



Basic Assessment for the Proposed Construction and Operation of Electrical Grid Infrastructure to support the juwi Kap Vley Wind Energy Facility, near Kleinsee, Northern Cape Province

DRAFT BASIC ASSESSMENT REPORT



APPENDIX G:

Environmental Management Programme (EMPr)

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Proposed Development of a Transmission Line and associated electrical infrastructure to support the proposed Kap Vley Wind Energy Facility, south-east of Kleinsee, Northern Cape Province

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1. INTRODUCTION

This Environmental Management Programme (EMPr) has been prepared as part of the requirements of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) Environmental Impact Assessment (EIA) Regulations promulgated in Government Gazette 40772 and Government Notice (GN) R326, R327, R325 and R325 on 7 April 2017. This EMPr is being submitted to the National Department of Environmental Affairs (DEA) as part of the Application for Environmental Authorisation (EA) for the proposed construction of electrical infrastructure to support the proposed Kap Vley Wind Energy Facility (WEF), 30 km south east of Kleinsee in the Northern Cape within the Nama Khoi Local Municipality, Northern Cape Province (Figure 1).

juwi Renewable Energies (PTY) Ltd (hereinafter referred to as juwi) intends to develop electrical infrastructure to connect the proposed Kap Vley WEF to the Eskom Gromis Substation or to the new proposed Eskom Substation which is closer and to ensure that the electricity generated by the proposed WEF feeds into the national grid. The proposed transmission line and electrical infrastructure will be constructed within a single electrical infrastructure corridor.

As noted in the Basic Assessment (BA) Report for the proposed electrical infrastructure, a separate Environmental Impact Assessment (EIA) Report was compiled for the proposed Kap Vley WEF (DEA Reference Number: 14/12/16/3/3/2/1046).

This EMPr is being made available to Interested and Affected Parties (I&APs), stakeholders and Organs of State, as part of the BA Report, for a 30-day review period. Comments received from stakeholders during this aforementioned review period will be incorporated into this EMPr, where applicable. Following the incorporation of comments from I&APs, stakeholders and Organs of State, this EMPr is intended as a “living” document and should continue to be updated regularly, as needed.

1.1 PROJECT DESCRIPTION

The following proposed transmission line and electrical infrastructure will be constructed:

- An 132 kV transmission line from the proposed Kap Vley WEF to the Gromis Substation located on the remainder of the Farm Dikgat 195 or closer to the new Eskom substation, for which the location still needs to be determined, via a 132 kV overhead transmission line. This will include tower/pylon infrastructure and foundations;
- An on-site substation with a capacity of 22/33 to 132 kV (this is assessed under the separate EIA process for the proposed Kap Vley WEF);
- For powerline maintenance existing service and access roads will be utilised as much as possible. Where no existing access is present, due to the low traffic anticipated, access will be provided in the form of jeep tracks, as opposed to formalised roads.

As part of this BA, three connectivity alternatives were considered, namely:

1. **Alternative 1– Transmission Line**
2. **Alternative 2– Transmission Line**
3. **Alternative 3– Transmission Line**

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A description of each alternative is summarised in Table 1 below.

Table 1: The Kap Vley Alternatives – Transmission Line descriptions

	Kap Vley Alternative 1	Kap Vley Alternative 2	Kap Vley Alternative 3
Line length	39 km	34 km	40 km
Farm portions affected	Kap Vley 315/1	Kap Vley 315/1	Kap Vley 315/1
	Kap Vley 315/2	Kourootjie 316/rem.	Komaggas 200/rem. of portion 5
	Kap Vley 315/3	Pienaars Bult 317/1	Kourootjie 316/rem.
	Kourootjie 316/rem.	Pienaars Bult 317/2	Pienaars Bult 317/2
	Pienaars Bult 317/1	Klein Schaap Kop 320/rem.	Pienaars Bult 317/rem.
	Pienaars Bult 317/2	Mannels Vley 321/rem.	Doornfontein 319/rem.
	Kannabieduin 317/rem.	Dikgat 195/rem.	Doornfontein Wes 196/rem.
	Sand Kop 322/rem.		Mannels Vley 321/rem.
	Mannels Vley 321/rem.		Dikgat 195/rem
	Dikgat 195/rem.		
Foundation	Concrete	Concrete	Concrete
Pylon	Tower	Tower	Tower
Tower type	Self-supporting suspension structures or Guyed monopoles	Self-supporting suspension structures or Guyed monopoles	Self-supporting suspension structures or Guyed monopoles
Height	32 m	32 m	32 m
Span length	100 - 200 m	100 - 200 m	100 - 200 m
Servitude width	40 m	40 m	40 m
Onsite substation with Feeder bays, Busbars and Transformers	2.3 ha	2.3 ha	2.3 ha

Each of these alternative connectivity options are proposed within a 200 m wide electrical infrastructure corridor. These corridors were considered and assessed by the specialists in order to ensure that any development constraints or environmental sensitivities will be avoided in the final siting and location of the proposed transmission line. It is important to note that should the routing change subsequent to the issuing of an EA (should such authorisation be granted), any alternative layout or revisions to the layout occurring within the boundaries of the corridor would not be regarded as a change to the scope of work or the findings of the impact assessments undertaken during the BA Phase. This is based on the understanding that the specialists have assessed the larger corridor and have identified sensitivities, which have been avoided in the siting of the proposed infrastructure. The corridor is considered to be a “box” in which the project components can be constructed at whichever location (within the boundary of the corridor) without requiring an additional assessment or change in impact significance. Any changes to the layout within the boundaries of the corridor following the issuing of the EA (should it be granted) will therefore be considered to be non-substantive.

The location of the proposed supporting electrical infrastructure, the three connectivity options, farm portions affected and the proposed Kap Vley WEF properties are shown in Figure 1.

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As discussed previously, the overall aim of this proposed project is to provide the necessary electrical infrastructure to ensure that the proposed Kap Vley WEF is equipped and enabled to transmit the generated electricity (from the WEF) to the Gromis Substation or the proposed Eskom Substation. The three routing options for the proposed transmission line were considered to determine the most acceptable and preferred routing. Please refer to Figure 1 for the locality map of the three routing options that were assessed. The three routing options for the proposed transmission line were considered to determine the most acceptable and preferred routing. The preferred routing option is the **Alternative 1 - Transmission line**, as described above. The preferred routing was determined based on environmental sensitivities, as well as economic feasibility (following farm boundaries and alignment with property boundaries and existing powerline corridors), and the willingness of landowners to provide consent for the development of the proposed electrical infrastructure on their land.

The proposed project can be divided into the following three main phases:

- Construction Phase;
- Operational Phase; and
- Decommissioning Phase.

Each activity undertaken as part of the above phases may have environmental impacts and has therefore been assessed by the specialist studies (Appendix E of the BA Report).

It is proposed that the local municipality will provide services in terms of water, waste removal, and sewage for the construction phase of the proposed project. However, should the municipality not have adequate capacity available for the handling of waste and sewage, and the provision of water; then the Applicant will make use of private contractors to ensure that the services are provided. The Applicant will also ensure that adequate waste disposal measures are implemented by obtaining waste disposal dockets of waste and sewage that is removed from site. Any electricity required during the construction phase will be generated through the use of onsite generators. During the operational phase, the distribution line will not have any electricity requirements as the project itself will transmit and distribute electricity. It is important to note that for the operational phase, requirements for water, sewage management and waste disposal do not apply.

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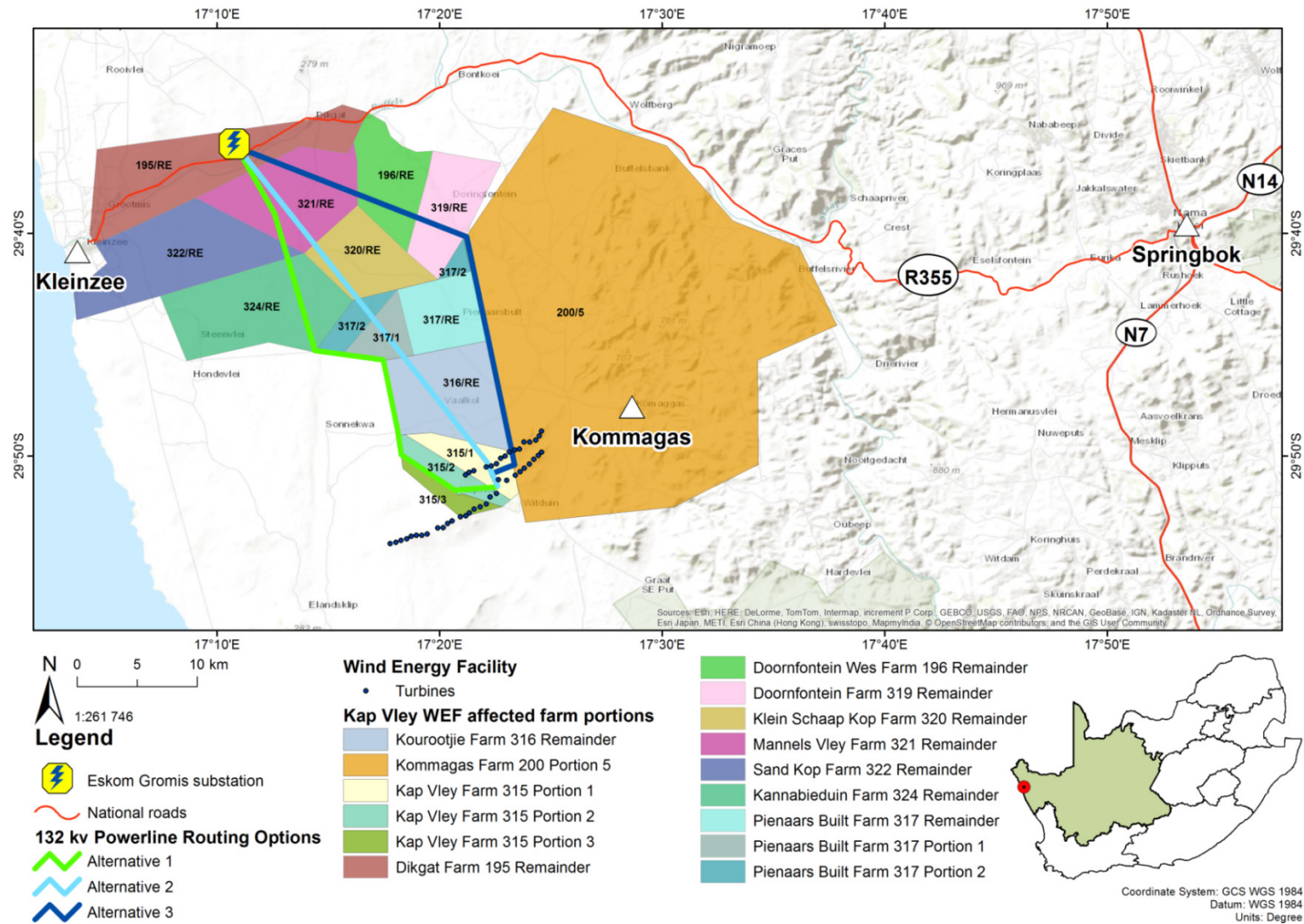


Figure 1: Locality Map of the proposed 132 kV Transmission line connectivity options (showing affected farm portions)

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The construction phase will take place subsequent to the issuing of an EA from the DEA and a successful off-taker is selected. The construction phase is expected to extend for approximately 12 months.

The main activities that will form part of the construction phase are:

- Removal of vegetation for the proposed infrastructure;
- Excavations for infrastructure and associated infrastructure;
- Stockpiling of topsoil and cleared vegetation;
- Transportation of material and equipment to site, and personnel to and from site; and
- Construction of the 132 kV transmission line and additional infrastructure.

The following main activities will occur during the operational phase:

- The transmission of electricity generated from the proposed Kap Vley WEF to the Eskom Gromis Substation or the proposed Eskom Substation; and
- Maintenance of the transmission line servitude including the gravel service road.

In the event of decommissioning, the main aim would be to return the land to its original, pre-construction condition. Should the unlikely need for decommissioning arise (i.e. if the actual WEF becomes redundant or the land needs to be used for other purposes), the decommissioning procedures will be undertaken in line with the EMPr and any legislation or guidelines relevant at the time and the site will be rehabilitated and returned to its pre-construction state. Possible decommissioning activities will include removing the infrastructure, and covering the concrete footings with soil to a depth sufficient for the re-growth of natural vegetation. Any other supporting infrastructure no longer in use will be removed from the site and either disposed of at a registered disposal facility or recycled if possible.

It should be noted that a detailed project description (based on the conceptual design) is provided in Section A (3) of the BA Report.

1.2 AUTHOR OF THE EMPr

This EMPr has been compiled by the Environmental Assessment Practitioner and the various specialists on the team (as indicated in Table 2). The details and expertise (including the Curriculum Vitae) of the Environmental Assessment Practitioner and the specialists are respectively provided in Appendix A and Appendix E of the BA Report.

Minnelise Levendal, Pri. Sci. Nat. registered, 117078 (EAP): Minnelise is a Senior EAP in the EMS group of the CSIR and has a Master's degree in Botany. She has 15 years of experience in Environmental Management (which includes nine years working as an EAP). Before she joined the CSIR she was employed at the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) where she assessed EIAs, BAs and EMPs. Minnelise is currently managing various EIAs for wind and solar renewable energy projects in South Africa. Minnelise was the CSIR project manager for the 100 MW Ubuntu Wind Energy Facility near Jeffrey's Bay (Environmental Authorisation granted in June 2012), as well as the 50 MW Banna Ba Pifhu Wind Energy Facility proposed by WKN Wind current near Humansdorp in the Eastern Cape (Environmental Authorisation granted in July 2014). She was the project manager of ten BAs for wind monitoring masts in South Africa as part of the National Wind Atlas Project of the Department of Energy. Environmental Authorisation from the national Department of Environmental Affairs for all the ten masts was obtained in 2010. She was also the Project Leader

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for seven Solar Photovoltaic facilities near Kenhardt in the Northern Cape in 2016 for Mulilo Renewable Project Developments. Minnelise is the Project Manager of the Special Needs and Skills Development Programme of DEA which provides pro bono environmental assessments (BAs) to applicants with special needs (i.e. financial constraints).

Table 2: The BA Management Team

NAME	ORGANISATION	ROLE/STUDY TO BE UNDERTAKEN
Environmental Management Services (CSIR)		
Paul Lochner	CSIR	Technical Advisor and Quality Assurance (EAPSA) Certified
Minnelise Levendal	CSIR	EAP (Pr. Sci. Nat.)
Specialists		
Simon Todd	Simon Todd Consulting	Terrestrial Ecology Impact Assessment (including fauna and flora)
Bernard Oberholzer and Quinton Lawson	Bernard Oberholzer Landscape Architect and BOLA	Visual Impact Assessment
Luanita Snyman van der Walt <i>External Reviewer: Dr Liz Day</i>	CSIR <i>External Reviewer: Freshwater Consulting</i>	Dry and Ephemeral Watercourses Impact Assessment
Dr. Jayson Orton	ASHA Consulting (Pty) Ltd	Heritage Impact Assessment (Archaeology and Cultural Landscape)
John Pether	Private, sub-contracted by ASHA Consulting (Pty) Ltd	Desktop Palaeontological Impact Assessment
Andrew Pearson and Anja Albertyn	ARCUS	Bird Impact Assessment
Jonathan Aronson		Bat Impact Assessment
Johann Lanz	Private	Soils and Agricultural Potential Assessment
Surina Laurie <i>External Reviewer: Elena Broughton</i>	CSIR <i>External Reviewer: Urban-Econ Development Economists</i>	Socio-Economic Impact Assessment
Morné de Jager	Enviro-Acoustic Research	Noise Impact Assessment
Christo Bredenhann	WSP Group Africa (Pty) Ltd	Transportation Impact Assessment

1.3 POTENTIAL IMPACTS IDENTIFIED DURING THE BA PROCESS

Based on the specialist studies, the following main direct potential impacts, as indicated in Table 3, have been identified and appropriate management and mitigation measures included within the EMPr (where required) as per the recommendations made in the specialist studies to ensure the potential impacts are suitably addressed and managed during all phases of the project. Indirect and cumulative impacts are noted in Sections 4 to 12 of this EMPr. It should be noted that other impacts for which specialist studies were not undertaken but where mitigation or management actions may be required, are also included in the EMPr.

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Table 3: Potential Impacts to Bats Identified in the Basic Assessment

KEY IMPACT	IMPACTS IDENTIFIED
Terrestrial Ecology (fauna and flora),	<p><u>Construction Phase:</u></p> <ul style="list-style-type: none"> Impact on vegetation and plant Species of Conservation Concern (SCC); and Direct and indirect impacts on fauna. <p><u>Operational Phase:</u></p> <ul style="list-style-type: none"> Increased soil erosion; and Impacts on CBAs. <p><u>Decommissioning Phase:</u></p> <ul style="list-style-type: none"> Increased soil erosion; and Increased alien plant invasion.
Birds	<p><u>Construction Phase:</u></p> <ul style="list-style-type: none"> Habitat destruction; Habitat loss through perceived increased predation risk (displacement), and reduced breeding success. <p><u>Operational Phase:</u></p> <ul style="list-style-type: none"> Bird mortality due to collisions with overhead powerlines; Habitat loss through perceived increased predation risk (displacement) due to disturbance and noise from maintenance activities. <p><u>Decommissioning Phase:</u></p> <ul style="list-style-type: none"> Habitat loss through perceived increased predation risk (displacement).
Bats	<p><u>Construction Phase:</u></p> <ul style="list-style-type: none"> Roost disturbance; Roost destruction; and Habitat modification. <p><u>Operational Phase:</u></p> <ul style="list-style-type: none"> Habitat creation in high risk locations leading to bat mortality; and Displacement and reduced foraging opportunities for bats due to light pollution. <p><u>Decommissioning Phase:</u></p> <ul style="list-style-type: none"> Roost disturbance.
Dry and Ephemeral Watercourses	<p><u>Construction Phase:</u></p> <ul style="list-style-type: none"> Physical disturbance and destruction of dry and ephemeral watercourses (incl. drainage lines); and Altered drainage patterns, increased runoff, erosion and sedimentation of surrounding ecosystems. <p><u>Operational Phase:</u></p> <ul style="list-style-type: none"> Altered drainage patterns, increased runoff, erosion and sedimentation of surrounding ecosystems

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KEY IMPACT	IMPACTS IDENTIFIED
	<p><u>Decommissioning Phase:</u></p> <ul style="list-style-type: none"> Physical disturbance and destruction of dry and ephemeral watercourses (incl. drainage lines); and Altered drainage patterns, increased runoff, erosion and sedimentation of surrounding ecosystems.
Visual	<p><u>Construction Phase:</u></p> <ul style="list-style-type: none"> Potential visual intrusion, dust and noise affecting the rural sense of place. <p><u>Operational Phase:</u></p> <ul style="list-style-type: none"> Potential visual intrusion of transmission line on ridgelines. <p><u>Decommissioning Phase:</u></p> <ul style="list-style-type: none"> Potential visual effect of remaining roads, after decommissioning.
Heritage (Archaeology and Cultural Landscape)	<p><u>Construction Phase:</u></p> <ul style="list-style-type: none"> Potential direct and indirect impacts to archaeological resources; Potential direct and indirect impacts to palaeontological resources; Potential direct and indirect impacts to graves; and Potential direct impacts to the cultural landscape and disruption of traditional activities. <p><u>Operational Phase:</u></p> <ul style="list-style-type: none"> Potential direct impacts to the cultural landscape and disruption of traditional activities. <p><u>Decommissioning Phase:</u></p> <ul style="list-style-type: none"> Potential direct impacts to the cultural landscape and disruption of traditional activities.
Soils and Agricultural Potential.	<p><u>Construction Phase:</u></p> <ul style="list-style-type: none"> Minimal loss of agricultural land use under project footprint; Soil erosion; Loss of topsoil; and Degradation of veld vegetation. <p><u>Operational Phase:</u></p> <ul style="list-style-type: none"> Minimal loss of agricultural land use under project footprint; and Soil erosion. <p><u>Decommissioning Phase:</u></p> <ul style="list-style-type: none"> Soil erosion; Loss of topsoil; and Degradation of veld vegetation.
Socio-Economic	<p><u>Construction Phase:</u></p> <ul style="list-style-type: none"> Employment opportunities and skills development;

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KEY IMPACT	IMPACTS IDENTIFIED
	<u>Operational-Decommissioning phase:</u> <ul style="list-style-type: none">Impacts are negligible.
Noise	<u>Construction Phase:</u> <ul style="list-style-type: none">Increase in ambient sound levels as a result of construction activities during the day. <u>Operational Phase:</u> <ul style="list-style-type: none">Impacts are negligible. <u>Decommissioning Phase:</u> <ul style="list-style-type: none">Increase in ambient sound levels as a result of decommissioning activities during the day.
Transportation	<u>Construction, Operational and Decommissioning Phases:</u> <ul style="list-style-type: none">Noise, dust & exhaust pollution due to the increased vehicles trips on the internal on-site roads;Noise, dust & exhaust pollution due to the increased vehicles trips on the local unsurfaced access roads;Noise, dust & exhaust pollution due to the increased vehicles trips on the local provincial road (R355); andNoise, dust & exhaust pollution due to the increased vehicles trips on the High-order (National) road network (N7).

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2. APPROACH TO PREPARING THE EMPr

2.1 COMPLIANCE WITH RELEVANT LEGISLATION

In terms of legal requirements, a crucial objective of the EMPr is to satisfy the requirements of Section 24N of the NEMA, as amended, and Appendix 4 of the amended NEMA EIA Regulations published in Government Notice No. R 326 of 7 April 2017. These regulations regulate and prescribe the content of the EMPr and specify the type of supporting information that must accompany the submission of the report to the authorities. An overview of where the requirements are addressed in this EMPr is presented in Tables 4 and 5.

Table 4: Compliance with Section 24N of NEMA

Requirements of Section 24N of NEMA	Where it is included in this EMPr?
2) The environmental management programme must contain- a) information on any proposed management, mitigation, protection or remedial measures that will be undertaken to address the environmental impacts that have been identified in a report contemplated in subsection 24(1A), including environmental impacts or objectives in respect of: (i) planning and design; (ii) pre-construction and construction activities; (iii) the operation or undertaking of the activity in question; (iv) the rehabilitation of the environment; and (v) closure, if applicable;	Section 1.3 (Page 8-11) and the columns detailing the impact description, mitigation and management objectives, and mitigation and management actions in Sections 4 to 12 of this EMPr (Page 18–82).
b) details of- (i) the person who prepared the environmental management programme; and (ii) the expertise of that person to prepare an environmental management programme;	Section 1.2 (Page 7) of this EMPr and Appendix A of the BA Report
c) a detailed description of the aspects of the activity that are covered by the environmental management programme;	Section 1 and Section 1.1 (Page 3-7)
d) information identifying the persons who will be responsible for the implementation of the measures contemplated in paragraph (a);	Columns in Section 4 to 12 (Page 18-82) of the EMPr regarding the monitoring responsibility, including the requirements for monitoring and reporting on compliance and the responsible parties noted in Section 3 (Page 15-17).
e) information in respect of the mechanisms proposed for monitoring compliance with the environmental management programme and for reporting on the compliance;	The columns detailing the mitigation and management actions, and the monitoring methodology, frequency and responsibility in Sections 4 to 12 of this EMPr (Page 18-82).
f) as far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and	Sections 4 to 12 (Page 18-82) of this EMPr, as applicable to the post-construction, rehabilitation phase and the decommissioning phase.
g) a description of the manner in which it intends to- (i) modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	The columns detailing the mitigation and management objectives, mitigation and management actions, and the monitoring

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Requirements of Section 24N of NEMA	Where it is included in this EMPr?
<ul style="list-style-type: none"> (ii) remedy the cause of pollution or degradation and migration of pollutants; and (iii) comply with any prescribed environmental management standards or practices. 	methodology, frequency and responsibility in Sections 4 to 12 (Page 18-82) of this EMPr.
<p>3) The environmental management programme must, where appropriate-</p> <ul style="list-style-type: none"> a) set out time periods within which the measures contemplated in the environmental management programme must be implemented; b) contain measures regulating responsibilities for any environmental damage, pollution, pumping and treatment of polluted or extraneous water or ecological degradation which may occur inside and outside the boundaries of the operations in question; and c) develop an environmental awareness plan describing the manner in which- <ul style="list-style-type: none"> (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment. 	The columns detailing the mitigation and management actions, and the monitoring methodology, frequency and responsibility in Sections 4 to 12 (Page 18-82) of this EMPr. Section 11 (Page 58-61) of this EMPr includes an Environmental Awareness Plan.
5) The Minister, the Minister responsible for mineral resources or an MEC may call for additional information and may direct that the environmental management programme in question must be adjusted in such a way as the Minister, the Minister responsible for mineral resources or the MEC may require.	Not applicable at this stage.
6) The Minister, the Minister responsible for mineral resources or an MEC may at any time after he or she has approved an application for an environmental authorisation approve an amended environmental management programme.	Not applicable at this stage.
<p>7) The holder and any person issued with an environmental authorisation-</p> <ul style="list-style-type: none"> a) must at all times give effect to the general objectives of integrated environmental management laid down in section 23; b) must consider, investigate, assess and communicate the impact of his or her prospecting or mining on the environment; c) must manage all environmental impacts <ul style="list-style-type: none"> (i) in accordance with his or her approved environmental management programme, where appropriate; and (ii) as an integral part of the prospecting or mining, exploration or production operation, unless the Minister responsible for mineral resources directs otherwise; d) must monitor and audit compliance with the requirements of the environmental management programme; e) must, as far as is reasonably practicable, rehabilitate the environment affected by the prospecting or mining operations to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and f) is responsible for any environmental damage, pollution, pumping and treatment of polluted or extraneous water or ecological 	Through-out the EMPr.

