

ESIZAYO WIND (RF) (PTY) LTD

ESIZAYO PROPOSED 132KV OVERHEAD POWERLINE

ENVIRONMENTAL MANAGEMENT
PROGRAMME (DFFE REF:
14/12/16/3/3/1/2489)

20 APRIL 2022

FINAL





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ENVIRONMENTAL
MANAGEMENT PROGRAMME
(DFFE REF:
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ESIZAYO WIND (RF) (PTY) LTD

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This Environmental Management Programme (Report) for the Proposed Esizayo 132kV Overhead Powerline by WSP Group Africa (Pty) Ltd (WSP) on behalf and at the request of Esizayo Wind (RF) (Pty) Ltd (Client), as part of the application process for Environmental Authorisation.

Unless otherwise agreed by us in writing, we do not accept responsibility or legal liability to any person other than the Client for the contents of, or any omissions from, this Report.

To prepare this Report, we have reviewed only the documents and information provided to us by the Client or any third parties directed to provide information and documents to us by the Client. We have not reviewed any other documents in relation to this Report, except where otherwise indicated in the Report

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GLOSSARY OF TERMS AND ABBREVIATIONS

ABBREVIATION	DEFINITION
AEL	Atmospheric Emissions License
BBBEE	Broad-Based Black Economic Empowerment
Contractor	A person or company appointed by the Project Company to carry out stipulated activities
DFFE	Department of Forestry, Fisheries and the Environment
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
ECF	Employment Creation Fund
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
Emergency	An undesired event that may result in a significant environmental impact and requires the notification of the relevant statutory body such as a local authority
EMPr	Environmental Management Programme
EMS	Environmental Management System
Environment	In terms of the National Environmental Management Act (No. 107 of 1998), “environment” means the surroundings within which humans exist and that are made up of: <ul style="list-style-type: none"> — the land, water and atmosphere of the earth; — micro-organisms, plant and animal life; — any part or combination of (i) of (ii) and the interrelationships among and between them; and — the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.
Environmental Control Officer	A suitably qualified individual who, on behalf of the Project Company, would on a weekly basis monitor the project compliance with conditions of the EMPr and conditions of the environmental authorisation.

Environmental Impact	A change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services
FMP	Fire Management Plan
General Waste	Waste that does not pose an immediate hazard or risk to health or to the environment and includes domestic waste, building and demolition waste, business waste and inert waste.
GNR	Government Notice Regulation
Hazardous Waste	Waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.
Incident	An undesired event which may result in a significant environmental impact but can be managed through internal response
km	Kilometre
m	Metre
SDS	Safety Data Sheets
NCR	Non-conformance register
NEMA	National Environmental Management Act (No. 107 of 1998)
NEMWA	National Environmental Management Waste Act (No. 59 of 2008)
NWA	National Water Act (No. 36 of 1998)
PPE	Personal Protective Equipment
Project Manager	An appointed person, appointed to act as the manager of the project on behalf of the Project Company
SANS	South African National Standard
Site Manager	The Project Company appointed person, appointed to act as Site Manager by the Project Company, and is responsible for managing the construction process onsite
WUL	Water Use License
WSP	WSP Group Africa (Pty) Ltd

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- B A3 MAPS
- C GENERIC EMPR FOR THE DEVELOPMENT AND EXPANSION FOR OVERHEAD ELECTRICITY TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE
- D GENERIC EMPR FOR THE DEVELOPMENT AND EXPANSION OF SUBSTATION INFRASTRUCTURE FOR THE TRANSMISSION AND DISTRIBUTION OF ELECTRICITY
- E INVASIVE ALIEN PLANT MANAGEMENT PROGRAMME FOR THE ESIZAYO WEF
- F PLANT RESCUE AND PROTECTION PLAN FOR THE ESIZAYO WEF
- G RE-VEGETATION AND HABITAT REHABILITATION PLAN FOR THE ESIZAYO WEF

1 INTRODUCTION

Changes made from the Draft Environmental Management Programme (EMPr) have been underlined in this Final EMPr for ease of reference to the updates made in the reporting

1.1 BACKGROUND

Esizayo Wind (RF) (Pty) Ltd (Esizayo) proposes an alternative transmission integration option which entails the construction of a 132kV overhead powerline (OHPL), approximately 6.5km in length, from the onsite substation at the authorised Esizayo Wind Energy Facility (WEF) to connect to the national grid at the existing Komsberg substation. The transmission line alignment will run in a northerly direction for approximately 6.5km. The Komsberg substation and proposed transmission powerline are situated near Matjiesfontein in the Laingsburg and Karoo Hoogland Local Municipalities within the Central Karoo and Namaqua District Municipalities of the Western Cape and Northern Cape Provinces, South Africa (**Figure 1-1**).

The Esizayo WEF was authorised on 14 July 2017 (DFFE Ref no: 14/12/16/3/3/2/967). An EA exists for a 132kV powerline (Reference: 14/12/16/3/3/1/1775 issued on 01 December 2017), however, it must be noted that this application will not replace the authorised powerline.

On 16 February 2018, the Department of Environmental Affairs (DEA), now the Department of Forestry, Fisheries and the Environment (DFFE), gazetted the Renewable Energy Development Zones (REDZ) and Strategic Transmission Corridors and procedures for the assessment of large-scale wind and solar photovoltaic energy development activities (Government Notice (GN) 114) and grid infrastructure (GN 113). The proposed Esizayo 132kV powerline falls within the Central Strategic Transmission Corridor as well as the Komsberg REDZ.

The powerline route traverses a Critical Biodiversity Areas (CBA 1 and CBA 2), Ecological Support Areas (ESA 1), according to the Western Cape CBA map (2016) (**Figure 1-2**), and falls within the Western Karoo National Protected Area Expansion Strategy (NPAES) focus area (**Figure 1-3**).

The proposed OHPL requires an EA in terms of the National Environmental Management Act (Act 107 of 1998), as amended (NEMA) and the associated Environmental Impact Assessment (EIA) Regulations (2014, as amended).

WSP Group Africa (Pty) Ltd (WSP) has been appointed by Esizayo, as the Independent Environmental Assessment Practitioner (EAP) to facilitate the Basic Assessment (BA) process in accordance with the EIA Regulations, 2014, as amended.

