercourse (being the riparian zone or the 1:100yr floodline whichever is greatest).*	Department of Water and Sanitation (DWS)
National Environmental Management: Air Quality Act (Act No 39 of 2004)	S18, S19, and S20 of the Act allow certain areas to be declared and managed as "priority areas." Declaration of controlled emitters (Part 3 of Act) and controlled fuels (Part 4 of Act) with relevant emission standards. GN R 827 – National Dust Control Regulations prescribes general measures for the control of dust in all areas	DEA Affected District and Local Municipalities
National Heritage Resources Act (Act No 25 of 1999)	» S38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including » The construction of a road, power line, pipeline, canal or other similar linear development or barrier exceeding 300 m in length; » Any development or other activity which will change the character of a site exceeding 5 000 m^2 in extent	South African Heritage Resources Agency (SAHRA) Provincial Heritage Resources Authority

Legislation	Applicable Requirements	Relevant Authority
	» The relevant Heritage Authority must be notified of developments such as linear developments (i.e. roads and power lines), bridges exceeding 50 m, or any development or other activity which will change the character of a site exceeding 5 000 m^2; or the re-zoning of a site exceeding 10 000 m^2 in extent. This notification must be provided in the early stages of initiating that development, and details regarding the location, nature and extent of the proposed development must be provided. *The Heritage Specialists on the project team will ensure compliance with these requirements, and has submitted the Notice of Intent to Develop (NID) to Western Cape Heritage. A permit may be required should identified cultural/heritage sites on site be required to be disturbed or destroyed as a result of the proposed development.*	
National Environmental Management: Biodiversity Act (Act No 10 of 2004)	In terms of S57, the Minister of Environmental Affairs has published a list of critically endangered, endangered, vulnerable, and protected species in GNR 151 in Government Gazette 29657 of 23 February 2007 and the regulations associated therewith in GNR 152 in GG29657 of 23 February 2007, which came into effect on 1 June 2007. In terms of GNR 152 of 23 February 2007: Regulations relating to listed threatened and protected species, the relevant specialists must be employed during the EIA Phase of the project to incorporate the legal provisions as well as the regulations associated with listed threatened and protected species (GNR 152) into specialist reports in order to identify permitting requirements at an early stage of the EIA Phase. The Act provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (National Environmental Management: Biodiversity Act: National list of ecosystems that are threatened and in need of protection, (GG 34809, GN 1002), 9 December 2011). GNR 598: The Alien and Invasive Species (AIS) Regulations provides for the declaration of weeds and invader plants. *Under this Act, a permit would be required for any activity which is of a nature that may negatively impact on the survival of a listed protected species.*	DEA

Legislation	Applicable Requirements	Relevant Authority
	An ecological study has been undertaken as part of the EIA Phase. As such the potential occurrence of critically endangered, endangered, vulnerable, and protected species and the potential for them to be affected has been considered. This report is contained in Appendix 4 of the EIA Report.	
National Forests Act (Act No. 84 of 1998)	In terms of S5(1) no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a license granted by the Minister to an (applicant and subject to such period and conditions as may be stipulated". Protected trees: According to this act, the Minister may declare a tree, group of trees, woodland or a species of trees as protected. The prohibitions provide that ' no person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister'. Forests: Prohibits the destruction of indigenous trees in any natural forest without a licence. *All the alternative routes cut across small pockets of Southern Afrotemperate Forest (FOz1) along the slopes of the larger rivers such as the Klein Brak and Groot Brak Rivers. Species such as Outeniqua Stinkwood (Ocotea bullata), Mountains Yellowwood (Afrocarpus falcatus & Podocarpus latifolius), Assegaai (Curtisia dentata) and Cheesewood (Pittosporum viridiflorum) could occur.* *Permits must be obtained from DAFF (Department of Agriculture, Forestry and Fisheries) to remove individual of any of these abovementioned species. The contractor must apply for these permits in a phased manner.*	Department of Agriculture, Forestry and Fisheries
National Veld and Forest Fire Act (Act 101 of 1998)	In terms of S13 the landowner would be required to burn firebreaks to ensure that should a veldfire occur on the property, that it does not spread to adjoining land. In terms of S13 the landowner must ensure that the firebreak is wide and long enough to have a reasonable chance of preventing the fire from spreading, not causing erosion, and is reasonably free of inflammable material. In terms of S17, the applicant must have such equipment, protective clothing, and trained personnel for extinguishing fires. *While no permitting or licensing requirements arise from this legislation, and this Act will find application during the construction and operational phase of the project.*	Department of Agriculture, Forestry and Fisheries
Minerals and Petroleum Resources	According to S27 of the act, any person who wishes to apply to the Minister for a mining permit must simultaneously apply for an environmental authorisation and must lodge the	DMR

Legislation	Applicable Requirements	Relevant Authority
Development Act (Act No 28 of 2002)	application (repealed by section 23 (b) of Act 49 of 2008). Requirements for Environmental Management Programmes and Environmental Management Plans are set out in S39 of the Act (repealed by section 33 of Act 49 of 2008) S53 Department of Mineral Resources: Approval from the Department of Mineral Resources (DMR) may be required to use land surface contrary to the objects of the Act in terms of section 53 of the Mineral and Petroleum Resources Development Act, (Act No 28 of 2002). Section 42 of Act 49 of 2008 (Repealed of section of S53) states that the Minister may cause an investigation to be conducted if it is alleged that a person intends to use the surface of any land in any way that could result in the mining of mineral resources being detrimentally affected.''. *As no borrow pits are expected to be required for the construction of the facility, no mining permit or environmental authorisation is to be obtained.*	
Electricity Regulation Act 4 of 2006	This Act governs the control of generation and supply of electricity in South Africa and the existence and functions of the National Energy Regulator. The Act aims to establish a national regulatory framework for the electricity supply industry; to make the National Energy Regulator the custodian and enforcer of the national electricity regulatory framework; to provide for licences and registration as the manner in which generation, transmission, distribution, trading and the import and export of electricity are regulated; and to provide for matters connected therewith.	Department of Energy
Hazardous Substances Act (Act No 15 of 1973)	This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitising or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products. » Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc, nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared as Group I or Group II substance » Group IV: any electronic product; and » Group V: any radioactive material. The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an	Department of Health

Legislation	Applicable Requirements	Relevant Authority
	appropriate license being in force. *It is necessary to identify and list all the Group I, II, III, and IV hazardous substances that may be on the site and in what operational context they are used, stored or handled. If applicable, a license is required to be obtained from the Department of Health*.	
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	The Minister may by notice in the *Gazette* publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment. The Minister may amend the list by – » Adding other waste management activities to the list. » Removing waste management activities from the list. » Making other changes to the particulars on the list. In terms of the Regulations published in terms of this Act (GN 921), A Basic Assessment or Environmental Impact Assessment is required to be undertaken for identified listed activities (Category A and B) while Category C Activities (such as storage of waste) must be undertaken in accordance with the necessary norms and standards. Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that: » The containers in which any waste is stored, are intact and not corroded or in » any other way rendered unlit for the safe storage of waste. » Adequate measures are taken to prevent accidental spillage or leaking. » The waste cannot be blown away. » Nuisances such as odour, visual impacts and breeding of vectors do not arise; and » Pollution of the environment and harm to health are prevented. *As no waste disposal site is to be associated with the proposed project, no permit is required in this regard.* *Waste handling, storage and disposal during construction and operation is required to be undertaken in accordance with the requirements of the Act, as detailed in the EMPr (refer to Appendix G).*	Hazardous Waste –DEA General Waste –Provincial Authorities

Legislation	Applicable Requirements	Relevant Authority
	The volumes of waste to be generated and stored on the site during construction and operation of the facility will not require a waste license.	
National Road Traffic Act (Act No 93 of 1996)	» The technical recommendations for highways (TRH 11): "Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads" outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed. » Legal axle load limits and the restrictions imposed on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges, and culverts. » The general conditions, limitations, and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power/mass ratio, mass distribution, and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the National Road Traffic Act and the relevant Regulations. *An abnormal load/vehicle permit may be required to transport the various components to site for construction. These include:* *Route clearances and permits will be required for vehicles carrying abnormally heavy or abnormally dimensioned loads.* *Transport vehicles exceeding the dimensional limitations (length) of 22m.* *Depending on the trailer configuration and height when loaded, some of the power station components may not meet specified dimensional limitations (height and width).*	South African National Roads Agency Limited (SANRAL) (national roads) Provincial Department of Transport
Conservation of Agricultural Resources Act (Act No 43 of 1983)	Regulation 15 of GNR1048 provides for the declaration of weeds and invader plants, and these are set out in Table 3 of GNR1048. Declared Weeds and Invaders in South Africa are categorised according to one of the following categories: Category 1 plants: are prohibited and must be controlled. Category 2 plants: (commercially used plants) may be grown in demarcated areas providing that there is a permit and that steps are taken to prevent their spread. Category 3 plants: (ornamentally used plants) may no longer be planted; existing plants may remain, as long as all	DAFF

Legislation	Applicable Requirements	Relevant Authority
	reasonable steps are taken to prevent the spreading thereof, except within the floodline of watercourses and wetlands. These regulations provide that Category 1, 2 and 3 plants must not occur on land and that such plants must be controlled by the methods set out in Regulation 15E. *While no permitting or licensing requirements arise from this legislation, this Act will find application during the EIA phase and will continue to apply throughout the life cycle of the project. In this regard, soil erosion prevention and soil conservation strategies must be developed and implemented. In addition, a weed control and management plan must be implemented.* *The permission of agricultural authorities will be required if the Project requires the draining of vleis, marshes or water sponges on land outside urban areas. However, none of these activities are expected to be undertaken on site.*	
Subdivision of Agricultural Land Act (Act No 70 of 1970)	Details the subdivision of agricultural land and provisions under which the act is triggered. It also provides for the approval of such division by the Minister of Agriculture. Applies for subdivision of all agricultural land and long-term leasing of portions of agricultural land. *Long-term leases on portions or subdivision of the site properties will require an approval of the Minister of Agriculture. An application to DAFF will need to be submitted detailing the areas to be subdivided or leased for the purposes of the proposed development. An application in terms of SALA will need to be undertaken and submitted following the issuing of an environmental authorisation for the proposed project.*	(DAFF) Provincial Departments of Agriculture and Environment - commenting authority. Local Municipality – competent authority
Spatial Planning And Land Use Management Act 16 OF 2013	**This Act** has the main objectives to: • provide for a uniform, effective and comprehensive system of spatial planning and land use management for the Republic; • ensure that the system of spatial planning and land use management promotes social and economic inclusion; • provide for development principles and norms and standards; • provide for the sustainable and efficient use of land; • provide for cooperative government and intergovernmental relations amongst the national, Regulations under the SPLUMA not in force yet.	Local municipalities

Legislation	Applicable Requirements	Relevant Authority
	Legislation that regulates Land Use Planning has lead to "spatial planning tools" that are contained in Municipal and District Strategic Management Frameworks (SMFs), Strategic Development Initiatives (SDIs) and Municipal By-laws. These include the by-Laws of the Eden District Municipality, the George Local Municipality and the Mossel Bay Municipality. The Eden District Municipality's Municipal Health By-Laws were Published in Western Cape Provincial Gazette 6566 of 17 October 2008. (see Chapter 8 waste management). and the Mossel Bay Local Municipality's By-Law Relating To Public Nuisances (Published in Western Cape Provincial Gazette 6688 of 18 January 2010) has relevance. The Land Use Planning Ordinance (Ordinance 15 of 1985) has relevance in the Western Cape Province.	
Development Facilitation Act (Act No 67 of 1995)	**The Development Facilitation Act** contains development facilitation regulations under the Regulations under Development facilitation Act 3. The Act is directed at provincial and local spheres of government; and serves to re-address the imbalances of the past and to ensure that there is equity in the application of spatial development planning and land use management systems. Provides for the overall framework and administrative structures for planning throughout the Republic. S (2-4) provide general principles for land development and conflict resolution. The applicant must submit a land development application in the prescribed manner and form as provided for in the Act. A land development applicant who wishes to establish a land development area must comply with procedures set out in the DFA.	Provincial Department of Environmental Affairs

5. PHASES OF THE PROJECT

The point of departure for this EMPr is to take a pro-active route by addressing potential problems before they occur. This must limit corrective measures needed during the construction and operational phases of the development. Additional mitigation will be included throughout the project's various phases, as required and if necessary.