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Requirements of Section 24N of NEMA	Where it is included in this EMPr?
degradation as a result of his or her operations to which such right, permit or environmental authorisation relates.	
8) Notwithstanding the Companies Act, 2008 (Act No. 71 of 2008), or the Close Corporations Act, 1984 (Act No. 69 of 1984), the directors of a company or members of a close corporation are jointly and severally liable for any negative impact on the environment, whether advertently or inadvertently caused by the company or close corporation which they represent, including damage, degradation or pollution.	Section 3 (Page 15) details the responsibility of the Project Applicant.

Table 5: Compliance with Appendix 4 of the 2014 NEMA EIA Regulations (as amended on 7 April 2017)

Requirements of Appendix 4 of the 2014 NEMA EIA Regulations (as amended on 7 April 2017 in GN R326)	Where it is included in this EMPr?
1. (1) An EMPr must comply with section 24N of the Act and include:	Section 1.2 (Page 7) of this EMPr and Appendices A and E of the BA Report . Appendices A and E of the BA Report includes the Curriculum Vitae of the Environmental Assessment Practitioners and specialists respectively.
a) details of:	
(i) the EAP who prepared the EMPr; and	
(ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	
b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 1 and Section 1.1 (Page 3-7).
c) a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Appendix A and Appendix B of this EMPr (Page 87-90).
d) a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including:	Section 1.3 Page 8-9) and the columns detailing the impact description, mitigation and management objectives, and mitigation and management actions in Sections 4 to 12 (Page 18-82) of this EMPr.
(i) planning and design;	
(ii) pre-construction activities;	
(iii) construction activities;	
(iv) rehabilitation of the environment after construction and where applicable post closure; and	
(v) where relevant, operation activities;	
e) a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to:	The columns detailing the mitigation and management actions in Sections 4 to 12 (Page 18-82) of this EMPr.
(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	
(ii) comply with any prescribed environmental management standards or practices;	
(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and	
(iv) comply with any provisions of the Act regarding financial	

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Requirements of Appendix 4 of the 2014 NEMA EIA Regulations (as amended on 7 April 2017 in GN R326)	Where it is included in this EMPr?
provisions for rehabilitation, where applicable;	
f) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	The columns detailing the monitoring methodology in Sections 4 to 12 (Page 21-98) of this EMPr.
g) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	The columns detailing the monitoring frequency in Sections 4 to 12 (Page 21-98) of this EMPr.
h) an indication of the persons who will be responsible for the implementation of the impact management actions;	The columns detailing the monitoring responsibility in Sections 4 to 12 (Page 21-98) of this EMPr.
i) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	The columns detailing the mitigation and management actions, and the monitoring methodology and frequency in Sections 4 to 12 (Page 21-98) of this EMPr.
j) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	The columns detailing the mitigation and management actions, and the monitoring methodology, frequency and responsibility in Sections 4 to 12 (Page 21-98) of this EMPr.
k) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Section 4 to 12 (Page 21-98) of the EMPr, including the requirements for monitoring and reporting on compliance and the responsible parties noted in Section 3.
l) an environmental awareness plan describing the manner in which: (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 11 (Page 58-61) of this EMPr.
m) any specific information that may be required by the competent authority.	Section 2.2 (Page 12-13) and the management objectives and management actions in Sections 4 to 11 (Page 18-82). It should be noted that this is based on previous renewable energy projects and corresponding feedback from the DEA.
(2) Where a government notice <i>gazetted</i> by the Minister provides for a generic EMPr, such generic EMPr as indicated in such notice will apply.	Not Applicable

2.2 COMPLIANCE WITH DEA REQUIREMENTS

The EMPr is structured in such a way to comply with the requirements of the DEA and to ensure that the mitigation and management measures that have been identified during the BA Process are included in the respective plans. These requirements are detailed in Table 6 below. It is important to note that other project specific aspects (such as the findings and recommendations of the specialist studies), in addition to those covered by the plans normally required by the DEA, have been included in Section 12 of the EMPr.

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Table 6: DEA Requirements for the EMPr

DEA Requirements	Relevant Section in the EMPr
All recommendations and mitigation measures recorded in the BA Report and the specialist studies conducted.	Recommended mitigation measures and monitoring actions as noted in the BA Report and specialist studies have been included in this EMPr, where relevant.
The final site layout map	Refer to Appendix A of this EMPr for the site layout map. Refer to Section 1.1 (Page 3-7) of this EMPr for a description of the proposed project infrastructure.
Measures as dictated by the final site layout map and micro-siting.	Refer to Appendix A (Page 84) of this EMPr for the site layout map. Refer to Section 1.1 (Page 3-7) of this EMPr for a description of the proposed project infrastructure and information regarding the final siting of the proposed infrastructure, which will take place during the detailed engineering phase (taking into consideration the findings of the specialists in terms of environmental sensitivity).
An environmental sensitivity map indicating environmental sensitive areas and features identified during the BA Process.	Refer to Appendix B (Page 87) of this EMPr for an environmental sensitivity map. Refer to Section 1.1 (Page 3-7) of this EMPr for a description of the approach followed to identify the environmental sensitivities.
A map combining the final layout map superimposed (overlain) on the environmental sensitivity map.	Refer to Appendix B (Page 87) of this EMPr for a combined environmental sensitivity and layout map.
An alien invasive management plan to be implemented during the construction and operation of the facility. The plan must include mitigation measures to reduce the invasion of alien species and ensure that the continuous monitoring and removal of alien species is undertaken.	Refer to Section 4 (Page 18-22) of this EMPr.
A plant rescue and protection plan which allows for the maximum transplant of conservation important species from areas to be transformed. This plan must be compiled by a vegetation specialist familiar with the site and be implemented prior to commencement of the construction phase.	Refer to Section 5 (Page 23-41) of this EMPr. It should be noted that faunal protection and habitat rehabilitation has also been included in this section.
A re-vegetation and habitat rehabilitation plan to be implemented during the construction and operation of the facility. Restoration must be undertaken as soon as possible after completion of construction activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats.	Refer to Section 5 (Page 23-41) of this EMPr. It should be noted that faunal protection and habitat rehabilitation has also been included in this section.
An open space management plan to be implemented during the construction and operation of the facility.	Refer to Section 6 (Page 42-44) of this EMPr.
A traffic management plan for the site access roads to ensure that no hazards would result from the increased truck traffic and that traffic flow would not be adversely impacted. This plan must include measures to minimise impacts on local commuters e.g. limiting construction vehicles travelling on public roadways during the morning and late afternoon	Refer to Section 7 (Page 45-47) of this EMPr.

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DEA Requirements	Relevant Section in the EMPr
commute time and avoid using roads through densely populated built-up areas so as not to disturb existing retail and commercial operations.	
A transportation plan for the transport of components, main assembly cranes and other large pieces of equipment.	Refer to Section 7 (Page 45-47) of this EMPr.
A storm water management plan to be implemented during the construction and operation of the facility. The plan must ensure compliance with applicable regulations and prevent off-site migration of contaminated storm water or increased soil erosion. The plan must include the construction of appropriate design measures that allow surface and subsurface movement of water along drainage lines so as not to impede natural surface and subsurface flows. Drainage measures must promote the dissipation of storm water run-off.	Refer to Section 8 (Page 48-51) of this EMPr.
A fire management plan to be implemented during the construction and operation of the facility.	Refer to Section 11 (Page 58-61) of this EMPr. It should be noted that this has been combined with an Environmental Awareness Plan.
An erosion management plan for monitoring and rehabilitating erosion events associated with the facility. Appropriate erosion mitigation must form part of this plan to prevent and reduce the risk of any potential erosion.	Refer to Section 9 (Page 52-54) of this EMPr.
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	Refer to Section 10 (Page 55-58) of this EMPr.
Measures to protect hydrological features such as streams, rivers, pans, wetlands, dams and their catchments, and other environmental sensitive areas from construction impacts including the direct or indirect spillage of pollutants.	Measures to protect hydrological features such as streams, rivers, pans, wetlands, dams and their catchments have been included throughout the EMPr, such as Sections 8 (Page 48-51), 9 (Page 52-54) and 10 (Page 55-58).

2.3 CONTENTS OF THE EMPr

Where applicable, each section of the EMPr is divided into the following four phases of the project cycle:

- Design Phase;
- Construction Phase;
- Operational Phase; and
- Decommissioning Phase.

The EMPr includes the findings and recommendations of the BA Process and specialists studies. Furthermore, as noted above, the EMPr is considered a “living” document and must be updated with additional information or actions during the design, construction, operational and decommissioning phases if applicable.

The EMPr follows an approach of identifying an over-arching goal and objectives, accompanied by management actions that are aimed at achieving these objectives. The management actions are presented in a table format in

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order to show the links between the goal and associated objectives, actions, responsibilities, and monitoring requirements and targets.

The management plans for the design, construction, operational and decommissioning phases consist of the following components:

- **Impact:** The potential positive or negative impact of the development that needs to be enhanced, mitigated or eliminated.
- **Objectives:** The objectives necessary in order to meet the goal; these take into account the findings of the specialist studies.
- **Mitigation/Management Actions:** The actions needed to achieve the objectives of enhancing, mitigating or eliminating impacts; taking into consideration factors such as responsibility, methods, frequency, resources required and prioritisation.
- **Monitoring:** The key monitoring actions required to check whether the objectives are being achieved, taking into consideration methodology, frequency and responsibility.

2.4 GOAL FOR ENVIRONMENTAL MANAGEMENT

The overall goal for environmental management for the proposed Kap Vley Transmission Line project is to construct and operate the project in a manner that:

- Minimises the ecological footprint of the project on the local environment;
- Minimises impacts on fauna, flora and freshwater ecosystems;
- Facilitates harmonious co-existence between the project and other land uses in the area; and
- Contributes to the environmental baseline and understanding of environmental impacts of WEFs and associated supporting electrical infrastructure in a South African context.

3. ROLES AND RESPONSIBILITIES

For the purposes of the EMP, the generic roles that need to be defined are those of the:

- Project Owner;
- Environmental Control Officer; and
- Construction Manager (Lead Contractor).

It is acknowledged that the specific titles for these functions will vary from project to project. The intent of this section is to give a generic outline of what these roles typically require. It is expected that this will be appropriately defined at a later stage.

3.1 PROJECT OWNER

The Project Owner is the current 'owner' of the project and, as such, is responsible for ensuring that the conditions of the EA issued in terms of NEMA (should the project receive such authorisation) are fully adhered to, as well as ensuring that any other necessary permits or licenses are obtained and complied with. It is

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expected that the Project Owner at the point of construction will appoint the Environmental Control Officer and the Lead Contractor.

3.2 ENVIRONMENTAL CONTROL OFFICER

An independent Environmental Control Officer (ECO) must be appointed to monitor the compliance of the proposed project with the conditions of EA (should such authorisation be granted by the DEA) are complied with at all times. The ECO must also monitor compliance of the proposed project with environmental legislation and recommendations of the EMPr, as well as oversee the implementation of the EMPr during the phases of the project, monitor environmental impacts, undertake record-keeping.

The ECO will be responsible for updating the EMPr as and when necessary, and compiling a monitoring checklist based on the EMPr. The roles and responsibilities of the ECO should include the following:

- The ECO must undertake periodic environmental audits during the relevant phases of the proposed project in order to monitor and record environmental impacts and non-conformances, and to monitor site activities to ensure adherence to the specifications contained in the EMPr, using a monitoring checklist. The timeframes for environmental audits will be indicated in the EA (should such authorisation be granted by the DEA);
- Environmental compliance/audit reports must be compiled and submitted by the ECO to the Competent Authority (i.e. DEA and/or Provincial Department of Environment and Nature Conservation) on a regular basis (i.e. at intervals as indicated in the EA (should such authorisation be granted by the DEA));
- The ECO must maintain a diary of site visits and audits, a copy of the EA (should such authorisation be granted by the DEA) and relevant permits for reference purposes, a non-conformance register, a public complaint register, and a copy of previous environmental audits undertaken;
- Prior to the commencement of construction, the ECO must meet on site with the Contractor to confirm the construction procedure and designated construction areas and work activity zones;
- Reporting of any non-conformances within 48 hours of identification of such non-conformance to the relevant agents;
- Conducting an environmental inspection on completion of the construction period and 'signing off' the construction process with the Contractor;
- Ensure that records are kept of all monitoring activities and results; and
- Conducting an environmental inspection on completion of decommissioning and 'signing off' the site rehabilitation process.

The Lead Contractor and sub-contractors may have their own Environmental Officers, or designate Environmental Officer functions to certain personnel.

3.3 CONSTRUCTION MANAGER

The Construction Manager will be responsible for the following:

- Ensure that all appointed contractors and sub-contractors are aware of the EMPr and their respective responsibilities;
- Prior to the commencement of construction, the Construction Manager must meet on site with the ECO in order to confirm the construction procedure and designated construction areas and work activity zones;

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- Ensure that each sub-contractor employs an Environmental Officer (or employs a designated suitably qualified individual to fulfil the role of an Environmental Officer) to monitor and report on the daily activities on-site during the construction period;
- Implementation of the overall construction programme, project delivery and quality control for the construction for the proposed electrical grid infrastructure project;
- Overseeing compliance with the Health, Safety and Environmental Responsibilities specific to the project management related to project construction;
- Promoting total job safety and environmental awareness by employees, contractors and sub-contractors and stress to all employees and contractors and sub-contractors the importance that the project proponent attaches to safety and the environment;
- Ensuring that safe, environmentally acceptable working methods and practices are implemented and that sufficient plant and equipment is made available properly operated and maintained, to facilitate proper access and enable any operational to be carried out safely;
- Ensuring that all appointed contractors and sub-contractors repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in the EMPr, to the satisfaction of the Project Owner's ECO; and
- Implement the Traffic Management Plan (Section 7), Transportation Plan (Section 7) and Storm Water Management Plan (Section 8).

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4. ALIEN INVASIVE VEGETATION MANAGEMENT PLAN

Impact	Mitigation/ Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
A. DESIGN PHASE					
4.1. Impacts due to establishment and increases in the prevalence of exotic and invasive plants.	Reduce proliferation of alien and invasive species, which is expected within any disturbed areas particularly as there is a degree of alien and invasive species within the study area at present.	4.1.1. Ensure compliance with relevant Environmental Specifications (amendments to the regulations under the Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA) and Section 28 of the NEMA) for the control and removal of alien invasive plant species. 4.1.2. Seek guidance from a suitably qualified specialist or contact relevant authorities on the removal of the alien vegetation on site. 4.1.3. Compile exotic weed, and alien and invasive control plan for the proposed project site to ensure that these species are eradicated and controlled to prevent their spread beyond the project footprint. Alien plant seed dispersal within the top layers of the soil within footprint areas, that will have an impact on future rehabilitation, has to be controlled.	<ul style="list-style-type: none">▪ Appoint a suitable specialist/ Contractor or contact the relevant authorities to seek guidance on the removal of the planted alien invasive species.▪ Appoint a suitable specialist to identify dominant weed species within the region and compile approach and management plan for exotic weed control during and post construction.▪ Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.	<ul style="list-style-type: none">▪ Once-off during the design phase.▪ Once-off during the design phase (i.e. prior to commencement).▪ Once-off during the design phase.	<ul style="list-style-type: none">▪ Project Owner▪ Project Owner and ECO▪ ECO
B. CONSTRUCTION PHASE					
4.2. Change in habitat form and structure as a result of general activities and disturbance on site, and import of earth materials during the construction phase, giving rise to prevalence of exotic vegetation. Indigenous	Reduce the opportunity for invasive plant material to establish on site, primarily arising through the import of fill and related materials.	4.2.1. Undertake exotic weed control, vegetation control and broader vegetation management of source materials and the construction site through monitoring during the construction phase and identifying the source of fill materials. 4.2.2. Identify any exotic plant material in the fill material and remove and dispose. Monitor the point of infilling and address any emergent exotic plant material.	<ul style="list-style-type: none">▪ Monitor the source of fill material, the importing of such material to the construction site, the presence of alien invasive plants in the fill material, as well as recurrence of these species in the area of infilling during the construction phase via visual inspections and take action to remove and control these species.	<ul style="list-style-type: none">▪ Ongoing during the construction phase.	<ul style="list-style-type: none">▪ ECO and Contractor

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Impact	Mitigation/ Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
vegetation may also serve to alter habitat form and structure.					
4.3. Increased presence of exotic and disturbance driven plant species. With increasing levels of anthropogenic activity on site and within the surrounding area (50 km radius), the propensity for plant invasion or the dominance of species that are tolerant of higher levels of disturbance will see such species dominating and perhaps ousting other less tolerant species. This is a cumulative impact.	Reduce the opportunity for invasive plant material to establish on site as a result of increased anthropogenic activity.	4.3.1. Implement vegetation management and conservation initiatives, such as control of exotic vegetation, and avoid unnecessary disturbance to the ground which promotes exotic weed invasion and vegetation change.	<ul style="list-style-type: none"> Undertake site and visual inspections and report any non-compliance. 	<ul style="list-style-type: none"> On-going 	<ul style="list-style-type: none"> ECO and Contractor
4.4. Increases in the prevalence of alien and invasive plants.	Ensure the appropriate removal of alien invasive vegetation from the proposed project area and prevent the establishment and spread of alien invasive plants due to the project activities.	<p>4.4.1. Ensure compliance with relevant Environmental Specifications (amendments to the regulations under the CARA and Section 28 of the NEMA for the control and removal of alien invasive plant species. Implement correct choice of herbicide to ensure that no additional impact and loss of indigenous plant species occurs due to the herbicide used.</p> <p>4.4.2. Implement the exotic weed, and alien and invasive control plan. Undertake regular visual monitoring and redress of exotic weeds in and around site, particularly during construction. Ensure that alien invasive vegetation found on site, within the proposed project footprint, is immediately</p>	<ul style="list-style-type: none"> Implement intermittent but regular weed control initiatives. Undertake site and visual inspections and report any non-compliance. Carry out visual inspections and site visits to ensure that the footprint of the area associated with alien plant species removal is kept as small as possible. Monitor and manage vegetation clearing by undertaking visual inspections to ensure minimal disturbance and to restrict activities to within demarcated areas. 	<ul style="list-style-type: none"> As necessary during the construction phase. Ongoing during the construction phase. Ongoing during the construction phase. Prior to construction and during construction phase following monitoring. Prior to the 	<ul style="list-style-type: none"> Project Owner, ECO Contractors and ECO Contractors and ECO Project Owner and ECO Project Owner, ECO and Specialist Contractor ECO Contractors and

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Impact	Mitigation/ Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>controlled and removed promptly, in a scheduled manner throughout the construction phase.</p> <p>4.4.3. Ensure footprint areas are kept as small as possible when removing alien plant species. Keep clearance and disturbance of indigenous vegetation to a minimum. The entire width of the distribution line servitude should not be cleared of vegetation and should be cleared below the distribution line and from either side of the centre line based on the requirements of Eskom and standard operating procedures.</p> <p>4.4.4. No vehicles should be allowed to drive through designated sensitive drainage line and riparian areas during the eradication of alien and weed species.</p> <p>4.4.5. All alien vegetation identified should be removed from rehabilitated areas and reseeded with indigenous vegetation as specified by a suitably qualified specialist (ecologist).</p> <p>4.4.6. The removed alien invasive vegetation should be immediately disposed at a suitable waste disposal facility and should not be kept on site for prolonged periods of time, as this will enhance the spread of these species.</p> <p>4.4.7. All soils compacted as a result of construction activities falling outside of the project footprint areas should be ripped and profiled. Special attention should be paid to alien and invasive control within these areas. Alien and invasive vegetation control should take place throughout all construction and rehabilitation phases to prevent loss of floral habitat.</p> <p>4.4.8. Ensure that the footprint required for the proposed</p>	<ul style="list-style-type: none"> Demarcate sensitive drainage and riparian areas during eradication to restrict vehicle access. Ensure that a suitably qualified specialist is contacted with regards to the re-seeding process. ECO to ensure that this is taken into consideration and implemented. Monitor the removal of the alien vegetation found on site via visual inspections. Monitor the presence of alien invasive plants via visual inspections and take action to remove, control, and rehabilitate these species. Verify that the proposed project area is determined and outlined prior to the commencement of the construction phase by undertaking visual inspections. ECO to conduct visual inspections to verify that machinery and equipment are cleaned, and report any non-compliance. 	<p>commencement of construction</p> <ul style="list-style-type: none"> As necessary during the construction phase. On-going Once-off prior to construction and as required during the construction process. As necessary during the construction phase. 	<p>ECO</p> <ul style="list-style-type: none"> Contractors and ECO Contractors and ECO

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Impact	Mitigation/ Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>project activities (such as temporary stockpiling, earthworks, storage areas, site establishment etc.) is kept at a minimum.</p> <p>4.4.9. All construction machinery and plant equipment delivered to site for use during the construction phase should be cleaned in order to limit the introduction of alien species.</p>			
C. OPERATIONAL PHASE					
4.5. Increased spread and introduction of exotic vegetation as a result of the movement of vehicles within the study area, particularly along the transmission line and service road, which may change or alter the local ecology.	<p>To prevent the excessive growth and propagation of exotic weeds on disturbed lands that form part of the power line.</p> <p>Reduce the establishment and spread of alien invasive plants.</p> <p>To remove exotic weeds as and when they may arise and thereby prevent alteration of local and adjacent habitat forms.</p>	<p>4.5.1. Implement vegetation management and conservation operations such as control of exotic vegetation along roads and the transmission line, and avoid unnecessary disturbance to the ground which promotes exotic weed invasion and vegetation change.</p> <p>4.5.2. Review the vegetation composition around the project site.</p> <p>4.5.3. Undertake removal of exotic vegetation using approved and appropriate herbicides.</p> <p>4.5.4. Implement management actions in Section 4.4 above as applicable.</p>	<ul style="list-style-type: none"> ▪ Carry out inspections to monitor the presence of exotic vegetation, and the level of disturbance, as well as the implementation of interventions. ▪ Undertake annual routine weed control. ▪ Monitor the use of herbicide sprays for removal of alien vegetation by undertaking visual inspections and reporting any non-compliance. ▪ Maintain register of weed spraying activities and ensure that herbicide use is recorded. 	Monthly	<ul style="list-style-type: none"> ▪ Project Owner
D. DECOMMISSIONING PHASE					
4.6. Exotic weed invasion of the decommissioned site resulting in ecological change	<p>To prevent the excessive growth and propagation of exotic weeds on disturbed lands that formed a portion of the proposed electrical infrastructure.</p>	<p>4.6.1. All natural areas must be rehabilitated with species indigenous to the area. Re-seed with locally-sourced seed of indigenous grass species that were recorded on site pre-construction.</p> <p>4.6.2. Exotic weed control measures to be instituted through weed control programme. Regular redress of exotic weed through the use of herbicides.</p> <p>4.6.3. Ensure the stabilization of site, once</p>	<ul style="list-style-type: none"> ▪ Final external audit of area to confirm that area is rehabilitated to an acceptable level. ▪ Undertake weed eradication according to weed eradication programme, along disturbance sites following dismantling of structures. ▪ Monitor newly disturbed areas where 	<ul style="list-style-type: none"> ▪ Once off ▪ Once-off ▪ During the decommissioning phase ▪ During the decommissioning phase 	<ul style="list-style-type: none"> ▪ Lead Contractor with advice from specialist ▪ Project Owner and ECO ▪ Project Owner and ECO ▪ Project Owner/

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Impact	Mitigation/ Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		decommissioning and removal of infrastructure has arisen. 4.6.4. Implement management actions in Section 4.4 above for the decommissioning phase, as applicable.	<p>infrastructure has been removed to detect and quantify any aliens that may become established after decommissioning and rehabilitation.</p> <ul style="list-style-type: none"> Monitor the condition of the distribution line route via site inspections throughout the decommissioning phase and at the end to verify that the site is stabilized and all infrastructure has been removed. Record non-compliance and incidents. Implement monitoring methodology in Section 4.4 above for the decommissioning phase, as applicable. 	<ul style="list-style-type: none"> During the decommissioning phase Implement monitoring frequency in Section 4.4 above for the decommissioning phase, as applicable. 	<p>Contractor</p> <ul style="list-style-type: none"> ECO Implement monitoring responsibility in Section 4.4 above for the decommissioning phase, as applicable.