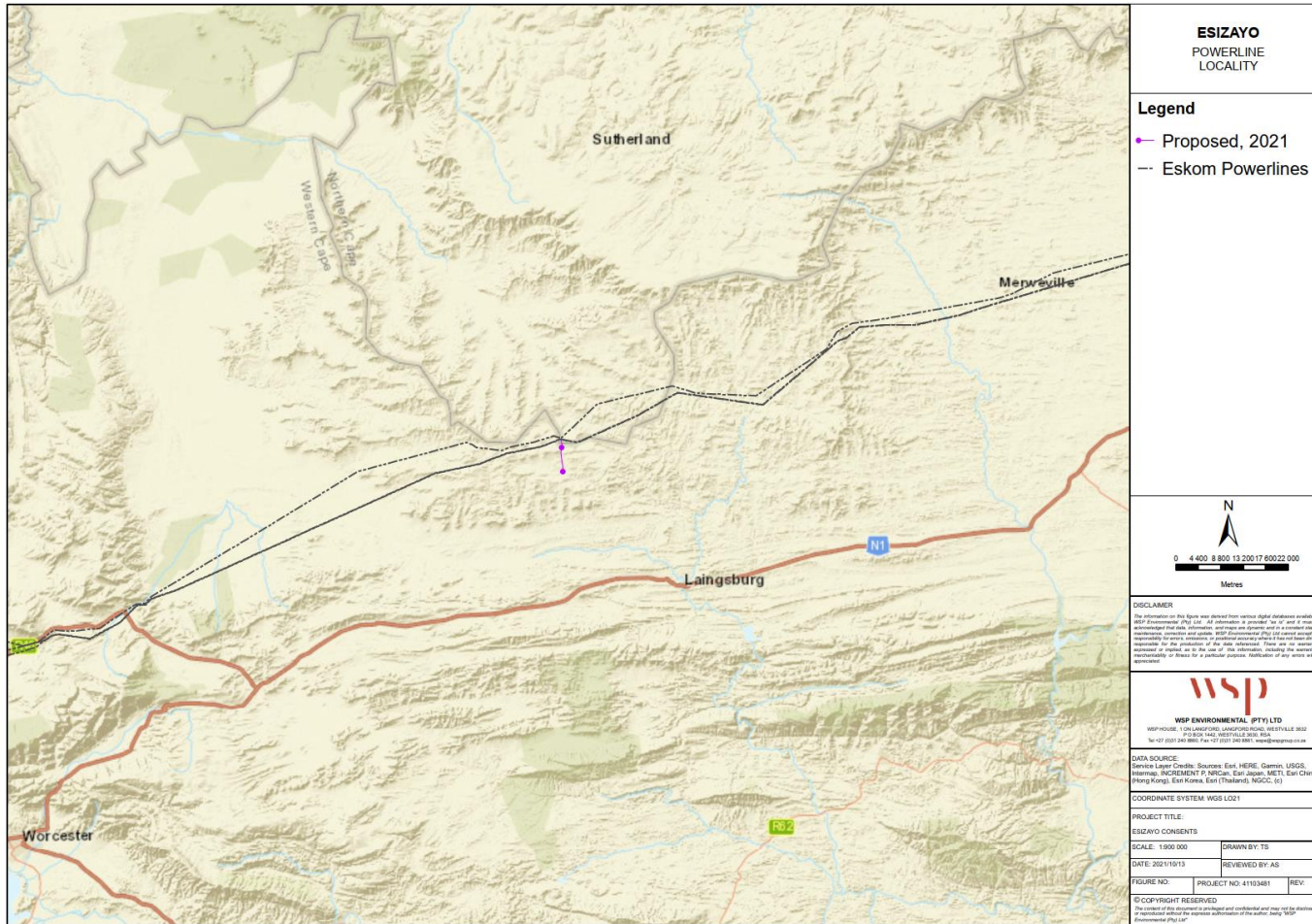


Figure 1-1: Location of the Proposed 132kV Esizayo OHPL

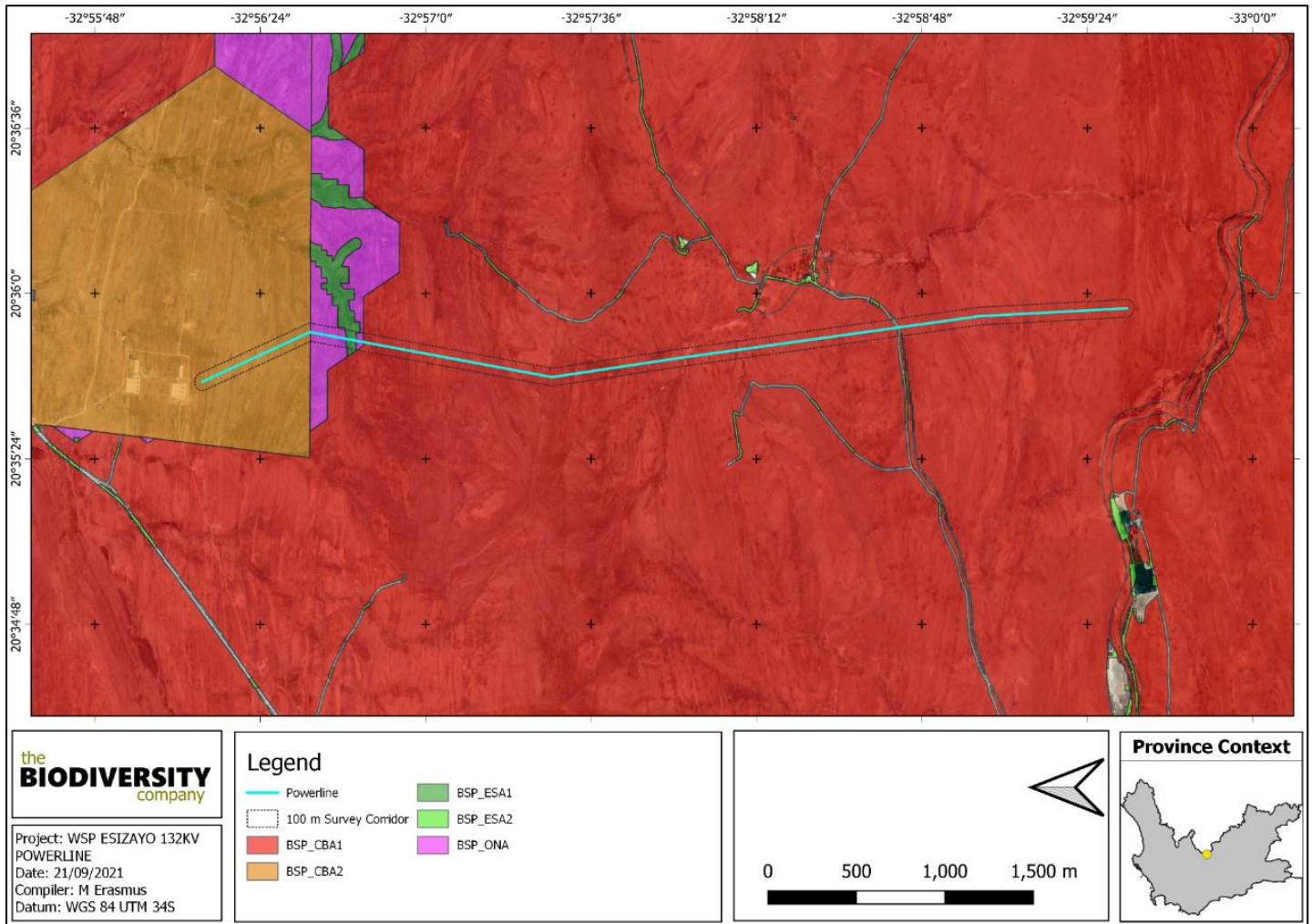


Figure 1-2: Location of the Proposed Esizayo 132kV OHPL in relation to CBAAs and ESAs