The EMPr deals with the following phases as detailed below:

5.1. The Planning and Design Phase

Overall Goal for Planning and Design: Undertake the planning and design phase of the development in a way that:

- Ensures that the design of the plant responds to the identified environmental constraints and opportunities.
- Ensures that the best environmental options are selected for all components of the project.

The EMPr offers an ideal opportunity to incorporate pro-active environmental management measures with the goal of attaining sustainable development.

Pro-active environmental measures minimize the chance of impacts taking place during the construction and operational phase. There is still the chance of accidental impacts taking place; however, through the incorporation of contingency plans (e.g. this EMPr) during the planning phase, the necessary corrective action can be taken to further limit potential impacts. In order to meet this goal, actions plans for the planning and design phase have been identified together with monitoring requirements (refer to Table 1).

5.2. The Construction Phase

The bulk of the impacts during this phase will have immediate effect (e.g. noise-, dust- and wetland pollution). If the site is monitored on a continual basis during the construction phase, it is possible to identify these impacts as they occur. These impacts will then be mitigated through the contingency plans identified in the planning phase, together with a commitment to sound environmental management from the developer.

Storm water will be managed according to the Eskom Guidelines for Erosion Control and Vegetation Management as well as the Environmental Management Programme (EMPr), which will be compiled for the construction phase. The power line construction contractor would need to set up at least one site camp but this does not necessarily need to be near the power line route. The contractor may however prefer to use a fully serviced site at another location. The contractor will be encouraged to utilised already disturbed areas for construction camp purposes, in order to minimise cumulative impacts. It is likely that a number of construction camps would need to be established for the construction period.

A negligible sewage flow is anticipated for the duration of the construction period. Chemical toilets will be utilised during construction, and the contactor will ensure regular treatment of these facilities. The toilets will be serviced regularly, as specified by the final site specific EMPr.

All solid waste will be collected at a central location at each construction site and will be stored temporarily until removal to an appropriately permitted landfill site in the vicinity of the construction site.

The construction team might have temporary connection and supply of electricity from the existing network. Diesel generators will be utilised as an option for the provision of electricity.

5.3. Rehabilitation Phase

After the project has been completed, all affected properties are rehabilitated to their original status. Landowners sign off release forms to confirm the rehabilitated status.

Vegetation in servitudes needs to be kept under control to allow access and to prevent the spread of veld fires. This will be undertaken by experienced contractors and permission will be obtained from land owners where access is required over private property.

This phase will involve restoring the land impacted during the construction phase back to its original state or a state that conforms to the principles of sustainable development. This phase of the development will involve restoring the site and rectify the negative impacts that have been caused during construction by removing pollution or contaminants and other dangerous substances from the stream, sediment, or surface water and improvement of the soil. This will also involve the removal of all foreign material (e.g. structures, waste etc.) introduced on site once the construction phase is completed.

5.4. The Operational Phase

The proposed development will require occasional maintenance during the operation phase. It is anticipated that a 6m strip will be cleared to facilitate access and construction, except where tower erection and stringing requires more space.

Eskom have their internal guidelines and standards for Bush Clearance and Maintenance within Overhead Power line Servitudes. This document provides minimum clearances for overhead conductors that will need to be taken into account in the formulation of any power line development. Nonetheless, by taking pro-active measures during the planning and construction phases, potential environmental impacts emanating during the operational phase will be minimised. This, in turn, will minimise the risk and reduce the monitoring effort, but it does not make monitoring obsolete. During operation, the infrastructure will have a visual impact that cannot be fully mitigated.

6. ROLES AND RESPONSIBILITIES

The implementation of this EMPr requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during the construction phase. The stakeholders are discussed below.

6.1 Developer

- The developer remains ultimately responsible for ensuring that the development is implemented according to the requirements of the EMPr.
- Although the developer appoints specific role players to perform functions on his/her behalf, this responsibility is delegated.
- The developer is responsible for ensuring that sufficient resources (time, financial, human, equipment, etc.) are available to the other role players (e.g. the ECO, ELO and contractor) to efficiently perform their tasks in terms of the EMPr.
- The developer is liable for restoring the environment in the event of negligence leading to damage to the environment.
- The developer must ensure to appoint an independent Environmental Control Officer (ECO to monitor and audit the implementation of the EMPr and environmental authorisation.
- The ECO must have the appropriate experience and qualifications to undertake the necessary tasks
- The developer must ensure that the EMPr is included in the tender documentation so that the contractor who is appointed is bound to the conditions of the EMPr.
- The developer must appoint an independent Environmental Control Officer (ECO) during the construction phase to oversee all the environmental aspects relating to the development.
- Submit an environmental audit report to the relevant competent authority (DEA).

6.2 Contractor and Service Providers:

All contractors (including sub-contractors and staff) and service providers are ultimately responsible for:

- The contractor, as the developer's agent on site, is bound to the EMPr conditions through his/her contract with the developer, and is responsible for ensuring that he adheres to all the conditions of the EMPr.
- Thoroughly familiarise him/herself with the EMPr requirements before construction begins and must request clarification on any aspect of these documents, should they be unclear.
- Ensuring that he/she has provided sufficient budget for complying with all EMPr conditions at the tender stage.
- Ensuring adherence to the environmental management specifications.
- Ensuring that Method Statements are submitted to the Site Manager, and ECO, for approval before any work is undertaken. Any lack of adherence to this will be considered as non-compliance to the specifications of the EMPr.
- Ensuring that any instructions (whether verbal or written) issued by the site Manager, project manager or site engineer, ECO, in terms of the EMPr are adhered to.
- Ensuring that a report is tabled at each site meeting, which will document all incidents that have occurred during the period before the site meeting.

- Ensuring that incidents register is kept in the site office, which lists all transgressions issued by the ECO.
- Ensuring that a register of all public complaints is maintained.
- Ensuring that all employees, including those of sub-contractors receive training before the commencement of construction in order that they can constructively contribute towards the successful implementation of the EMPr (i.e. ensure their staff are appropriately trained as to the environmental obligations).
- He/she must form part of the project team and be involved in all aspects of project planning that can influence environmental conditions on the site.

6.3 The Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) is appointed by the developer as an independent monitor of the implementation of the EMPr. He/she must form part of the project team and be involved in all aspects of project planning that can influence environmental conditions on the site. The ECO must attend relevant project meetings, conduct inspections to assess compliance with the EMPr and be responsible for providing feedback on potential environmental problems associated with the development. In addition, the ECO is responsible for:

- Assisting in ensuring that the necessary environmental authorisations and permits have been obtained prior to construction commencing.
- Reviewing the Contractor's construction Method Statements.
- Monthly site inspections of all construction areas with regard to compliance with the EMPr.
- Monitoring and verifying adherence to the EMPr, the EA and approved Method Statements at all times.
- Monitoring and verifying that environmental impacts are kept to a minimum.
- Taking appropriate action if the specifications are not followed.
- Monitoring the undertaking by the Contractor of environmental awareness training for all new personnel coming onto site.
- Advising on the removal of person(s) and/or equipment not complying with the specifications.
    - Auditing the implementation of the EMPr and compliance with the EA on a monthly basis.
    - Compiling a final audit report regarding the EMPr and its implementation during the construction period after completion of the contract and submitting this report to the Employer and the authorising authority.

The ECO has the right to enter the site and do monitoring and auditing at any time, subject to compliance with health and safety requirements applicable to the site (e.g. wearing of safety boots and protective head gear).

(a) Liaison with Authorities

The ECO will be responsible for liaising with the Department of Environmental Affairs (DEA), the Western Cape DEA&DP (Region 3) and the Cape Nature Regional Office: Garden Route where required. The ECO must submit monthly environmental audit reports to the relevant authorities. These audit reports must contain information on the contractor and developer's levels of compliance with the EMPr. The audit report must also include a description of the general state of the site, with specific reference to sensitive areas and areas of non-conformance. The ECO must indicate suggested corrective action measures to eliminate the cause of the non-conformance incidents. In order to keep a record of any impacts, an Environmental Log Sheet (refer to Appendix 1) is to be kept on a continual basis.

(b) Liaison with Contractors

The ECO is responsible for informing the contractors of any decisions that are taken concerning environmental management during the construction phase. This would also include informing the contractors of the necessary corrective actions to be taken.

6.4 Resident Engineer (RE)

The Resident Engineer (RE) will be appointed by the 'Consultant' and will be required to oversee the construction programme and construction activities performed by the Contractor. The RE is expected to liaise with the Contractor and ECO on environmental matters, as well as any pertinent engineering matters where these may have environmental consequences. He/she will oversee the general compliance of the Contractor with the EMPr and other pertinent site specifications. The RE will also be required to be familiar with the EMPr specifications and further monitor the Contractor's compliance with the Environmental Specifications on a daily basis, through the Site Diary, and enforce compliance.

6.5 Environmental Liaison Officer (ELO)

The contractor must appoint an Environmental Liaison Officer (ELO) to assist with day-to-day monitoring of the construction activities. Any issues raised by the ECO will be routed to the ELO for the contractors' attention. The ELO shall be permanently on site during the construction phase to oversee the Contractor's internal compliance with the EMPr requirements and ensuring that the environmental specifications are adhered to. The ELO must ideally also be a senior and respected member of the construction crew.

The ELO will be responsible for keeping detailed records of all site activities that may pertain to the environment and include all these aspects in an environmental register. This register must be presented at each EMC meeting and be made available to the ECO during his/her monthly audits. In addition to the environmental register the ELO must keep a register of complaints from any community members on environmental issues. Finally, the ELO will be required to keep a record of all on-site environmentally related incidents and how these incidents were dealt with. Past experience has revealed

that, ELO's that can relate to the work force are the most effective for information transfer and ensuring compliance with the EMPr.

7. ENVIRONMENTAL MANAGEMENT PROGRAM (EMPr)

The following tables form the core of this EMPr for the construction and operational phases of the development. This table must be used as a checklist on site, especially during the construction phase. Compliance with this EMPr must be audited monthly during the construction phase and once immediately following completion of construction. This must be followed up with annual audits during the operational phase.

Table 3: Planning and Design Phase: Environmental Management Programme for the proposed project

Activity / issue	Action required	Responsible party	Frequency
Appointment and Duties of ECO	The Developer must appoint an independent Environmental Control Officer (ECO) who must monitor the contractor's compliance with the EMPr.	Developer	Once-Off
	The developer must provide the ECO and contractor with a copy of the EMPr.	Developer	Once-Off
	The priority of the ECO is to maintain the integrity of the development conditions outlined in the EMPr.	ECO	Continuous
	The ECO must form part of the project management team and attend all project meetings.	ECO	Continuous
	The contractor must ensure that the construction crew attend an environmental briefing and training session presented by the ECO prior to commencing activities on site.	ECO, Contractor	Once-Off
	Report on environmental compliance at the monthly site meetings	ECO, ELO	As necessary
	An Environmental Completion Statement will be prepared by the ECO for submission to Eskom indicating completion of the project and compliance with the EMP and conditions. This statement will be prepared after the final audit during the rehabilitation phase.	ECO	Once-Off
Appointment and Duties of ELO	The contractor must appoint an Environmental Liaison Officer (ELO). This person will be required to monitor the situation with a direct hands-on approach, and ensure compliance and co-operation of all personnel. He must be fluent in the languages of the employees.	Contractor	Once-Off
EMPr	This EMPr must be made binding to the main contractor as well as individual contractors and must be included in tender documentation for the construction contract.	Developer, ECO	Once-Off
Training for Site Personnel	All Contractor teams involved in construction work are to be required to undergo some form of environmental induction on their obligations towards environmental controls and methodologies in terms of this EMP, prior to commencing of the works.	Developer, ECO	Once-Off
	• The Contractor shall ensure that all site personnel have a basic level of environmental awareness training. Topics covered must include; • What is meant by "Environment" • Why the environment needs to be protected and conserved • How construction activities can impact on the environment • What can be done to mitigate against such impacts • Awareness of emergency and spills response provisions • Social responsibility during construction of the road. It is the Contractor's responsibility to	Contractor	Continuous