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5. PLANT RESCUE AND PROTECTION PLAN INCLUDING RE-VEGETATION AND HABITAT REHABILITATION PLAN (INCLUDING AQUATIC ECOLOGY, FRESHWATER RESOURCES, AND TERRESTRIAL AND AQUATIC FAUNA AND FLORA)

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
A. DESIGN PHASE					
5.1. Alteration of surface water quality on account of construction activities that lead to change in water chemistry.	To reduce the potential of contamination of soils and local water resources and change in ecological structure. To ensure that as far as possible all infrastructure is placed outside of water resource areas and their respective buffer zones.	5.1.1. Ensure that as far as possible all infrastructure is placed outside of water resource areas and their respective 32 m buffer zones. If these measures cannot be adhered to, strict mitigation measures will be required to minimise the impact on the receiving watercourses. 5.1.2. Special mention is made of the need to ensure that careful planning of the placement of the monopoles takes place in order to minimise the risk of placing infrastructure unnecessarily within riparian zones. Wherever possible, it is highly recommended that where the linear development (i.e. transmission lines) spans the relevant watercourse, and every effort should be made to prevent/avoid placement of monopoles within the riparian zone/habitat or applicable zones of regulation in terms of NEMA and/or GN509. If this is not avoidable, the monopoles should be placed as far from the active channel of the watercourse as possible. If at all practicable, all monopoles should be developed above the applicable zone of regulation in terms of Regulation GN509 of the NWA. This is particularly relevant to the Buffels River which needs to be crossed by all three proposed alternative routings for the 132 kV powerline near to the Eskom Gromis substation. The river is considered to be sensitive	<ul style="list-style-type: none">▪ Ensure that the 32 m zone of regulation is taken into consideration in the final layout of the proposed electrical infrastructure. Ensure that this is taken into account, where possible and as feasible, and that the recommended mitigation measures are implemented as required.▪ Monitor the placement of the monopoles to ensure minimal interference with riparian habitat.▪ Monitor the placement of the substation to be 32 m away from watercourses.	<ul style="list-style-type: none">▪ Once-off prior to the commencement of construction.	<ul style="list-style-type: none">▪ Project Owner and ECO

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Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>environment that should be avoided (Figure A.6.2 in the BA Report). The banks on either side of the river are however steep and it is likely that the river can be spanned without impact.</p> <p>5.1.3. Careful planning of the location of the substations. The applicable zone of regulation around the freshwater resources in terms of NEMA is 32 m, and this must be adhered to, in order to assist in minimising impacts on the freshwater resources in close proximity to the proposed substations.</p>			
5.2. Impact on avian behavior and avian species as a result of collision with transmission line and associated electrical infrastructure.	To reduce impact on avifauna	<p>5.2.1. The most important mitigation measure is to select the optimal route for the new power line. As discussed in detail in Section 4 of Appendix E3 of the BA Report, it is recommended that Alternative 1 transmission line be selected as the preferred alternative. Alternative 2 is also a viable alternative. However, Alternative 3 is not recommended by the Ecologist as it traverses a large extent of habitat that is sensitive to disturbance and also cuts through the <i>Acacia erioloba</i> forest on the plains below the site</p> <p>5.2.2. A site specific avifaunal walk through should be conducted by a qualified ornithologist as part of the site specific EMP just prior to construction, so as to ensure that no sensitive bird species have started breeding on or near site. If any such sites are found case specific mitigation measures will need to be designed.</p>	<ul style="list-style-type: none"> Ensure that this is taken into consideration during the planning and design phase by reviewing. 	<ul style="list-style-type: none"> Once during the design and planning phase. 	<ul style="list-style-type: none"> Project Owner and Contractor (and Ornithologist for the walk-through)
B. CONSTRUCTION PHASE					
5.3. Change in ecological processes and habitat form and alteration of	Reduce points of vegetation clearance and unnecessary clearance of vegetation.	5.3.1. Conduct a site survey, habitat identification and relocation prior to construction. Carry out a survey of all the proposed transmission line tower points at	<ul style="list-style-type: none"> Appoint a suitably qualified Ecologist to conduct a pre-construction survey of the construction corridor. 	<ul style="list-style-type: none"> Once-off, prior to construction. Once-off, prior to 	<ul style="list-style-type: none"> Project Owner, Construction Manager, ECO

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biophysical factors at a localised level as a result of the removal of indigenous vegetation, site clearance and levelling for the stringing of the transmission line, as well as earthworks.		5.3.2. the final survey stage prior to the construction phase, taking measures to avoid more sensitive terrain, while meeting stringing distance between towers, together with a plant and fauna rescue programme.	<ul style="list-style-type: none"> Ensure that this is taken into consideration by reviewing signed minutes of meetings or signed reports. Appoint a suitable contractor to complete the search and rescue. Identify the plants that may need to be relocated or rescued. Contact the relevant Authorities if any protected species are found during the search and rescue. Review permits prior to undertaking search and rescue. Ensure that this is taken into consideration by reviewing signed minutes of meetings or signed reports. 	<ul style="list-style-type: none"> construction. At commencement Prior to commencement of construction and search and rescue. Once-off prior to construction. Once-off prior to construction and implementation during construction. Once-off prior to construction. Once-off prior to construction. Once-off prior to construction. 	<ul style="list-style-type: none"> and Ecologist Project Owner, Search and Rescue Contractor, and ECO Project Owner and ECO Project Owner and ECO ECO Project Owner, Construction Manager, ECO and Ecologist Project Owner and ECO Project Owner and ECO Project Owner and ECO Project Owner and ECO
		5.3.3. Undertake a site review and fauna and plant search and rescue prior to the commencement of the construction phase, and possible removal/relocation of flora and fauna of value within the affected site (i.e. such specimens may be relocated/removed or avoided (with the relevant permits and approvals in place)).	<ul style="list-style-type: none"> Ensure the necessary permits or licences are identified and applied for as applicable for removal of protected, indigenous vegetation. Await response and provision of permit (as required) from the relevant Authorities prior to the removal of the indigenous species (if required). Once these permits are obtained, search and rescue must be undertaken for the indigenous species. Efforts should be made to minimise impacts on protected trees (if any) by avoiding areas where such species may occur. 		
		5.3.4. Ensure that demarcation of the construction area is undertaken prior to the commencement of construction and that it is maintained throughout. Fencing of the site is an option for containment. In this regard, conduct a survey of the work space around the proposed on-site substation site and laydown area (i.e. in order to ensure delimiting through demarcation of the construction area).	<ul style="list-style-type: none"> Ensure that a suitable specialist is appointed to compile a Vegetation Rehabilitation Plan. Verify that the proposed project construction area is determined and outlined prior to the commencement of the construction phase by reviewing signed minutes of meetings or signed reports. Verify that the proposed access routes are determined and outlined prior to the commencement of the construction phase by reviewing signed minutes of meetings or signed reports. Ensure that vegetation removal is kept to a minimum by reviewing and contributing to the approved site plan. 		
		5.3.5. Ensure that access roads are adequately routed and	<ul style="list-style-type: none"> Ensure that significant lithic 		

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		<p>identified prior to the construction phase, and ensure that they are clearly demarcated for use throughout the construction phase. Access roads should be surveyed prior to the construction of the proposed power line towers and follow routes that avoid unnecessary large scale clearance of vegetation and avoid sensitive habitats.</p> <p>5.3.6. Ensure that lithic environments are incorporated or avoided during the construction phase.</p> <p>5.3.7. Stringing of towers may be performed using aerial methods (e.g. helicopter) if and where possible, to avoid undue disturbance to habitat.</p>	<p>environments and features, in proximity to the proposed project area, are demarcated as no-go areas so that they can be avoided.</p> <ul style="list-style-type: none"> Ensure that suitable methods for the stringing of the power line are taken into consideration and adopted as required. 		
5.4. The disturbance of fauna and loss of vegetation/habitat through anthropogenic activities, disturbance of refugia and general change in habitat.	To reduce change in faunal populations and faunal ethos within the region and/associated development area.	<p>5.4.1. Undertake survey of sites prior to construction. Carry out a survey of all the proposed transmission line tower points and development footprint prior to the construction phase, taking measures to avoid more sensitive terrain, while meeting stringing distance between towers.</p> <p>5.4.2. A pre-construction site walk-through should be undertaken shortly before commencement of construction in order to identify any important faunal communities that may have relocated to the line route.</p> <p>5.4.3. Undertake plant search and rescue operations within the affected site, where such specimens may be relocated/removed or avoided (with the relevant permits and approvals in place).</p> <p>5.4.4. Ensure that demarcation of the construction area is undertaken prior to the commencement of construction and that it is maintained throughout (i.e. containment of construction and laydown areas).</p>	<ul style="list-style-type: none"> Appoint a suitably qualified Ecologist to conduct a pre-construction survey of the final site and development footprint. The specific impact of construction on these species should be noted and the possibility of relocation of species may be considered. Ensure that this is taken into consideration by reviewing signed minutes of meetings or signed reports. Appoint a suitable contractor to complete the search and rescue. Identify the plants that may need to be relocated or rescued. Contact the relevant Authorities if any protected species are found during the search and rescue. Review permits prior to undertaking search and rescue. Ensure that this is taken into 	<ul style="list-style-type: none"> Once-off, prior to construction. Once-off, prior to construction. Once-off, prior to construction. At commencement Prior to commencement of construction and search and rescue. Once-off, prior to construction. Once-off, prior to construction. 	<ul style="list-style-type: none"> Project Owner, Construction Manager, ECO and Ecologist Project Owner, Construction Manager, ECO and Ecologist Project Owner, Search and Rescue Contractor, and ECO Project Owner and ECO Project Owner and ECO Project Owner and ECO

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			consideration by reviewing signed minutes of meetings or signed reports. <ul style="list-style-type: none"> Verify that the proposed project construction area is determined and outlined prior to the commencement of the construction phase by reviewing signed minutes of meetings or signed reports. 		
5.5. Loss of refugia particularly in respect of fauna associated with lithic habitats (e.g. <i>Homopus</i> spp). Rock ledges and other geological structures are intrinsic habitat for species such as padloppers and tortoises, and removal of these features (as a result of site clearance and levelling) will result in the loss of this habitat (i.e. localised ousting of species and change in ecosystem function).	Identify affected points of lithic or eco-geomorphological importance within the development footprint or adjacent to the development footprint.	5.5.1. Undertake survey of sites prior to construction. Carry out a survey of all the proposed power line tower points and development footprint prior to the construction phase, taking measures to avoid more sensitive terrain, while meeting stringing distance between towers. 5.5.2. Undertake plant search and rescue operations within the affected site, where such specimens may be relocated/removed or avoided (with the relevant permits and approvals in place). 5.5.3. Ensure that demarcation of the construction area is undertaken prior to the commencement of construction and that it is maintained throughout (i.e. containment of construction and laydown areas). 5.5.4. Ensure that lithic environments are incorporated or avoided during the construction phase. Ensure that these features are cordoned off or demarcated, if required. 5.5.5. Postpone construction activities (in the affected specific area) and consult with a suitably qualified Ecologist, where refugia are utilised by gravid or rearing of juveniles.	<ul style="list-style-type: none"> Appoint a suitably qualified Ecologist to conduct a pre-construction survey of the final site and development footprint. Ensure that this is taken into consideration by reviewing signed minutes of meetings or signed reports. Appoint a suitable contractor to complete the search and rescue. Identify the plants that may need to be relocated or rescued. Contact the relevant Authorities if any protected species are found during the search and rescue. Review permits prior to undertaking search and rescue. Ensure that this is taken into consideration by reviewing signed minutes of meetings or signed reports. Verify that the proposed project construction area is determined and outlined prior to the commencement of the construction phase by reviewing signed minutes of meetings or signed reports. 	<ul style="list-style-type: none"> Once-off, prior to construction. Once-off, prior to construction. At commencement Prior to commencement of construction and search and rescue. Once-off, prior to construction. Once-off, prior to construction. 	<ul style="list-style-type: none"> Project Owner, Construction Manager, ECO and Ecologist Project Owner, Search and Rescue Contractor, and ECO Project Owner and ECO Project Owner and ECO Project Owner and ECO Project Owner, Construction Manager, ECO and Ecologist

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			<ul style="list-style-type: none"> Ensure that significant lithic environments and features, in proximity to the proposed project area, are demarcated as no-go areas so that they can be avoided. Consult with a suitably qualified Ecologist where refugia are utilised by gravid or rearing of juveniles within the development footprint. 		
5.6. Local extinction of species leading to ecosystem change due to direct faunal mortalities as a result of construction activities such as traffic movement and general disturbance on site.	To reduce the risk to fauna in respect of activities within construction footprints and activities that may arise in and around construction areas.	<p>5.6.1. Ensure proper management of traffic movement and construction labour conduct is implemented. The construction personnel and staff should be made aware of the presence of fauna within the proposed project area. The construction personnel and staff must also be made aware of the general speed limits on site and must be alert at all times for potential crossings.</p> <p>5.6.2. Develop protocols in respect of management of wildlife within and adjacent to construction sites.</p> <p>5.6.3. Undertake pre operations assessment of the construction site to identify the presence of fauna within work areas. Address and relocate any fauna identified. Establish a recording method in order to monitor the construction activities, including species presence within site, mortalities and sitings.</p>	<ul style="list-style-type: none"> Carry out Environmental Awareness Training with a discussion on the management of terrestrial fauna and flora on site, and traffic movement in this regard. Place signage to inform and educate the construction staff regarding this. Conduct audits of the signed attendance registers. Place signage to inform and educate the construction staff regarding the management of terrestrial fauna and flora on site. Undertake inspections of the construction site to verify the presence of fauna, monitor mortalities and identify the cause if encountered, as well as to relocate the identified fauna (if applicable). 	<ul style="list-style-type: none"> Once-off training and ensure that all new staff are inducted. Monthly Intermittent during the construction phase 	<ul style="list-style-type: none"> Contractor/ECO ECO Project Owner, Contractor and ECO Contractor and ECO
5.7. Change in habitat form and structure as a result of alteration of surface hydrology due to	Reduce changes in surface hydrology associated with construction activities.	<p>5.7.1. Implement ripping of disturbed areas and compacted soils, and create a managed environment.</p> <p>5.7.2. Implement measures to attenuate or decelerate</p>	<ul style="list-style-type: none"> Identify areas of compaction and rip or remediate. Identify changes in surface topography and implement deceleration 	<ul style="list-style-type: none"> Ongoing during the construction phase, with a weekly evaluation 	<ul style="list-style-type: none"> ECO and Contractor ECO and Contractor

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hardpanning of the upper soil horizon (i.e. soil compaction) due to traffic movement within and around the construction area, as well as use of materials to establish a sound working platform (including site levelling and site earthworks). This is also linked to a cumulative impact as a result of increased levels of areas dominated by built structures (within a 50 km radius).		surface flow, where required.	mechanisms if and where required. Ensure that this is taken into consideration in the Method Statement for Stormwater Management during the construction phase.	in response to the commencement and progression of construction work. ▪ As required during the construction phase	
5.8. Change in habitat structure due to general erosion primarily as a result of the movement of construction traffic, earth and plant operations, which causes compaction and surface disturbance. Erosion may occur particularly on steeper slopes where the trampling and compaction of vegetation occurs.	Reduce the likelihood of excessive erosion arising from construction traffic and plant operations.	5.8.1. Ensure site management and timeous redress of evident wind and water erosion. Identify points of rilling and address through ripping or infilling. 5.8.2. Identify alteration in surface topography and address through sculpting or remediation of surface flow.	<ul style="list-style-type: none"> ▪ Undertake monitoring of the construction site and access routes to the construction site. Identify points of rilling and implement mechanisms to rectify it, if and where required. Ensure that this is taken into consideration in the Method Statement for Erosion Management during the construction phase. ▪ Identify changes in surface topography and implement sculpting or remediation of surface flow, if and where required. Ensure that this is taken into consideration in the Method Statement for Stormwater Management during the construction 	Weekly	<ul style="list-style-type: none"> ▪ Project Owner, ECO and Contractor

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5.9. Impact of solid waste generation on fauna with possible mortalities as a result of potential ingestion or ensnarement. Solid waste (e.g. small bolts, wires etc.) has the potential to harm or kill animals through ingestion or ensnarement.	To reduce the impact of solid waste materials on particular fauna. The containment and disposal of solid waste is required in order to avert behavioural change in local fauna as well as general pollution impacts on terrestrial habitat.	5.9.1. Reduce the amount of material packaging imported to sites. Monitor site for materials (small metallic objects, off cuts, wire etc.) that may be within and around the construction area. 5.9.2. Ensure that waste disposal systems are present on site. 5.9.3. Ensure that waste generated on site is contained in order to prevent access by terrestrial fauna and avifauna. 5.9.4. Remove waste from site on a regular basis, following by safe disposal at a licensed waste disposal facility.	phase. <ul style="list-style-type: none"> Conduct audits to ensure that a waste disposal system is compiled and abided by, and updated as required. Conduct audits to ensure that receptacles for waste are available at all sites of operation and that these are sealed off and contained. Record and report any non-compliance. Conduct audits and site inspections to ensure that regular cleaning operations are undertaken on site, and that this includes the clearance of waste materials. Record and report any non-compliance. 	Daily	<ul style="list-style-type: none"> Project Owner and ECO Contractor and ECO Contractor and ECO
5.10. Changes in ecological processes and vegetation and habitat alteration through the introduction of nutrients and other materials which may impact directly or indirectly on flora and faunal components of region.	Identify points where surface run off and related disposals may arise and reduce potential for change in habitat by identifying habitat form and nature and taking avoidance actions.	5.10.1. Compile and implement a Vegetation Rehabilitation Plan for the construction phase. 5.10.2. Conduct a site survey of the final development footprint prior to construction and identify points of significance or the overall significance of the site. 5.10.3. Containment and demarcation of the construction area, labour workforce and related activities. Construction activities should be confined to the laydown area and construction footprints. 5.10.4. Cordon off any significant features if required, or take remedial measures to avoid area if required. 5.10.5. Implementation of control measures relating to the conduct of construction staff and contractors on site and in relation to the prevailing natural environment. Construction staff should be managed and maintained within construction areas, and educated on waste management and	<ul style="list-style-type: none"> Ensure that a suitable specialist is appointed to compile a Vegetation Rehabilitation Plan. Review signed minutes of meetings or signed reports. Appoint a suitably qualified Ecologist to conduct a pre-construction survey of the final site and development footprint. Verify that the proposed project construction area is determined and outlined prior to the commencement of the construction phase by reviewing signed minutes of meetings or signed reports. Ensure that significant lithic environments and features, in proximity to the proposed project area, 	<ul style="list-style-type: none"> Prior to the commencement of construction. Prior to construction Once-off, prior to the commencement of construction Once-off, prior to the commencement of construction Once-off, prior to the commencement of construction Once-off, prior to the commencement of construction 	<ul style="list-style-type: none"> Project Owner, Construction Manager, ECO and Ecologist Project Owner, Construction Manager, ECO and Ecologist Project Owner and ECO Project Owner and ECO Contractor/ECO ECO ECO ECO and Contractor

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		<p>conduct on site.</p> <p>5.10.6. Control of all imported materials including concrete and hazardous materials to ensure that materials are managed on site and within the construction footprint. Control of all waste materials to ensure that all materials are removed from site, including sewage, for disposal at an appropriate point (i.e. a licenced facility).</p> <p>5.10.7. Ensure a well-managed and timeous construction schedule to avoid prolonged period of construction and disturbance.</p>	<p>are demarcated as no-go areas so that they can be avoided.</p> <ul style="list-style-type: none"> Ensure that this is taken into consideration by reviewing signed minutes of meetings or signed reports. Carry out Environmental Awareness Training. Conduct audits of the signed attendance registers. Conduct audits to ensure that a waste disposal system is compiled and abided by, and updated as required. Carry out audits to verify if the construction process is being managed efficiently with the aim of avoiding unnecessary delays, which may have an impact on the surrounding environment. 	<ul style="list-style-type: none"> Once-off training and ensure that all new staff are inducted. Monthly Daily Weekly 	<ul style="list-style-type: none"> ECO and Contractor
5.11. Ousting and behavioural change in fauna through effects such as altering corridors associated with movement, herbivory and predation. Certain species will benefit from the various changes in land use, while others will be ousted from areas.	Changes in factors around the proposed on-site substation and transmission line areas (e.g. noise, human presence etc.), changes to the localized ecology and through extension affects corridors and the broader ecology of the region.	<p>5.11.1. Refer to management measures in Sections 5.9.1 to 5.9.8 above and implement them for this potential impact, along with the associated monitoring methodology, frequency, and responsibility.</p> <p>5.11.2. Identify areas that may show increased faunal presence (streams, rivers, pans etc.).</p> <p>5.11.3. Identify mitigation measures to reduce impacts on faunal movement, access to water points etc.</p>	<ul style="list-style-type: none"> Consider site topography and nature using ecological assessment techniques. Ensure that a suitable specialist is appointed in this regard. Identify the proposed project site in relation to the broader habitat. Introduce specific management measures to mitigate against noise, light and human presence. 	<ul style="list-style-type: none"> Prior to and during construction 	<ul style="list-style-type: none"> Construction Manager and ECO (and Ecologist once-off)
5.12. Increased ELP levels as a result of light pollution that may be associated with all built structures of the	To reduce the impact of increased ELP on nocturnal species, resulting in alteration of ecological processes.	5.12.1. The direction of lighting should not be focused outside of the subject area, while the level of lumens should be such that the necessary lighting to achieve its objective is achieved (security,	<ul style="list-style-type: none"> Ensure that these lighting requirements are taken into consideration and included in the contract specifications. Verify this by 	<ul style="list-style-type: none"> Once-off, prior to the commencement of construction 	<ul style="list-style-type: none"> Contractor and ECO

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proposed project and the projects considered within the 50 km radius (cumulative impact). The cumulative level of increased lighting in the area will serve to alter the behaviour of a number of nocturnal (and possibly crepuscular and diurnal) species and alter ecological processes in and around these points (i.e. localised change in species composition and ethology with concomitant change in ecosystem function).		operations etc.).	undertaking site audits and recording and reporting any non-compliance.		
5.13. Increased and expanded anthropogenic influences across the region (within a 50 km radius), with the likely influence of ousting particular species of fauna. Increased noise pollution levels with concomitant impact on faunal behaviour in respect of smaller mammals and other fauna that utilise sound in their various behavioural patterns (prey	To reduce the likelihood of ousting of fauna and impact on faunal behaviour as a result of increased and expanded anthropogenic influences and noise pollution.	5.13.1. Control and management procedures relating to construction activities in and around the transmission line and associated infrastructure to be implemented (i.e. management relating to disturbance of flora and fauna).	<ul style="list-style-type: none"> Carry out visual inspections to ensure strict control over the disturbance of flora and fauna. 	<ul style="list-style-type: none"> Weekly 	<ul style="list-style-type: none"> ECO

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<p>detection, social interaction).</p> <p>These are cumulative impacts.</p>					
<p>5.14. Vegetation and habitat alteration, and change in ecological processes and habitat with reversion to secondary habitat structure at transformed sites. Recruitment and behavioural change in fauna (i.e. change in ecological processes and habitat). These are cumulative impacts.</p>	<p>To reduce the impact of vegetation and habitat alteration and the likelihood of recruitment and behavioural change in fauna.</p>	<p>5.14.1. Compile and implement a Vegetation Rehabilitation Plan in order to improve habitat diversity and maintenance of improved habitat within areas subject to change as a consequence of the proposed development.</p>	<ul style="list-style-type: none"> Ensure that a suitable specialist is appointed to compile a Vegetation Rehabilitation Plan. Review signed minutes of meetings or signed reports. 	<ul style="list-style-type: none"> Once-off prior to construction and implementation during construction. 	<ul style="list-style-type: none"> Project Owner, Construction Manager, ECO and Ecologist
<p>5.15. Increased dissection of habitat on account of increasing levels of infrastructure resulting in changes in plant community structure and species composition. This is a cumulative impact.</p>	<p>Reduce dissection of habitat.</p>	<p>5.15.1. Implementation of control measures relating to conduct of staff and contractors on site and in relation to the prevailing natural environment.</p>	<ul style="list-style-type: none"> Carry out Environmental Awareness Training. Conduct audits of the signed attendance registers. 	<ul style="list-style-type: none"> Once-off training and ensure that all new staff are inducted. Monthly 	<ul style="list-style-type: none"> Contractor and ECO ECO
<p>5.16. Loss of freshwater habitat and ecological structure; changes to the freshwater resource ecological and</p>	<p>To reduce the potential of loss of freshwater habitat and ecological structure and associated impacts.</p>	<p>5.16.1. All areas of increased ecological sensitivity should be marked as such and be off limits to all unauthorised construction vehicles and personnel.</p> <p>5.16.2. Where it is impossible to avoid placing</p>	<ul style="list-style-type: none"> Ensure that the 32 m zone of regulation is taken into consideration in the final layout of the proposed electrical infrastructure. Ensure that 	<ul style="list-style-type: none"> Once-off prior to the commencement of construction. 	<ul style="list-style-type: none"> Project Owner and ECO ECO and Contractor

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sociocultural service provision; impacts on the freshwater resources hydrological function and sediment balance; and potential impacts on water quality.		<p>infrastructure within riparian habitat, flow connectivity must be retained by preventing fragmentation of the riparian habitat. Fragmentation of the riparian habitat can be avoided by (for example) ensuring that the disturbance footprint remains as small as possible, that no solid strips are excavated within the riparian habitat, that structures (such as culverts or monopoles) placed within the active channel do not cause increased turbulence, which will result in erosion. It must also be ensured that no canalization or incision of the riparian resource takes place as a result of the construction activities.</p> <p>5.16.3. Ensure that vegetation clearing and indiscriminate vehicle driving does not occur within demarcated sensitive areas, including the identified freshwater resources, their associated riparian zones and the applicable 32 m NEMA zone of regulation.</p> <p>5.16.4. Contractor laydown areas must not be permitted within the 32 m NEMA zone of regulation around the identified freshwater resources.</p> <p>5.16.5. Minimize construction footprints and edge effects of construction activities. Edge effects of activities, particularly erosion and alien/weed control need to be strictly managed.</p> <p>5.16.6. Clearing of vegetation at all impact sites must be kept to an absolute minimum, and growth of indigenous vegetation must be promoted to protect soils.</p> <p>5.16.7. All development footprint areas should remain as small as possible and should not encroach onto surrounding more sensitive areas. It must be</p>	<p>this is taken into account, where possible and as feasible (as recommended by the Aquatic Ecology Specialist), and that the recommended mitigation measures are implemented as required.</p> <ul style="list-style-type: none"> Ensure that flow connectivity is retained if it is not avoidable to place infrastructure within riparian habitat, and that fragmentation is prevented. Ensure that these measures are implemented by undertaking site audits and reporting any non-compliance. Undertake site audits and inspections to ensure that vegetation removal and vehicle driving occurs on demarcated routes and that all sensitive areas are regarded as no-go areas. Ensure that the contractor demarcates sensitive areas and dedicated access routes for construction personnel. Monitor and report any non-compliance. Ensure that the limits of the construction boundary and temporary access roads are confirmed and that the construction area and vegetation removal is kept to a minimum. Conduct site audits and inspections to verify if this is undertaken and record and report any non-compliance. Ensure that these management actions 	<ul style="list-style-type: none"> Weekly Once-off prior to construction for demarcation and weekly to ensure these demarcated areas are respected. Weekly Weekly 	<ul style="list-style-type: none"> ECO and Contractor ECO and Contractor ECO and Contractor

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			Methodology	Frequency	Responsibility
		<p>ensured that the freshwater resources, and their associated regulatory zones are off-limits to construction vehicles and personnel. The boundaries of footprint areas are to be clearly defined and it should be ensured that all activities remain within defined footprint areas.</p> <p>5.16.8. Planning of temporary access routes should take the site sensitivity plan into consideration, and wherever possible, existing roads should be utilised. If additional roads are required, such as in the form of jeep tracks, then wherever feasible such "roads" should be constructed a distance from the more sensitive riparian areas and not directly adjacent thereto. If crossings are required they should cross the system at right angles, as far as possible to minimise impacts in the receiving environment, and any areas where bank failure is observed due to the effects of such crossings should be immediately repaired by reducing the gradient of the banks to a maximum of a 1:3 slope and where needed necessary, installing support structures. This should only be necessary if existing access roads are not utilised.</p> <p>5.16.9. Implement alien vegetation control program; and promote indigenous vegetation growth to protect soils.</p> <p>5.16.10. Construction activities should occur in the low flow season/ dry season to avoid sedimentation and minimize disturbance to hydraulic function. The duration of possible impacts on the riverine system should be minimised as far as possible by ensuring that the duration of time in which possible flow</p>	are taken into consideration during the construction phase via site audits and inspections, and record and report any non-compliance.		