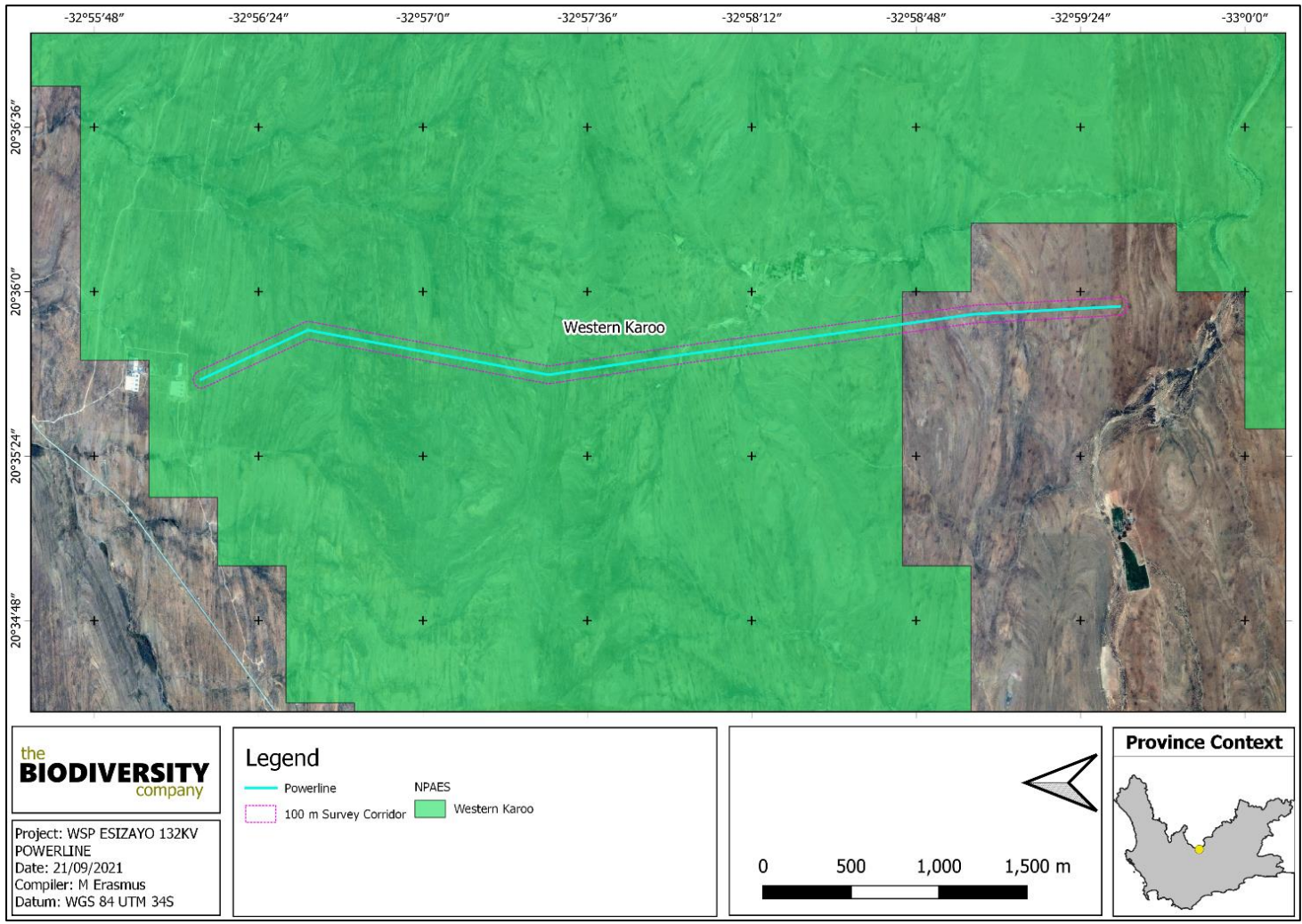


Figure 1-3: The project area in relation to the National Protected Area Expansion Strategy

1.2 DETAILS OF THE APPLICANT

Esizayo Wind (RF) (Pty) Ltd is the project proponent (Applicant) with regards to this application for the construction and operation of the Esizayo 132kV OHPL. **Table 1-1** provides the relevant details of the Applicant.

Table 1-1: Details of the Applicant

COMPANY NAME: ESIZAYO WIND (RF) (PTY) LTD

Contact Person:	Werner Engelbrecht
Postal Address	Building 1, Leslie Ave East Design Quarter District, Fourways P O Box 69408, Bryanston 2021
Email:	eiaadmin@biothermenergy.com

1.3 TERMS OF REFERENCE AND DETAILS OF EAP

WSP was appointed in the role of Independent EAP to undertake the BA processes for the proposed Project. This Environmental Management Programme (EMPr) was compiled as part of the BA process and must be read in conjunction with the Basic Assessment Report (BAR) in support of the EA application. The CV of the EAP is available in **Appendix A. Table 1-2** details the relevant contact details of the EAP.

Table 1-2: Details of the EAP

NAME OF THE EAP WSP GROUP AFRICA (PTY) LTD

Contact Person:	Ashlea Strong
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Postal Address:	P.O. Box 98867, Sloane Park 2151, Johannesburg
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To adequately identify and assess potential environmental impacts, the EAP was supported by a number of specialists, the details of which are provided in the BAR.

STATEMENT OF INDEPENDENCE

Neither WSP nor any of the authors of this Report have any material present or contingent interest in the outcome of this Report, nor do they have any business, financial, personal or other interest that could be reasonably regarded as being capable of affecting their independence. WSP has no beneficial interest in the outcome of the assessment.

1.4 ENVIRONMENTAL MANAGEMENT PROGRAMME STRUCTURE

Table 1-3 cross-references the sections within the EMPr with the legislated requirements as per Appendix 4 of GNR 982 of 2014.

Table 1-3: Legislation Requirements as detailed in Appendix 4 of GNR 982

APPENDIX 4 LEGISLATED REQUIREMENTS AS PER THE NEMA GNR 982		REPORT SECTION
(a)	Details of	
	i) the EAP who compiled the EMPr; and	Section 1.3 Appendix A
	ii) the expertise of the EAP, including a Curriculum Vitae	Section 1.3 Appendix A
(b)	Detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 3
(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 any areas that should be avoided, including buffers;	Section 3.5 Appendix B
(d)	A description of the impact management objectives, 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-	
	i) Planning and design;	Section 5
	ii) Pre-construction activities;	Section 7 Section 8
	iii) Construction activities	
	iv) Rehabilitation of the environment after construction and where applicable post closure; and	
	v) Where relevant, operation activities.	
(e)	A description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	Section 7 Section 8
(f)	A description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to -	
	i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	Section 7 Section 8
	ii) Comply with any prescribed environmental management standards or practices;	
	iii) comply with any applicable provisions of the Act regarding closure, where applicable; and	

APPENDIX 4 LEGISLATED REQUIREMENTS AS PER THE NEMA GNR 982**REPORT
SECTION**

	iv) Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable	
(g)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 6
(h)	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 6
(i)	An indication of the persons who will be responsible for the implementation of the impact management actions;	Section 6 Section 7 Section 8
(j)	The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 7 Section 8
(k)	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 6
(l)	A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations	Section 6
(m)	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	Section 6
	ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment; and	
(n)	any specific information that may be required by the competent authority	N/A

1.5 APPLICABLE DOCUMENTATION

The following documents are to be read in conjunction with the EMPr:

- Basic Assessment Report (BAR) for the proposed 132kV Powerline for the Esizayo WEF;
- Environmental Authorisation for the proposed 132kV Powerline for the Esizayo WEF (once issued);
- Environmental Authorisation for the Esizayo WEF issued by the DFFE in terms of the NEMA (14/12/16/3/3/2/967) on the 14th of July 2017;
- Environmental Authorisation for the proposed transmission integration issued by the DFFE in terms of the NEMA (14/12/16/3/3/1/1775) on 1st December 2017;
- Amended Environmental Authorisation for the proposed transmission integration issued by the DFFE in terms of the NEMA (14/12/16/3/3/1/1775/AM) on 26th January 2018; and
- Social Impact Assessment for the Esizayo Powerline, Western Cape Province, October 2021 (Compiled by Tony Barbour);
- Avifaunal Assessment - Esizayo 132kV Overhead Power Line Grid Connection for the Esizayo Wind Energy Facility located in the Northern Cape and Western Cape Provinces, October 2021 (Compiled by Chris van Rooyen Consulting);

- Biodiversity Baseline and Impact Assessment for the Proposed Esizayo 132kV Powerline, September 2021 (Compiled by The Biodiversity Company);
- Heritage Impact Assessment: Proposed Esizayo 132kV Transmission Integration Project, on Farms Standvastigheid 210 Remainder and Aurora 285, Western and Northern Cape, December 2021 (Compiled ACO Associates)
- Proposed 132 kV Transmission Integration Project for the Authorized Esizayo WEF near Laingsburg, Central Karoo District Municipality, Western Cape & Karoo Hoogland District Municipality, Northern Cape: Palaeontological Heritage Basic Assessment, October 2021 (Compiled by Natura Viva cc);
- Esizayo 132kV Powerline Freshwater Assessment, October 2021 (Compiled by WSP Group Africa (Pty) Ltd);
- Esizayo 132kV Powerline Hydrological Assessment, October 2021 (Compiled by WSP Group Africa (Pty) Ltd);
- Proposed Esizayo 132kV Transmission Integration Project, Western and Northern Cape Provinces, Visual Impact Assessment, September 2021 (Compiled By Logis)
- The Project Company Environmental Management System (once developed).

2 ENVIRONMENTAL GOVERNANCE FRAMEWORK

2.1 SOUTH AFRICAN REGULATORY FRAMEWORK

The national environmental legislation applicable to the proposed Esizayo 132kV OHPL project includes, but is not limited, to the following:

- The Constitution of the Republic of South Africa (No. 108 of 1996);
- National Environmental Management Act (No. 107 of 1998);
- National Environmental Management, Waste Act (No 59 of 2008);
- National Environmental Management, Air Quality Act (No 39 of 2004);
- National Environmental Management Biodiversity Act (No. 10 of 2004);
- The National Water Act, (No 36 of 1998);
- Occupational Health and Safety Act, (No 85 of 1993);
- National Heritage Resource Act (No. 25 of 1999);
- Civil Aviation Act (No 13 of 2009);
- Astronomy Geographic Act, 2007 (No. 21 of 2007);
- The Conservation of Agricultural Resources Act, (No 43 of 1983) (CARA); and
- Hazardous Substances Act (No. 15 of 1973).