Activity / issue	Action required	Responsible party	Frequency
	provide the site foreman with environmental training and to ensure that the foreman has sufficient understanding to pass this information onto the construction staff. • Training must be provided to the staff members in the use of the appropriate fire-fighting equipment. Translators are to be used where necessary. • Use must be made of environmental awareness posters on site. • The need for a "clean site" policy also needs to be explained to the workers. • Staff operating equipment (such as excavators, loaders, etc.) shall be adequately trained and sensitised to any potential hazards associated with their tasks. • No transgression or movement within demarcated wetland areas and wetland buffers. • The Contractor must monitor the performance of construction workers to ensure that the points relayed during their introduction have been properly understood and are being followed.		
	• Environmental inductions may take the form of onsite talks and demonstrations by the Contractor and the ECO. Induction report will be signed by the Contractor as well as the Employee undergoing Induction, and records kept for auditing purposes and copies given to the ECO for filing. • The education / awareness programme must be aimed at all levels of management and staff within the Contractor's team, and particularly labour drawn from surrounding communities	ELO, ECO, Contractor	Continuous
Record Keeping	• It is recommended that photographs are taken of the site prior to, during and immediately after construction as a visual reference. These photographs must be stored with related documents and other records related to this EMPr.	Developer, Contractor	As necessary
	• Records must be kept of those that have completed the relevant training. • Records of attendance and the awareness talk subject must be kept on file. • Records of public complaints (public register) • Environmental authorisation and any other relevant project permits i.e. Water Use Licence and Heritage permit etc • Waste Documentation • ECO Site Audit/Monitoring Reports • Compile and implement a grievance mechanism procedure for the public to be implemented during both the construction phase. This procedure must include details of the contact person who will be receiving issues raised by interested and affected parties, and the process that will be followed to address issues. • Method Statements etc.	Developer, Contractor	Continuous
	The Contractor shall ensure that all pertinent permits, certificates and permissions have	Contractor,	Continuou

Activity / issue	Action required	Responsible party	Frequency
	been obtained prior to any activities commencing on site and ensure that they are strictly enforced / adhered to. This includes, for example, the Water Use License from the Department of Water and Sanitation DWS).	Developer	s
	All records related to the implementation of this management plan (e.g. site instruction book, ECO reports, induction records, method statements, must be kept together in an office where it is safe and can be retrieved easily.	Developer, Contractor, ELO	As necessary
	All relevant records must be kept for a minimum of two years after construction and must at any time be available for scrutiny by any relevant authorities or stakeholder.	Developer, Contractor	As necessary
Layout Plan/ Designs	Those areas surrounding the construction site that are not part of the demarcated development area must be considered as "no-go" areas for employees, machinery or even visitors.	Developer, ECO, Contractor	Continuous
	When finalising the alignment, endeavour to plan the route through as much low sensitivity vegetation groups as possible, and avoid protective buffer areas.	Developer, Contractor	Once - off
	The final alignment must avoid sensitive vegetation where possible, or endeavour to impact on as little portion thereof as possible while adhering to mitigation measures as set out in the wetland assessment	Developer, Contractor	Once - off
	All delineated wetlands and buffers must be cordoned off before construction commences and must be monitored on a weekly bases	Developer, Contractor	Once – off and Weekly
	It is recommended that a 32-m buffer zone, outside riparian zones and on either side of watercourses and drainage lines where possible		
Environmental Protection Plan	Within 21 days of the Commencement Date, the Site Contractor shall prepare and submit to the Project Manager for approval in consultation with the ECO an Environmental Protection Plan. The Plan shall cover all environmental protection works and shall also include descriptions of environmental safeguards and emergency procedures.	Developer, ECO, Contractor	Once - off
	The Plan shall include a description of the administrative structure and lines of communication which shall be established between the Contractor's and his subcontractors' workforce for the implementation of environmental protection procedures. Details of the expertise available for the implementation of environmental protection procedures must also be provided. The plan must ensure that all hazards material is stored above the 1:100 yare flood line and appropriate berms are in place to	Contractor, RE, ECO	Once off

Activity / issue	Action required	Responsible party	Frequency
	contain spils.		
	In addition this plan must have a site layout plan and showing the final positions and extent of all permanent and temporary site structures and infrastructure, including: • Contractors' camp • Roads and access routes • Gates and fences. • Rubble and waste storage areas • Site toilets and ablutions. • Excavations and trenches. • Topsoil stockpiles. • Spoil areas. • Construction materials stores. • Vehicle and equipment stores. • Sensitive and No go areas & applicable buffers. This must include all areas of Environmental sensitivity (natural environment, sensitive habitats and wetland areas) • All temporary and pollution management structures e.g. bunds and sumps (where applicable) • No Activities are allowed within delineated wetlands and wetland buffer areas	Contractor, RE, ECO	Once off
Existing Services and Infrastructure	The Contractor shall ensure that existing services (e.g. roads, pipelines, power lines and telephone services) are not damaged or disrupted unless required by the contract and with the permission of the RE.	Contractor, RE, ECO	Continuous.
	The Contractor shall be responsible for the repair and reinstatement of any existing infrastructure that is damaged or services which are interrupted.	Contractor	As necessary
	Such repair or reinstatement will be to the Contractor's cost and shall receive top priority over all other activities.	Contractor	Continuous
	A time limit for the repairs may be stipulated by the RE in consultation with the Contractor.	Contractor, RE, ECO	Continuous
Emergency Preparedness	If chemicals in sufficient quantity and toxicity have the potential to be released on the construction sites, emergency contingency plans must be prepared as safety measures (Bunded areas). These safety measures must be communicated to the relevant personnel on the construction site. All hazardous installations require a Risk Assessment in terms of the Occupational Health and Safety Act, (Act No.85 of 1993) for construction sites.	Contractor, ELO	Once - Off
	The Contractor shall submit written Method Statements to the RE for the activities identified by the RE or ECO. Activities that will require method statements include:	Contractor	As necessary

Activity / issue	Action required	Responsible party	Frequency
Method Statements	• Logistics for the Environmental Awareness Training Course • Location and Layout of Construction camp • Construction procedures • Solid and Hazardous Waste Management • Drainage and Storm water planning • Dust Control • Stockpiling area • Vegetation removal • Materials and equipment to be used • Getting the equipment to and from the site • How the equipment material will be moved while on site • How and where material will be stored • The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur • Timing and location of activities • Compliance/non compliance with Specifications • Site camp establishment • Concrete pre-cast and batching operation (if required) • Emergency procedures • Materials, equipment and staffing requirements • Transporting the materials and/or equipment to, from and within the site • Stockpiling of rubble • General and Hazardous waste management on site • The storage provisions for the materials and/or equipment • The proposed construction procedure designed to implement the relevant Environmental Specifications • Other information deemed necessary by the RE and/or ECO. • Wetland area control and management Method Statements shall be submitted at least ten working days prior to the proposed commencement of work on an activity to allow the RE (and/or ECO) time to study and approve the method statement.		
Site Establishment	Contractor shall not commence work on that activity until such time as the Method Statement has been approved in writing by the RE contract.	Contractor, RE, ECO	Continuous

Activity / issue	Action required	Responsible party	Frequency
	The Contractor shall carry out the activities in accordance with the approved Method Statement.	Contractor, RE. ECO	Continuous
	Under certain circumstances, the RE may require changes to an approved Method Statement. In such cases the proposed changes must be agreed upon in writing between the Contractor and the RE, and appropriate records retained.	Contractor, RE	Continuous
	Approved Method Statements shall be readily available on the site and shall be communicated to all relevant personnel. Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the EMPr specifications.	Contractor, Developer	Continuous
	The contractor shall establish his construction camp, office/s and any other infrastructure as per the agreed site layout plan in a manner that does not adversely affect the environment.	Contractor, ECO	Once-Off
	The contractor shall submit a method statement for site clearance for approval by the RE in consultation with the ECO. Site establishment shall take place in an orderly manner and all required amenities shall be installed at the camp site(s) before the main workforce move onto site.	RE, Contractor, ECO	Once-Off
	The Construction camp(s) shall have the necessary ablution facilities with chemical toilets at commencement of construction activities to the satisfaction of the Project Manager. The Contractor shall inform all site staff to make use of supplied ablution facilities and under no circumstances shall indiscriminate sanitary activities be allowed other than in supplied facilities.	Contractor, ECO	Continuous
	Safe drinking water for human consumption shall be available at the site offices and at other convenient locations on site. All water used on site must be taken from a legal source and comply with the recognised standards for potable and other uses.	Contractor, ECO	Continuous
	No open fires will be allowed on site. Activities which may pose a risk of fire must be identified and suitable measures must be put in place to prevent any possible damage by fire. Contractors must inform the staff of the risk of fires and fire prevention and emergency procedures in the event of a fire. Fire fighting equipment shall be supplied by the Contractor at suitable locations	Contractor, ECO	Continuous
	The construction camp(s) must preferably be positioned where it will not visually impact on adjacent landowners and must not be located in an environmentally sensitive area	Contractor, ECO	Once off

Activity / issue	Action required	Responsible party	Frequency
	All sensitive areas, heritage (if encountered), wetland, drainage lines must be demarcated and fenced off before development and site establishment commences. These areas must be treated as "no go" areas. Activities in the wetland must be limited to those areas authorised.	Contractor, ECO, ELO	Continuous
	Invasive alien plant species must be controlled in an appropriate manner.	ELO and Contractor	Continuous
	Alien plant eradication and follow-up control activities prior to construction, to prevent spread into disturbed soils, as well as follow-up control during construction.	ELO and Contractor	Continuous
Protection of protected plants and plants of conservation concern	• There must be a preconstruction walk-through of the development footprint/project site in order to assess the pylon footprint areas for Red Data species as well as sensitive ecosystems such as streams, wetlands, etc • Implement a Plant Rescue and Rehabilitation Plan: Where plants of conservation concern are deemed to be under threat from the construction activity, the plants must be removed by a suitably qualified specialist and replanted as part of vegetation rehabilitation after the construction (*Note, these plants may only be removed with the permission of the provincial authority*). • If the provincially protected species are used as part of rehabilitation, their survival must be monitored for at least two growing seasons after rehabilitation was completed	Contractor, ELO	Once - Off
Protection of Fauna & avifauna	• Where possible access/service roads and pylon bases must be planned and constructed to avoid being located in areas defined as highly sensitive or areas which have been described as valuable habitats for protected faunal species. • Where access roads and/or pylon bases do need to be located within any of the defined sensitive areas then ground-truthing to determine exact road routes and pylon base locations should be carried out. • It must be noted that the **Brandwagrivier Wetland System** and the intact vegetation surrounding **Wolwedans dam** must be treated as "**No-go**" areas for roads or pylon hardstands and access/services roads.dam must be treated as "No-go" areas for roads or pylon hardstands and access/services roads.	Contractor, ELO	Once - Off
	• Where access roads and/or pylon bases do need to be located within any of the identified sensitive areas then there must be further ground-truthing by an avifaunal specialist to determine exact road routes and pylon base locations so to, where possible, avoid site specific sensitive areas such as nests and roosts.	Contractor, ELO	Once - Off