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Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>alteration and sedimentation will take place is minimised.</p> <p>5.16.11. Use construction techniques to support the hydrology and sediment control functions of the freshwater resource. A suitably qualified engineer should be consulted for guidance in this regard, and these techniques should be incorporated into the EMPr and stormwater management plan.</p> <p>5.16.12. Limit excavations to ensure that drainage patterns return to normal after construction.</p> <p>5.16.13. No disposal of waste within/in the vicinity of the freshwater resources. Correct waste management principles must be implemented on site and adequate waste disposal facilities must be provided.</p> <p>5.16.14. Rehabilitate disturbed areas following completion of construction activities through reprofiling and revegetation.</p> <p>5.16.15. Desilt the freshwater resource areas affected by construction activities, in the vicinity of construction activities. Desilting should preferably be undertaken by hand, and not using heavy machinery to avoid further impacts on the freshwater resources.</p> <p>5.16.16. Strict erosion control and soil management measures must be implemented during the construction and operational phases, particularly in areas where vegetation has been removed.</p> <p>5.16.17. Stockpiled soil must be levelled as required during construction and post-construction to avoid sedimentation from runoff, and revegetated with indigenous vegetation.</p> <p>5.16.18. Compacted soil should be ripped, reprofiled and reseeded with indigenous vegetation following</p>			

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			Methodology	Frequency	Responsibility
		completion of construction activities.			
5.17. Disturbance of terrestrial fauna and flora on site due to construction workers and activities.	To advise construction staff of the requirements in respect of management of flora and fauna on site during the construction phase.	5.17.1. Conduct an Environmental Awareness Training and induction for all construction staff and personnel.	<ul style="list-style-type: none"> Carry out Environmental Awareness Training with a discussion on the management of terrestrial fauna and flora on site. Conduct audits of the signed attendance registers. 	<ul style="list-style-type: none"> Prior to construction and as required by the ECO. Ensure that all new staff are inducted. Monthly 	<ul style="list-style-type: none"> ECO and Contractor ECO
C. OPERATIONAL PHASE					
5.18. Change in ecological processes and habitat due to disturbance as a result of general activities associated with the maintenance operations around the transmission line, which will include replacing of parts and infrastructure, as well as use of materials such as hydrocarbons.	Reduce impacts on terrestrial fauna and flora as a result of the operation of the proposed on-site substation.	5.18.1. Implement sound and appropriate management of the proposed project (i.e. electrical infrastructure) site including storm water management, vegetation management and related aspects around the site. 5.18.2. Ensure that containment of maintenance activities is achieved to within the on-site substation to avoid unnecessary disturbance outside of the footprint. 5.18.3. Implementation of control measures relating to the conduct of maintenance staff and contractors on site and in relation to the prevailing natural environment. Operational staff should be educated on correct procedures to be used in waste disposal, conduct on site and operations of vehicles and machinery. 5.18.4. Implement control of all imported material (where applicable) to ensure that all materials are managed on site and within the footprint of the proposed on-site substation and O&M Building. 5.18.5. Control of all waste materials to ensure that all materials are removed from site, including sewage, for disposal at an appropriate facility (i.e. a licenced facility).	<ul style="list-style-type: none"> Ensure that these factors are taken into consideration by undertaking site audits and visits and recording any non-compliance. 	<ul style="list-style-type: none"> Ongoing 	<ul style="list-style-type: none"> Project Owner

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			Methodology	Frequency	Responsibility
		<p>5.18.6. Appropriate lighting of the on-site substation should be provided in order to avoid unnecessary illumination of the surrounding environment.</p> <p>5.18.7. Ensure the appropriate establishment of electric fencing around the proposed on-site substation (neutral line lowest). Inter alia, a neutral line should be established at ground level, while methods to prevent perching of birds on upper stands should be explored.</p> <p>5.18.8. Monitoring of the fence line on an ongoing basis will alleviate impacts on smaller fauna, such as tortoise, that may become entrapped by the electric fence.</p>			
5.19. Change in ecological processes and habitat, disturbance of emergent and established vegetation, changes in edaphics and other drivers, ousting of fauna in and around the site and particularly adjacent to the transmission line, mortalities of species such as tortoise, and changes in biophysical drivers along the proposed transmission line route (soil, vegetation cover, surface hydrology etc.), as a result of general activities during the transmission line and service road maintenance	Reduce impacts on terrestrial fauna and flora as a result of the operation of the proposed transmission line and service road.	<p>5.19.1. Implement sound and appropriate management of points around the proposed towers including storm water management and vegetation control.</p> <p>5.19.2. Ensure that containment of maintenance activities is achieved to the proposed transmission line servitude and points around towers to avoid unnecessary disturbance outside of the footprint.</p> <p>5.19.3. Implementation of control measures relating to the conduct of maintenance staff and contractors on site and in relation to the prevailing natural environment. Operational staff should be educated on waste management while on site, adherence to speed limits and general conduct on site.</p> <p>5.19.4. Implement control of all imported material to ensure that materials are managed during operations along the proposed transmission line route.</p> <p>5.19.5. Control of all waste materials to ensure that all materials are removed from along the proposed transmission line route and disposed of correctly at</p>	<ul style="list-style-type: none"> Ensure that these factors are taken into consideration by undertaking site audits and visits and recording any non-compliance. 	<ul style="list-style-type: none"> Ongoing 	<ul style="list-style-type: none"> Project Owner

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			Methodology	Frequency	Responsibility
processes.		a licenced facility.			
5.20. Disturbance of vegetation and alteration of vegetation community structure and habitat form as a result of maintenance operations around the proposed on-site substation and O&M building, of the transmission line and service road, as well as increased human and vehicle traffic levels.	The maintenance of the prevailing habitat form and type in areas subject to disturbance during the operational phase.	5.20.1. Implement vegetation management and conservation initiatives which includes exotic weed control; vegetation management along the power line and service road route; and around fence lines and within the site; and monitoring and maintenance of larger plant associations in proximity to infrastructure. 5.20.2. Undertake regular review of vegetation and habitat in and around the towers and substation. 5.20.3. Specific consideration of habitat change indicated by moribund state, rapid change in structure and composition of vegetation etc.	<ul style="list-style-type: none"> Undertake monitoring via visual inspections of the site, and record and report non-compliance and recommend methods to rectify any areas of concern. 	Monthly	Project Owner
5.21. Increase in terrestrial mortalities through the movement of vehicles along the line route (particularly tortoises). Electric fencing also offers a potential threat to some species. This has the potential to inflict lethal consequences on smaller and less mobile species such as tortoises (i.e. localised extinction or ousting of species with concomitant change in ecosystem function).	To reduce the risk to fauna due to activities associated with the operations of the proposed infrastructure.	5.21.1. Develop protocols in respect of management of wildlife within and immediately adjacent to the operational area. 5.21.2. Undertake a regular assessment of the operational site to identify the presence of fauna within work areas. Address and relocate any fauna identified. 5.21.3. Log any identified mortalities and identify the cause of such, along with remedial actions.	<ul style="list-style-type: none"> Monitor mortalities and identify the associated cause if encountered. Record the number of faunal mortalities and ensure that remedial actions are implemented. 	Ongoing	Project Owner
5.22. Change in faunal behaviour due to	To manage impacts on faunal behaviour and associated	5.22.1. Develop protocols in respect of management of wildlife within and immediately adjacent to the	<ul style="list-style-type: none"> Identify points of excessive noise or light and consider mitigation measures, 	Daily to intermittent	Project Owner

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			Methodology	Frequency	Responsibility
increased lighting around the proposed on-site substation and O&M Building (ELP), which will be lit at night. In particular, invertebrate species may be attracted to lights which have concomitant influences on the behavioural patterns of other species in the area. Alternatively, hunting and other behaviours may alter as a consequence of additional lighting within an area previously devoid of such factor. Increased ELP levels is also listed as a cumulative impact.	ecological aspects associated with ELP and operations.	<p>operational area.</p> <p>5.22.2. Undertake a regular assessment of the operational site to identify the presence of fauna within work areas. Address and relocate any fauna identified.</p> <p>5.22.3. Ensure that nuisance factors, in particular noise and light are mitigated and minimised.</p> <p>5.22.4. Apply suitable lumens and ensure direction of lighting is within the boundary of the proposed on-site substation. The direction of lighting should not be focused outside of the subject area, while the level of lumens should be such that the necessary lighting to achieve its objective is achieved (security, operations etc.).</p>	if possible; and monitor and log changes and faunal mortalities that are identified from time to time.		
5.23. Birds nesting on transmission line or on-site substation.	<p>To reduce conflict with infrastructure management and fire risks of nests.</p> <p>Reduce nesting of birds on the electrical infrastructure</p>	<p>5.23.1. Nest management on a case by case under the supervision of an Ornithologist, and in conformance with all relevant national and provincial legislation.</p> <p>5.23.2. The operational phase EMP must include provision for application to the provincial authority for permits for any necessary nest management.</p>	<ul style="list-style-type: none"> Nest relocation or removal should be done under permit from the provincial authority. 	<ul style="list-style-type: none"> As required 	<ul style="list-style-type: none"> ECO
D. DECOMMISSIONING PHASE					
5.24. Recruitment and behavioural change in	To manage impacts on faunal behaviour and associated	5.24.1. Develop protocols in respect of management of wildlife within and adjacent to the site designated	<ul style="list-style-type: none"> Appoint a suitable specialist to undertake a final site evaluation and to 	<ul style="list-style-type: none"> Prior to demolition and/or 	<ul style="list-style-type: none"> Project Owner and ECO

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Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
fauna resulting in change in ecological processes and habitat.	ecological aspects during decommissioning activities.	<p>for decommissioning. Compile and implement a Vegetation Rehabilitation Plan in order to improve habitat diversity. Improved habitat complexity will buffer transformation and reduce impacts on faunal behaviour and populations.</p> <p>5.24.2. Undertake regular assessment of sites to identify the presence of fauna within work areas prior to and post construction. Address and relocate any fauna identified prior to demolition.</p> <p>5.24.3. Ensure that nuisance factors, in particular noise and light are mitigated and minimised during removal.</p>	<p>complete the search and rescue. Identify the plants that may need to be relocated or rescued.</p> <ul style="list-style-type: none"> Ensure that a suitable specialist is appointed to compile a Vegetation Rehabilitation Plan. Review signed minutes of meetings or signed reports. Undertake site audits and record and report any non-compliance. 	<p>decommissioning Prior to demolition and/or decommissioning</p> <ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> Project Owner, Ecologist and ECO ECO and Contractor
5.25. Impact of solid waste generation on fauna as a result of potential ingestion or ensnarement. Solid waste (e.g. small bolts, wires etc.), and solid and derelict structures left on site following the demolition and removal of structures has the potential to harm or kill animals (local fauna) through ingestion or ensnarement.	The containment and correct disposal of solid waste is required in order to avert behavioural change in local fauna as well as general pollution impacts on the terrestrial habitat.	<p>5.25.1. Ensure that waste generated on site is contained in order to prevent access by terrestrial fauna and avifauna.</p> <p>5.25.2. Remove waste from site on a regular basis, following by safe disposal at a licensed waste disposal facility.</p> <p>5.25.3. Ensure that a thorough survey of the site following clearance and decommissioning is undertaken. All material is to be removed from site at the end of the decommissioning phase.</p>	<ul style="list-style-type: none"> Conduct audits to ensure that receptacles for waste are available at all sites of operation and that these are sealed off and contained. Record and report any non-compliance. Conduct audits and site inspections to ensure that regular cleaning operations are undertaken on site, and that this includes the clearance of waste materials. Record and report any non-compliance. Conduct a final external audit to confirm that area is left in a suitable condition. 	<ul style="list-style-type: none"> Daily Daily At the end of the decommissioning phase 	<ul style="list-style-type: none"> Contractor and ECO Contractor and ECO Project Owner and ECO
5.26. Vegetation and habitat alteration and reversion to secondary habitat structure at transformed sites. Removal of the proposed transmission line and related infrastructure	Reinstatement of vegetation and habitat following closure of site or decommissioning of operations.	<p>5.26.1. Remove all structures and relocate material off site and dispose of waste materials correctly.</p> <p>5.26.2. Rip and manage compacted surface soils at areas. Areas that have been subject to compaction should be ripped mechanically, or by hand in order to promote vegetative colonisation of the affected areas. Undertake topographic sculpting of site. If</p>	<ul style="list-style-type: none"> Carry out site inspections and audits to review the site and ensure that all structures are removed from site and correctly disposed (as required and where applicable). Carry out inspections and site audits to ensure that the site is ripped and 	<ul style="list-style-type: none"> Once-off operation Throughout the decommissioning phase. Throughout the decommissioning 	<ul style="list-style-type: none"> Project Owner and ECO Project Owner and ECO Project Owner and ECO Project Owner,

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Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
will alter the localised topography at points, which may prevent successional processes establishing at these points on account of intrinsic changes in edaphics, lithic or other factors.		<p>and where required, areas should be sculpted to mimic the prevailing habitat. Ensure that the site is revegetated.</p> <p>5.26.3. Monitor and address any exotic plant establishment.</p> <p>5.26.4. Compile and implement a Vegetation Rehabilitation Plan in order to improve habitat diversity. Establish rehabilitation protocols and management interventions for site that would include post construction remediation and rehabilitation.</p> <p>5.26.5. Undertake management of secondary emergent vegetation communities to ensure that emergent vegetation is aligned to prevailing habitat.</p>	<p>sculpted to conform to the prevailing topography, and that the site is re-vegetated, if and where required. Monitor the management measures to verify if they are implemented successfully in order to ensure plant re-vegetation.</p> <ul style="list-style-type: none"> Carry out visual inspections to verify the removal of exotic plant species and record and report any non-compliance. Ensure that a suitable specialist is appointed to compile a Vegetation Rehabilitation Plan. Review signed minutes of meetings or signed reports. 	<p>phase.</p> <ul style="list-style-type: none"> Once-off prior to decommissioning and implementation during decommissioning. 	Decommissioning Manager, ECO and Ecologist
5.27. Rehabilitation of flora on site	Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to construction.	<p>5.27.1. All damaged areas shall be rehabilitated upon completion of the contract.</p> <p>5.27.2. All natural areas must be rehabilitated with species indigenous to the area. Re-seed with locally-sourced seed of indigenous grass species that were recorded on site pre-construction.</p> <p>5.27.3. Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas.</p>	<ul style="list-style-type: none"> Conduct a final external audit to confirm that area is rehabilitated to an acceptable level. 	<ul style="list-style-type: none"> Once off 	<ul style="list-style-type: none"> Project Owner with feedback and input from an appropriate specialist.

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6. OPEN SPACE MANAGEMENT PLAN

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
A. DESIGN PHASE					
6.1. Loss of vegetation and habitat fragmentation.	Keeping the area cleared of vegetation to a minimum.	6.1.1. Clearing of vegetation should be kept to a minimum and take into consideration the sensitivities on site shown in Appendix B of this EMPr.	<ul style="list-style-type: none">▪ Ensure that design and layout is uniform and well-adapted to the surrounding environment and that no unnecessary areas are cleared of vegetation.	<ul style="list-style-type: none">▪ Once-off during design	<ul style="list-style-type: none">▪ Project Owner
6.2. Impacts due to establishment of alien invasive plants.	Ensure the appropriate removal of alien invasive vegetation from the proposed project area and prevent the establishment and spread of alien invasive plants due to the project activities.	6.2.1. Ensure compliance with relevant Environmental Specifications for the control and removal of alien invasive plant species. 6.2.2. Appoint a specialist or contact relevant authorities to seek guidance on the removal of the alien vegetation on site. 6.2.3. Compile and finalise an alien weed eradication programme.	<ul style="list-style-type: none">▪ Appoint a suitable specialist/ Contractor or contact the relevant authorities to seek guidance on the removal of the planted alien invasive species.▪ Appoint a suitable specialist to compile an alien invasive vegetation eradication plan.▪ Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.	<ul style="list-style-type: none">▪ Once-off during the design phase.▪ Once-off during the design phase.▪ Once-off during the design phase.	<ul style="list-style-type: none">▪ Project Owner▪ Project Owner▪ ECO
6.3. Permanent barriers to animal movement and habitat fragmentation.	To reduce the impact that permanent barriers (as a result of construction activities and the proposed infrastructure) will have on animal movement within the area.	6.3.1. Fencing should allow for the passage of small and medium sized mammals and all forms of mesh fencing should be avoided. 6.3.2. All remaining areas that are not impacted upon by the proposed development footprint should remain unfenced to allow for movement corridors between the remainder of the farm.	<ul style="list-style-type: none">▪ Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.▪ Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.	<ul style="list-style-type: none">▪ Once-off during the planning and design phase▪ Once-off during the planning and design phase	<ul style="list-style-type: none">▪ Project Owner▪ Project Owner
B. CONSTRUCTION PHASE					
6.4. Permanent barriers to animal movement and habitat fragmentation.	The reduction in the impact that permanent barriers (as a result of construction activities) will have on animal movement	6.4.1. Fencing should allow for the passage of small and medium sized mammals and all forms of mesh fencing should be avoided.	<ul style="list-style-type: none">▪ Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.	<ul style="list-style-type: none">▪ Once-off during the planning and design phase	<ul style="list-style-type: none">▪ Project Owner

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Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
	within the area.				
6.5. Loss of vegetation and habitat fragmentation.	Keeping the area cleared of vegetation to a minimum.	6.5.1. Clearing of vegetation should be kept to a minimum, keeping the width and length of the earthworks to a minimum.	<ul style="list-style-type: none"> Monitor activities and record and report non-compliance. 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> ECO and Contractor
6.6. Increases in the prevalence of exotic and invasive plants.	Reduce area of disturbance and decrease the level of exotic plants within or around the site.	6.6.1. Regular monitoring through visual inspection and redress of exotic weeds in and around site, particularly during construction. 6.6.2. Avoidance of excessive earthworks and sculpting of land.	<ul style="list-style-type: none"> Monitor the presence of alien invasive species on the development site. Maintenance of vegetation and avoidance of unnecessary clearance of route. 	<ul style="list-style-type: none"> Ongoing, and as required. Ongoing 	<ul style="list-style-type: none"> ECO and Contractor ECO and Contractor
C. OPERATIONAL PHASE					
6.7. Increased risk of alien plant invasion.	Ensure that the site is kept free from alien invasive species.	6.7.1. Monitor the site and remove alien invasive species that are found.	<ul style="list-style-type: none"> Implement intermittent but regular weed control initiatives on the development site. 	<ul style="list-style-type: none"> Reporting frequency depends on legal compliance framework. 	<ul style="list-style-type: none"> Project Owner
6.8. Increased animal road mortality.	Minimise loss of fauna as a result of road mortalities.	6.8.1. Create awareness during staff induction programmes. Staff must be made aware of the general speed limits as well as the potential animals that may cross and how to react in these situations.	<ul style="list-style-type: none"> Conduct staff awareness training programmes. 	<ul style="list-style-type: none"> Once-off training and ensure all new staff are inducted. 	<ul style="list-style-type: none"> Project Owner
D. DECOMMISSIONING PHASE					
6.9. No specific impacts are associated with the decommissioning phase other than those from the operational phase that will still be relevant for the duration of the decommissioning phase due to on-going	To manage impacts on the surrounding environment during the operational phase.	6.9.1. Disturbed and transformed areas should be contoured to approximate naturally occurring slopes to avoid lines and forms that will contrast with the existing landscapes	<ul style="list-style-type: none"> Final external audit of area to confirm that area is rehabilitated to an acceptable level 	<ul style="list-style-type: none"> Once off 	<ul style="list-style-type: none"> Project Owner
		6.9.2. Stockpiled topsoil should be reapplied to disturbed areas and these areas should be re-vegetated using a mix of native species in such a way that the areas will form as little contrast in form, line, colour and texture with the surrounding undisturbed landscape.	<ul style="list-style-type: none"> Final external audit of area to confirm that area is rehabilitated to an acceptable level 	<ul style="list-style-type: none"> Once off 	<ul style="list-style-type: none"> Project Owner

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			Methodology	Frequency	Responsibility
occupation of the area.		6.9.3. Edges of re-vegetated areas should be feathered to reduce form and line contrasts with surrounding undisturbed landscape.	▪ Final external audit of area to confirm that area is rehabilitated to an acceptable level.	▪ Once off	▪ Project Owner

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7. TRAFFIC MANAGEMENT PLAN INCLUDING TRANSPORTATION PLAN

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
A. DESIGN PHASE					
7.1. Increased traffic generation	Manage impact that additional traffic generation will have on road network	7.1.1. If abnormal loads need to be transported by road to the site, a permit needs to be obtained from the relevant provincial government department.	<ul style="list-style-type: none">Ensure that the permits are applied for and obtained prior to commencement.Verify that this has been undertaken by reviewing approved permits.	<ul style="list-style-type: none">Once-off during the design phaseOnce-off during the design phase.	<ul style="list-style-type: none">ContractorECO
B. CONSTRUCTION PHASE					
7.2. Increased traffic generation during the construction phase resulting in a reduction of road based level of service	Reduce the amount of road based traffic during the construction phase.	<div>7.2.1. Well maintained vehicles should be used together with well-trained drivers during the construction phase. Vehicle maintenance and driver competency should be monitored. Proof of driver competency as well as the vehicle checks should be verified and undertaken to ensure that vehicles are roadworthy and hence, do not pose a safety risk. The Contractors must ensure that construction vehicles are roadworthy, properly serviced and maintained, and respect the vehicle safety standards implemented by the Project Owner.</div> <div>7.2.2. During the construction phase, suitable parking areas should be designated for trucks and vehicles.</div> <div>7.2.3. The use of public transport (buses and/or minibus taxis) to convey construction personnel to the site should be encouraged.</div> <div>7.2.4. It is recommended that vehicles are not overloaded during the construction phase in order to reduce impacts on the road structures, particularly the access roads leading to the site.</div>	<ul style="list-style-type: none">Carry out random checks of driver licenses and conduct random visual inspections of construction vehicles for roadworthiness.Monitor the placement of the designated parking area for trucks and vehicles via visual inspections and record and report any non-compliance.Contractor may record arrival and departure times as well as number of workers using minibuses.Perform visual inspection of vehicles during the construction phase.	<ul style="list-style-type: none">Random visual inspection of vehicles weekly.Once-off prior to construction and as required during the construction phase.Once a month on a randomly selected day.Random visual inspection of vehicles weekly.	<ul style="list-style-type: none">ContractorProject Owner and ECOContractorContractor

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Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		Random visual inspection of vehicles should be undertaken in order to monitor for overloading. The inspections should also verify if the trucks are covered with appropriate material (such as tarpaulin) if and where possible.			
7.3. Increased level of road accidents (involving pedestrians, animals, other motorists on the surrounding tarred/gravel road network) due to increased traffic during construction.	Minimise the impact of the construction activities on the local traffic and avoid accidents with pedestrians, animals and other drivers on the surrounding tarred/gravel roads. Reduce number of road accidents due to increased traffic during construction.	<p>7.3.1. Well maintained vehicles should be used together with well-trained drivers during the construction phase. Vehicle maintenance and driver competency should be monitored. Proof of driver competency as well as the vehicle checks should be verified and undertaken to ensure that vehicles are roadworthy and hence, do not pose a safety risk. The Contractors must ensure that construction vehicles are roadworthy, properly serviced and maintained, and respect the vehicle safety standards implemented by the Project Owner.</p> <p>7.3.2. Road mortality monitoring programme (inclusive of wildlife collisions record keeping) should be established.</p> <p>7.3.3. Adhere to all speed limits applicable to all roads used.</p> <p>7.3.4. Implement clear and visible signage and signals indicating movement of vehicles within and around site, especially along access roads and intersections with public and private roads.</p>	<ul style="list-style-type: none"> Carry out random checks of driver licenses and conduct random visual inspections of construction vehicles for roadworthiness. Appropriate monitoring should be undertaken. Ensure that speed limits are adhered to. Carry out random visual inspections to verify speed limits and general awareness of vehicle drivers. Implement clear signalisation. Carry out random inspections to verify whether proper construction signage is being implemented. 	<ul style="list-style-type: none"> Random visual inspection of vehicles weekly. Weekly Daily Random during the construction phase On-going Random during the construction phase 	<ul style="list-style-type: none"> Contractor and ECO Contractor and ECO ECO Contractor and ECO ECO
C. OPERATIONAL PHASE					
7.4. Increased level of road accidents (involving pedestrians, animals, other motorists on the surrounding tarred/gravel road network) due to increased traffic during construction.	Minimise the impact of the operational activities on the local traffic and avoid accidents with pedestrians, animals and other drivers on the surrounding tarred/gravel roads.	<p>7.4.1. Adhere to all speed limits applicable to all roads used.</p> <p>7.4.2. Implement clear and visible signage and signals indicating movement of vehicles at the intersection with the Transnet Service Road to</p>	<ul style="list-style-type: none"> Ensure that speed limits are adhered to. Carry out random visual inspections to verify speed limits and general awareness of vehicle drivers. 	<ul style="list-style-type: none"> Daily Random during the operational phase Ongoing Random during the 	<ul style="list-style-type: none"> Project Owner Project Owner

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Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
gravel road network) due to traffic on the maintenance road during the operational phase.	the surrounding tarred/ gravel roads. Reduce number of road accidents due to traffic during the operational phase.	ensure safe entry and exit.	<ul style="list-style-type: none">Implement clear signalisation.Carry out random inspections to verify whether proper operational signage is being implemented.	operational phase	
D. DECOMMISSIONING PHASE					
7.5. Ensure that the construction mitigation and management measures are adhered to during the decommissioning phase.					