2.2 INTERNATIONAL REGULATORY FRAMEWORK

2.2.1 IFC PERFORMANCE STANDARDS

The objectives and applicability of the eight International Finance Corporation (IFC) Performance Standards (PS) are detailed in **Table 2-1**.

Table 2-1: Objectives and Applicability of the IFC Performance Standards

REFERENCE	REQUIREMENTS	PROJECT SPECIFIC APPLICABILITY
Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts		
Overview	Performance Standard 1 underscores the importance of managing environmental and social performance throughout the life of a project. An effective Environmental and Social Management System (ESMS) is a dynamic and continuous process initiated and supported by management, and involves engagement between the client, its workers, local communities directly affected by the project (the Affected Communities) and, where appropriate, other stakeholders.	
Objectives	<ul style="list-style-type: none">– To identify and evaluate environmental and social risks and impacts of the project.– To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for risks and impacts to workers, Affected Communities, and the environment.– To promote improved environmental and social performance of clients through the effective use of management systems.	

REFERENCE	REQUIREMENTS	PROJECT SPECIFIC APPLICABILITY	
	<ul style="list-style-type: none"> – To ensure that grievances from Affected Communities and external communications from other stakeholders are responded to and managed appropriately. – To promote and provide means for adequate engagement with Affected Communities throughout the project cycle on issues that could potentially affect them and to ensure that relevant environmental and social information is disclosed and disseminated. 		
Aspects	1.1	Policy	The IFC Standards state under PS 1 (Guidance Note 23) that “ <i>the breadth, depth and type of analysis included in an ESIA must be proportionate to the nature and scale of the proposed project’s potential impacts as identified during the course of the assessment process.</i> ” This document is the final deliverable from the BA process undertaken for the proposed Project. The impact assessment comprehensively assesses the key environmental and social impacts and complies with the requirements of the South African EIA Regulations. In addition, an EMPr has been compiled (this report).
	1.2	Identification of Risks and Impacts	
	1.3	Management Programmes	
	1.4	Organisational Capacity and Competency	
	1.5	Emergency Preparedness and Response	
	1.6	Monitoring and Review	
	1.7	Stakeholder Engagement	
	1.8	External Communication and Grievance Mechanism	
	1.9	Ongoing Reporting to Affected Communities	
Performance Standard 2: Labour and Working Conditions;			
Overview	Performance Standard 2 recognises that the pursuit of economic growth through employment creation and income generation should be accompanied by protection of the fundamental rights of workers.		
Objectives	<ul style="list-style-type: none"> – To promote the fair treatment, non-discrimination, and equal opportunity of workers. – To establish, maintain, and improve the worker-management relationship. – To promote compliance with national employment and labour laws. – To protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the client’s supply chain. – To promote safe and healthy working conditions, and the health of workers. – To avoid the use of forced labour. 		
Aspects	2.1	<ul style="list-style-type: none"> – Working Conditions and Management of Worker Relationship – Human Resources Policy and Management – Working Conditions and terms of Engagement – Workers organisation – Non- Discrimination and Equal Opportunity – Retrenchment – Grievance Mechanism 	PS2 is not considered highly applicable as construction activities will not be significant for a project of this nature and scale. This BA Report and the EMPr, however, incorporate the requirements for compliance with local and international Labour and Working legislation and good practice on the part of the contractors. Formal human resource and labour policies will be compiled in the event that the project is developed in the future.

REFERENCE	REQUIREMENTS	PROJECT SPECIFIC APPLICABILITY
	2.2	<ul style="list-style-type: none"> — Protecting the Workforce — Child Labour — Forced Labour
	2.3	Occupational health and Safety
	2.4	Workers Engaged by Third Parties
	2.5	Supply Chain
Performance Standard 3: Resource Efficiency and Pollution Prevention		
Overview	Performance Standard 3 recognises that increased economic activity and urbanisation often generate increased levels of pollution to air, water, and land, and consume finite resources in a manner that may threaten people and the environment at the local, regional, and global levels. There is also a growing global consensus that the current and projected atmospheric concentration of greenhouse gases (GHG) threatens the public health and welfare of current and future generations. At the same time, more efficient and effective resource use and pollution prevention and GHG emission avoidance and mitigation technologies and practices have become more accessible and achievable in virtually all parts of the world.	
Objectives	<ul style="list-style-type: none"> — To avoid or minimise adverse impacts on human health and the environment by avoiding or minimising pollution from project activities. — To promote more sustainable use of resources, including energy and water. — To reduce project related GHG emissions. 	
Aspects	3.1	<ul style="list-style-type: none"> — Policy Resource Efficiency — Greenhouse Gases — Water Consumption
	3.2	<ul style="list-style-type: none"> — Pollution Prevention — Air Emissions — Stormwater — Waste Management — Hazardous Materials Management — Pesticide use and Management
		<p>PS3-related impacts, such as the management of construction waste, hazardous substances, and stormwater were assessed in BAR.</p> <p>There are no material resource efficiency issues associated with the Project. Refer to this EMPr for general resource efficiency measures.</p> <p>The project is not GHG emissions intensive and a climate resilience study or a GHG emissions-related assessment is not deemed necessary for a project of this nature. However, as supporting infrastructure to the Esizayo WEF, the OHPL seeks to facilitate resource efficiency and pollution prevention by contributing to the South African green economy.</p> <p>Dust air pollution in the construction phase has been adequately addressed in this EMPr.</p> <p>The Project will not result in the release of industrial effluents. Potential pollution associated with sanitary wastewater is low and mitigation measures have been included in this EMPr.</p> <p>Land contamination of the site from historical land use (i.e. low intensity agricultural / grazing) is not considered to be a cause for concern.</p> <p>The waste generation profile of the project is not complex. Waste mitigation and management measures have been included in this EMPr.</p> <p>Hazardous materials are not a key issue; small quantities of construction materials (oil, grease, diesel fuel etc.) are the only wastes expected to be associated with the project. The EMPr identifies these anticipated hazardous materials and recommends relevant mitigation and management measures.</p>

REFERENCE	REQUIREMENTS	PROJECT SPECIFIC APPLICABILITY
Performance Standard 4: Community Health, Safety, and Security		
Overview	Performance Standard 4 recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts.	
Objectives	<ul style="list-style-type: none"> — To anticipate and avoid adverse impacts on the health and safety of the Affected Community during the project life from both routine and non-routine circumstances. — To ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the Affected Communities 	
Aspects	4.1	<ul style="list-style-type: none"> — Community Health and Safety — Infrastructure and Equipment Design and Safety — Hazardous Materials Management and Safety — Ecosystem Services — Community Exposure to Disease — Emergency Preparedness and Response
	4.2	Security Personnel
<p>The requirements included in PS 4 have been addressed in the BAR process and the development of this EMPr.</p> <p>The number of generic plans have been included in Section 9 of this EMPr.</p> <p>All plans will be made site specific as part of the financial close process, in the event that the project is developed in the future.</p> <p>The location of the powerline inside of the security perimeter of the Esizayo WEF reduces the potential risk of electrocution and potential electromagnetic fields exposure.</p>		
Performance Standard 5: Land Acquisition and Involuntary Resettlement		
Overview	Performance Standard 5 recognises that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons that use this land. Involuntary resettlement refers both to physical displacement (relocation or loss of shelter) and to economic displacement (loss of assets or access to assets that leads to loss of income sources or other means of livelihood) as a result of project-related land acquisition and/or restrictions on land use.	
Objectives	<ul style="list-style-type: none"> — To avoid, and when avoidance is not possible, minimise displacement by exploring alternative project designs. — To avoid forced eviction. — To anticipate and avoid, or where avoidance is not possible, minimise adverse social and economic impacts from land acquisition or restrictions on land use by (i) providing compensation for loss of assets at replacement cost and (ii) ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation, and the informed participation of those affected. — To improve, or restore, the livelihoods and standards of living of displaced persons. — To improve living conditions among physically displaced persons through the provision of adequate housing with security of tenure at resettlement sites. 	
Aspects	5.1	<ul style="list-style-type: none"> — Displacement — Physical Displacement — Economic Displacement — Private Sector Responsibilities under Government Managed Resettlement
		<p>PS5 is not applicable to the proposed Esizayo OHPL as no physical or economic displacement or livelihood restoration will be required.</p> <p>The proposed OHPL route is located on privately owned land that is utilised for agriculture by the landowners. The land will continue to be used for agriculture without impediment by the OHPL.</p>