Activity / issue	Action required	Responsible party	Frequency
	• **All bird nest/roost** sites encountered must be considered "**No-Go" areas** for any pylon hardstands or the construction of access roads. • The power line must be constructed in close proximity to the existing power line as many birds will be aware of the existing infrastructure which may reduce collisions in low visibility conditions. • All areas defined as having a medium avifaunal sensitivity must have bird diverters installed (spacing to be determined following ground-truthing). These areas include suitable habitat for numerous powerline priority species (e.g. cranes, bustards, and storks).		
Limit the impact on wetlands	It is recommended that a buffer of 50m from the top of the river banks and/or approximately 100m from the edge of the wetland areas be allowed for as a development setback for the construction of the pylons.	ELO, Contractor	Continuous
	Locate and clearly indicate convenient access routes, temporary loading and packing areas and turning circles so that vehicle movement can be confined to these areas. None of these areas are allowed with in the demarcated wetland areas	ELO, Contractor	Continuous
	The Contractor shall provide sanitation facilities in the form of chemical toilets, at all camps, offices, workshops and construction sites for staff and visitors. No other form of sanitation will be permitted unless a connection with a local sewer main is possible. The provision of this facility will comply with current legislation. A minimum of one toilet per 11 people or within 100 meters of the work site in order to prevent any breach of sanitary bylaws or offence to public decency	Contractor, ELO, ECO	Continuous
	Direct lights so that they do not pose a nuisance to neighbours	ELO, Contractor	Continuous
	Locate temporary waste bins and skips so that they are easily accessible for removal	ELO, Contractor	Continuous
	Those areas surrounding the construction site that are not part of the demarcated development area must be considered as "no-go" areas for employees, machinery or even visitors.	Developer, ECO, Contractor	Continuous
	Avoid activities within delineated wetlands and associated buffer zones. Only authorised activities are to be undertaken e.g. Plan construction activities that necessitate water crossings to only cross watercourses at designated points	Contractor	Continuous
	Project engineers must compile a method statement, outlining the construction methodologies. The required mitigation measures to limit the impacts on the watercourse and associated buffers must be contained within the method statement. The method statement must be approved by the ECO and be available on site for reference purposes	Project Engineer	As necessary
	Plan construction activities to have the smallest possible footprint	Developer, Project Engineers	Once off

Activity / issue	Action required	Responsible party	Frequency
	Demarcate the construction footprint prior to commencement of construction and ensure that all workers and contractors are aware that access beyond the demarcated areas is not allowed. Where the structures will affect a wetland, the edge / boundary of this wetland must be clearly demarcated in the field with poles, sticks, or any solid structure that will last for the duration of the development.	Contractor, ECO, ELO	Continuous
	Ensure that copies of the Wetland and Rehabilitation Reports and other applicable documents are available on site and that all workers and contractors are aware of it. Implementation thereof must be monitored by the appointed the site Safety and Environmental Officer (SHE) or independent Environmental Control officer (ECO)	Contractor, Developer, ELO	Continuous
Ensure effective communication mechanisms with the various stakeholders	• Compile and implement a grievance mechanism procedure for the public to be implemented during both the construction and operational phases of the facility (refer to the draft generic grievance mechanism. This procedure must include details of the contact person who will be receiving issues raised by interested and affected parties, and the process that will be followed to address issues. • Liaison with landowners is to be undertaken prior to the commencement of construction must they be required to plan accordingly.	Contractor, ECO, ELO	Continuous
Limit impact on the heritage resources	• CRM reports confirm that the coastline is sensitive from an archaeological perspective and a buffer of at least I km should be maintained from the ocean; • A walk-down of targeted areas along the selected powerline alternative will be required. This would include areas around rocky koppies, steeply sided valleys and gorges, the banks of rivers, and in areas in close proximity to farm houses in order to ensure that a sufficient buffer has been implemented to avoid impacts to historic kraals, old sheds, rubbish dumps, etc; • If graveyards are discovered during the walk down phase, a buffer of at least 15m should be employed around them; • If unmarked graves are uncovered during the construction of the tower footings, all work in that area should cease immediately, and HWC must be contacted. • Following the walkdown identification of sites, a report must be submitted to HWC for approval. • This report must include the findings of the walkdown as well as a workplan detailing mitigation strategies where applicable. Or treated as no-go areas during all phases of the project. A report to HWC is required for approval; • The ECO must be briefed on what to look out for in terms of archaeological and palaeontological heritage resources that might be revealed during construction; The ECO must report as described below. o If any archaeological material, palaeontological material ar human burials are uncovered during the course of development then work in the immediate area must be halted and the find protected in situ as for as is possible. The find would need to be reported to the heritage authorities and may require inspection by an appropriate heritage practitioner. Such heritage is the property of the state and may require excavation and curation in an approved institution.	Contractor, ECO, ELO	Continuous
Limit impact on high agricultural land	The placement of power line pylon on **high intensity agriculture** will have to be **negotiated with landowners** on a site-specific basis.	Contractor, ECO, ELO	Continuous

Table 4: Construction Phase: Environmental Management Programme for the proposed project

Activity / issue	Action required	Responsible party	Frequency
Minimise loss of indigenous biodiversity, including plants of conservation concern	• An independent Environmental Control Officer (ECO) must be appointed to oversee construction. • The route alignment must be fixed through areas with the least vegetation sensitivity. • The work area (e.g. area disturbed) must be kept to a minimum in sensitive areas and no construction camps or related activities may be places within these areas. • A temporary fence or demarcation must be erected around the construction area (include the servitude, construction camps, areas where equipment is stored and the actual footprint of the development) to prevent access to adjacent sensitive grasslands. Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area. • No open fires are permitted within naturally vegetated areas. • Formalise access roads and make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas. • A vegetation rehabilitation plan must already be implemented during construction	Contractor, ECO, ELO	Continuous
Minimise loss of vegetation	• Construction workers may not remove flora and neither may anyone collect seed from the plants without permission from the local authority. • No activities must take place during rainy events and at least 2 days afterwards. • Maintain site demarcations in position until the cessation of construction work. • The construction site must be cleaned daily and litter removed. • Provide bins for construction workers and staff at appropriate locations, particularly where food is consumed.		
Prevention of negative impact on Wetlands	• The wetland as delineated by the wetland specialist and associated buffer zones must be fenced during the construction phase to prevent any human activity from encroaching into these areas, other than that which is essential to the road construction. Monitoring of the fences is important to ensure no		

Activity / issue	Action required	Responsible party	Frequency
	infringement of the fences occurs. • Construction within moist grassland must preferably take place during the dry months. • Input of sediment during construction activities must be prevented at all cost. Mitigation for this potential impact includes establishment of vegetation as soon as possible after construction. • Pollution of the surface and groundwater. Mitigation for this potential impact includes: o In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water Affairs must be informed immediately; o Emergency pollution control equipment must be onsite at all times. o Store all litter carefully so it cannot be washed or blown into the water course; o Construction vehicles are to be maintained in good working order so as to reduce the probability of leakage of fuels and lubricants; o A walled concrete platform, dedicated store with adequate flooring or bermed area must be used to accommodate chemicals such as fuel, oil, paint, herbicide and insecticides, as appropriate, in well-ventilated areas;		
Protection of wetland vegetation	Removal / Destruction of protected plants and plants of conservation concern: • Where possible, construction activities must be restricted to previously disturbed areas. • Where the road construction will take place in proximity to these species, cordon off the sensitive vegetation that house the protected plant species and the plants of conservation concern and protect from construction activities and vehicles. • Construction workers may not tamper or remove these plants and neither may anyone collect seed from the plants without permission from the local authority.	Contractor, ECO, ELO	Continuous
	If concrete batching will be required on site: The contractors must provide and maintain a method statement for “cement and concrete batching”. The method statement must provide information on proposed location, storage, washing & disposal of cement, packaging, tools and plant storage	Contractor, RE ECO	Once off

Activity / issue	Action required	Responsible party	Frequency
Prevention of pollution on wetland	Cement must only be mixed within mixing trays. Washing and cleaning of equipment must also be done within a bermed area (outside of wetland buffers), in order to trap any cement and avoid excessive soil erosion. These sites must be rehabilitated prior to commencing the operational phase	Contractor, ELO, ECO	As necessary
	The mixing of concrete must only be done at specifically selected sites on mortar boards or similar structures to contain run-off into drainage lines, streams and natural vegetation	Contractor, ELO, ECO	As necessary
	Where access cannot be avoided into sensitive areas (wetland), the amount of vehicle and personnel traffic must be kept to a minimum and must make use of only one route	Contractor, ELO, ECO	As necessary
	Materials such as fuel, oil, paint, herbicide and insecticides must be sealed and stored in bermed areas or under lock and key, as appropriate, in well-ventilated areas. These substances must be confined to specific and secured areas within the contractor's camp, and in a way that does not pose a danger of pollution even during times of high rainfall	Contractor, ELO, ECO	Continuous
	Storage of materials as described above may not be within the 1:100 floodline, watercourses or associated buffer areas	Contractor, ELO, ECO	Continuous
Prevention of pollution of wetlands	No vehicles will be allowed within the 30m buffer of sensitive environments (wetland, drainage lines).	Contractor, ELO, ECO	Continuous
	In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water and Sanitation (DWS) must be informed immediately	Contractor, ELO	As necessary
	No hydrocarbon spillages and dirty water from site must not be allowed to flow into the watercourse.	Contractor, ELO, ECO	Continuous
	All equipment must be parked overnight and/or fuelled at least 30 meters from the wetland	Contractor, ELO	As necessary
	Spill kits must be available on site for the cleanup of any hydrocarbon spillages	Contractor, ELO, ECO	Continuous
	Drip trays (minimum of 10cm deep) must be placed under all leaking vehicles and machinery under repair and maintenance. Vehicles suspected of leaking must not be left unattended, drip trays must be utilised	Contractor, ELO, ECO	Continuous

Activity / issue	Action required	Responsible party	Frequency
	Construction vehicles are to be maintained in good working order so as to reduce the probability of leakage of fuels and lubricants	Contractor, ELO, ECO	Continuous
	Provision of adequate sanitation facilities located outside of the wetland/riparian area or its associated buffer zone	Contractor, ELO, ECO	Continuous
	Remove all construction equipment and material on completion of construction	Contractor, ELO	Once off
Prevention of degradation of wetlands	○ Storage of potentially hazardous materials must be above any 100-year flood line or the functional wetland boundary (and its associated buffer zone). These materials include fuel, oil, cement, etc.; ○ Surface water draining off contaminated areas containing oil and petrol would need to be channelled towards a sump which will separate these chemicals and oils; ○ Concrete is to be mixed on mixing trays only, not on exposed soil; ○ Concrete shall be mixed only in areas which have been specially demarcated for this purpose; ○ After all the concrete mixing is complete all waste concrete shall be removed from the batching area and disposed of at an approved dumpsite; ○ All construction materials liable to spillage are to be stored in appropriate structures with impermeable flooring; Portable septic toilets are to be provided and maintained for construction crews. Maintenance must include their removal without sewage spillage; ○ Under no circumstances may ablutions occur outside of the provided facilities; and No uncontrolled discharges from the construction crew camps to any surface water resources shall be permitted. Any discharge points need to be approved by the relevant authority.	Contractor, ELO	As necessary
	Where any hard structures (concrete, gabion or otherwise) are used, it must be well keyed into the surrounding bank walls and secured to the ground.	Contractor, ELO	As necessary
	A temporary fence or demarcation must be erected around the works area to prevent access to sensitive environs.	Contractor, ELO, ECO	Continuous

Activity / issue	Action required	Responsible party	Frequency
	Prevent pedestrian and vehicular access into the wetland and buffer areas as well as riparian areas.	Contractor, ELO, ECO	Continuous
	Consider the various methods of construction and take cognisance of that which will have the least impact on watercourses	Contractor, ELO, ECO	Once off
	No activities must take place in the watercourses and associated buffer zone. Where the above is unavoidable, only authorised activities must be undertaken. This is subjected to authorization by means of a water use license.	Once off	Once off
	• Existing dirt road must be used for service roads as far as possible. • Erosion control methods must be implemented within and adjacent to the road to prevent further erosion and erosional gullies. • Vehicular movement must be restricted to a single access roadway only. • Any soil that is removed from the wetland and/or the non-perennial areas must be stored in the layers it was removed. • Soil compaction must be avoided in the wetland, if soil compaction has occurred the soil must be loosened. • The bare soil must be revegetated with plant species specific to the area.	Contractor, ELO, ECO	Continuous
Environmental incidents	The contractor must take corrective action to mitigate an incident appropriate to the nature and scale of the incident and must also rehabilitate any residual environmental damage caused by the incident or by the mitigation measures themselves	Contractor , ELO,	Continuous
Handling and disposal of contaminated water	Materials storage areas will not be allowed in close proximity to ecologically sensitive areas (wetland on site)	Contractor	Continuous
	Storage of potentially hazardous materials must be above any 100-year flood line or the functional wetland boundary (and its associated buffer zone). These materials include fuel, oil, cement, bitumen etc.	Contractor, ECO	Continuous
	Spill kits must be available on site for the clean-up of any hydrocarbon spillages	Contractor, ECO	Continuous
	The areas around fuel tanks are to be bunded in accordance with SANS 1089:1999: Part 1	ELO, Contractor	Once off