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8. STORM WATER MANAGEMENT PLAN

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
A. DESIGN PHASE					
8.1. Impact of the project if a detailed storm water management plan is not correctly prepared.	To limit the effect of uncontrolled storm water run-off from developed areas onto natural areas.	8.1.1. Prepare a detailed stormwater management plan outlining appropriate treatment measures to address runoff from disturbed portions of the site, such that they do not: <ul style="list-style-type: none">result in concentrated flows into natural watercourses i.e. provision should be made for temporary or permanent measures that allow for attenuation, control of velocities and capturing of sediment upstream of natural water courses;result in any necessity for concrete or other lining of natural water courses to protect them from concentrated flows of the development;divert flows out of their natural flow pathways, thus depriving downstream watercourses of water.	<ul style="list-style-type: none">Check compliance with specified conditions.Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.	<ul style="list-style-type: none">Once-off during design followed by regular controlDuring the design phase	<ul style="list-style-type: none">ContractorECO
B. CONSTRUCTION PHASE					
8.2. Diversion and impedance surface water flows – changes to the hydrological regime and increased potential for erosion. Diversion and	Prevent interference with natural run-off patterns, diverting flows and increasing the velocity of surface water flows.	8.2.1. The appointed Contractor should compile a Method Statement for Stormwater Management during the construction phase. 8.2.2. Erosion and sedimentation into water bodies must be minimised through the effective stabilisation (gabions and Reno mattresses or similar) and the re-vegetation of any disturbed riverbanks.	<ul style="list-style-type: none">Compile a Method Statement for Stormwater Management during the construction phase.Inspect and verify if a Method Statement for Stormwater Management has been compiled by the Contractor via audits prior to the commencement of the construction	<ul style="list-style-type: none">Prior to the construction phase.Once-off prior to the commencement of the construction phase.Weekly or Bi-weeklyWeekly or bi-weeklyAs needed during the	<ul style="list-style-type: none">ContractorECOECOECOECO

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Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
increased velocity of surface water flows – reduction in permeable surfaces.		<p>8.2.3. Place energy dissipation structures in a manner that allows the management of flows prior to being discharged into the natural environment, thus not only preventing erosion, but supporting the maintenance of natural base flows within these systems i.e. hydrological regime (water quantity and quality) is maintained.</p> <p>8.2.4. Reinforce soil slopes to minimise erosion during rehabilitation (as needed, and once construction in a specific area has ceased).</p> <p>8.2.5. Drainage along the sides of the roads should be designed so that it does not result in concentrated flows into watercourses.</p> <p>8.2.6. Perform periodic inspections and maintenance of soil erosion measures and stormwater control structures.</p>	<p>phase.</p> <ul style="list-style-type: none"> Check compliance with specified conditions of the Stormwater Management Plan and Method Statement. Check compliance with specified conditions of the Stormwater Management Plan and Method Statement. Monitor activities and record and report non-compliance. Check compliance with specified conditions of the Stormwater Management Plan and Method Statement. Monitor activities and record and report non-compliance. 	<p>construction phase</p> <ul style="list-style-type: none"> Weekly or bi-weekly As needed during the construction phase 	<ul style="list-style-type: none"> ECO ECO
<p>8.3. Pollution of the surrounding environment as a result of the contamination of stormwater. Contamination could result from the spillage of chemicals, oils, fuels, sewage, solid waste, litter etc.</p>	<p>To prevent contaminated stormwater from entering into and adversely impacting on freshwater ecosystems and reducing the water quality.</p> <p>To reduce sedimentation of nearby water systems.</p> <p>To apply best practice principles in managing risks to storm water pollution.</p>	<p>8.3.1. The appointed Contractor should compile a Method Statement for Stormwater Management during the construction phase.</p> <p>8.3.2. Provide secure storage for fuel, oil, chemicals and other waste materials to prevent contamination of stormwater runoff. Fuels and chemicals (i.e. any hazardous materials and dangerous goods) used during the construction phase must be stored safely on site and in bunded areas. Fuel and chemical storage containers must be inspected to ensure that any leaks are detected early.</p> <p>8.3.3. All stockpiles must be protected from erosion and stored on flat areas where run-off will be minimised. Erosion and sedimentation into</p>	<ul style="list-style-type: none"> Compile a Method Statement for Stormwater Management during the construction phase. Inspect and verify if a Method Statement for Stormwater Management has been compiled by the Contractor via audits prior to the commencement of the construction phase. Monitor the storage and handling of dangerous goods and hazardous materials on site via site audits and record non-compliance and incidents. Monitor if spillages have taken place and if they are removed correctly. 	<ul style="list-style-type: none"> Prior to the construction phase. Once-off prior to the commencement of the construction phase. Weekly Daily Weekly Weekly or Bi-weekly Weekly or Bi-weekly Once-off prior to construction and as required during the construction phase. 	<ul style="list-style-type: none"> Contractor ECO ECO ECO Contractor and ECO ECO ECO ECO

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Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>water bodies must be minimised through effective stabilisation. No stockpiling should take place within a watercourse.</p> <p>8.3.4. Stockpiles must be located away from river channels i.e. greater than 32 m.</p> <p>8.3.5. Littering and contamination of water resources during construction must be prevented by effective construction camp management.</p> <p>8.3.6. Emergency plans must be in place to deal with potential spillages (especially those leading to any watercourses).</p> <p>8.3.7. Erosion and sedimentation into water bodies must be minimised through the effective stabilisation (gabions and Reno mattresses or similar) and the re-vegetation of any disturbed riverbanks.</p> <p>8.3.8. Ensure that the temporary site camp and ablution facilities are established at least 32 m away from the banks of the major drainage lines.</p> <p>8.3.9. Ensure that there is no ad-hoc crossing of channels by vehicles during the construction phase. Access routes across the site should be strictly demarcated and selected with a view to minimise impacts on drainage lines.</p> <p>8.3.10. Ensure that no waste materials or sediments are left in the surrounding drainage lines (as a result of the construction).</p> <p>8.3.11. Regular inspections of stormwater infrastructure should be undertaken to ensure that it is kept clear of all debris and weeds.</p>	<ul style="list-style-type: none"> Monitor the excavations and stockpiling process throughout the construction phase via visual site inspections. Record non-compliance and incidents. Monitor via site audits and record non-compliance and incidents (i.e. by implementing walk through inspections). Check compliance with specified conditions of the Stormwater Management Plan and Method Statement. Check compliance with specified conditions of the Stormwater Management Plan and Method Statement. Monitor the placement of the site camp via visual inspections, and record and report any non-compliance. 	<ul style="list-style-type: none"> Weekly or Bi-weekly Weekly or Bi-weekly Weekly 	<ul style="list-style-type: none"> ECO ECO Contractor and ECO
C. DECOMMISSIONING PHASE					

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Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
8.4. Ensure that the construction mitigation and management measures are adhered to during the decommissioning phase.					

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9. EROSION MANAGEMENT PLAN

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
A. CONSTRUCTION PHASE					
9.1. Increased wind erosion and resultant deposition of dust.	Prevent wind erosion and resultant deposition of dust on surrounding indigenous vegetation.	<div>9.1.1. Sand, stone and cement should be stored in demarcated areas, and covered or sealed to prevent wind erosion and resultant deposition of dust on the surrounding indigenous vegetation.</div> <div>9.1.2. During construction, efforts should be made to retain as much natural vegetation as possible on the site, to reduce disturbed areas and maintain plant cover, thus reducing erosion risks.</div> <div>9.1.3. All stockpiles must be protected from erosion and stored on flat areas where run-off will be minimised. Erosion and sedimentation into water bodies must be minimised through effective stabilisation.</div>	<div>▪ Undertake regular inspections to verify that sand, stone and cement are stored and handled as instructed.</div> <div>▪ Monitor activities via site inspections and record and report non-compliance.</div> <div>▪ Monitor the stockpiling process throughout the construction phase via visual site inspections. Record non-compliance and incidents.</div>	<div>▪ Daily</div> <div>▪ Daily</div> <div>▪ Daily</div>	<div>▪ ECO and Contractor</div> <div>▪ ECO and Contractor</div> <div>▪ ECO</div>
9.2. Sedimentation of the surrounding drainage lines as a result of stormwater runoff and stockpiling of excavated material during the construction phase. The excavated material could potentially be washed into the drainage lines via stormwater. This could also impact on	Reduce sedimentation as a result of erosion caused by stockpiling and stormwater runoff.	<div>9.2.1. All material that is excavated during the construction phase must be stored appropriately on site in order to minimise impacts on the surrounding aquatic environment.</div> <div>9.2.2. Exposed soil surfaces should be graded to minimise runoff and increase infiltration.</div> <div>9.2.3. Where possible, sandbags (or similar) should be placed at the bases of the stockpiled material in order to prevent erosion of the material.</div> <div>9.2.4. Undertake periodic inspections and maintenance of soil erosion measures and</div>	<div>▪ Monitor activities via site inspections and record and report non-compliance.</div>	<div>▪ Daily</div>	<div>▪ ECO and Contractor</div>

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Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
avifauna.		<p>stormwater control structures.</p> <p>9.2.5. Stockpiles must be located at least 32 m away from the drainage lines, on flat areas where run-off will be minimised.</p> <p>9.2.6. During periods of strong winds and heavy rain (in line with relevant rainfall patterns), the stockpiles should be covered with appropriate material (e.g. cloth, tarpaulin etc.).</p>			
B. OPERATIONAL PHASE					
9.3. Excessive loss of natural vegetation in the development footprint area and resulting impacts on Species of Special Concern (SSC), faunal habitat and habitat fragmentation.	Prevent loss of natural vegetation and minimise habitat fragmentation and the loss of connectivity as a result of erosion.	<p>9.3.1. To prevent erosion, indigenous grasses that seed themselves should (where possible) be left to form a ground cover and kept short.</p> <p>9.3.2. The use of silt fences, sand bags or other suitable methods must be implemented in areas that are susceptible to erosion. Other erosion control measures that can be implemented are as follows: 1) Brush packing with cleared vegetation, 2) Planting of vegetation, 3) Hydro seeding/hand sowing. All erosion control mechanisms need to be regularly maintained.</p> <p>9.3.3. Conduct regular monitoring for erosion to ensure that no erosion problems are occurring at the site as a result of the roads and other infrastructure. Ensure that all erosion problems are rectified as soon as possible.</p>	<ul style="list-style-type: none"> ECO to advise on seed to be used. Monitor efficiency of erosion control measures. Undertake regular monitoring for erosion to ensure is reduced and rectified as soon as possible. 	<ul style="list-style-type: none"> Prior to re-vegetation. Weekly or monthly Monthly 	<ul style="list-style-type: none"> Project Owner Project Owner Project Owner
9.4. Increased wind erosion and resultant deposition of dust.	Prevent wind erosion and resultant deposition of dust on surrounding indigenous vegetation.	9.4.1. Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion.	<ul style="list-style-type: none"> Include periodic site inspections in environmental performance reporting that inspects the effectiveness and integrity of the run-off control system and specifically records occurrence or non-occurrence of any erosion on site 	<ul style="list-style-type: none"> Quarterly 	<ul style="list-style-type: none"> Project Owner

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Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
			or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.		
C. DECOMMISSIONING PHASE					
9.5. No specific impacts are associated with the decommissioning phase other than those from the operational phase that will still be relevant for the duration of the decommissioning phase due to on-going occupation of the area. Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas. Monitoring: Final external audit of area to confirm that area is rehabilitated to an acceptable level (once off event to be conducted by ECO).					

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10. HAZARDOUS SUBSTANCES LEAKAGE OR SPILLAGE MONITORING SYSTEM

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
A. CONSTRUCTION PHASE					
10.1. Contamination of soil and risk of damage to vegetation and/or fauna through spillage of concrete and cement.	To control concrete and cement batching activities in order to reduce spillages and resulting contamination of soil, groundwater and the vegetation and/or fauna.	<div>10.1.1. If any concrete mixing takes placed on site, this must be carried out in a clearly marked, designated area at the site camp on an impermeable surface (such as on boards or plastic sheeting and/or within a bunded area with an impermeable surface).</div> <div>10.1.2. Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains.</div> <div>10.1.3. A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted.</div> <div>10.1.4. Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility. Proof of disposal (i.e. waste disposal slips or waybills) should be retained on file for auditing purposes.</div> <div>10.1.5. Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site. Empty cement bags must be collected from the construction area at the end of every day. Sand and aggregates containing cement must be kept damp to prevent the generation of dust.</div> <div>10.1.6. Any excess sand, stone and cement must be removed from site at the completion of the construction period and disposed at a licenced waste disposal facility. Proof of disposal (i.e. waste disposal slips or waybills) should be retained on file for auditing purposes.</div>	<div><div>▪ Monitor the handling and storage of sand, stone and cement as instructed.</div><div>▪ Monitor the handling and storage of sand, stone and cement as instructed.</div><div>▪ Monitor the handling and storage of sand, stone and cement as instructed.</div><div>▪ Monitor the handling and storage of sand, stone and cement as instructed.</div><div>▪ Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents.</div><div>▪ Monitor the handling and storage of sand, stone and cement as instructed.</div><div>▪ Monitor the handling and storage of sand, stone and cement as instructed.</div><div>▪ Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents.</div></div>	<div><div>▪ Daily</div><div>▪ Daily</div><div>▪ Daily</div><div>▪ Monthly</div><div>▪ Daily</div><div>▪ Daily</div><div>▪ Monthly</div></div>	<div><div>▪ Project Owner, Contractor and ECO</div><div>▪ Project Owner, Contractor and ECO</div><div>▪ Project Owner, Contractor and ECO</div><div>▪ Project Owner, Contractor and ECO</div><div>▪ ECO</div><div>▪ Project Owner, Contractor and ECO</div><div>▪ Project Owner, Contractor and ECO</div><div>▪ ECO</div></div>
10.2. Contamination of soil and	To control and eliminate fuel	<div>10.2.1. Ensure that adequate containment structures are</div>	<div>▪ Monitor the storage and</div>	<div>▪ Weekly</div>	<div>▪ Contractor and ECO</div>

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Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
risk of damage to vegetation and/or fauna through spillage of fuels and oils.	and oil spillages which may result in soil contamination and damage to vegetation and/or fauna.	provided for the temporary storage of liquid dangerous goods and hazardous materials on site (such as chemicals, oil, fuel, hydraulic fluids, lubricating oils etc.). Appropriate bund areas must be provided for the storage of these materials at the site camp. Bund areas should contain an impervious surface in order to prevent spillages from entering the ground. Bund areas should have a capacity of 110 % of the volume of the largest tank in the bund (tanks include storage of fuel/diesel). It must be ensured that all hazardous storage containers and storage areas comply with the relevant South African Bureau of Standards (SABS) standards to prevent leakage.	handling of dangerous goods and hazardous materials on site via site audits and record non-compliance and incidents.	<ul style="list-style-type: none"> ▪ Daily ▪ During spill events ▪ Once-off prior to commencement of construction. ▪ During emergency refuelling and servicing activities. ▪ Daily (or during spills) ▪ Daily (or during spills) 	<ul style="list-style-type: none"> ▪ Contractor and ECO ▪ ECO ▪ ECO ▪ Contractor and ECO ▪ Contractor and ECO
		10.2.2. Monitor and inspect construction equipment and vehicles to ensure that no fuel spillage takes place. Ensure that drip trays are provided for construction equipment and vehicles as required.	<ul style="list-style-type: none"> ▪ Monitor the construction equipment and vehicles and monitor the occurrence of spills and the management process thereof. ▪ Record all spills and lessons learnt. ▪ Verify if a Method Statement is compiled by reviewing approved and signed off reports. 		
		10.2.3. Contractor to compile a Method Statement for refuelling activities under normal and emergency situations. If on-site servicing and refuelling is required in emergency situations, a designated area must be created at the construction site camp for this purpose (i.e. refuelling must take place on a sealed surface area to prevent ingress of hydrocarbons into topsoil). Drip trays or similar impervious materials must be used during these procedures. All vehicles must be regularly inspected for leaks.	<ul style="list-style-type: none"> ▪ Monitor the refuelling/ servicing process and record the occurrence of any spillages. ▪ Monitor the handling and storage of fuels and oils via site audits and monitor if spillages have taken place and if so, are removed correctly. Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents. 		
		10.2.4. Spilled fuel, oil or grease must be retrieved and the contaminated soil removed, cleaned and replaced or treated accordingly.	<ul style="list-style-type: none"> ▪ Monitor the correct removal of contaminated soil. Monitor waste disposal slips and 		
		10.2.5. Contaminated soil to be collected by the Contractor (under observation of the ECO) and disposed of at a			

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			Methodology	Frequency	Responsibility
		registered waste facility designated for this purpose. Proof of disposal (i.e. waste disposal slips or waybills) should be retained on file for auditing purposes.	waybills via site audits and record non-compliance and incidents.		
		10.2.6. A Spill Response Method Statement must be compiled by the Contractor for the construction phase in order to manage potential spill events.	<ul style="list-style-type: none"> Compile a Spill Response Method Statement. 	<ul style="list-style-type: none"> Once-off (and thereafter updated as required during the construction phase). 	<ul style="list-style-type: none"> Contractor and Project Owner
		10.2.7. The Contractor must ensure that adequate spill containment and clean-up equipment are provided on site for use during spill events.	<ul style="list-style-type: none"> Audit signed and approved Spill Response Method Statement. 		<ul style="list-style-type: none"> ECO
		10.2.8. Portable bioremediation kit (to remedy chemical spills) is to be held on site and used as required.	<ul style="list-style-type: none"> Monitor via site audits and record incidents and non-compliance. 	<ul style="list-style-type: none"> Once-off (and thereafter as required during the construction phase). 	<ul style="list-style-type: none"> Contractor and ECO
		10.2.9. In case of a spillage of hazardous chemicals where contamination of soil occurs, depending on the degree and level of contamination, excavation and removal to a hazardous waste disposal facility could be necessary. If the spillage is widespread and the soil is considered to be significantly contaminated, a specialist will need to be immediately appointed to address the spillage. This will usually entail the collection of samples of the contaminated soil followed by analysis in terms of the 2014 National Norms and Standards for the Remediation of Contaminated Land and Soil Quality (i.e. GN 331). If the soil is determined to be significantly contaminated, then compliance with Part 8 of the NEMWA should be achieved by the Applicant, including notifying the Minister of Environmental Affairs of the significant contamination.	<ul style="list-style-type: none"> Ensure that a well-maintained portable bioremediation kit is available on site and that construction personnel and contractors are aware of its location and instructions Ensure that a suitably qualified specialist is appointed to collect and analyse the contaminated soil samples in terms of the 2014 Norms and Standards (i.e. GN 331) in order to determine if the soil is significantly contaminated or not. 	<ul style="list-style-type: none"> Daily/Weekly Daily During spill events During spill events 	
		10.2.10. The Contractor must record and document all significant spill events.	<ul style="list-style-type: none"> If the contaminated soil is considered to be significantly contaminated, then compliance with Part 8 of the NEMWA should be achieved by the Applicant. 		

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Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
			<ul style="list-style-type: none">Monitor documentation and records of significant spill events via audits and record non-compliance and incidents.		
B. DECOMMISSIONING PHASE					
10.3. No specific impacts are associated with the decommissioning phase other than those from the operational phase that will still be relevant for the duration of the decommissioning phase due to on-going occupation of the area.					

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11. ENVIRONMENTAL AWARENESS AND FIRE MANAGEMENT PLAN

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring			
			Methodology	Frequency	Responsibility	
A. DESIGN PHASE						
11.1. Potential impacts resulting from the lack of overall compliance with the conditions of the EA (issued by the DEA).	Ensure compliance with all environmental conditions of approval (issued by DEA as part of the EA).	11.1.1. Audit the implementation of the EMPr requirements.	<ul style="list-style-type: none">Audit report on compliance with actions and monitoring requirements.Audit report on compliance with actions and monitoring requirements.	<ul style="list-style-type: none">WeeklyBased on EA conditions	<ul style="list-style-type: none">Project Owner.Project Owner and ECO	
		11.1.2. Establish clear and transparent reporting of the activities undertaken with regard to all recommendations included in the EMPr.				
B. CONSTRUCTION PHASE						
11.2. Potential risk of fire due to construction activities or behaviour of staff on site during the construction phase.	Prevent fire on site resulting from workers smoking or starting fires (i.e. cooking, heating purposes).	11.2.1. Designate smoking areas, as well as areas for cooking, where the fire hazard could be regarded as insignificant.	<ul style="list-style-type: none">Ad-hoc checks to ensure workers are smoking or cooking in designated areas only.Ensure fire safety requirements are well understood and respected by construction personnel.Carry out Environmental Awareness Training.Conduct audits of the signed attendance registers.	<ul style="list-style-type: none">DailyOngoing.Once-off training and ensure that all new staff are inducted.Monthly	<ul style="list-style-type: none">ECO and ContractorECO and ContractorContractor/ECOECO	
		11.2.2. Educate workers on the dangers of open and/or unattended fires.				
		11.2.3. Open fires must be prohibited. No informal fires should be permitted in or near the construction areas. Appropriate fire safety training should also be provided to staff that are to be on the site for the duration of the construction phase.	<ul style="list-style-type: none">Ensure fire safety requirements are well understood and respected by construction personnel. Provide basic fire safety training.Check compliance with specified conditions using a report card, and allocate fines when necessary.Ensure fire safety requirements are well understood and respected by workers.Assurance of functionality of fire extinguishers via inspections and	<ul style="list-style-type: none">On-goingOn-goingOn-goingBi-annually	<ul style="list-style-type: none">ECO and ContractorECO and ContractorsECO and ContractorContractor	
		11.2.4. Ensure that cooking takes place in a designated area shown on the site map. Ensure that no firewood or kindling may be gathered from the site or surrounds.				
		11.2.5. Fire-fighting equipment must be made				

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			Methodology	Frequency	Responsibility
		available at appropriate locations on the construction site.	certification by an accredited fire service company.		
11.3. Inappropriate behaviour of civil contractors and sub-contractors during the construction phase.	Prevent unnecessary impacts on the surrounding environment by ensuring that contractors are aware of the requirements of the EMPr. Ensure that contractors and sub-contractors do not induce impacts on the surrounding environment as a result of unplanned pollution on site. Ensure that actions by on-site contractors and sub-contractors and workers are properly managed in order to minimise impacts to surrounding environment.	11.3.1. Ensure that the EMPr and the EA (should it be granted by the DEA), are included in all tender documentation and contractors and sub-contractors contracts.	<ul style="list-style-type: none"> ▪ Check compliance with specified conditions using a report card, and allocate fines when necessary. ▪ Check compliance with specified conditions using a report card, and allocate fines when necessary. ▪ Check compliance with specified conditions using a report card, and allocate fines when necessary. ▪ Check compliance with specified conditions using a report card, and allocate fines when necessary. ▪ Check compliance with specified conditions using a report card, and allocate fines when necessary. ▪ Carry out Environmental Awareness Training. ▪ Conduct audits of the signed attendance registers. 	<ul style="list-style-type: none"> ▪ On-going ▪ On-going ▪ On-going ▪ On-going ▪ Once-off training and ensure that all new staff are inducted. ▪ Monthly 	<ul style="list-style-type: none"> ▪ ECO and Contractors ▪ ECO and Contractors ▪ ECO and Contractors ▪ ECO and Contractors ▪ ECO and Contractors ▪ Contractor/ECO ▪ ECO
		11.3.2. Contractors and sub-contractors must use the ablution facilities situated in a designated area within the site; and no bathing/washing should be permitted outside the designated area.			
		11.3.3. All litter will be deposited in a clearly labelled, closed, animal-proof disposal bin in the construction area; particular attention needs to be paid to food waste.			
		11.3.4. No person other than a qualified specialist or personnel authorised by the Project Owner, will disturb or remove plants outside the demarcated construction area.			
		11.3.5. No person other than a qualified specialist or personnel authorised by the Project Owner, will disturb animals on the site.			
		11.3.6. Educate workers on site about suitable behaviour on site and initiate environmental awareness. Staff must be informed that no trapping, snaring or feeding of any animal will be allowed.			
11.4. Inappropriate planning of site camp establishment.	Ensure that environmental issues are taken into consideration in the planning for site establishment.	11.4.1. All construction activities, materials, equipment and personnel must be restricted to the actual construction area specified (as required to undertake the construction work). The construction area must be demarcated by the Contractor.	<ul style="list-style-type: none"> ▪ Monitor compliance and record non-compliance and incidents. ▪ Monitor compliance and record non-compliance and incidents. ▪ Monitor compliance and record non-compliance and incidents. 	<ul style="list-style-type: none"> ▪ Before construction ▪ Before construction ▪ Before construction 	<ul style="list-style-type: none"> ▪ ECO ▪ ECO ▪ ECO