REFERENCE	REQUIREMENTS	PROJECT SPECIFIC APPLICABILITY
Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources		
Overview	Performance Standard 6 recognizes that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable development.	
Objectives	<ul style="list-style-type: none"> — To protect and conserve biodiversity. — To maintain the benefits from ecosystem services. — To promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities. 	
Aspects	6.1 Protection and Conservation of Biodiversity	<p>The powerline route traverses a CBA and ESA. A Biodiversity Impact Assessment and Freshwater Impact Assessment have been undertaken for the proposed Esizayo OHPL.</p> <p>The methodologies for the specialist assessments included a combination of literature review, in-field surveys and sensitivity mapping. This substantively complies with the PS 6 general requirements for scoping and baseline assessment for determination of biodiversity and ecosystem services issues. The determination of habitat sensitivity was undertaken within the legal and best practice reference framework for South Africa.</p> <p>The prevalence of invasive alien species on the site is low; however, the BAR process had noted the propensity for the spread of alien invasive species in the construction and operational phases and mitigation and management measures are included in this EMP.</p>
Performance Standard 7: Indigenous People		
Overview	Performance Standard 7 recognizes that Indigenous Peoples, as social groups with identities that are distinct from mainstream groups in national societies, are often among the most marginalized and vulnerable segments of the population. In many cases, their economic, social, and legal status limits their capacity to defend their rights to, and interests in, lands and natural and cultural resources, and may restrict their ability to participate in and benefit from development. Indigenous Peoples are particularly vulnerable if their lands and resources are transformed, encroached upon, or significantly degraded.	
Objectives	<ul style="list-style-type: none"> — To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples. — To anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts. — To promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner. — To establish and maintain an ongoing relationship based on Informed Consultation and Participation (ICP) with the Indigenous Peoples affected by a project throughout the project's life-cycle. — To ensure the Free, Prior, and Informed Consent (FPIC) of the Affected Communities of Indigenous Peoples when the circumstances described in this Performance Standard are present. — To respect and preserve the culture, knowledge, and practices of Indigenous Peoples. 	
Aspects	7.1 General <ul style="list-style-type: none"> — Avoidance of Adverse Impacts — Participation and Consent 	As per the international instruments under the United Nations (UN) Human Rights Conventions, no indigenous peoples are present within the study area.
	7.2 Circumstances Requiring Free, Prior, and Informed Consent	

REFERENCE	REQUIREMENTS	PROJECT SPECIFIC APPLICABILITY
	<ul style="list-style-type: none"> — Impacts on Lands and Natural Resources Subject to Traditional Ownership or Under Customary Use — Critical Cultural Heritage — Relocation of Indigenous Peoples from Lands and Natural Resources Subject to Traditional Ownership or Under Customary Use 	
	7.3 Mitigation and Development Benefits	
	7.4 Private Sector Responsibilities Where Government is Responsible for Managing Indigenous Peoples Issues	
Performance Standard 8: Cultural Heritage		
Overview	Performance Standard 8 recognizes the importance of cultural heritage for current and future generations.	
Objectives	<ul style="list-style-type: none"> — To protect cultural heritage from the adverse impacts of project activities and support its preservation. — To promote the equitable sharing of benefits from the use of cultural heritage. 	
Aspects	8.1 Protection of Cultural Heritage in Project Design and Execution	In accordance with prevailing national legislation, A Heritage NID was submitted to HWC for the project. The heritage Officers discussed the project in a meeting held on 4 November 2021. The final comment issued by HWC is included in the Heritage Impact Assessment (inclusive of palaeontology) undertaken as part of the BA process. A Chance Find Procedure is included in this EMPr.

2.2.2 EQUATOR PRINCIPLES

Table 2-2: Requirements and Applicability of the Equator Principles

REQUIREMENT	PROJECT SPECIFIC APPLICABILITY
Principle 1: Review and Categorisation	
<p>Overview</p> <p>When a project is proposed for financing, the EPFI will, as part of its internal social and environmental review and due diligence, categorise such project based on the magnitude of its potential impacts and risks in accordance with the environmental and social screening criteria of the IFC.</p> <p>Using categorisation, the EPFI's environmental and social due diligence is commensurate with the nature, scale, and stage of the Project, and with the level of environmental and social risks and impacts.</p> <p>The categories are:</p> <ul style="list-style-type: none"> — Category A: Projects with potential significant adverse environmental and social risks and/or impacts that are diverse, irreversible or unprecedented; 	<p>Based upon the significance and scale of the Project's environmental and social impacts, the proposed project is regarded as a Category B project i.e. a project with potential limited adverse environmental or social risks and/or impacts that are few in number, generally site-specific, largely reversible, and readily addressed through mitigation measures.</p>

REQUIREMENT	PROJECT APPLICABILITY	SPECIFIC
<ul style="list-style-type: none"> — Category B: Projects with potential limited adverse environmental and social risks and/or impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures; and — Category C: Projects with minimal or no adverse environmental and social risks and/or impacts. 		
Principle 2: Environmental and Social Assessment		
Overview	<p>For all Category A and Category B Projects, the EPFI will require the client to conduct an appropriate Assessment process to address, to the EPFI's satisfaction, the relevant environmental and social risks and scale of impacts of the proposed Project (which may include the illustrative list of issues found in Exhibit II). The Assessment Documentation should propose measures to minimise, mitigate, and where residual impacts remain, to compensate/offset/remedy for risks and impacts to Workers, Affected Communities, and the environment, in a manner relevant and appropriate to the nature and scale of the proposed Project.</p> <p>The Assessment Documentation will be an adequate, accurate and objective evaluation and presentation of the environmental and social risks and impacts, whether prepared by the client, consultants or external experts. For Category A, and as appropriate, Category B Projects, the Assessment Documentation includes an Environmental and Social Impact Assessment (ESIA). One or more specialised studies may also need to be undertaken. For other Category B and potentially C Projects, a limited or focused environmental or social assessment may be appropriate, applying applicable risk management standards relevant to the risks or impacts identified during the categorisation process.</p> <p>The client is expected to include assessments of potential adverse Human Rights impacts and climate change risks as part of the ESIA or other Assessment, with these included in the Assessment Documentation.</p>	<p>This document is the final deliverable from the BA process undertaken for the proposed Project. The impact assessment comprehensively assesses the key environmental and social impacts and complies with the requirements of the South African EIA Regulations. In addition, an EMPr has been compiled (this report).</p>
Principle 3: Applicable Environmental and Social Standards		
Overview	<p>The Assessment process should, in the first instance, address compliance with relevant host country laws, regulations and permits that pertain to environmental and social issues.</p> <p>The EPFI's due diligence will include, for all Category A and Category B Projects globally, review and confirmation by the EPFI of how the Project and transaction meet each of the Principles.</p> <p>For Projects located in Non-Designated Countries, the Assessment process evaluates compliance with the then applicable IFC PS and WBG EHS Guidelines. For Projects located in Designated Countries, compliance with relevant host country laws, regulations and permits that pertain to environmental and social issues.</p>	<p>As South Africa has been identified as a non-designated country, the reference framework for environmental and social assessment is based on the IFC PS. In addition, this BAR process has been undertaken in accordance with NEMA (the host country's relevant legislation).</p>
Principle 4: Environmental and Social Management System and Equator Principles Action Plan		
Overview	<p>For all Category A and Category B Projects, the EPFI will require the client to develop or maintain an Environmental and Social Management System (ESMS).</p> <p>Further, an Environmental and Social Management Plan (ESMP) will be prepared by the client to address issues raised in the Assessment process and incorporate actions required to comply with the applicable standards. Where the applicable standards are not met to the EPFI's</p>	<p>A formal project specific ESMS will be compiled in the event that the project is developed in the future. Management and monitoring plans outlined in the EMPr will serve as the basis for an ESMS for the proposed Project.</p>