Activity / issue	Action required	Responsible party	Frequency
	Hazardous chemicals or potentially hazardous chemicals used during construction shall be stored in secondary containers.	Contractor	Continuous
	Safety Data Sheets (SDSs) must always be readily available on site for all chemicals and hazardous substances to be used on site.	Contractor	Continuous
	• Concrete is to be mixed on mixing trays only, not on exposed soil; • Concrete shall be mixed only in areas which have been specially demarcated for this purpose; • After all the concrete mixing is complete all waste concrete shall be removed from the batching area and disposed of at an approved dumpsite;	Contractor, ELO	As necessary
	The relevant emergency procedures relevant to particular chemicals used on site, as per the MSDSs and suppliers guidelines, will be followed in the event of an emergency	Contractor	Continuous
	The contractor shall prevent discharge of any pollutants such as cement, concrete, lime, chemicals, fuels and oils into any water sources and adequate storm water control measures will be implemented where these substances are handled	Contractor	Continuous
	No discharge of pollutants such as cement, concrete, lime, chemicals, fuels or oils will be allowed into any water resource or wetland area	ELO, Contractor	Continuous
	Surface water draining off contaminated areas containing carbon fuels (e.g. oils, diesel etc.) would need to be channelled towards a sump which will separate these chemicals and oils;	Contractor	Continuous
	Only above ground temporary storage tanks will be allowed on site	ELO, Contractor	Continuous
	Contaminated or potentially contaminated water must not be discharged into the watercourse on site	ELO, Contractor	Continuous
Lighting	Working hours shall generally be restricted to daylight hours	ELO, Contractor	Continuous
	If working hours are required outside of daylight hours, the contractor shall provide notification by completing the Night work Application three days in advance of the work taking place.	ELO, Contractor	Continuous
	Security lights shall be directed from the perimeter wall towards the centre of the camp with a down angle	ELO, Contractor	Continuous

Activity / issue	Action required	Responsible party	Frequency
Waste management (waste management plan)	Implement a site specific waste management plan during the construction phase	ELO, Contractor	Continuous
	Corrective action must be undertaken immediately if a complaint is received, or potential/actual leak or spill of polluting substance identified. This includes stopping the contaminant from further escaping, cleaning up the affected environment as much as practically possible and implementing preventive measures.	ELO, Contractor	As required
	Litter generated by the construction crew must be collected in rubbish bins and disposed of weekly at registered waste disposal sites.	ELO, Contractor	Weekly
	All building rubble, solid and liquid waste etc must be disposed of as necessary at an appropriately licensed refuse facility.	ELO, Contractor	Once off, as necessary
	Ensure that no refuse wastes are burnt on the premises or on surrounding premises. No fires will be allowed on site.	ELO, Contractor	Monitor daily
	The construction site must be kept in a clean and orderly state at all times.	Contractor, site crew	Monitor daily
	No waste may be dumped into any wetlands or river courses	ELO, Contractor, ECO	As necessary
	No waste is to be buried on site or any area but is to be disposed of at a relevant disposal site.	ELO, Contractor, ECO	As necessary
	No burning of waste will be allowed on site	ELO, Contractor	Monitor daily
	All related documents for disposal of general and hazardous waste are to retained on site to be included in the end of project documents.	Contractor, ELO, ECO	Continuous
	Empty containers in which hazardous substances were kept are to be treated as hazardous waste	ELO, Contractor, ECO	As necessary
	Ensure that no litter, refuse, wastes, rubbish, rubble, debris and builders wastes generated on the premises be placed, dumped or deposited on adjacent/surrounding properties during or after the construction period of the project are disposed of an approved at dumping site as approved by the Local Municipality.	ELO, Contractor	Monitor daily - weekly
	The Contractor shall provide sanitation facilities in the form of chemical toilets, at all camps, offices, workshops and construction sites for staff and visitors. No other form of sanitation will be permitted unless a connection with a local	Contractor, ELO, ECO	Continuous

Activity / issue	Action required	Responsible party	Frequency
	sewer main is possible. The provision of this facility will comply with current legislation. A minimum of one toilet per 11 people or within 100 meters of the work site in order to prevent any breach of sanitary bylaws or offence to public decency		
	All staff are to use the toilets at all times rather than informal defecation in the environment	Contractor, ELO, ECO	Continuous
	Any sewerage spillages must be regarded as hazardous and cleaned up immediately using appropriate PPE.	Contractor, ELO, ECO	Continuous
	Implement an effective monitoring system to detect any leakage or spillage of all hazardous substances during their transportation, handling, use and storage. This must include precautionary measures to limit the possibility of oil and other toxic liquids from entering the soil or storm water systems.	Contractor, ELO, ECO	Continuous
Storm water Management	No stockpiles or construction materials may be stored or placed within any drainage line	Contractor, ELO, ECO	Continuous
	Should a freak storm displace temporary earth embankments or other erosion control structures, a visual inspection of the site must be made and any damage be recorded. Any damage and loss of soil resulting from a storm is to be remedied immediately. Should the temporary walls collapse due to construction error, the contractor is to fund the remediation process	Contractor, ELO, ECO	Continuous
	Storm water at the construction crew camp must be managed so as to reduce the silt loads into the ecological environment. Measures must be implemented to distribute storm water as evenly as possible to avoid point sources of erosion	Contractor, ELO, ECO	Continuous
	The site must be managed in a manner that prevent pollution of downstream watercourses or groundwater, due to suspended solids, silt or chemicals	Contractor, ELO, ECO	Continuous
	No stockpiles or construction materials may be stored or placed in close proximity to storm water drainage lines.	Contractor, ELO, ECO	Continuous
	Temporary cut-off drains and berms may be required to capture storm water and promote infiltration.	Contractor, ELO, ECO	Continuous
Noise management	Construction and the use of construction machinery must be limited between 06h00 and 18h00 on weekdays only. If after hours work is required a permit must be obtained from the Department of labour	Developer, Contractor	Once off, as necessary

Activity / issue	Action required	Responsible party	Frequency
	Institute noise control measures throughout the construction phase for all applicable activities, including the construction times.	ELO, Contractor	Once off, as necessary
	Unnecessary horning of construction vehicles must not be allowed on site.	ECO, ELO, Contractor	Continuous
	Inform residents of nearby residential areas of planned noisy activities outside the timeframes stated above.	ECO, ELO, Contractor	Once off, as necessary
	No construction must occur during weekends, unless the adjacent residents have been notified in writing at least three days in advance.	ELO, Contractor	Once off, as necessary
	Construction activities must abide by the national noise laws and the municipal noise by-laws with regard to the abatement of noise caused by mechanical equipment.	Developer, ELO, Contractor	Continuous
Air Pollution	Wet all unprotected cleared areas and stockpiles with water to suppress dust pollution during dry and windy periods. • A provision for a minimum of twice daily dampening by water cart must be provided. • The first dampening must commence with the start of work daily and the second watering to commence no later than four hours later. • During exceptional circumstances additional dampening may be required should the watering not be deemed effective by the ECO. The ECO will determine the nuisance and health issues in considering this recommendation. • All reasonable measures must be taken to minimize air emissions in the form of smoke, dust and gases.	ECO, ELO	As necessary
	All forms of dust/air pollution must be managed in terms of the NEMA Air Quality Act (AQA) 2004, (Act 39 of 2004); this includes the control of noxious and offensive gases, smoke, dust and vehicular emissions. Under no circumstances may toxic pollutants of high concentration be released into the air.	ECO, ELO	As necessary
	Burning of vegetation including tree trunks and stumps cut during site clearing and establishment shall not be permitted.	Contractor, ELO	As necessary
	A speed limit of 40km/h to be maintained on all dirt roads.	ECO, ELO, Contractor	Continuous

Activity / issue	Action required	Responsible party	Frequency
	All vehicles and other plant must comply with road worthy requirements and comply with legislation in terms of allowable emissions.	Contractor, ELO	As necessary
	Ensure proper rehabilitation of disturbed areas in order to minimise bare patches that can be a source of fugitive dust.	ELO, Contractor	Continuous
Crime, safety and security	Ensure that the construction vehicles are under the control of competent personnel and are in proper working order.	Contractor	Continuous
	Ensure that only suitably qualified personnel use construction vehicles	Contractors	Continuous
	Ensure that the contact details of the police or security company and ambulance services are available on site	Contractor	Continuous
	Limit access to the construction crew camp to construction workers through access control.	ELO, Contractor	Continuous
	Comply with the requirements of the Occupational Health and Safety Act, 1993 (Act No.85 of 1993) requirements.	ELO, Contractor	Continuous
	Ensure that the handling of equipment and materials is supervised and adequately instructed.	ELO, Contractor	Continuous
	Vehicular traffic during construction activities must be limited to a maximum speed limit of 60 km/hr.	ELO, Contractor	Continuous
	The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act, 1993 (Act No.85 of 1993) and the National Building Regulations.	Contractor	Continuous
	The contractor must supply his own security arrangements for the construction camp within the framework of the EMPr.	Contractor, ELO	Continuous
	Equipment and materials must be handled by staff that have been supervised and adequately trained.	Contractor, ELO	Continuous
	Staff must be regularly updated about the safety procedures.	Contractor, ELO	Continuous
	Emergency facilities must be available and adequately supplied for use by staff and customers.	Contractor, ELO	Continuous
	Ensure that the handling of equipments and materials is supervised and adequately instructed.	Contractor, ELO	Continuous
	Limit access to the construction crew camp only to the workforce.	Contractor, ELO	Continuous

Activity / issue	Action required	Responsible party	Frequency
	Any crimes to be reported to the local South African Police Service (SAPS). These incidents are either reported by the PM or though the knowledge of the PM.	Contractor, ELO	Continuous
	• All employees to be clearly identifiable. • Proper supervision of employees at all times. • Construction activities must remain within construction footprint. • No unauthorized people to be allowed on site.	Contractor, ELO	Monitor daily
	Appropriate notification signs must be erected, warning the residents, pedestrians and cyclist about the hazards around construction sites and presence of heavy vehicles	Contractor, ELO	Once-off, or as necessary
	• Education of the construction staff about the value of wildlife and environmental sensitivity. • Restrict access to the suitable and sensitive habitats of faunal species. • The contractor/contractors must ensure that no animals are disturbed, trapped, hunted or killed during the construction phase. Conservation-orientated clauses must be built into contracts for construction personnel, complete with penalty clauses for non-compliance. • Safety and evacuation procedures and measures must be in place for flood events that could occur during construction caused by high rainfall events in the catchment area of the construction	ELO, Contractor	Continuous
Stripping of vegetation	The working strip must be effectively monitored to prevent excessive vegetation removal. By maintaining the maximum amount of stabilising vegetation, the extent of erosive action will be contained.	ELO, Contractor	Continuous
	Re-vegetation must be on-going and relevant to terrestrial, wetness zone and slope	ELO, Contractor	Continuous
	Where possible, remove vegetation as sods that can be replanted as part of the rehabilitation of vegetation around the conduit footprint. Store sods in already cleared areas or degraded areas and water at least once week	ELO, Contractor	As necessary
	Stripping of vegetation for construction must occur in a phased manner and must be restricted to the construction footprint to reduce the risk of erosion during times of precipitation	ELO, Contractor	As necessary
	Limit the removal of naturally occurring vegetation to only that which is absolutely necessary	ELO, Contractor	Once off, as