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		<p>11.4.2. The Contractor should install and maintain Construction Site Information Boards in the position, quantity, design and dimensions specified by the Project Owner.</p> <p>11.4.3. General building materials should be stored in appropriate designated areas on site such that there will be no runoff from these areas towards sensitive systems. The site camp must be removed after construction.</p>			
11.5. Increased animal road mortality.	Reduction in animal mortality.	<p>11.5.1. The construction staff should be made aware of the presence of fauna and within the proposed project area. The construction personnel and staff must also be made aware of the general speed limits on site and must be alert at all times for potential crossings, and should be trained on how to react in these situations.</p> <p>11.5.2. To ensure that animals are not attracted to the site (and potentially resulting in increased road mortality), the waste collection bins and skips should be covered with suitable material, where appropriate, and the site camp must be kept clean on a daily basis.</p> <p>11.5.3. Establish a monitoring programme to record the number of faunal road mortalities and collisions. If it is established that the number of collisions and faunal fatalities increase within an area, particularly with regards to smaller species (reptiles), then measures such as exclusion fences within these areas only should be considered.</p>	<ul style="list-style-type: none"> Carry out Environmental Awareness Training. Conduct audits of the signed attendance registers. Monitor the activities via visual inspections, and record and report any non-compliance. Appropriate monitoring and recording should be undertaken. Exclusion fences should be considered, if needed to direct animals to safe road crossings. 	<ul style="list-style-type: none"> Once-off training and ensure that all new staff are inducted. Monthly Daily Weekly As required 	<ul style="list-style-type: none"> Contractor/ECO ECO Contractor and ECO ECO ECO and Contractor
11.6. Increased energy	Reduce energy consumption	11.6.1. Encourage the use of energy saving equipment	Contractor to monitor energy usage via	Monthly	Contractor

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			Methodology	Frequency	Responsibility
consumption during the construction phase.	where possible.	at the site camp site (such as low voltage lights and low pressure taps) and promote recycling. Construction personnel must be made aware of energy conservation practices as part of the Environmental Awareness Training programme.	audits. ▪ Carry out Environmental Awareness Training. ▪ Conduct audits of the signed attendance registers.	▪ Once-off training and ensure that all new staff are inducted. ▪ Monthly	▪ Contractor/ECO ▪ ECO
11.7. Impact on the regional water balance as a result of increased water usage.	Reduce water usage during the construction phase.	<p>11.7.1. Water conservation should be practiced as follows:</p> <ul style="list-style-type: none"> ▪ Cleaning methods utilised for cleaning vehicles, floors, etc. should aim to minimise water use (e.g. sweep before wash-down). ▪ Ensure that regular audits of water systems are conducted to identify possible water leakages. <p>11.7.2. Avoid the use of potable water for dust suppression during the construction phase and consider the use of alternative approved sources, where possible.</p> <p>11.7.3. Make construction personnel aware of the importance of limiting water wastage, as well as reducing water use.</p>	<ul style="list-style-type: none"> ▪ Monitor via site audits and record non-compliance and incidents. ▪ Carry out Environmental Awareness Training with a discussion on water usage and conservation. ▪ Conduct audits of the signed attendance registers. 	<ul style="list-style-type: none"> ▪ Monthly ▪ Once-off training and ensure that all new staff are inducted. ▪ Monthly 	<ul style="list-style-type: none"> ▪ ECO ▪ Contractor/ECO ▪ ECO

C. DECOMMISSIONING PHASE

11.8. Ensure that the construction mitigation and management measures are adhered to during the decommissioning phase.

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12. SPECIFIC PROJECT RELATED ENVIRONMENTAL IMPACTS

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
A. DESIGN PHASE					
A.1. TERRESTRIAL ECOLOGY IMPACTS					
12.1. Potential impact on terrestrial ecology as a result of the proposed infrastructure.	To reduce the impact on terrestrial ecology as a result of vegetation clearing for project infrastructure.	12.1.1. Ensure that a Rehabilitation Plan is compiled that identifies tasks and procedures to be instituted at specific sites where transformation of habitat has arisen. 12.1.2. Detailed design and incorporation of habitat and features into the routing of the proposed transmission line.	<ul style="list-style-type: none">▪ Ensure that this is taken into consideration during the planning and design phase, and that a suitable specialist is appointed to compile a Rehabilitation Plan. Review signed minutes of meetings or signed reports.▪ Ensure that this is taken into consideration during the planning and design phase.	<ul style="list-style-type: none">▪ Once-off during design cycle and before construction commences.	<ul style="list-style-type: none">▪ Project Owner and Appointed Specialist▪ Project Owner/ECO
12.2. Potential impact on vegetation and fauna Species of Conservation Concern (SCC).	To reduce potential impact on SCC.	12.2.1. Fine-scale habitat and SCC population mapping within Kap Vley section to inform the final routing and pylon placement to ensure that impact on these features can be minimised through avoidance at the design stage. 12.2.2. No development of roads or pylons within No-Go areas for fauna and flora. Avoidance of identified areas of high faunal and floral importance at the design stage. 12.2.3. Preconstruction walk-through of the development footprint to further refine the layout and reduce impacts on SCC through micro-siting of the pylons and access roads.	<ul style="list-style-type: none">▪ Ensure that this is taken into consideration during the planning and design phase, and that an Ecologist is appointed to undertake the mapping for the final routing and pylon placement.▪ Ensure that this is taken into consideration during the planning and design phase.▪ Appoint an Ecologist to do a preconstruction walk-through.	<ul style="list-style-type: none">▪ Once-off during design cycle and before construction commences.	<ul style="list-style-type: none">▪ Project Owner and appointed Ecologist▪ Project Owner/ECO▪ Project Owner and appointed Ecologist
A.2. IMPACT ON BIRDS					
12.3. Impact on birds.	To reduce disturbance on birds	12.3.1. Ensure that the proposed power line design includes the	<ul style="list-style-type: none">▪ Ensure that this is taken into	<ul style="list-style-type: none">▪ Once-off before	<ul style="list-style-type: none">▪ Ornithologist and

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Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
	and collisions with the earthwire of the proposed transmission line.	<p>best available anti -bird collision line marking devices in order to make the cables more visible to birds, as recommended by the Avifauna Specialist.</p> <p>12.3.2. Use only a bird-friendly pylon structure.</p> <p>12.3.3. The proposed tower/pylon structure has not been decided in detail. It will however be either concrete or steel monopole. It is critically important that sufficient clearance be allowed between phase-phase and phase-earth hardware on the structure. For large eagles these clearances should be a minimum of 1.8 m.</p>	<p>consideration during the planning and design phase.</p> <ul style="list-style-type: none"> Ensure that the design phase takes cognizance of the Specialists' recommendations. 	<p>construction commences.</p> <ul style="list-style-type: none"> Once-off before construction commences. 	<p>Project Owner and Ornithologist and Project Owner</p>
A.3. AQUATIC ECOLOGY (FRESHWATER) IMPACTS					
12.4. Impact on surface water resources	To reduce the impact of the proposed development on the surrounding drainage lines and freshwater features	<p>12.4.1. Ensure that the sensitivity maps guide the design and layout of the proposed development. In terms of the applicable legislation, a 32 m zone of regulation in terms of the NEMA is stipulated around all freshwater features; and these should be respected where possible and as much as feasible.</p> <p>12.4.2. Avoid placing pylons in identified sensitive dry and ephemeral watercourses, drainage lines and associated buffers. (The powerline pylons have a span distance of 150 m, and must be placed to avoid the non-perennial Buffels River and its associated ephemeral wetlands).</p> <p>12.4.3. Routing should follow existing linear infrastructure and disturbance corridors (e.g. roads) where possible. (Alternative 1 follows existing linear infrastructure and disturbance corridors, and is preferred).</p> <p>12.4.4. In terms of Section 21 (c) and (i) of the National Water Act (Act 36 of 1998) (NWA), the relevant authorisation must be obtained from the Department of Water and Sanitation (DWS) for any and all activities that take place within the</p>	<ul style="list-style-type: none"> Ensure that the 32 m zone of regulation is taken into consideration in the final layout of the proposed electrical infrastructure. Ensure that this is taken into account, where possible and as feasible (as recommended in the Dry and Ephemeral Specialist Study), and that the recommended mitigation measures are implemented as required. Ensure that the requirements of the DWS are considered during the planning and design phase and prior to construction. Ensure that the application for a Water Use Licence (WULA) is submitted and approved prior to the 	<ul style="list-style-type: none"> Once-off prior to the commencement of construction. Once-off prior to the commencement of construction, in consultation with the DWS (based on the requirements for a WULA). Once-off prior to the commencement of construction, in consultation with the DWS (based on the requirements for a WULA). Once-off prior to the commencement of construction, in 	<ul style="list-style-type: none"> Project Owner and ECO Project Owner and ECO Contractors and ECO Project Owner and ECO Project Owner and ECO

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		<p>watercourses. It is recommended that the relevant DWS officials be consulted in this regard to ensure that all legislative requirements are complied with. Overall, the relevant authorisations required for must be obtained in terms of Section 21 (c) and (i) of the NWA, and in terms of Regulation 509 of 2016 as it pertains to the NWA.</p> <p>12.4.5. Maintenance of a high level of housekeeping on route of the proposed transmission line during the construction phase.</p>	<p>commencement of construction (if required), based on the requirements of the DWS.</p> <ul style="list-style-type: none"> Ensure that the recommendations in the Dry and Ephemeral Watercourse study are implemented regarding the avoidance of placing the pylons in the dry and ephemeral watercourses (particularly the Buffels River). The recommendation regarding the routing along existing linear infrastructure and disturbance corridors must be adhered to. Inspection of drainage features immediately outside of the footprint of the proposed transmission line and undertake removal of solid waste and litter on a regular basis. 	<p>consultation with the DWS (based on the requirements for a WULA).</p> <ul style="list-style-type: none"> Ongoing 	
A.4. VISUAL IMPACTS					
12.5. Potential visual intrusion of construction activities on existing views of sensitive visual receptors.	Reduce visual intrusion of construction activities project wide.	<p>12.5.1. Ensure plans are in place to minimise fire and dust generation.</p> <p>12.5.2. Ensure plans are in place to rehabilitate temporary cleared areas as soon as possible.</p> <p>12.5.3. Ensure that the laydown area is not located in an area that is highly sensitive for visual receptors,</p> <p>12.5.4. Ensure plans are in place to control and minimise erosion</p>	<ul style="list-style-type: none"> Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports. 	<ul style="list-style-type: none"> Once-off during design cycle and before construction commences. 	<ul style="list-style-type: none"> Project Owner ECO

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		risks. 12.5.5. Structure style (e.g. power line pylons/towers) should be the same as for other similar developments along the same route where possible (taking into consideration other specialist recommendations and specifications).			
A.5. HERITAGE IMPACTS (PALAEONTOLOGY, ARCHAEOLOGY AND CULTURAL LANDSCAPE)					
12.6. Impacts on archaeological remains and palaeontological material.	Achieve a layout that minimizes the potential impacts to archaeological remains and palaeontological material.	12.6.1. Ensure that the project layout avoids significant palaeontological and archaeological sites that were identified in the Heritage Impact Assessment (Appendix E6 of the BA Report). These sites should be identified on project maps and regarded as no-go zones with buffers of at least 30 m around all associated features.	<ul style="list-style-type: none"> Take cognizance of the archaeological remains and palaeontological material reported in the HIA when designing layout and routing. Ensure and verify that the significant palaeontological and archaeological sites identified in the Heritage Impact Assessment (Appendix E6 of the BA Report) are included on project maps and regarded as no-go zones with buffers during the planning and design phase. Review the site layout plan, and signed minutes of meetings or signed reports. 	<ul style="list-style-type: none"> Once-off Once-off 	<ul style="list-style-type: none"> Project Owner ECO
B. CONSTRUCTION PHASE					
B.1. TERRESTRIAL ECOLOGICAL IMPACTS (FAUNA AND FLORA)					
12.7. Impact on plant SCC through habitat loss as a result of construction activities.	Avoid and/or reduce impacts on plant SCC.	12.7.1. No development roads or pylons within No-Go areas. 12.7.2. Preconstruction walk-through of the development footprint to further refine the layout and reduce impacts on SCC through micro-siting of the pylons and access roads. 12.7.3. Demarcate all areas to be cleared with construction tape or	<ul style="list-style-type: none"> Ensure that this is taken into consideration during the construction phase. Appoint an Ecologist to undertake the preconstruction 	<ul style="list-style-type: none"> In the construction phase before construction activities commence. Before construction 	<ul style="list-style-type: none"> Contractor and ECO Appointed Ecologist ECO

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			Methodology	Frequency	Responsibility
		other appropriate and effective means. However caution should be exercised to avoid using material that might entangle fauna.	<ul style="list-style-type: none"> walk-through. Carry out visual inspections and site audits to verify if construction activities are restricted to demarcated areas and record and report any non-compliance. 	<ul style="list-style-type: none"> activities commence. Weekly 	
12.8. Impacts on fauna through habitat loss as a result of construction activities.	Avoid or reduce impacts on fauna.	<p>12.8.1. Ensure that lay-down and other temporary infrastructure is within medium- or low- sensitivity areas, preferably previously transformed areas if possible.</p> <p>12.8.2. Search and rescue for reptiles and other vulnerable species during construction, before areas are cleared.</p> <p>12.8.3. During construction any fauna directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person.</p> <p>12.8.4. Environmental induction for all staff and contractors on-site.</p> <p>12.8.5. All construction vehicles should adhere to a low speed limit (40km/h for cars and 30km/h for trucks) to avoid collisions with susceptible species such as snakes and tortoises and rabbits or hares. Speed limits should apply within the facility as well as on the public gravel access roads to the site.</p> <p>12.8.6. No holes or trenches should be left open for extended periods as fauna will fall in and be trapped.</p> <p>12.8.7. If any parts of site such as construction camps must be lit at night, this should be done with low-UV type lights (such as most LEDs) as far as practically possible, which do not attract insects and which should be directed downwards.</p>	<ul style="list-style-type: none"> Ensure that this is taken into consideration during the construction phase. Appoint an Ecologist to undertake search and rescue before areas are cleared. Ensure the removal of fauna is taking place as indicated. Carry out visual inspections and site audits to monitor this and record and report non-compliance. Ensure all staff and contractors receive environmental induction. Carry out visual inspections and site audits to monitor this and record and report non-compliance. Carry out visual inspections and site audits to monitor this and record and report non-compliance. Carry out visual inspections and site audits to monitor this and record and report non-compliance. 	<ul style="list-style-type: none"> Once-off before construction activities commence. Before areas are cleared for construction. On-going When staff are appointed before commencing with construction activities. Ongoing Ongoing Monthly 	<ul style="list-style-type: none"> Contractor and ECO Appointed Ecologist ECO or suitably qualified person. ECO Contractor and ECO Contractor and ECO Contractor and ECO

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			Methodology	Frequency	Responsibility
			compliance.		
B.2. BIRD IMPACTS					
12.9. Disturbance of birds and displacement effects.	To reduce disturbance of birds, in particular breeding birds.	<p>12.9.1. A site-specific avifaunal walk-through should be conducted by a qualified ornithologist as part of the site specific EMP just prior to construction, so as to ensure that no sensitive bird species have started breeding on or near site.</p> <p>12.9.2. Buffer nest sites.</p> <p>12.9.3. Reduce disturbance by adhering to OEMP; on-site manager / ECO to be trained to ID priority species and signs of breeding; monitor raptor nest breeding success and conduct post-construction monitoring.</p>	<ul style="list-style-type: none"> ▪ If any such sites are found case specific mitigation measures will need to be designed. ▪ Ensure that on-site manager/ECO receive training to ID priority species and signs of breeding. 	<ul style="list-style-type: none"> ▪ Once-off prior to construction. ▪ Once-off prior to construction. 	<ul style="list-style-type: none"> ▪ Ornithologist ▪ Ornithologist
12.10. Bird collision with transmission line.	To reduce the risk of bird collisions.	<p>12.10.1. New powerline to be buried where possible.</p> <p>12.10.2. The transmission line should be fitted with the best available (at the time of construction) anti bird collision line marking devices in order to make the overhead cables more visible to birds. More specifically:</p> <ul style="list-style-type: none"> • Devices should be fitted on the entire length of the power line as collision risk is high all along the alignment for nomadic species such as Ludwig's Bustard. • Devices should be fitted on the earth wire/s. • On each span, the full span should be fitted with marking devices (i.e. not only the middle 60% as done previously by Eskom). Research has shown that collisions occur even close to pylons (Shaw, 2013). • Light and dark colour devices should be alternated so as to provide contrast against both dark and light backgrounds. • These devices should be fitted as soon as the earth wires are strung as collision risk begins 	<ul style="list-style-type: none"> ▪ Verify that this is undertaken by reviewing the signed approved designs. 	<ul style="list-style-type: none"> ▪ Once-off after construction and erection of powerlines. 	<ul style="list-style-type: none"> ▪ Project Owner and ECO

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		<p>immediately, not only once the line is commissioned and live.</p> <ul style="list-style-type: none"> The power line owner will be responsible for ensuring that the marking devices remain in place and effective on the power line for its' full lifespan. Any device failures must be rectified immediately by replacement with new devices. 			
12.11. Electrocution of birds on transmission line.	Prevent any electrocutions of avifauna during construction of the proposed transmission line.	12.11.1. The proposed tower/pylon structure has not been decided in detail. It will however be either concrete or steel monopole. It is critically important that sufficient clearance be allowed between phase-phase and phase-earth hardware on the structure. For large eagles these clearances should be a minimum of 1.8 m.	<ul style="list-style-type: none"> Ensure that this is taken into consideration during the planning and design phase. 	<ul style="list-style-type: none"> Once-off before construction. 	<ul style="list-style-type: none"> Project Owner, ECO and Contractor
B.3. BAT IMPACTS					
12.12. Roost destruction and bat mortality as a result of removal of buildings, trees or rocky outcrops (bat roosts)	Avoid the destruction of roosts and bat mortality as a result of construction activities.	<p>12.12.1. Develop and Implement the Construction Phase EMP. All contractors are to adhere to the CEMP and should apply good environmental practice during construction.</p> <p>12.12.2. The grid connection infrastructure must be designed and constructed in such a way as to avoid the destruction of potential roosts, particularly trees, rocky crevices (if blasting is required) and buildings.</p> <p>12.12.3. No construction activities with the potential to physically affect any bat roosts will be permitted without the express permission of a suitably qualified bat specialist following appropriate investigation and mitigation.</p> <p>12.12.4. It is recommended that a bat specialist surveys the locations of pylons, for the presence of occupied roosts before any construction activities commence and once the preliminary design and layout of the site is complete.</p> <p>12.12.5. If occupied roosts are confirmed these should be buffered based on best practice guidelines at the time.</p>	<ul style="list-style-type: none"> Oversee activities to ensure that the Construction EMP is implemented and enforced via site audits and inspections. Report and record any non-compliance. Ensure that the construction area and footprint is kept to a minimum. Carry out regular site inspections to verify the limits of the construction area to ensure unnecessary disturbance is avoided. Appoint a bat specialist to do a preconstruction walk-through. Ensure that bat roosts are avoided and buffered by doing 	<ul style="list-style-type: none"> On a daily basis Weekly Once-off prior to the completion of construction. Weekly 	<ul style="list-style-type: none"> ECO ECO and Contractor Bat specialist ECO and Contractor Manager or Contractor

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			Methodology	Frequency	Responsibility
			visual inspections and site audits to monitor compliance.		
B.4. AQUATIC ECOLOGY (FRESHWATER) IMPACTS					
12.13. Impact on surface water resources.	To reduce the impact of the proposed development on the surrounding surface water features and rivers.	12.13.1. Use existing Buffels River crossing for vehicles, including stringing vehicles. 12.13.2. Avoid clearance of vegetation for the powerline servitude, minimise clearance of vegetation to the pylon foundations. 12.13.3. Phased clearance of the area in order to reduce the amount and duration of bare soil exposure. 12.13.4. Permit only essential construction personnel within 32m of the freshwater habitat, if absolutely necessary that they enter the regulatory zone. 12.13.5. Limit the footprint area of the construction activities to what is only essential in order to minimise environmental damage. 12.13.6. Implement effective waste management in order to prevent construction related waste from entering the freshwater environments. 12.13.7. Rehabilitate all wetland and riparian habitat areas affected by the proposed electrical infrastructure to ensure that the ecology of these areas is re-instated during all phases. 12.13.8. As far as possible, all rehabilitation activities should occur in the low flow season, during the drier summer months. 12.13.9. As much vegetation growth as possible should be promoted within the proposed electrical infrastructure 12.13.10. Commence with restoration of disturbed, cleared land as soon as possible e.g. as soon as non-permanent construction gear and infrastructure are removed). 12.13.11. Implement net barriers, active rehabilitation and other erosion control measures as needed, especially for pylons placed on steeper slopes. 12.13.12. Riparian vegetation cover should be monitored to ensure	<ul style="list-style-type: none"> Carry out visual inspections and site audits to verify if these management actions are undertaken, and record and report any non-compliance. Ensure rehabilitation specialist is appointed to implement and monitor rehabilitation success. 	<ul style="list-style-type: none"> Weekly Ongoing through-out construction. 	<ul style="list-style-type: none"> ECO Project Owner Rehabilitation specialist

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			Methodology	Frequency	Responsibility
		that sufficient vegetation is present to bind the bankside soils and prevent bankside erosion and incision. 12.13.13. It is recommended that a detailed rehabilitation plan be developed by a suitably qualified ecologist in order to address specific rehabilitation requirements.			
B.5. VISUAL IMPACTS					
12.14. Potential visual intrusion of construction activities on existing views of sensitive visual receptors.	Prevent unnecessary visual clutter and focusing attention of surrounding visual receptors on the proposed development.	<p>12.14.1. Parking areas should be demarcated and strictly controlled so that vehicles are limited to specific areas only.</p> <p>12.14.2. Where possible construction camps and laydown areas should be located (where sensitive visual receptors are least likely to be affected):</p> <ul style="list-style-type: none"> In low visibility areas (e.g. avoid ridgelines and open plains); Previously disturbed areas (e.g. clearings created by farmers for other purposes which are no longer being used); and/or Areas near derelict farmsteads (taking into consideration the findings of the Heritage Impact Assessment as well as other assessments that may be relevant), particularly where existing trees can be used to screen these areas from views. <p>12.14.3. Night time construction should be avoided where possible (however some construction work on electrical components may need to occur after dark).</p> <p>12.14.4. Night lighting of the construction sites should be minimised within requirements of safety and efficiency.</p> <p>12.14.5. Maintain good housekeeping on site to avoid litter and minimize waste.</p> <p>12.14.6. Monitor construction sites for strict adherence to demarcated boundaries and minimise areas of vegetation,</p>	<ul style="list-style-type: none"> Carry out visual inspections to ensure that good housekeeping are maintained and record and report any non-compliance. Carry out visual inspections to ensure the construction parking area is demarcated clearly, and record and report any non-compliance. Carry out visual inspections to ensure strict control over the parking of construction vehicles and access routes in order to restrict activities to within demarcated areas. Ensure that this is taken into consideration for the siting of the proposed construction site camp and laydown area. Carry out visual inspections to ensure the construction camp and laydown area are demarcated clearly, and record and report any non-compliance. Carry out visual inspections to 	<ul style="list-style-type: none"> Weekly Weekly Weekly Weekly Weekly or bi-weekly Daily Daily Daily Daily Daily and as complaints arise. Daily Daily Daily 	<ul style="list-style-type: none"> ECO ECO ECO ECO Contractor and ECO Construction Manager and ECO

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		<p>ground and surface disturbance. Existing clearings should be used where possible and where required.</p> <p>12.14.7. Monitor that existing roads will be used for access as far as possible and that construction of new access roads is minimised.</p> <p>12.14.8. Monitor that topsoil from the site is stripped, stockpiled, and stabilised before excavating earth for the proposed construction.</p> <p>12.14.9. Monitor that vegetation material from vegetation removal is mulched and spread over fresh soil disturbances to aid in the rehabilitation process.</p> <p>12.14.10. Monitor adherence to lighting plan.</p> <p>12.14.11. Monitor adherence to rehabilitation plan (i.e. where cleared areas are rehabilitated as soon as possible).</p> <p>12.14.12. Monitor adherence to erosion control plan.</p> <p>12.14.13. Monitor adherence to dust and fire control plans.</p>	<p>ensure strict control over the boundary of the site camp and laydown area in order to restrict activities to within demarcated areas.</p> <ul style="list-style-type: none"> ▪ Construction operation times to be monitored and managed (as well as included in the tender contract). ▪ Complaints about night lights should be investigated and documented in a register. ▪ Carry out site visits and inspections of the construction sites and ensure good housekeeping is maintained. Record and report any non-compliance. ▪ Carry out site visits and record and report any non-compliance. ▪ Carry out site visits and inspections of the access routes. Record and report any non-compliance. ▪ Carry out site visits and inspections of the topsoil management process. Record and report any non-compliance. ▪ Carry out site visits and inspections of the re-vegetation 		

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			<p>process. Record and report any non-compliance.</p> <ul style="list-style-type: none"> Complaints about night lights should be investigated and documented in a register. Investigate any complaints about night lights and document it in a register. Visit sites requiring rehabilitation. Carry out site visits and record and report any non-compliance. Carry out site visits and record and report any non-compliance. 		
B.6. HERITAGE IMPACTS (PALAEONTOLOGY, ARCHAEOLOGY AND CULTURAL LANDSCAPE) (These are direct and cumulative impacts)					
12.15. Destruction of archaeological remains or graves as a result of the construction of the proposed transmission line. Direct impacts to archaeological resources may also occur when construction vehicles move through the area and when foundation	Minimise the chances of significant archaeological sites being disturbed. Minimise the chances of significant palaeontological material being disturbed. Minimise the chances of impacts to other heritage resources located outside of the proposed route of the electrical grid infrastructure.	<p>12.15.1. The Contractor and ECO must be informed of the possibility of any heritage material (i.e. ensure that all personnel are aware of the potential of encountering graves and what to do if this occurs (i.e. to report any suspicious stone features prior to disturbance)).</p> <p>12.15.2. Ensure that a suitably qualified archaeologist is appointed to carry out a pre-construction survey of the sections of the final alignment that were not surveyed in order to locate any sites that need to be avoided or mitigated. Note that this requirement pertains to un-surveyed parts of the assessed routes as well as to any alterations to the routing made after completion of the Heritage Impact Assessment.</p> <p>12.15.3. The probability of uncovering graves during construction anywhere in the surrounding landscape is extremely unlikely. If any of the graves or potential graves found on</p>	<ul style="list-style-type: none"> Carry out Environmental Awareness Training to ensure that the Contractors are informed of the possible type of heritage features that may be encountered during the construction phase. Appoint a suitably qualified archaeologist to conduct a pre-construction survey. Appoint a professional archaeologist to conduct a test excavation to determine if the sites are graves. Conduct an audit to verify that the 	<ul style="list-style-type: none"> Once-off training before construction commences. Once-off, 6 months prior to start of construction. As potential graves are encountered Once-off, prior to start of construction. Once-off, prior to start of construction. Once-off, prior to start of construction and weekly during 	<ul style="list-style-type: none"> Contractor/ECO Project Owner, ECO and Archaeologist Project Owner ECO ECO and Archaeologist ECO ECO Contractor and ECO Project Owner ECO