REQUIREMENT	PROJECT APPLICABILITY	SPECIFIC
<p>satisfaction, the client and the EPFI will agree on an Equator Principles Action Plan (EPAP). The EPAP is intended to outline gaps and commitments to meet EPFI requirements in line with the applicable standards.</p>		
Principle 5: Stakeholder Engagement		
Overview	<p>EPFI will require the client to demonstrate effective Stakeholder Engagement as an ongoing process in a structured and culturally appropriate manner with Affected Communities Workers and, where relevant, Other Stakeholders. For Projects with potentially significant adverse impacts on Affected Communities, the client will conduct an Informed Consultation and Participation process.</p> <p>To accomplish this, the appropriate assessment documentation, or non-technical summaries thereof, will be made available to the public by the borrower for a reasonable minimum period in the relevant local language and in a culturally appropriate manner. The borrower will take account of and document the process and results of the consultation, including any actions agreed resulting from the consultation.</p> <p>Disclosure of environmental or social risks and adverse impacts should occur early in the Assessment process, in any event before the Project construction commences, and on an ongoing basis.</p> <p>All Projects affecting Indigenous Peoples will be subject to a process of Informed Consultation and Participation, and will need to comply with the rights and protections for Indigenous Peoples contained in relevant national law, including those laws implementing host country obligations under international law.</p>	<p>The BA process includes an extensive stakeholder engagement process which complies with the South African EIA Regulations. The process includes consultations with local communities, nearby businesses and a range of government sector stakeholders (state owned enterprises, national, provincial and local departments).</p> <p>The stakeholder engagement process solicits interest from potentially interested parties through the placement of site notices and newspaper advertisements as well as written and telephonic communication.</p>
Principle 6: Grievance Mechanism		
Overview	<p>For all Category A and, as appropriate, Category B Projects, the EPFI will require the client, as part of the ESMS, to establish effective grievance mechanisms which are designed for use by Affected Communities and Workers, as appropriate, to receive and facilitate resolution of concerns and grievances about the Project's environmental and social performance.</p> <p>The borrower will inform the Affected Communities and Workers about the grievance mechanism in the course of the stakeholder engagement process and ensure that the mechanism addresses concerns promptly and transparently, in a culturally appropriate manner, and is readily accessible, at no cost, and without retribution to the party that originates the issue or concern.</p>	<p>The EMPr includes a <i>Grievance Mechanism Process for Public Complaints and Issues</i>. This procedure effectively allows for external communications with members of the public to be undertaken in a transparent and structured manner. This procedure will be revised and updated as part of the EMPr amendment process in the event that the project is developed in the future.</p>
Principle 7: Independent Review		
Overview	<p>For all Category A and, as appropriate, Category B Projects, an Independent Environmental and Social Consultant, not directly associated with the client, will carry out an Independent Review of the Assessment Documentation including the ESMPs, the ESMS, and the Stakeholder Engagement process documentation in order to assist the EPFI's due diligence, and assess Equator Principles compliance.</p>	<p>This principle will only become applicable in the event that that the project is developed in the future.</p>
Principle 9: Independent Monitoring and Reporting		
Overview	<p>To assess Project compliance with the Equator Principles after Financial Close and over the life of the loan, the EPFI will require independent monitoring and reporting for all Category A, and as appropriate,</p>	<p>This principle will only become applicable in the event that the project is developed in the future.</p>

REQUIREMENT	PROJECT APPLICABILITY	SPECIFIC
<p>Category B projects. Monitoring and reporting should be provided by an Independent Environmental and Social Consultant; alternatively, the EPFI will require that the client retain qualified and experienced external experts to verify its monitoring information, which will be shared with the EPFI in accordance with the frequency required.</p>		

2.3 OTHER GUIDELINES AND BEST PRACTICE RECOMMENDATIONS

2.3.1 WORLD BANK GROUP ENVIRONMENTAL, HEALTH, AND SAFETY GUIDELINES

EHS GENERAL GUIDELINES

The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of GIIP. They contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs.

The EHS General Guidelines contain information on cross-cutting environmental, health and safety issues potentially applicable to all industry sectors, used together with the relevant industry sector guideline(s), to guide the development of management and monitoring strategies for various project-related impacts.

EHS GUIDELINES FOR ELECTRIC POWER TRANSMISSION AND DISTRIBUTION

The EHS Guidelines for Electric Power Transmission and Distribution include information relevant to power transmission between a generation facility and a substation located within an electricity grid, in addition to power distribution from a substation to consumers located in residential, commercial, and industrial areas.

The Guidelines includes industry-specific impacts and management, provides a summary of EHS issues associated with electric power transmission and distribution that occur during the construction and operation phases of a facility, along with recommendations for their management. Additionally, it includes performance indicators and monitoring related to the environment an occupational health and safety.

These Guidelines have been considered in the impact assessment and formulation of mitigation measures in this BAR.

2.3.2 GENERIC EMPR RELEVANT TO AN APPLICATION FOR SUBSTATION AND OVERHEAD ELECTRICITY TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE

NEMA requires that an EMPr be submitted where an EIA has been identified as the environmental instrument to be utilised as the basis for a decision on an application for environmental authorisation. The content of an EMPr must either contain the information set out in Appendix 4 of the EIA Regulations, 2014, as amended, or must be a generic EMPr relevant to an application as identified and gazetted by the Minister in a government notice. Once the Minister has identified, through a government notice, that a generic EMPr is relevant to an application for EA, that generic EMPr must be applied by all parties involved in the EA process, including, but not limited to, the applicant and the CA.

GN 435 of 22 March 2019 identified a generic EMPr relevant to applications for substations and overhead electricity transmission and distribution infrastructure which require authorisation in terms of Section 42(2) of NEMA. Applications for overhead electricity transmission and distribution infrastructure and applications for the development or expansion of substation infrastructure for the transmission and distribution of electricity that trigger Activity 11 or 47 of Listing Notice 1 or Activity 9 of Listing Notice 2 and any other listed or specified activities must use the generic EMPrs.

The objective of the generic EMPr is to prescribe and pre-approve generally accepted impact management outcomes and impact management actions, which can commonly and repeatedly be used for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of overhead electricity transmission and distribution infrastructure and the development or expansion of substation infrastructure for the transmission and distribution of electricity. The use of a generic EMPr is intended to reduce the need to prepare and review individual EMPrs for applications of a similar nature.¹

Both the generic EMPr for transmission lines as well as the generic EMPr for substations have been used as a basis for this EMPr. The *Generic Environmental Management Programme (EMPr) for the Development and Expansion for Overhead Electricity Transmission and Distribution Infrastructure* is attached as **Appendix C** and the *Generic Environmental Management Programme (EMPr) for the Development and Expansion of Substation Infrastructure for the Transmission and Distribution of Electricity* is attached as **Appendix D**.

¹ DEA (2019) *Appendix 1: Generic Environmental Management Programme (EMPr) for the Development and Expansion for Overhead Electricity Transmission and Distribution Infrastructure*; DEA (2019) *Generic Environmental Management Programme (EMPr) for the Development and Expansion of Substation Infrastructure for the Transmission and Distribution of Electricity*

3 PROJECT DETAILS

3.1 LOCATION OF THE PROPOSED PROJECT

The proposed Project is located in the Ward 2 of the Laingsburg Local Municipality in the Central Karoo District Municipality in the Western Cape Province and ending at the Komsberg substation in Ward 4 of the Karoo Hoogland Local Municipality in the Namakwa District Municipality in the Northern Cape Province. The Project area is located approximately 30km Northeast of Laingsburg in the Western Cape (**Figure 3-1**).

The proposed OHPL project entails the construction of a 132 kV transmission line from the onsite substation at the authorised Esizayo WEF to connect to the existing Komsberg substation. The transmission line route runs in a northerly direction to the existing Komsberg MTS Substation located approximately 6.5km north of the substation (**Figure 3-2**).