Activity / issue	Action required	Responsible party	Frequency
			necessary
	Vegetation to be retained during the construction phase must be clearly demarcated with danger tape.	ELO, Contractor	Once off, as necessary
	Where activities occur in areas that slope towards wetlands, the slopes must be re-vegetated by either using removed sods or by seeding with a grass mixture containing species naturally occurring in the area. Sloped areas where vegetation has been removed or destroyed must be replanted immediately after the initial disturbance to reduce the potential of erosion or invasion of the disturbed soils by alien invasive plant species	ELO, Contractor	Immediately after installation of culverts
	The removal of any plant material from site, including flowers or bulbs is strictly prohibited unless unavoidable and essential for the purposes of construction	Contractor, ELO, ECO	As necessary
	Stripping of vegetation for construction must occur in a phased manner and must be restricted to the excavation footprint to reduce the risk of erosion during times of precipitation	Contractor, ELO, ECO	As necessary
	Limit the removal of naturally occurring vegetation to only that which is absolutely necessary	Contractor, ELO, ECO	As necessary
	Where soils are removed, the topsoil and subsoil must be stockpiled separately in low heaps	Contractor, ELO, ECO	As necessary
	The felling and cutting of trees and clearing of shrubs must be minimised. Shrubs must only be cleared to provide essential access for construction	Contractor, ELO, ECO	As necessary
	After construction, compacted areas must be ripped and topsoil replaced from the areas where it was removed. Areas within the construction footprint can be re-vegetated using the sods that were removed prior to construction. The sods must be placed level, or slightly deeper than surrounding vegetation, on ripped soils. Against slopes, the sods must be pegged to ensure that it does not wash away before the roots establish	Contractor, ELO, ECO	As necessary
	Where possible, cut vegetation to ground-level rather than removing completely, leaving root systems to ensure rapid re-colonisation	Contractor, ELO, ECO	As necessary
	All sloped areas must be re-vegetated by either using removed sods or by seeding with a grass mixture containing species naturally occurring in the area. Sloped areas where vegetation has been removed or destroyed must be replanted immediately after completion of construction to avoid erosion	Contractor, ELO, ECO	As necessary

Activity / issue	Action required	Responsible party	Frequency
	Badly damaged areas must be fenced in to allow for rehabilitation to take place without further impacts on these areas	Contractor, ELO, ECO	As necessary
	Where possible, remove vegetation as sods that can be replanted as part of the rehabilitation of vegetation within the construction footprint. Store sods in already cleared areas and water at least once week	Contractor, ELO, ECO	As necessary
	All disturbed areas will requiring rehabilitation must be mulched to encourage vegetation re-growth. Mulch used must be free from alien seed. These areas must be cordoned off so that vehicles or construction personnel cannot gain access to these areas	Contractor, ELO, ECO	As necessary
	All rehabilitated areas must be monitored for the presence of exotic and alien plant species during rehabilitation	Contractor, ELO, ECO	As necessary
Excavation	Topsoil and subsoil must be placed on opposite sides of the trench and must be kept separate throughout construction and rehabilitation	Contractor, ELO, ECO	As necessary
	Topsoil must not be stockpiled for an extensive period (> 3 months). This is to prevent the redundance of the existing seed bank as well as the alteration of the soil characteristics (permeability, bulk density etc.).	ELO, ECO, Contractor	As necessary
	Erect signs and/or danger tape around the exposed excavations to warn the public of the inherent dangers.	ELO, Contractor	Continuous
	Ensure that excavated and stockpiled soil material is stored and bermed on the higher lying areas of the site and not in any storm water run-off channels or any other areas where it is likely to cause erosion or where water would naturally accumulate.	ECO, Contractor	As necessary
Top Soil Management	Topsoil (top 300mm as a minimum) must be temporarily stockpiled separately from subsoil or rocky material (the topsoil contains both the seedbed and nutrient supply necessary for plant growth - if mixed with subsoil layers the usefulness of the topsoil for rehabilitation will be lost) Topsoil shall be stripped from all areas to be utilized during construction period and where permanent structures and access is required. These areas will include all temporary and permanent access roads and construction camps	ELO, Contactor	As necessary
	It is imperative that top soil is collected and stored to ensure that valuable seeds in the soil are not lost to the process of eventual rehabilitation of the site.	ELO, Contactor	As necessary

Activity / issue	Action required	Responsible party	Frequency
	Disturbance of topsoil on construction sites with severe slopes must be minimised at all costs.	ELO, Contactor	As necessary
	The areas where excavated soil will be stockpiled must be bordered by berms to prevent soil loss caused by rain.	ELO, Contactor	As necessary
	Topsoil shall be stripped after clearing of woody vegetation and before excavation or construction commences.	ELO, Contactor	As necessary
	Soil shall be stripped to a minimum depth of 300 mm or to the depth of bedrock where soil is shallower than 300 mm	ELO, Contractor	As necessary
	Herbaceous vegetation, overlying grass and other fine organic matter shall not be removed from the stripped soil.	ELO, Contactor	As necessary
	Position topsoil stockpiles away from the watercourse and drainage lines	ELO, Contactor	As necessary
	When possible and space allows: Stockpiled soil (particularly topsoil) must be protected by erosion-control berms if exposed for a period of greater than 14 days during the wet season (this will prevent topsoil being leached of its nutrient content and/or being washed away or mixed with other stockpiled soil).	ELO, Contactor	As necessary
	The topsoil will be stored in such a way and at such a place that it will not cause damming up of water or wash away itself	ELO, Contactor	As necessary
	If topsoil is to be stockpiled for extended periods, especially during the wet season, then the ECO may recommend one of the following measures: • The covering of the stockpiles with a protective material such as hessian mats. • Seeded with a temporary grass to keep the microbial activity within the soil alive.	ELO, Contactor	As necessary
	Soil stockpiles shall not be higher than 1,5m and the slopes of soil stockpiles shall not have a vertical/horizontal gradient exceeding 1: 1,5.	ELO, Contactor	As necessary
	Ensure that topsoil is at no time buried, mixed with spoil (excavated subsoil), rubble or building material, or subjected to compaction or contamination by vehicles or machinery. This will render the topsoil unsuitable for use during rehabilitation	ELO, Contactor	As necessary
	The stockpiled topsoil must be replaced as the final soil layer.	ELO, Contactor	As necessary

Activity / issue	Action required	Responsible party	Frequency
	Vehicle access onto the topsoil must be strictly prohibited once it has been prepared as per above for seeding to take place and up until the grass has germinated and become established.	ELO, Contactor	As necessary
	Stockpiled topsoil must not be compacted, this includes the movement of any form of vehicles over the stockpiles	ELO, Contactor	As necessary
	Topsoil placement shall be done concurrent with construction as soon as construction in an area has ceased. After topsoil placement is complete, stockpiled vegetative matter may be spread randomly by hand over the top soiled area which may serve as mulch.	ELO, Contactor	As necessary
	Replace topsoil to the original depth (i.e. as much as was removed prior to construction - These areas will be quantified by the PM / ECO.	ELO, Contactor	As necessary
	Place topsoil in the same area from where it was stripped. If there is Insufficient topsoil available from a particular soil zone to produce the minimum specified depth, topsoil of similar quality may be brought from other areas of similar quality. The PM / ECO will advise	ELO, Contactor	As necessary
Destruction of heritage resources	Should any archaeological artefacts be exposed during excavation, work on the area where the artefacts were found, shall cease immediately and the ECO shall be notified as soon as possible.	ELO, Contractor	As necessary
	Upon receipt of such notification, the ECO will arrange for the excavation to be examined by an Archaeologist as soon as possible	ECO, Contractor	As necessary
	Under no circumstances shall archaeological artefacts be removed, destroyed or interfered	ELO, Contractor	Continuous
	Any archaeological sites exposed during construction activities may not be disturbed prior to authorisation by the South African Heritage Resources Agency	ECO, Contractor	As necessary
Aesthetic / visual	Prevent unnecessary removal of vegetation outside the width of the working area by clearly demarcating the working area	ELO, Contractor	Continuous
	The clearing of all sites must be kept to a minimum and surrounding vegetation must as far as possible be left intact as a natural shield.	ELO, Contractor	Continuous

Activity / issue	Action required	Responsible party	Frequency
	No painting or marking of natural features shall be allowed. Marking for surveying and other purposes shall only be with pegs and beacons	ELO, Contractor	Continuous
	The ECO may instruct the contractor to screen unsightly construction works where it has become evident that a visual disturbance is been encountered.	ECO, Contractor	As necessary
	Remove spoil material from the area once excavations have been filled	Contractor	Continuous
	Reinstatement of soil levels, roadways, entrances, verges must be prioritized to be undertaken as soon as construction works are complete to lessen the visual and scenic degradation of the site.	ELO, Contractor	Continuous
	Trees and all woody shrubs must be protected from damage to provide a natural visual shield. Excavated material must not be placed on such plants and movement across them must not be allowed as far as practical.	ELO, Contractor	Continuous
	Revegetate disturbed ground in the working area (outside the servitude) by seeding and spreading of vegetation that has been removed at the start of construction.	ELO, Contractor	Continuous
	The Contractor shall position all temporary structures as well as temporary plant on site in locations and at elevations which limit visual intrusion on neighbours.	ELO, Contractor	Continuous
	No construction rubble, construction material, refuse, litter or any other material not found naturally in the surroundings must be allowed at anytime to be lying around on the construction site.	ECO, Contractor	As necessary
Traffic impact	Implement the traffic management plan and transport plan include within this EMPr document	ECO, Contractor	Continuous
	Access to the site must follow current and established routes. The contractor must be responsible for any damage caused to the road or road curb/verges.	Contractor	Continuous
	Permits for abnormal loads must be applied for from the relevant authority, if required.	Contractor	As necessary
	The Contractor shall comply with all legislation with regard to man-made facilities and activities in the area, including the Occupational Health and Safety Act (Act 85 of 1993).	Contractor	Continuous

Activity / issue	Action required	Responsible party	Frequency
	It must be ensured that a backlog of traffic does not develop on site during peak hours, through the erection of signage to warn motorist of construction, closed road lanes, traffic delays etc. and consideration for use of alternatives routes	Contractor	Continuous
	Prior to construction informative hazard Warning Signage must be erected to inform public of the inherent dangers;	Contractor, ELO	Continuous
	During day time, designate responsibility to some construction crew to guide traffic (traffic controllers) during construction to motorist that will be affected during construction. During night time, traffic warning signs must be erected to guide traffic after construction working hours.	Contractor, ELO	Continuous
Prevent/limit sedimentation	Cause of sedimentation must be identified and dealt with appropriately	Contractor, ELO	Continuous
	Increased run-off during construction must be managed using berms and other suitable structures as required to ensure flow velocities are reduced; this must be done in consultation with the ECO	Contractor, ELO	Continuous
	The contractor shall ensure that excessive quantities of sand, silt and silt-laden water do not enter watercourses. Appropriate measures, e.g. erection of silt traps, or drainage retention areas to prevent silt and sand entering drainage or watercourses must be taken	Contractor, ELO	Continuous
	Silt trenches between the works area and downstream wetland could be used to trap any sediment washing off the works area and to prevent scouring of the stream line in case of heavy flows. This will provide protection for the downstream section of the wetland	Contractor, ELO	Continuous
	Where wetlands are adjacent to the construction areas and these areas slopes toward the wetland, install sediment barriers along the edge of the construction areas as necessary to prevent sediment flow into the wetland	Contractor, ELO	Continuous
	Sediment barriers must be properly maintained throughout construction and reinstalled as necessary until replaced by permanent erosion controls or restoration of adjacent upland areas is complete	Contractor, ELO	Continuous

Activity / issue	Action required	Responsible party	Frequency
	Should water need to be pumped around the works area and discharged back into the wetlands, care must be taken to ensure that the water is discharged in a manner that does not cause siltation or erosion downstream. As such it is recommended that any water to be discharged from pumping around the construction area or from dewatering operations be first discharged into a structure that allows the settlement of all suspended material, and which allows the diffuse discharge of water into the wetland. The water must be dissipated on re-entry into the wetland, to reduce the changes of erosion	Contractor, ELO	As necessary
	It is important that topsoil must be conserved in areas where bedrock is shallow to avoid sedimentation	Contractor, ELO	As necessary
	The contractor shall ensure that excessive quantities of sand, silt and silt-laden water do not enter watercourses. Appropriate measures, e.g. erection of silt traps, or drainage retention areas to prevent silt and sand entering drainage or watercourses must be taken	Contractor, ELO	Continuous
Preventing spread of alien invasive species	Appointment of alien plant working group / assign this duty to specific staff		
	• Alien invasive species (particularly category 1b species) that were identified within the study area and in specific along the final alignment must be removed prior to construction-related soil disturbances. By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation. • All alien seedlings and saplings must be removed as they become evident for the duration of construction. • Manual / mechanical removal is preferred to chemical control. • All construction vehicles and equipment, as well as construction material must be free of plant material. Therefore, all equipment and vehicles must be thoroughly cleaned prior to access on to the construction areas. This must be verified by the ECO.	Contractor, ELO	Continuous
	• A register of the methods used, dates undertaken, as well as herbicides and dosage used must be kept and available on site. The register must also include incidents of poisoning or spillage • Ensure that contractors can identify the relevant plants and are aware of the	Contractor, ELO	Continuous