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excavations are made. Direct impacts to palaeontological material.		<p>site cannot be avoided then an archaeologist should be contracted to conduct a test excavation to determine the status of the feature. If it is determined to be a grave, then exhumation would need to occur (if necessary) with the permission of SAHRA (and in accordance with any requirements that SAHRA might impose at the time). Record significant sites within the project footprint that cannot be avoided.</p> <p>12.15.4. Avoid and protect all identified archaeological and palaeontological sites if possible. Ensure that all sensitive areas are cordoned off and protected prior to the start of construction with the buffers as stated in the Heritage Impact Assessment.</p> <p>12.15.5. The no-go sites should be examined periodically by the ECO during the construction phase to ensure that they are being avoided.</p> <p>12.15.6. If any archaeological or palaeontological material is encountered during any phase of the project, work in the immediate area should be halted, and the find should be protected <i>in situ</i> and reported to an appropriate specialist and/or to SAHRA so that a decision can be made as to how to proceed (i.e. it may require inspection by an archaeologist or palaeontologist). Such heritage is the property of the state and may require excavation and curation in an approved institution. Sufficient time should be allowed to remove/collect such material. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit, must be alerted immediately. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required.</p> <p>12.15.7. Ensure that no activity takes place outside of the authorized</p>	<p>necessary permits are obtained by the archaeologist for the test excavation, if required.</p> <ul style="list-style-type: none"> Ensure that this is taken into consideration by reviewing signed minutes of meetings or signed reports. Monitor and verify if any significant sites are found within the project footprint that cannot be avoided, subsequent to the pre-construction survey. Ensure that this is taken into consideration in the site plan. Identify and cordon off sites with appropriate barriers. Carry out visual inspections and site visits to ensure strict control over the demarcation of no-go areas. Record and report any non-compliance. Carry out visual inspections and site visits to ensure strict control over the demarcation of no-go areas. Record and report any non-compliance. Monitor excavations and construction activities for archaeological materials via visual inspections and report the finds accordingly. 	<p>construction.</p> <ul style="list-style-type: none"> Weekly Daily or during excavations. As required/necessary during the construction phase. Weekly 	

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		construction footprint (and construction vehicles should remain within the construction corridor).	<ul style="list-style-type: none"> Contact the heritage authorities and the identified archaeologist if any heritage features are uncovered. Carry out visual inspections to ensure strict control over the behaviour of construction staff in order to restrict activities to within demarcated areas. 		
12.16. Alteration of the cultural landscape as a result of the construction of the proposed transmission line electrical infrastructure. The cultural landscape will be impacted through the presence of incompatible structures (i.e. the proposed power line and pylons) and the construction vehicles in the rural landscape.	Minimise the chances of the cultural landscape being disturbed.	12.16.1. Ensure use of existing roads as far as possible. 12.16.2. Minimise overall footprint. 12.16.3. Minimise fencing in communal lands. 12.16.4. Minimise landscape scarring from cut and fill operations.	<ul style="list-style-type: none"> Ensure that this is taken into consideration by reviewing signed minutes of meetings or signed reports, and the approved site layout. Ensure that these recommendations are adhered to. 	<ul style="list-style-type: none"> Once-off, prior to start of construction. During the construction phase. 	<ul style="list-style-type: none"> ECO and Project Owner ECO and Project Owner
12.17. Disturbance, damage or destruction of scientifically important fossils at or	Reporting, conservation, recording and judicious sampling of scientifically important fossil material exposed during the construction	12.17.1. Reporting chance fossil finds to SAHRA for possible professional mitigation. 12.17.2. Recording and sampling of fossil material and associated geological data (only necessary for chance fossil finds made during the proposed development).	<ul style="list-style-type: none"> Monitoring of all substantial excavations into sedimentary bedrocks for fossil material (e.g. vertebrate bones & teeth, fossilized wood, shells) 	<ul style="list-style-type: none"> Throughout the construction phase. Throughout the construction phase. Following alert of 	<ul style="list-style-type: none"> ECO ECO Qualified palaeontologist appointed and

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beneath the ground surface as a result of surface clearance and excavations.	phase of development (The paleontological sensitivity of the site is reported as Very Low in the Palaeontological Study).		<ul style="list-style-type: none"> Safeguarding of chance fossil finds, preferably in situ in the original assessment. Application by a qualified palaeontologist for fossil collection permit from SAHRA. Palaeontologist to undertake field study of fossil finds in situ on site. Photography and sampling of important finds. Curation of fossils collected in an approved repository (museum/of significant chance fossil finds. 	chance fossil finds on site (It is important to note that there is no need for on-site palaeontological monitoring unless new fossil finds are made during development).	commissioned by the Project Owner <ul style="list-style-type: none"> Qualified palaeontologist appointed and commissioned by the Project Owner Qualified palaeontologist appointed and commissioned by the Project Owner
B.7. AGRICULTURE AND SOIL POTENTIAL IMPACTS					
12.18. Erosion caused by the change in land surface characteristics	Reduce erosion.	12.18.1. Implement an effective system of storm water run-off control using bunds and ditches, where it is required - that is at points where water accumulation might occur. The system must effectively collect and safely disseminate any run-off water from all hardened surfaces and it must prevent any potential down slope erosion.	<ul style="list-style-type: none"> Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water run-off control system and to specifically record the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring. 	<ul style="list-style-type: none"> Monthly during the construction phase. 	<ul style="list-style-type: none"> ECO
12.19. Loss of topsoil as a result of construction activities that disturb soil	Reduce loss of topsoil.	12.19.1. Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize the soil against erosion. 12.19.2. If an activity will mechanically disturb the soil below surface	<ul style="list-style-type: none"> Establish an effective record keeping system for each area where soil is disturbed for constructional and 	<ul style="list-style-type: none"> As needed, dependent on the specifics of the construction activities. 	<ul style="list-style-type: none"> ECO

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profile.		in any way, then any available topsoil should first be stripped from the entire surface to be disturbed and stockpiled for re-spreading during rehabilitation. Topsoil stockpiles must be conserved against losses through erosion by establishing vegetation cover on them. During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface. Any subsurface spoils from excavations must be disposed of where they will not bury the topsoil of agricultural land.	decommissioning purposes. Recommendations for the recording system are included in the EMPr.		
12.20. Degradation of veld vegetation as a result of traffic and dust generation.	Avoid or minimise degradation of veld vegetation as a result of traffic and dust generation.	12.20.1. Restrict vehicle access to approved roads and areas only. 12.20.2. Control dust generation during construction activities by implementing standard construction site dust control measures of damping down with water where dust generation occurs.	Undertake a periodic site inspection during construction to check for vehicle tracks beyond the approved vehicle areas.		
B.8. SOCIO-ECONOMIC IMPACTS					
12.21. Employment opportunities	Create local employment opportunities.	12.21.1. Implement a 'locals first' policy with regard to labour needs. 12.21.2. Where possible, subcontract to local construction companies. 12.21.3. Consultation with local authorities is essential so as to manage job creation expectations and ensure that all eligible workers in the primary study area are informed of the opportunities.	<ul style="list-style-type: none"> Verify that local labour is, as far as practically possible, being used. 	<ul style="list-style-type: none"> Three times during the estimated 12 month construction period (i.e. at 3 months, 6 months, and 9 months). 	<ul style="list-style-type: none"> Construction Manager and ECO
B.9. NOISE IMPACTS					
12.22. Noise pollution stemming from construction activities.	Limit the increase in ambient sound levels as a result of increased noise levels during construction.	12.22.1. Ensure equivalent A-weighted daytime noise levels below 52 dBA at potentially sensitive receptors. 12.22.2. Ensure that maximum noise levels at potentially sensitive receptors be less than 65 dBA; 12.22.3. Prevent the generation of disturbing or nuisance noises; 12.22.4. Ensure acceptable noise levels at surrounding stakeholders and potentially sensitive receptors. 12.22.5. Ensuring compliance with the National Noise Control	<ul style="list-style-type: none"> Monitor compliance with National Noise Control Standards and Regulations. Ensure equivalent weighted daytime noise levels below 52 dBA at potentially sensitive receptors. Ensure that maximum noise 	<ul style="list-style-type: none"> Ongoing through-out the construction phase. 	<ul style="list-style-type: none"> Project developer Contractor ECO

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		<p>Regulations.</p> <p>12.22.6. Avoid construction activities during night-time.</p>	<p>levels at potentially sensitive receptors be less than 65 dBA.</p> <ul style="list-style-type: none"> Prevent the generation of disturbing or nuisance noises; Ensure acceptable noise levels at surrounding stakeholders and potentially sensitive receptors. Ensuring compliance with the National Noise Control Regulations. 		
B.10. WASTE MANAGEMENT					
12.23. Pollution of the surrounding environment (including drainage features) as a result of the handling, temporary stockpiling and disposal of general waste.	<p>Reduce environmental impacts such as soil, surface water and groundwater contamination as a result of incorrect storage, handling and disposal of general waste.</p> <p>Minimise the production of waste.</p> <p>Prevent environmental problems (e.g. pollution / change in soil pH) due to solid and liquid wastes disposed of on the site.</p> <p>Ensure compliance with waste management legislation.</p>	<p>12.23.1. General waste (i.e. construction waste, building rubble, discarded concrete, bricks, tiles, wood, glass, window panes, air conditioners, plastic, metal, excavated material, packaging material, paper and domestic waste etc.) generated during the construction phase should be stockpiled temporarily (i.e. once-off) on site in a designated area within suitable waste collection bins and skips (or similar). Waste collection bins and skips should be covered with suitable material, where appropriate.</p>	<ul style="list-style-type: none"> Monitor the strategic placement of the temporary, designated waste stockpiling area at the site camp via visual inspections, and record and report any non-compliance. Monitor the temporary storage and handling of general waste on site via site audits and record non-compliance and incidents (i.e. conduct visual inspections of the temporary waste storage area). 	<ul style="list-style-type: none"> Once-off prior to the commencement of the construction phase and as required as the construction phase process evolves. Daily 	<ul style="list-style-type: none"> ECO and Contractor ECO
		<p>12.23.2. Should the on-site stockpiling of general waste exceed 100 m³ and a period of 90 days, then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under GN 926) must be adhered to.</p>	<ul style="list-style-type: none"> Record the amount of general waste that is temporarily stockpiled at the designated area on site, as well as the duration and record non-compliance and incidents. Monitor the duration and 	<ul style="list-style-type: none"> Daily Weekly Monthly 	<ul style="list-style-type: none"> Contractor ECO Project Owner.

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			<p>amounts of general waste that is temporarily stockpiled at the designated area on site via site audits and record non-compliance and incidents (i.e. conduct visual inspections of the temporary waste storage area).</p> <ul style="list-style-type: none"> Audit compliance with the Norms and Standards for the Storage of Waste (published on 29 November 2013 under GN 926) if the storage amounts are exceeded (i.e. only if required). 		
		12.23.3. Ensure that the designated stockpiling area for general waste (i.e. skips and waste collection bins) is inspected on a daily basis to verify its condition and integrity, particularly after rainfall events.	<ul style="list-style-type: none"> Monitor the temporary, designated waste stockpiling area at the site camp, as well as the handling of general waste on site via site audits and record non-compliance and incidents. 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> ECO
		12.23.4. Ensure that general waste generated during the construction phase is removed from the site on a regular basis, and safely disposed of at an appropriate, licenced waste disposal facility by an approved waste management Contractor. Waste disposal slips or waybills should be kept on file as proof of disposal. As a general principle, waste manifests must be obtained to prove legal disposal of waste.	<ul style="list-style-type: none"> Ensure that a suitable Waste Management Contractor is appointed to remove and dispose the general waste at an appropriate, licenced waste disposal facility. Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents. 	<ul style="list-style-type: none"> Once-off prior to the construction phase. Weekly 	<ul style="list-style-type: none"> Project Owner/ Contractor ECO
		12.23.5. Ensure that the construction site is kept clean at all times	<ul style="list-style-type: none"> Monitor the condition of the 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> ECO and Contractor

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		and that construction personnel are made aware of correct waste disposal methods. Littering must be prevented through effective site camp management.	<ul style="list-style-type: none"> site camp throughout the construction phase via visual site inspections. Record non-compliance and incidents. Carry out Environmental Awareness Training. Conduct audits of the signed attendance registers. 	<ul style="list-style-type: none"> Once-off training and ensure that all new staff are inducted. Monthly 	<ul style="list-style-type: none"> ECO and Contractor ECO
		12.23.6. Sufficient general waste disposal bins must also be provided for use by construction personnel throughout the site. These bins must be emptied on a regular basis.	<ul style="list-style-type: none"> Monitor general waste generation by construction staff and collection via audits throughout the construction phase. 	<ul style="list-style-type: none"> Daily or Weekly 	<ul style="list-style-type: none"> ECO and Contractor.
		12.23.7. Ensure that all general waste emanating from the construction phase is removed from site prior to the commencement of the rehabilitation and operational phases.	<ul style="list-style-type: none"> Undertake a final inspection at the end of the construction phase in order to verify and ensure that all general waste is removed from site and correctly disposed, prior to the commencement of the rehabilitation and operational phases. 	<ul style="list-style-type: none"> At the end of the construction phase. 	<ul style="list-style-type: none"> ECO and Contractor.
		12.23.8. Promote waste reduction, re-use, and recycling opportunities on site during the construction phase.	<ul style="list-style-type: none"> Monitor waste generation and collection throughout construction. Investigate if any complaints have been expressed by the surrounding community regarding waste handling. 	<ul style="list-style-type: none"> Weekly or bi-weekly 	<ul style="list-style-type: none"> ECO and Contractor
		12.23.9. Ensure an adequate and sustainable use of resources.	<ul style="list-style-type: none"> Monitor waste generation and collection throughout construction. 	<ul style="list-style-type: none"> Weekly or bi-weekly 	<ul style="list-style-type: none"> ECO and Contractor

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		12.23.10. Control and implement waste management plans provided by contractors. Ensure that relevant legislative requirements are respected.	<ul style="list-style-type: none"> Control of waste management practices throughout construction phase 	<ul style="list-style-type: none"> Weekly or bi-weekly 	<ul style="list-style-type: none"> ECO and Contractor
		12.23.11. Normal sewage management practices should be implemented. These include ensuring that portable sanitation facilities are regularly emptied and the resulting sewage is contained and transported safely (by an appointed (suitable) service provider) for correct disposal at an appropriate, licenced facility. Proof of disposal (in the form of waste disposal slips or waybills) should be retained on file for auditing purposes. No waste water must be discharged to the natural environment.	<ul style="list-style-type: none"> Monitor the placement of sanitation facilities during the construction phase via visual site inspections. Record non-compliance and incidents. Ensure that a suitable Contractor is appointed to remove and dispose the sewage at an appropriate, licenced facility. 	<ul style="list-style-type: none"> Weekly During construction Weekly Once-off training and ensure that all new staff are inducted. Monthly 	<ul style="list-style-type: none"> ECO and Contractor ECO ECO ECO and Contractor ECO
		12.23.12. As part of the Environmental Awareness Training, all construction personnel should be made aware of the sewage management practices.	<ul style="list-style-type: none"> Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents. Carry out Environmental Awareness Training. Conduct audits of the signed attendance registers. 		
12.24. Pollution of the surrounding environment as a result of the handling, temporary stockpiling and disposal of hazardous waste.	Reduce environmental impacts such as soil, surface water and groundwater contamination as a result of incorrect storage, handling and disposal of hazardous waste.	12.24.1. Hazardous waste (i.e. empty tins, oils, fuel spillages, spilled materials and chemicals etc.) generated during the construction phase should be stockpiled temporarily (i.e. once-off) on site in a designated area in suitable waste collection bins and leak-proof storage skips (or similar). Waste collection bins and skips should be covered with suitable material, where appropriate. Hazardous waste must be stored separately from all other general waste. The designated stockpiling area must be labelled correctly.	<ul style="list-style-type: none"> Monitor the strategic placement of the temporary, designated waste stockpiling area at the site camp via visual inspections, and record and report any non-compliance. Monitor the temporary storage and handling of hazardous waste on site via site audits and record non-compliance and incidents (i.e. conduct visual 	<ul style="list-style-type: none"> Once-off prior to the commencement of the construction phase and as required as the construction process evolves. Daily 	<ul style="list-style-type: none"> ECO and Contractor ECO

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			Methodology	Frequency	Responsibility
			inspections of the temporary waste storage area).		
		12.24.2. Should the on-site stockpiling of hazardous waste exceed 80 m ³ , then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under GN 926) must be adhered to.	<ul style="list-style-type: none"> Record the amount of hazardous waste that is temporarily stockpiled at the designated area on site, as well as the duration and record non-compliance and incidents. Monitor the duration and amounts of hazardous waste that is temporarily stockpiled at the designated area on site via site audits and record non-compliance and incidents (i.e. conduct visual inspections of the temporary waste storage area). Audit compliance with the Norms and Standards for the Storage of Waste (published on 29 November 2013 under GN 926) if the storage amounts are exceeded (i.e. only if required). 	<ul style="list-style-type: none"> Daily Weekly Monthly 	<ul style="list-style-type: none"> Contractor ECO Project Owner
		12.24.3. Ensure that the designated stockpiling area for hazardous waste (i.e. leak proof skips and waste collection bins) is inspected on a daily basis to verify its condition and integrity, particularly after rainfall events.	<ul style="list-style-type: none"> Monitor the temporary, designated waste stockpiling area at the site camp, as well as the handling of hazardous waste on site via site audits and record non-compliance and incidents. 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> ECO
		12.24.4. Ensure that all hazardous waste is removed from the site on a regular basis, and safely disposed at an appropriate,	<ul style="list-style-type: none"> Ensure that a suitable Waste Management Contractor is 	<ul style="list-style-type: none"> Once-off prior to the construction phase. 	<ul style="list-style-type: none"> Project Owner/ Contractor

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			Methodology	Frequency	Responsibility
		licenced hazardous waste disposal facility by an approved waste management Contractor.	<div>appointed to remove and dispose the hazardous waste at an appropriate, licenced hazardous waste disposal facility.</div> <div><div>▪</div>Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents.</div>	<div>▪</div> Weekly	<div>▪</div> ECO
		12.24.5. All liquid waste (used oil, paints, lubricating compounds and grease) to be packaged and disposed of by appropriate means.	<div>▪</div> Waste removal and disposal to be monitored throughout construction.	<div>▪</div> Weekly or bi-weekly	<div>▪</div> ECO and Contractor
		12.24.6. Adequate containers for the cleaning of equipment and materials (paint, solvent) must be provided as to avoid spillages.	<div>▪</div> Waste removal and disposal to be monitored throughout construction.	<div>▪</div> Weekly or bi-weekly	<div>▪</div> ECO and Contractor
		12.24.7. Waste water from construction and painting activities must be collected in a designated container and disposed of at a suitable disposal point off site.	<div>▪</div> Waste removal and disposal to be monitored throughout construction.	<div>▪</div> Weekly or bi-weekly	<div>▪</div> ECO and Contractor
		12.24.8. Control and implement waste management plans provided by contractors. Ensure that relevant legislative requirements are respected.	<div>▪</div> Control of waste management practices throughout construction phase.	<div>▪</div> Weekly or bi-weekly	<div>▪</div> ECO and Contractor
C. OPERATIONAL PHASE					
C.1. TERRESTRIAL ECOLOGICAL IMPACTS					
12.25. Increased soil erosion due to disturbance	Avoid or reduce soil erosion.	<div>12.25.1. Erosion management at the site should take place according to the Rehabilitation Plan (Section 5) and the Erosion Management Plan (Section 9).</div> <div>12.25.2. All hardened roads and other surfaces should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk.</div> <div>12.25.3. Regular monitoring for erosion along the power line route after construction to ensure that no erosion problems have</div>	<div>▪</div> Monitor the erosion on site during operations, as well as the implementation and effectiveness of the Rehabilitation Plan and the Erosion Management Plan (such as the use of gabions and geofabric materials or similar)	<div>▪</div> Ongoing and as required	<div>▪</div> Facility Manager and Environmental Manager/ECO

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			Methodology	Frequency	Responsibility
		<p>developed as result of the disturbance, as per the Erosion Management and Rehabilitation Plans for the project.</p> <p>12.25.4. All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques.</p> <p>12.25.5. All cleared areas should be revegetated with indigenous perennial species from the local area.</p> <p>12.25.6. Avoid areas of high wind erosion vulnerability as much as possible.</p> <p>12.25.7. Use net barriers, geotextiles, active rehabilitation and other measures during and after construction to minimise sand movement at the site.</p>	<p>at appropriate points.</p> <ul style="list-style-type: none"> Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water run-off control system and to specifically record the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring. Undertake visual inspections and site audits to monitor if the mitigation measures are adhered to. 		
12.26. Impacts on CBAs as a result of habitat loss and disturbance	Avoid or reduce impacts on CBAs.	12.26.1. Avoid impact to restricted and specialised habitats such as quartz patches or active dune fields.	<ul style="list-style-type: none"> Undertake periodic site inspections to monitor if specialised habitats are avoided during operation phase. 	<ul style="list-style-type: none"> Ongoing during the operational phase. 	<ul style="list-style-type: none"> Facility Manager and Environmental Manager/ECO
C.2. BIRD IMPACTS					
12.27. Bird collision with transmission line.	To reduce the risk of bird collisions.	<p>12.27.1. The transmission line should be fitted with the best available (at the time of construction) anti- bird collision line marking devices in order to make the overhead cables more visible to birds. More specifically:</p> <ul style="list-style-type: none"> Devices should be fitted on the entire length of the power line as collision risk is high all along the alignment for nomadic species such as Ludwig's Bustard. Devices should be fitted on the earth wire/s. 	<ul style="list-style-type: none"> Verify that this is undertaken by reviewing the signed approved designs. 	<ul style="list-style-type: none"> Once-off 	<ul style="list-style-type: none"> ECO

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			Methodology	Frequency	Responsibility
		<ul style="list-style-type: none"> On each span, the full span should be fitted with marking devices (i.e. not only the middle 60% as done previously by Eskom). Research has shown that collisions occur even close to pylons (Shaw, 2013). Light and dark colour devices should be alternated so as to provide contrast against both dark and light backgrounds. These devices should be fitted as soon as the earth wires are strung as collision risk begins immediately, not only once the line is commissioned and live. <p>12.27.2. The power line owner will be responsible for ensuring that the marking devices remain in place and effective on the power line for its' full lifespan. Any device failures must be rectified immediately by replacement with new devices.</p>			
12.28. Electrocution of birds on transmission line and on-site substation.	Prevent any electrocutions of avifauna during the operation of the proposed transmission line.	12.28.1. The proposed tower/pylon structure has not been decided in detail. It will however be either concrete or steel monopole. It is critically important that sufficient clearance be allowed between phase-phase and phase-earth hardware on the structure. For large eagles these clearances should be a minimum of 1.8m.	<ul style="list-style-type: none"> Ensure that this is taken into consideration during the planning and design phase. 	<ul style="list-style-type: none"> Once-off before construction. 	<ul style="list-style-type: none"> Project Owner, ECO and Contractor
12.29. Bird nesting on transmission line.	To reduce conflict with infrastructure management.	<p>12.29.1. Nest management on a case by case under the supervision of an Ornithologist, and in conformance with all relevant national and provincial legislation.</p> <p>12.29.2. The operational phase EMP must include provision for application to the provincial authority for permits for any necessary nest management.</p>	<ul style="list-style-type: none"> Nest relocation or removal should be done under permit from the provincial authority. 	<ul style="list-style-type: none"> As required 	<ul style="list-style-type: none"> ECO
C.3. IMPACTS ON DRY AND EPHEMERAL WATERCOURSES					
12.30. Altered drainage	To avoid or reduce impact on	12.30.1. Use existing Buffels River crossing for all vehicles.	<ul style="list-style-type: none"> Undertake periodic site 	<ul style="list-style-type: none"> Through-out the 	<ul style="list-style-type: none"> ECO

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			Methodology	Frequency	Responsibility
patterns, increased runoff, erosion and sedimentation of surrounding ecosystems.	watercourses.	12.30.2. Avoid clearance of vegetation for the powerline servitude for maintenance. 12.30.3. Service vehicles should keep to the servitude and follow existing roads and tracks where possible.	inspections, especially after rainfall events, to verify and inspect the effectiveness and integrity of the storm water runoff control system and to specifically record the occurrence of any erosion on site or downstream. ▪ Correct or improve the runoff control system in the event of any erosion occurring.	operational phase as required.	
C.4. VISUAL IMPACTS					
12.31. Visual intrusion of transmission line on ridgelines.	Reduce visual intrusion of transmission line on ridgeline	12.31.1. Avoidance of ridgelines where possible.	▪ Conduct visual inspections to ensure that ridgelines are avoided.	▪ Weekly	▪ ECO and Contractor
12.32. Visual effect of access roads.	Reduce visual clutter of infrastructure on the open landscape	12.32.1. Use existing roads where possible.	▪ Conduct visual inspections to ensure that ridgelines are avoided.	▪ Weekly	▪ ECO and Contractor
C.5. AGRICULTURE AND SOIL POTENTIAL IMPACTS					
12.33. Erosion caused by the change in land surface characteristics	Reduce erosion.	12.33.1. Implement an effective system of storm water run-off control using bunds and ditches, where it is required - that is at points where water accumulation might occur. The system must effectively collect and safely disseminate any run-off water from all hardened surfaces and it must prevent any potential down slope erosion.	▪ Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water run-off control system and to specifically record the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion	▪ As required.	ECO