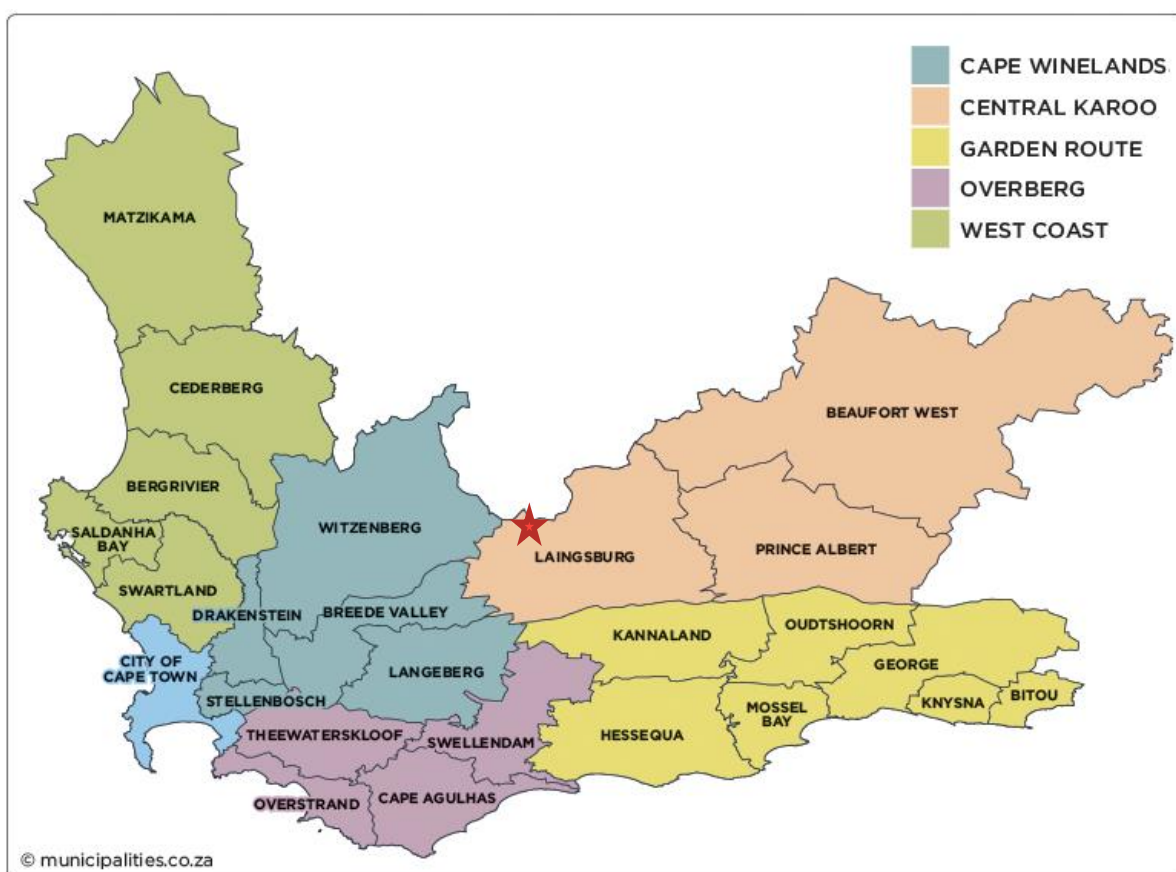


Figure 3-1: The study area (red star in relation to the Western Cape District and Local Municipalities

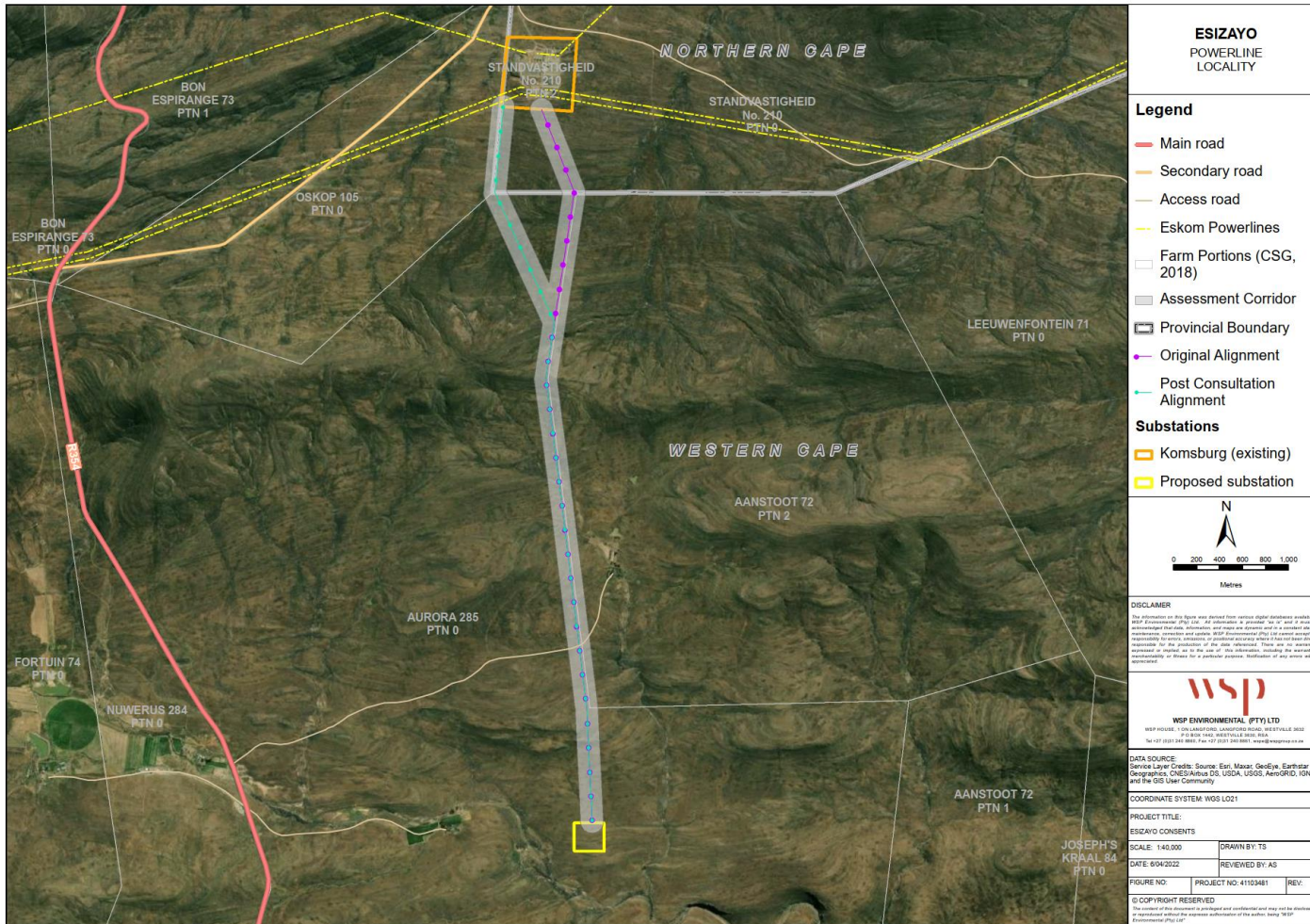


Figure 3-2: Locality of the Proposed Esizayo 132kV OHPL.

The centre point of the OHPL is located at 32°58'3.58"S 20°35'47.14"E. During the course of the stakeholder consultation process the landowner of the Remainder of Farm Standvastigheid 210 requested a slight re-alignment of the preferred route so as not to sterilise the land portion for future development considerations. It was confirmed that the impacts for the re-alignment would not differ from those assessed for the original proposed route. **Table 3-1** below provides the co-ordinates of the onsite and Komsberg substations as well as bend points along the preferred OHPL route. **Figure 3-3** illustrates the co-ordinates of all the bend points along the proposed OHPL.

The proposed Esizayo 132kV OHPL is proposed to be located over three properties with three different landowners (**Table 3-2**).