Activity / issue	Action required	Responsible party	Frequency
	removal procedures		
	Construction equipment must be cleaned prior to site access. This will prevent alien invasive seed from other sites to spread into disturbed soils	Contractor, ELO	As necesssary
	Alien invasive species that are identified within servitudes must be removed prior to construction related soil disturbances. This will prevent seed spreading into disturbed soils	Contractor, ELO	Continuous
Erosion Prevention	The removal of surface vegetation will expose the soils, which in rainy events would result in a loss of topsoil and sedimentation of proximate moist grasslands. In addition, indigenous vegetation communities are unlikely to colonise eroded soils successfully and seeds from proximate alien invasive trees can spread easily into these eroded soil. The earthworks and digging will result in stockpiled and loose soils, which could also increase the likelihood of sedimentation in proximate watercourses. • Do not allow erosion to develop on a large scale before taking action. • No construction / activities must be undertaken within the moist soils until a Water Use License was granted by the Department of Water and Sanitation (DWS). • Make use of existing roads and tracks where feasible, rather than creating new routes through grassland areas. • Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area. • Runoff from access roads must be managed to avoid erosion and pollution problems. • Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover.	Contractor, ELO	Continuous
	• Colonisation of the disturbed areas by plant species from the surrounding natural vegetation must be monitored to ensure that vegetation cover is sufficient within one growing season. If not, then the areas need to be rehabilitated with a grass seed mix containing species that naturally occur within the study area.	Contractor, ELO	Continuous

Activity / issue	Action required	Responsible party	Frequency
	• Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.		
Mobilisation of pollutants .	• Remove all project-related material used to support equipment on completion of construction	Contractor	During and immediately after Any construction
	• Any contaminated soil from the construction site needs to be removed and properly disposed of	Contractor	Continuous
	• Implement preventative maintenance system to ensure that work vehicles are maintained in an acceptable condition. This would involve routinely checking vehicles for leaks before construction begins; and not allowing vehicles/equipment with significant leaks to operate or be repaired within the construction site.	Contractor	As necessary
	• Materials such as fuel, oil and paint must be sealed and stored in bermed areas or under lock and key, as appropriate, in well-ventilated areas	Contractor	Continuous
	• These substances must be confined to specific and secured areas within the contractor's camp, and in a way that does not pose a danger of pollution even during times of high rainfall	Contractor	Continuous
	• Storage of materials as described above may not be within the 1:100 floodline, watercourses or associated buffer areas	Contractor	Continuous
	• In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water and SAnittation (DWS) must be informed immediately	Contractor	Continuous
	• All equipment must be parked overnight and/or fuelled at least 500 meters from any watercourse	Contractor	Continuous
	• Drip trays (minimum of 10cm deep) must be placed under all vehicles that stand for more than 24 hours. Vehicles suspected of leaking must not be left unattended, drip trays must be utilised.	Contractor	Continuous

Activity / issue	Action required	Responsible party	Frequency
	• Drip trays must be utilised during repairs and maintenance of all machinery. The depth of the drip tray must be determined considering the total amount / volume of oil in the vehicle. The drip tray must be able to contain the volume of oil in the vehicle	Contractor	Continuous
	• The watercourses may not be used for the purposes of bathing, washing of clothing or vehicles.	Contractor	Continuous
Enhance positive socio-economic impacts during the construction phase	• Increase the local procurement practices and employment of people from local communities as far as feasible to maximise the benefits to the local economies. • Inform the local community meetings to advise the local labour on the project that is planned to be established and the jobs that can potentially be applied for.	Developer, Contractor	As necessary
Temporary Loss of Grazing Land (if any)	• Mitigation measures must be implemented to avoid any negative impact on animals (e.g. fencing off the excavations). • Eskom or its appointed contractor(s) must assist with the temporary relocation of livestock (if any), as well as relocating cattle (if any) back to their original grazing area. • Grazing areas must be rehabilitated to its original grazing conditions to ensure that cattle (if any) can continue to graze in the area once they are returned to the area. Where the area cannot be rehabilitated to its original condition within a short space of time, Eskom or its appointed contractor(s) must provide alternative food sources to the farmer for the time period required for natural rehabilitation to occur within the grazing area.		
Fauna Management Recommendations	• To protect reptile species, no further rock removal must occur adjacent to existing towers. No termite mounds must be destroyed. If any termite mounds have to be destroyed a qualified herpetologist must be present in case any protected species is unearthed. • Any animals rescued or recovered will be relocated in suitable habitat away from the transmission tower and line. • Trees including stumps; bark and holes in trees are vital habitats for numerous arboreal reptiles (chameleons, snakes, agamas, geckos and monitors). • The removal of indigenous tree species as well as vegetation clearance must		

Activity / issue	Action required	Responsible party	Frequency
	be kept to the minimum area required and remain in the existing servitude wherever possible. This is especially pertinent for the remnant riparian vegetation along the wetlands of the project area. • Only the alien vegetation must be removed off the site during vegetation clearance. • Rebuilding activities will be restricted to daylight hours reducing the potential impact on amphibians. • Ideally the installation of the new towers must be undertaken during the dry winter months (summer) when the majority of amphibian species are dormant. • No activities must be allowed within any wetland habitat. • Avifauna/Birds Management Recommendations • The breeding sites of raptors and other wild bird species shall be taken into consideration during the planning of the construction programme. • Larger bird species are heavily impacted on by collision with powerlines, electrocution as well as nesting on transmission towers. The specific recommendations for Eskom's Transmission bird nesting, bird perching and bird collision prevention must be implemented. • Should any new sites or nests be found, during the construction process, each site shall be assessed for merit and the necessary precautions be taken to ensure the least disturbance. • The recommendations of the avian specialist shall be adhered to at all time to prevent unnecessary disruption of such species. • Bird guards and diverters shall be installed, as per the recommendations of the avian specialist, on the new lines in particular near wetland areas. • Bird flight diverters shall be ideally be installed at all river crossings to reduce collision with the new transmission lines. Bird flight diverters shall be installed according to Eskom Specifications. • Activities within the wetland habitats must be restricted. No vehicles or even footpaths must be allowed through the valley bottom. • Construction activities along the valley bottom wetlands must ideally be undertaken during the dry summer months after the completion of breeding activities the majority of bird species.		

Activity / issue	Action required	Responsible party	Frequency
	Mammals Management Recommendations • No activities must be allowed within the valley bottom wetlands. • No hunting or poaching activities must be allowed during the construction and maintenance of the lines. This is valid for wild mammals, game as well as livestock on farms.		
Completion of Construction	• The ECO must ensure that all construction equipment and all foreign material are removed on completion of construction	Developer	
	• On completion of construction activities, monitoring must be done in order to record compliance with the targets set out in the EMP and to highlight any areas where further action are required in terms of rehabilitation or routine monitoring	Developer	

Table 5: Operational Phase: Environmental Management Programme for the proposed project

Activity / issue	Action required	Responsible party	Frequency
Pollution of wetlands & rivers	During maintenance, activities must be limited to the areas where maintenance has to be undertaken.	Developer	Continuous
	In the event that maintenance must be carried out, all equipment must be parked overnight and/or fuelled at least 30 meters from the wetlands	Developer	As necessary
	Storage of maintenance materials / chemicals may not be within the 30m of wetlands or associated buffer areas	Developer	As necessary
	The SHE must ensure that all maintenance equipment and material are removed on completion of maintenance	Developer	As necessary
	Removal of vegetation during maintenance must be limited to the area of operation only.	Developer	As necessary
	• Maintenance of construction vehicles • Control of waste discharges • Guidelines for implementing Clean Technologies • Maintenance of buffer zones to trap sediments with associated toxins	Developer	As necessary
Preventing spread of alien invasive	The following must be undertaken: • Use grass sods that were removed prior to construction to rehabilitate the construction footprints. • Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas must be fenced off to prevent vehicular, pedestrian and livestock access. • Delay the re-introduction of livestock (where applicable) to all rehabilitation areas until an acceptable level of re-vegetation has been reached.	Developer	Continuous
	• Remove alien invasive plant species from the area disturbed by construction and follow-up for at least three years post construction. • Maintenance workers may not trample natural vegetation and work must be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the		

Activity / issue	Action required	Responsible party	Frequency
	construction phase must be adhered to.		
Protection of indigenous natural vegetation, fauna and maintenance of rehabilitation	The vegetation occurring along the completed roads could degrade over time if suitable rehabilitation of the disturbed soils do not take place. Furthermore, maintenance work and vehicles could damage the vegetation along the route which could lead to soil erosion, habitat modification and trampling of vegetation. Arterial roads also attract commercial opportunities which could lead to future impacts on the sensitive vegetation. Furthermore, pollutants from roads could reach adjacent grassland and the watercourses and also result in increased flooding resulting in erosion. The following must be undertaken: • After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction. • Ensure that the vegetation disturbed during construction is rehabilitated with the plant species that naturally occur in the area • Ensure that maintenance work does not take place haphazardly, but according to a fixed plan and only within the dedicated road reserves. • Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas must be fenced off to prevent vehicular, pedestrian and livestock access until such time that rehabilitation was successful. • Delay the re-introduction of livestock (where applicable) to all rehabilitated areas until an acceptable level of re-vegetation has been reached. • Maintenance workers may not trample natural vegetation and work must be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase must be adhered to. • Address erosion donga crossings, applying soil erosion control and bank stabilisation procedures as specified by the ECO.	Developer	Continuous

Activity / issue	Action required	Responsible party	Frequency
Minimise soil degradation and erosion (Erosion Management Plan)	• Rehabilitate disturbance areas must the previous attempt be unsuccessful. • Maintain erosion control measures implemented during the construction phase (i.e. run-off attenuation on slopes, bags, logs), silt fences, storm water catch-pits, and shade nets). • Implement an appropriate stormwater management plan for the operational phase of the road. • Yearly inspections of the drainage and storm water infrastructure must be undertaken to determine erosion and to set out maintenance and corrective action plan. • Impact of the Floodplain wetland must be monitored over a 5 year period by a Wetland Specialist to determine impact on the Floodplain and surrounding areas and if required corrective mitigation implemented.	Developer	Continuous

Table 6: Rehabilitation Phase: Environmental Management Programme for the proposed project

Activity / issue	Action required	Responsible party	Frequency
Establishment of Alien Plant species	If establishment of alien invasive plant species in rehabilitated areas or in watercourses occurs. The following must be undertaken: • Remove emergent invasive vegetation from the servitudes as well as rehabilitated footprint as soon as it becomes apparent • Manual labour is preferred above chemical or manual removal. • Do not use herbicides or pesticides in or within 200 meters of wetland areas	Developer	Continuous
	Burning of vegetation including tree trunks and stumps cut during site clearing and establishment shall not be permitted. Woody material must be chipped and reused as mulch back on the site. No organic matter other than alien invasive material may leave the site. This will enable the environment to be rehabilitated easier.		
	All rehabilitated areas must be monitored for the presence of exotic and alien plant species. • Should the presence of exotic/alien plant species be observed it must be removed appropriately		