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			Methodology	Frequency	Responsibility
			occurring.		
C.6. HERITAGE IMPACTS (PALAEONTOLOGY, ARCHAEOLOGY AND CULTURAL LANDSCAPE)					
12.34. Destruction of archaeological remains as a result of the existence and maintenance of the proposed transmission line, on-site substation and service road.	Minimise the chances of significant archaeological sites and/or graves being disturbed.	12.34.1. Ensure that all vehicles remain on the service road at all times and ensure that no activity takes place outside of the authorized operational footprint. Keep traffic on site to a minimum.	<ul style="list-style-type: none"> Carry out visual inspections to ensure strict control over the behaviour of operational staff in order to restrict activities to within demarcated areas. 	<ul style="list-style-type: none"> Monthly 	<ul style="list-style-type: none"> ECO
12.35. Destruction of palaeontological material as a result of the existence and maintenance of the proposed transmission line, on-site substation and service road.	Minimise the chances of significant fossil material or palaeontological sites being disturbed.	12.35.1. Ensure that all vehicles remain on the service road at all times and ensure that no activity takes place outside of the authorized operational footprint.	<ul style="list-style-type: none"> Carry out visual inspections to ensure strict control over the behaviour of operational staff in order to restrict activities to within demarcated areas. 	<ul style="list-style-type: none"> Weekly 	<ul style="list-style-type: none"> ECO
D. DECOMMISSIONING PHASE					
D.1. TERRESTRIAL ECOLOGICAL IMPACTS					
12.36. Increased soil erosion due to habitat loss and disturbance.	Minimise soil erosion during decommissioning activities.	12.36.1. All hard infrastructure should be removed and the footprint areas rehabilitated with locally-sourced perennial species. 12.36.2. The use of net barriers, geotextiles, active rehabilitation and other measures after decommissioning to minimise sand movement and enhance revegetation at the site. 12.36.3. Monitoring of rehabilitation success at the site for at least 5 years after decommissioning. 12.36.4. All erosion problems observed should be rectified as soon	<ul style="list-style-type: none"> Develop and Implementation of Decommissioning EMP and oversee activities to ensure that it is implemented and enforced, via site audits and inspections. Record and report any non-compliance. Appoint a suitably qualified 	<ul style="list-style-type: none"> Ongoing through-out the decommissioning phase. Before decommissioning commences. Before rehabilitation commences. 	<ul style="list-style-type: none"> Project Applicant Suitably qualified contractor Rehabilitation specialist Contractor and Rehabilitation specialist

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			Methodology	Frequency	Responsibility
		as possible, using the appropriate erosion control structures and revegetation techniques.	<ul style="list-style-type: none"> contractor to undertake and oversee the decommissioning of transmission lines. Appoint a suitably qualified specialist to monitor rehabilitation via site audits and site inspections to ensure compliance. Ensure erosion problems are rectified as soon as possible. Record and report any non-compliance. 	<ul style="list-style-type: none"> Erosion problems to be rectified as soon as possible. 	
12.37. Increased alien plant invasion due to habitat loss and disturbance.	Minimise alien plant invasion during decommissioning activities.	<p>12.37.1. Alien management plan to be implemented during the decommissioning phase of the development, which makes provision for regular alien clearing and monitoring for at least 5 years after decommissioning.</p> <p>12.37.2. Active rehabilitation and revegetation of previously disturbed areas with indigenous species selected from the local environment.</p> <p>12.37.3. Wherever excavation is necessary for decommissioning, topsoil should be set aside and replaced after decommissioning activities are complete to encourage natural regeneration of the local indigenous species.</p> <p>12.37.4. Due to the disturbance at the site alien plant species are likely to be a long-term problem at the site following decommissioning and regular control will need to be implemented until a cover of indigenous species has returned.</p> <p>12.37.5. Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.</p>	<ul style="list-style-type: none"> Compile and implement alien management plan to monitor and clear aliens for five years post the decommissioning phase. Implement the Plant Rehabilitation Plan (Section 5) to ensure that rehabilitation is effective. Appoint contractor to implement clearing of aliens in terms of the alien management plan in the long-term as required. Implement the Alien Invasive Vegetation Management Plan (Section 4) of this EMPr. 	<ul style="list-style-type: none"> Regular monitoring of alien plants within disturbed areas for at least five years after decommissioning or until alien invasives are no longer a problem at the site. Weed eradication exercise to be undertaken every 6 months for a period of 5 years following decommissioning. 	<ul style="list-style-type: none"> Project Developer Contractor ECO
D.2. BIRD IMPACTS					

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			Methodology	Frequency	Responsibility
12.38. Disturbance of avifauna and displacement effects.	To reduce impact on avifauna.	<p>12.38.1. A site specific avifaunal walk-through should be conducted by a qualified ornithologist as part of the site specific EMP just prior to decommissioning, so as to ensure that no sensitive bird species have started breeding on or near site.</p> <p>12.38.2. Amendments to decommissioning schedule required if any of the Red Data species are confirmed to be breeding. Decommissioning activities within 500 m of the breeding site must cease, and an avifaunal specialist may advise changes to the schedule.</p>	<ul style="list-style-type: none"> ▪ If any such sites are found case specific mitigation measures will need to be designed. ▪ Appoint an Ornithologist if breeding sites are found within 500 m from decommissioning activities. 	<ul style="list-style-type: none"> ▪ Once-off prior to the start of decommissioning. ▪ At the time when this occurs. 	<ul style="list-style-type: none"> ▪ ECO and Ornithologist ▪ ECO and Ornithologist
D.3. IMPACTS ON DRY AND EPHEMERAL WATERCOURSES					
12.39. Altered drainage patterns, increased runoff, erosion and sedimentation of surrounding ecosystems due to land and vegetation clearance.	As far as possible, avoid identified sensitive dry and ephemeral watercourses, drainage lines and associated buffers. (The current layout already avoids the identified drainage lines).	<p>12.39.1. Use existing Buffels River crossing for all vehicles.</p> <p>12.39.2. During decommissioning activities, avoid identified sensitive dry and ephemeral watercourses, drainage lines and associated buffers as far as possible.</p> <p>12.39.3. Commence with restoration of disturbed, cleared land as soon as permanent structures have been removed.</p> <p>12.39.4. Ecology specialist/ECO to monitor progress and success of rehabilitation.</p>	<ul style="list-style-type: none"> ▪ Carry out visual inspections to ensure strict control over the behaviour of staff in order to restrict activities to within demarcated areas. Record non-compliance and incidents. ▪ Monitor the decommissioning period to verify if this is being undertaken (where possible). ▪ Monitor if restoration of disturbed areas are effected as soon as permanent structures are removed. ▪ Appoint an Ecology Specialist. 	<ul style="list-style-type: none"> ▪ Ongoing ▪ Restoration activities to commence as soon as structures have been removed. ▪ Rehabilitation monitoring to take place during rehabilitation. 	<ul style="list-style-type: none"> ▪ ECO ▪ Contractor/ Project Developer ▪ Ecology specialist
D.4. VISUAL IMPACTS					
12.40. Potential visual intrusion of decommissioning activities on existing views of sensitive visual receptors.	Prevent unnecessary visual clutter and focusing attention of surrounding visual receptors on the proposed development.	<p>12.40.1. Disturbed and transformed areas should be contoured to approximate naturally occurring slopes to avoid lines and forms that will contrast with the existing landscapes.</p> <p>12.40.2. Edges of re-vegetated areas should be feathered to reduce form and line contrasts with surrounding undisturbed landscape.</p>	<ul style="list-style-type: none"> ▪ Conduct visual inspections to ensure that landscaping is following the rehabilitation plan. 	<ul style="list-style-type: none"> ▪ Weekly 	<ul style="list-style-type: none"> ▪ ECO

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		12.40.3. Where possible decommissioning camps and laydown areas should be located (where sensitive visual receptors are least likely to be affected): <ul style="list-style-type: none"> In low visibility areas (e.g. avoid ridgelines and open plains); Previously disturbed areas (e.g. clearings created by farmers for other purposes which are no longer being used); and/or Areas near derelict farmsteads (taking into consideration the findings of the Heritage Impact Assessment as well as other assessments that may be relevant), particularly where existing trees can be used to screen these areas from views. 	<ul style="list-style-type: none"> Ensure that this is taken into consideration for the siting of the proposed site camp and laydown area. Carry out visual inspections to ensure the site camp and laydown area are demarcated clearly, and record and report any non-compliance. Carry out visual inspections to ensure strict control over the boundary of the site camp and laydown area in order to restrict activities to within demarcated areas. 	<ul style="list-style-type: none"> Weekly Weekly 	<ul style="list-style-type: none"> ECO ECO
		12.40.4. Stockpiled topsoil should be reapplied to disturbed areas and these areas should be re-vegetated using a mix of indigenous species in such a way that the areas will form as little contrast in form, line, colour and texture with the surrounding undisturbed landscape.	<ul style="list-style-type: none"> Site visits to ensure that stockpiled topsoil (or appropriate soil for vegetation when stockpiled topsoil is exhausted) is used. 	<ul style="list-style-type: none"> Weekly 	<ul style="list-style-type: none"> ECO
		12.40.5. Night lighting of decommissioning sites should be minimised within requirements of safety and efficiency.	<ul style="list-style-type: none"> Complaints about night lights should be investigated and documented in a register. 	<ul style="list-style-type: none"> Weekly or bi-weekly 	<ul style="list-style-type: none"> ECO
		12.40.6. Working at night should be avoided where possible.	<ul style="list-style-type: none"> Operation times for decommissioning activities to be monitored and managed (as well as included in the tender contract). 	<ul style="list-style-type: none"> Weekly 	<ul style="list-style-type: none"> ECO
		12.40.7. Maintain good housekeeping on site to avoid litter and minimize waste.	<ul style="list-style-type: none"> Carry out site visits and inspections of the sites and ensure good housekeeping is maintained. Record and report 	<ul style="list-style-type: none"> Daily Daily Daily Daily 	<ul style="list-style-type: none"> Decommissioning Manager and ECO
		12.40.8. Monitor sites for strict adherence to demarcated boundaries and minimise areas of vegetation, ground and			
	Reduce the visual impact of decommissioning activities project wide				

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		<p>surface disturbance. Existing clearings should be used where possible and where required.</p> <p>12.40.9. Monitor that existing roads will be used for access as far as possible.</p> <p>12.40.10. Monitor that topsoil from the site is stripped, stockpiled, and stabilised before excavating earth.</p> <p>12.40.11. Monitor that vegetation material from vegetation removal is mulched and spread over fresh soil disturbances to aid in the rehabilitation process.</p> <p>12.40.12. Monitor adherence to lighting plan.</p> <p>12.40.13. Monitor adherence to rehabilitation plan (i.e. where cleared areas are rehabilitated as soon as possible).</p> <p>12.40.14. Monitor adherence to erosion control plan.</p> <p>12.40.15. Monitor adherence to dust and fire control plans.</p>	<p>any non-compliance.</p> <ul style="list-style-type: none"> Carry out site visits and record and report any non-compliance. Carry out site visits and inspections of the access routes. Record and report any non-compliance. Carry out site visits and inspections of the topsoil management process. Record and report any non-compliance. Carry out site visits and inspections of the re-vegetation process. Record and report any non-compliance. Complaints about night lights should be investigated and documented in a register. Investigate any complaints about night lights and document it in a register. Visit sites requiring rehabilitation. Carry out site visits and record and report any non-compliance. Carry out site visits and record and report any non-compliance. 	<ul style="list-style-type: none"> Daily Daily and as complaints arise. Daily Daily Daily 	
D.5. HERITAGE IMPACTS (PALAEOLOGY, ARCHAEOLOGY AND CULTURAL LANDSCAPE)					

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			Methodology	Frequency	Responsibility
12.41. Destruction of archaeological remains as a result of the removal of the proposed transmission line, on-site substation and rehabilitation of the service road.	Minimise the chances of significant archaeological sites and/or graves being disturbed.	12.41.1. Ensure that all vehicles remain on the service road at all times and ensure that no activity takes place outside of the decommissioning footprint.	<ul style="list-style-type: none"> Carry out visual inspections to ensure strict control over the behaviour of decommissioning contractors and staff in order to restrict activities to within demarcated areas. 	<ul style="list-style-type: none"> Weekly 	<ul style="list-style-type: none"> ECO and Contractor
12.42. Alteration of the cultural landscape as a result of the removal of the proposed transmission line, on-site substation and rehabilitation of the service road.	Minimise the impact on the cultural landscape as a result of the presence of vehicles in the rural landscape during the decommissioning process.	12.42.1. Ensure that rehabilitation is effective and that no landscape scarring remains visible from long distances.	<ul style="list-style-type: none"> Carry out visual inspections to ensure that the rehabilitation process is effective and record and report any non-compliance. 	<ul style="list-style-type: none"> Weekly 	<ul style="list-style-type: none"> ECO and Contractor
12.43. Destruction of palaeontological material as a result of the removal of the proposed transmission line, on-site substation and rehabilitation of the service road.	Minimise the chances of significant fossil material or palaeontological sites being disturbed.	12.43.1. Ensure that all vehicles remain on the service road at all times and ensure that no activity takes place outside of the decommissioning footprint. 12.43.2. Report chance finds.	<ul style="list-style-type: none"> Carry out visual inspections to ensure strict control over the behaviour of decommissioning contractors and staff in order to restrict activities to within demarcated areas. Ensure that chance finds are reported to the relevant Heritage authorities. 	<ul style="list-style-type: none"> Weekly At the time when this occurs. 	<ul style="list-style-type: none"> ECO and Contractor ECO and Contractor
D.6. AGRICULTURAL AND SOIL POTENTIAL IMPACTS					
12.44. Loss of topsoil due to poor topsoil management.	Ensure effective topsoil covering to conserve soil fertility on all disturbed areas, after they have	12.44.1. Strip, stockpile and re-spread topsoil during rehabilitation.	<ul style="list-style-type: none"> Photograph the area on completion of rehabilitation and on an annual basis 	<ul style="list-style-type: none"> As needed, dependent on the specifics of decommissioning 	<ul style="list-style-type: none"> ECO Contractor

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			Methodology	Frequency	Responsibility
	been rehabilitated.		thereafter to show vegetation establishment and evaluate progress of restoration over time.	activities.	
12.45. Soil erosion due to alteration of the land surface characteristics	To reduce erosion on site and downstream of the site as a result run-off from the site, or due to wind erosion.	12.45.1. Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces of and prevents potential down slope erosion.	<ul style="list-style-type: none"> Include periodic site inspection in environmental performance reporting that inspects the effectiveness and integrity of the run-off control system and specifically records the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring. Implement Stormwater Management Plan (Section 8) and the Erosion Management Plan (Section 9). 	<ul style="list-style-type: none"> Monthly during the decommissioning phase. 	<ul style="list-style-type: none"> ECO
D.7. NOISE IMPACTS					
12.46. Noise pollution stemming from decommissioning activities.	Limit the increase in ambient sound levels as a result of increased noise levels during decommissioning.	12.46.1. Ensure equivalent A-weighted daytime noise levels below 52 dBA at potentially sensitive receptors. 12.46.2. Ensure that maximum noise levels at potentially sensitive receptors be less than 65 dBA; 12.46.3. Prevent the generation of disturbing or nuisance noises; 12.46.4. Ensure acceptable noise levels at surrounding stakeholders and potentially sensitive receptors. 12.46.5. Ensuring compliance with the National Noise Control Regulations. 12.46.6. Avoid decommissioning during night-time.	<ul style="list-style-type: none"> Monitor compliance with National Noise Control Standards and Regulations. Ensure equivalent weighted daytime noise levels below 52 dBA at potentially sensitive receptors. Ensure that maximum noise levels at potentially sensitive receptors be less than 65 dBA. 	<ul style="list-style-type: none"> Ongoing through-out the decommissioning phase. 	<ul style="list-style-type: none"> Contractor

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DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Proposed Development of a Transmission Line and associated electrical infrastructure to support the proposed Kap Vley Wind Energy Facility,
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Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
			<ul style="list-style-type: none"> Prevent the generation of disturbing or nuisance noises; Ensure acceptable noise levels at surrounding stakeholders and potentially sensitive receptors. Ensuring compliance with the National Noise Control Regulations. 		
D.8. WASTE MANAGEMENT					
12.47. Generation of waste due to disassembly of the transmission line and associated structures.	Avoid substantial negative impacts at the decommissioning phase due to insufficient planning.	12.47.1. Suitable receptacles must be provided for the temporary storage of various waste types such as scrap metal and concrete, until it is removed to the nearest licensed landfill.	<ul style="list-style-type: none"> Audit the implementation of mitigation measures recommended for the decommissioning phase. 	<ul style="list-style-type: none"> During the decommissioning phase 	<ul style="list-style-type: none"> ECO
		12.47.2. Waste separation is encouraged and therefore receptacles should be labelled to reflect the different waste types.	<ul style="list-style-type: none"> Audit the implementation of mitigation measures recommended for the decommissioning phase. 	<ul style="list-style-type: none"> During the decommissioning phase 	<ul style="list-style-type: none"> ECO
		12.47.3. Ensure that the construction mitigation and management measures are adhered to during the decommissioning phase.	<ul style="list-style-type: none"> Audit the implementation of mitigation measures recommended for the decommissioning phase. 	<ul style="list-style-type: none"> During the decommissioning phase 	<ul style="list-style-type: none"> ECO

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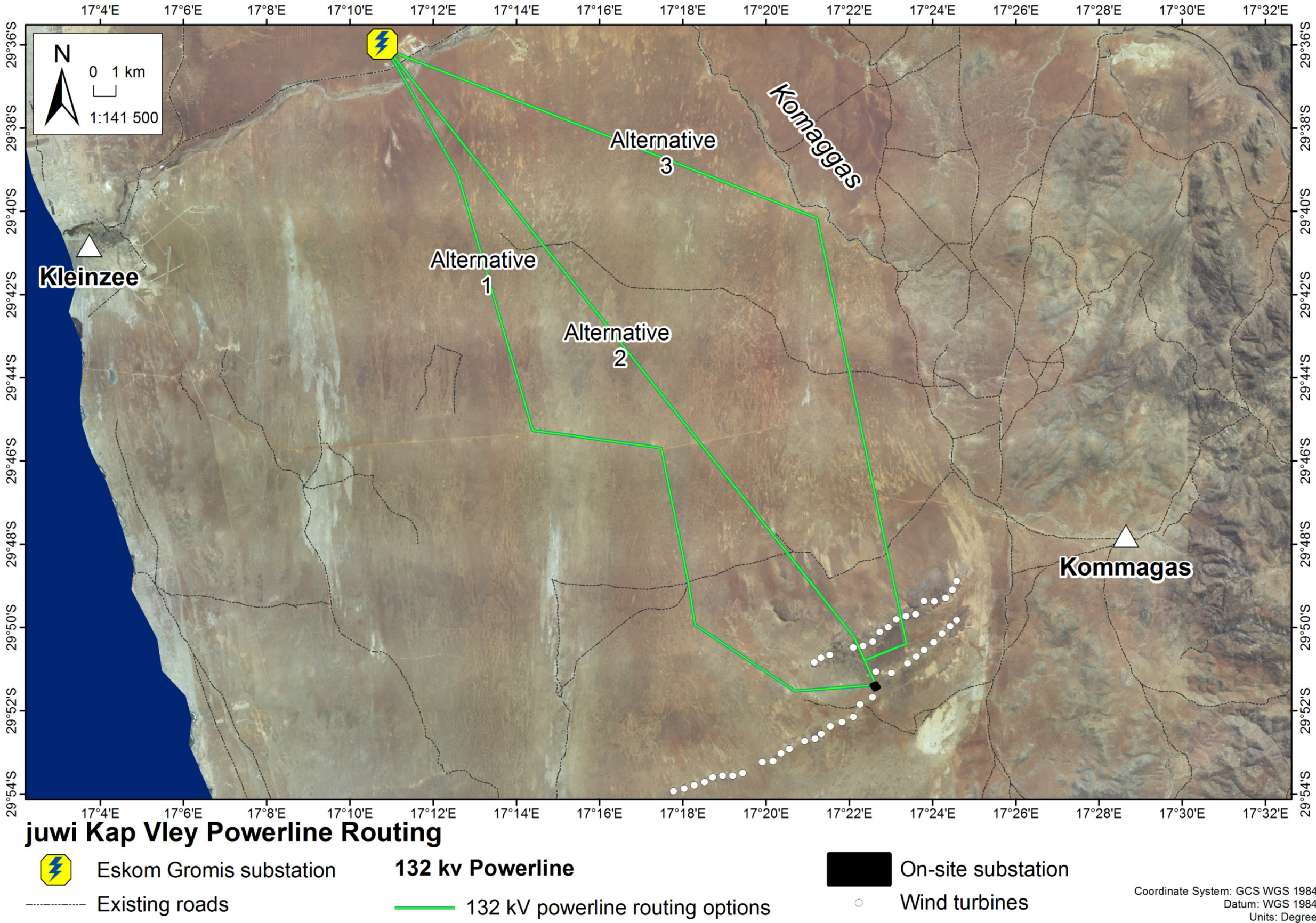
Basic Assessment for the Proposed Development of a Transmission Line and associated electrical infrastructure to support the proposed Kap Vley Wind Energy Facility, south-east of Kleinsee, Northern Cape Province

APPENDIX A – SITE LAYOUT MAP

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DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Proposed Development of a Transmission Line and associated electrical infrastructure to support the proposed Kap Vley Wind Energy Facility, south-east of Kleinzee, Northern Cape Province



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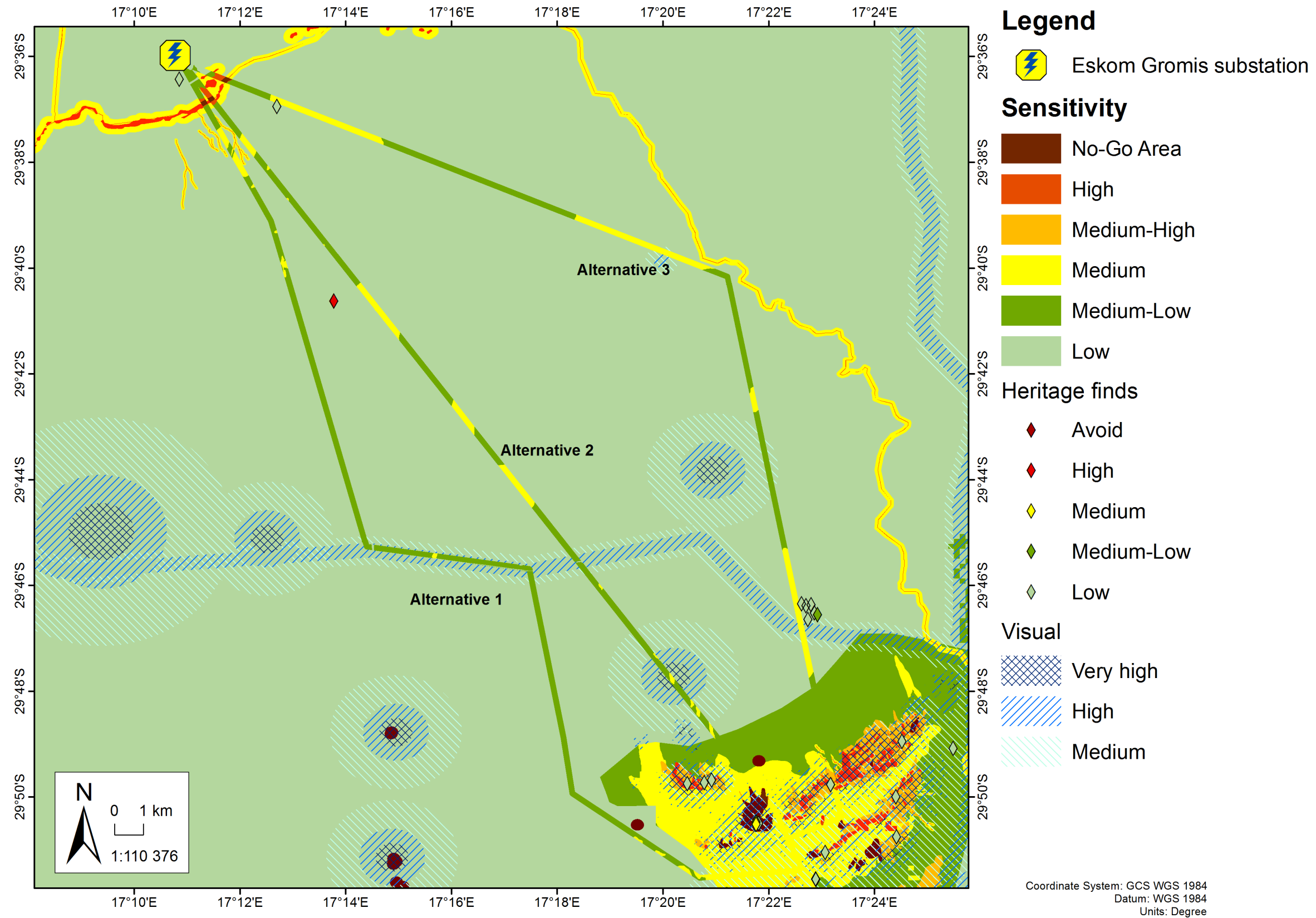
Basic Assessment for the Proposed Development of a Transmission Line and associated electrical infrastructure to support the proposed Kap Vley Wind Energy Facility, south-east of Kleinsee, Northern Cape Province

APPENDIX B – ENVIRONMENTAL SENSITIVITY MAP

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Environmental Sensitivity Map (with visual layer)