Activity / issue	Action required	Responsible party	Frequency
Mobilisation of pollutants	In case of emergencies or unforeseen events, problem must be remediated immediately and any spillage into any watercourses be reported to the Department of Water and Sanitation. In addition, the soil must be stabilised (import additional topsoil if necessary) and re-vegetated as soon as possible. Re-vegetation must include seeds from the adjacent grassland and any rescued protected plants and/or plants of conservation concern that might have been impacted upon by the emergency / unforeseen event	Contractor, ELO	As necessary
	Remove all project-related material used to support equipment on completion of construction	Contractor, ELO	Once off
	Any contaminated soil from the onsite needs to be removed and properly disposed off	Contractor, ELO,ECO	As necessary
	Materials such as fuel, oil, paint, herbicides and insecticides must be sealed and stored in bermed areas or under lock and key, as appropriate, in well-ventilated areas	Contractor, ECO, ELO	Continuous
	These substances must be confined to specific and secured areas within the contractor's camp, and in a way that does not pose a danger of pollution even during times of high rainfall	ECO, Contractor, ELO	Continuous
	Storage of materials as described above may not be within the 1:100 floodline, watercourses or associated buffer areas	Contractor, ELO, ECO	Continuous
	In the case of significant pollution of the watercourse, the Regional Representative of the Department of Water and Sanitation (DWS) must be informed immediately	Contractor, ELO, ECO	As necessary
	All equipment must be parked overnight and/or fuelled at least 500 meters from a watercourse	Contractor, ELO	Continuous
	Drip trays (minimum of 10cm deep) must be placed under all leaking vehicles and machinery that stand for more than 24 hours. Vehicles suspected of leaking must not be left unattended, drip trays must be utilised.	Contractor, ELO, ECO	Continuous
	Drip trays must be utilised during repairs and maintenance of all machinery. The depth of the drip tray must be determined considering the total amount / volume of oil in the vehicle. The drip tray must be able to contain the volume of oil in the vehicle	Contractor, ELO	As necessary
	Provision of adequate sanitation facilities located outside of the wetland/riparian area or its associated buffer zone	Contractor, ELO	Continuous

Activity / issue	Action required	Responsible party	Frequency
Rehabilitation of disturbed areas	Any water discharged must comply with the relevant Water Quality limits/guidelines specified by Department of Water and Sanitation (DWS).	Contractor, ELO	As necessary
	• Stripping of vegetation for construction must occur in a phased manner and must be restricted to the excavation footprint to reduce the risk of erosion during times of precipitation • Where possible, remove vegetation as sods that can be replanted as part of the rehabilitation of vegetation within the construction footprint. Store sods in already cleared areas and water at least once week • Where soils are removed, the topsoil and subsoil must be stockpiled separately in low heaps (Topsoil are deemed to be the top layer of soil containing organic material, nutrients and plant grass seed. For this reason it is an extremely valuable resource for the rehabilitation and vegetation of disturbed areas) • After construction, compacted areas must be ripped and topsoil replaced from the areas where it was removed. Areas within the construction footprint can be re-vegetated using the sods that were removed prior to construction. The sods must be placed level, or slightly deeper than surrounding vegetation, on ripped soils. Against slopes, the sods must be pegged to ensure that it does not wash away before the roots establish • All sloped areas must be re-vegetated by either using removed sods or by seeding with a grass mixture containing species naturally occurring in the area. Sloped areas where vegetation has been removed or destroyed must be replanted immediately after completion of construction to avoid erosion • Badly damaged areas must be fenced in to allow for rehabilitation to take place without further impacts on these areas • All rehabilitated areas must be monitored for the presence of exotic and alien plant species during rehabilitation • Should the presence of exotic/alien plant species be observed it must be removed appropriately	Contractor, ELO	As necessary

Activity / issue	Action required	Responsible party	Frequency
	• All disturbed areas will requiring rehabilitation must be mulched to encourage vegetation re-growth. Mulch used must be free from alien seed. These areas must be cordoned off so that vehicles or construction personnel cannot gain access to these areas • The rehabilitation areas must be inspected twice a year for 5 years to ensure that the rehabilitation has been successful • Stockpiled vegetation is to be properly demarcated such that it is not unnecessarily disturbed by construction activities. The vegetation must preferably be shaded and kept moist • Where possible, cut vegetation to ground-level rather than removing completely, leaving root systems to ensure rapid re-colonisation		

8. ENVIRONMENTAL AWARENESS PLAN

OBJECTIVE: Ensure all operation personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimisation of environmental harm (Environmental Awareness Plan)

To achieve effective environmental management, it is important that Contractors and site employees are aware of the responsibilities in terms of the relevant environmental legislation and the contents of this EMPr. The developer is responsible for informing its employees and contractors of their environmental obligations in terms of the environmental specifications, and for ensuring that employees are adequately experienced and properly trained in order to execute the works in a manner that will minimise environmental impacts

- Employees must have a basic understanding of the key environmental features of the site and its surrounding environment.
- Ensuring that a copy of the EMP is readily available on-site and that all site staff is aware of the location and has access to the document. Employees must be familiar with the requirements of the EMPr and the environmental specifications as they apply to the operation of the road
- Ensuring that, prior to commencing any new site works, all employees have attended an Environmental Awareness Training course. The course must provide the site staff with an appreciation of the project's environmental requirements, and how they are to be implemented.
- Awareness of any other environmental matters, which are deemed to be necessary by the site manager.
- Ensure that construction workers have received basic training in environmental management, including the storage and handling of hazardous substances, minimise of disturbance to sensitive areas (wetland), management of waste and prevention of water pollution
- Records must be kept of those that have completed the relevant training.
- Training must be done either in a written or verbal format but must be in an appropriate format and language for the receiving audience
- Refresher sessions must be held to ensure the operating staffs are aware of their environmental obligations.

Therefore, prior to the commencement of construction activities on site and before any person commences with work on site thereafter, adequate environmental awareness and responsibility are to be appropriately presented to all staff present onsite, clearly describing their obligations towards environmental controls and methodologies in terms of this EMPr. This training and awareness will be achieved in the following ways:

8.1 Environmental Awareness Training

Environmental Awareness Training must be undertaken by the SHE Manager/Officer and must take the form of an on-site talk and demonstration by the the SHE Manager before the commencement of construction activities on site. A record of attendance of this training must be maintained by on site.

8.2 Induction Training

Environmental induction training must be presented to all persons who are to work on the site – be it for short or long durations. Contractors or Engineers staff; site staff, sub-contractors or visitors to site.

This induction training must include discussing the developer's environmental policy and values, the function of the EMPr and the importance and reasons for compliance to these. The induction training must highlight overall do's and don'ts on site and clarify the repercussions of not complying with these. The reporting procedure must be explained during the induction as well. Opportunity for questions and clarifications must form part of this training. A record of attendance of this training must be maintained by the SHE officer on site.

8.3 Toolbox Talks

Toolbox talks must be held on a scheduled and regular basis (at least once a month) where the foreman/site supervision manager, environmental and safety representative and all employees on site hold talks relating to environmental practices and safety awareness on site. These talks must also include discussions on possible common incidents occurring on site and the prevention of reoccurrence thereof. Records of attendance and the awareness talk subject must be kept on file.

9. MONITORING PROGRAMME

Monitoring refers to the repetitive and continued observation, measurement and evaluation of environmental criteria to follow changes over a period of time and to assess the efficiency of control measures. The monitoring plan aims to establish whether rehabilitation was successful, whether maintenance or related activities have impacts and whether the implementation of the proposed development has detrimental impacts on the riparian area after construction.

OBJECTIVE: Monitor the performance of the control strategies employed against environmental objectives and standards

A monitoring programme must be in place not only to ensure conformance with the EMPr, but also to monitor any environmental issues and impacts which have not been accounted for in the EMPr that are, or could result in significant environmental impacts for which corrective action is required. The period and frequency of monitoring will be stipulated by the environmental authorisation (once issued). Where this is not clearly dictated, Eskom will determine and stipulate the frequency of monitoring required in consultation with the relevant authority. The contractor project manager will work with the site manager of the contractor to ensure that monitoring is conducted and reported.

The aim of the monitoring and auditing process would be to routinely monitor the implementation of the specified environmental specifications, in order to:

- Monitor and audit compliance with the prescriptive and procedural terms of the environmental specifications.
- Ensure adequate and appropriate interventions to address non-compliance.
- Ensure adequate and appropriate interventions to address environmental degradation.
- Provide a mechanism for the lodging and resolution of public complaints.

- Ensure appropriate and adequate record keeping related to environmental compliance.
- Determine the effectiveness of the environmental specifications and recommend the requisite changes and updates based on audit outcomes, in order to enhance the efficacy of environmental management on site.
- Aid communication and feedback to authorities and stakeholders.

9.1 Method of Monitoring

- Monitoring will be done as per the ECO monitoring protocol.
- The Contractor is deemed not to have complied with the Performance Specifications if:
    - There is evidence of willful or accidental contravention of any specification included in the Specification.
    - There is evidence of the contractor carrying out activities not permitted in terms of the Contract and / or the Specification.
    - There is evidence of environmental negligence and / or mismanagement resulting in negative impacts on the environment.
    - The contractor has failed to meet with the requirements of the approved schedule.
- A checklist of items, works and behaviors as outlined in the EMP, and conditions of the Environmental authorisation (EA) will be created that will be monitored.
- Non-compliance of the EMP and EA will be reported as per the ECO monitoring protocol
- The independent ECO will ensure compliance with the EMPr, and will conduct monitoring activities. The ECO will undertake site inspections on a monthly basis or as specified in the environmental authorisation once issued. The ECO will report all non-compliances to the Site Manager and submit such reports to DEA if specified in the environmental authorisation.

9.2 Non Conformance Report

All supervisory stuff and ECO must be provided a means to be able to submit a non conformance report to the site manager. The Non conformance report will describe in detail, the cause and effect of any environmental non-conformance by the contractor. Records of penalties may be required by the Authorities within 48 hours. The non conformance report will be updated upon completion of the corrective measures indicated on the finding sheet. The report must indicate that remediation measures have been implemented timeously and that the non-conformance can be closed out to the satisfaction of the site manager and ECO.

9.3 Monitoring Reports

A monitoring report will be compiled by the ECO on a monthly basis and must be submitted to DEA as deemed practical or with the Final audit report. The report must include details of the activities undertaken in the reporting period, any non-

conformances or incidences recorded, corrective action required and details of these non-conformances or incidents which have been closed out.

9.4 Internal Audits and Reporting

Internal audits must be undertaken by the developer. This report must indicate the date of the audit, the name of the auditor and the outcome of the audit in terms of compliance with the environmental authorisation conditions and the requirements of the EMPr. Findings of the audit must be made available to the external auditor.

9.5 Final Audit Report

A final environmental report must be compiled by the ECO and submitted to DEA upon completion of construction and rehabilitation activities within 30 days of completion of construction phase (i.e. within 30 days of the site handover) and within 30 days of completion of rehabilitation activities). This report must indicate the date of the audit, the name of the auditor and the outcome of the audit in terms of compliance of the environmental authorisation conditions) once issued and the requirements of the EMPr.

10. CONCLUSION

After assessing all alternatives on EIA phase level, it was concluded that Alternative 1 would be the option through which better avoidance and minimisation of most impacts can be achieved therefore Alternative 1 is recommended as the preferred alternative provided this project is mitigated, as per the EMPr, the project will result in limited negative environmental impacts that can be mitigated through implementation of this EMPr. It is the applicant's responsibility to ensure that this EMPr is made binding on the contractor by including the EMPr in the contract documentation. The contractor must thoroughly familiarise himself with the requirements of the EMPr and appoint an environmental liaison officer (ELO) to oversee the implementation of the EMPr on a day-to-day basis.

Parties responsible for transgression of this EMPr must be held responsible for any rehabilitation that may need to be undertaken. Parties responsible for environmental degradation through irresponsible behaviour/negligence must receive penalties.

APPENDIX 1: INCIDENT AND ENVIRONMENTAL LOG

ENVIRONMENTAL INCIDENT LOG				
Date	**Env. Condition**	**Comments** *(Include any possible explanations for current condition and possible responsible parties. Include photographs, records etc. if available)*	**Corrective Action Taken** (*Give details and attach documentation as far as possible)*	**Signature**

COMPLAINTS RECORD SHEET	**File Ref:**	**DATE:**
	Page of ….	**……**
COMPLAINT RAISED BY:		
CAPACITY OF COMPLAINANT:		
COMPLAINT RECORDED BY:		
COMPLAINT:		
PROPOSED REMEDIAL ACTION:		
ECO: _____ Date: _____		
NOTES BY ECO:		
ECO: _____ Date: _____ Site Manager: _____ Date: _____		