Table 3-1: Co-ordinates along the OHPL Route

POINT	LATITUDE	LONGITUDE
A – Onsite Substation	32°59'32.624" S	20°35'56.796" E
B	32° 59' 0.514" S	20° 35' 55.074" E
C	32° 57' 54.839" S	20° 35' 45.918" E
D	32° 57' 27.534" S	20° 35' 41.807" E
<u>G</u>	<u>32° 56' 34.777" S</u>	<u>20° 35' 25.010" E</u>
<u>H - Komsberg Substation</u>	<u>32° 56' 10.494" S</u>	<u>20° 35' 27.931" E</u>

Table 3-2: Farm portions on which the proposed OHPL is located

FARM NAME & NUMBER	21 DIGIT SG CODE	MUNICIPALITY / PROVINCE	PROVINCE
Farm Aurora 285	C04300000000028500000	Laingsburg Local Municipality/ Central Karoo District Municipality/ Western Cape	Western Cape
Remainder of Farm Standvastigheid 210	C07200000000021000000	Karoo Hoogland Local Municipality / Namakwa District Municipality / Northern Cape	Northern Cape
Portion 2 of Farm Standvastigheid 210 (Komsberg Substation)	C07200000000021000002	Karoo Hoogland Local Municipality / Namakwa District Municipality / Northern Cape	Northern Cape

3.2 PROJECT INFRASTRUCTURE

3.2.1 TRANSMISSION LINE

The transmission line will be a 132kV steel single or double structure with kingbird conductor. The powerline towers will either be steel lattice or monopole structures.

Figure 3-4 below provides an example of a conventional lattice tower compared with a monopole structure. Pole positions will only be available once the powerline design has started. It is anticipated that towers will be located approximately 200m to 250m apart.



Figure 3-4: Conventional lattice powerline tower compared with a steel monopole structure

3.2.2 SERVITUDE

A 200m corridor around the OHPL (100m on either side of the centreline) has been assessed for the purposes of this BAR. The registered servitude will fall within this 200m corridor and will likely be between 36 and 40m. The length of the transmission line is approximately 6.5km, which will result in a servitude area of approximately 26ha.

The servitude is required to ensure safe construction, maintenance and operation of the powerline. Registration of the servitude grants Esizayo the right to erect, operate and maintain the powerline and to access the land to carry out such activities, but it does not constitute full ownership of the land. It should be noted that the OHPL will be ceded to Eskom post-construction. Construction and operation activities and access to the powerline

must be carried out with due respect to the affected landowners. The servitude required for the Project will be registered at the Deeds Office and will form part of the title deed of the relevant properties once the environmental authorisation has been obtained.

3.2.3 SUBSTATIONS

An onsite substation will be established within the extent of the authorised Esizayo WEF. The site itself is very homogenous and there are no significant features in the immediate vicinity of the substation location that might be affected by the development. The following infrastructure is proposed:

- A high voltage substation yard to allow for multiple 132 kV feeder bays and transformers;
- The control building, telecommunication infrastructure, oil dams(s) etc; and
- All the access road infrastructure to and within the substation.

The Eskom 400kV Komsberg substation is operational.

3.2.4 SITE ACCESS

The Esizayo WEF and surrounding areas are already easily accessible. The preferred powerline route is accessible via the service roads associated with the authorised Esizayo WEF. New access roads or tracks may be required to provide access to sections of the powerline route. Access roads will be approximately 4m in width and will be mostly a two-track gravel road under the OHPL in order to access pylons for construction and maintenance purposes.

3.3 PROPOSED PROJECT DEVELOPMENT ACTIVITIES

- The typical steps involved in the construction and operation of a transmission line is summarised below:
 - Planning Phase
 - Step 1: Surveying of the development area and negotiation with affected landowners; and
 - Step 2: Final design and micro-siting of the infrastructure based on geotechnical, topographical conditions and potential environmental sensitivities.
 - Construction Phase
 - Step 3: Vegetation clearing and construction of access roads/tracks (where required);
 - Step 4: Construction of tower structure foundations;
 - Step 5: Assembly and erection of infrastructure on site;
 - Step 6: Stringing of conductors; and
 - Step 6: Rehabilitation of disturbed areas and protection of erosion sensitive areas.
 - Operation Phase
 - Step 7: Continued maintenance during operation.
-

3.3.1 CONSTRUCTION PHASE

CONSTRUCTION SCHEDULE

Construction of the OHPL is anticipated to take 6 - 12 months.

SITE ESTABLISHMENT AND TRANSPORTATION OF MATERIALS AND EQUIPMENT TO SITE

The selected Contractor will establish a temporary site camp including, but not be limited to, temporary offices, laydown areas for equipment and materials, storage facilities, ablutions, waste storage and handling area, and parking area. The location and extent of the Contractors camp, to be established within the Project area, will be

undertaken in line with specifications detailed within the EMPr. Materials are to be collected on a daily basis from the contractor laydown area for the construction activities along the servitude. This limits areas to be impacted for storage along the servitude as well as for security purposes when activities cease at the end of each day.

The required materials and equipment will be transported to the site via public roads and private farm roads/tracks along the proposed servitude, as far as possible. Large mobile plant including mechanical/hydraulic augers, mobile cranes, bucket trucks/cherry pickers will be used during installation of the OHPL.

LABOUR REQUIREMENTS

During site preparation and installation of Project related infrastructure the selected Contractor, working on behalf of Esizayo, is anticipated to require 20-30 people to undertake the required works. Approximately 5% of workers would be highly skilled, 15% medium skilled, and 80% low skilled.

VEGETATION CLEARING

Due to the nature of the vegetation within the Project area, which is predominantly low shrubs, limited vegetation clearing will be required. Clearing of vegetation will be limited to pylon areas to facilitate installation of each pylon. Clearing will be done in phases along the OHPL route as required prior to installation activities.

INSTALLATION OF OHPL

Standard OHPL installation methods will be employed, which entails the drilling of holes, planting of monopoles (compaction only, no concrete casting) and stringing of the conductors. It is not envisaged that any large excavations and stabilized backfill will be required. However, this will be verified on site once the geotechnical assessment has been undertaken at each monopole position (part of construction works).

The Project will utilise either steel lattice or monopole structures/pylons, which are reported to have a life expectancy of more than 25 years. The actual height of the pylons will vary based on the site topography to maintain the specified clearance of the transmission lines.

The next stage of the process requires installation of insulators on the wooden pylons to support the conductors as well as the equipment necessary for running out and stringing the conductors. Once the pylons have been installed, the lines will be strung.

The Contractor in collaboration with Eskom will be responsible for functional testing and commissioning of the Transmission Line. This consists of connecting the line from the WEF facility to the national grid, to transmit power.

ONSITE SUBSTATION

A new onsite substation will be established within the extent of the authorized Esizayo WEF. The area to be cleared will be approximately 2,5ha in size.

DEMOBILISATION

Upon completion of the installation phase, any temporary infrastructure will be removed, and the affected areas rehabilitated.

3.3.2 OPERATIONAL PHASE

Eskom will be responsible for managing the operations of the OHPL in line with their internal management systems. Eskom is considered to have the requisite expertise to operate and maintain the transmission line. Eskom will adhere to all existing Safety Codes and Guidelines for the operation and maintenance of the OHPL infrastructure.

During the operational phase there will be little to no Project-related movement along the servitude as the only activities are limited to maintaining the servitude (including maintenance of access roads and cutting back or pruning of vegetation to ensure that vegetation does not affect the OHPL), inspection of the powerline

infrastructure and repairs when required. Limited impact is expected during operation since there will not be any intrusive work done outside of maintenance in the event that major damage occurs to site infrastructure.

Operation of the OHPL will involve the following activities, discussed below.

SERVITUDE MANAGEMENT AND ACCESS ROAD MAINTENANCE

Servitude and access road maintenance is aimed at eliminating hazards and facilitating continued access to the OHPL. The objective is to prevent all forms of potential interruption of power supply due to overly tall vegetation/climbing plants or establishment of illegal structures within the right servitude. It is also to facilitate ease of access for maintenance activities on the OHPL. During the operational phase of the project, the servitude will be maintained to ensure that the OHPL functions optimally and does not compromise the safety of persons within the vicinity of the OHPL.

TRANSMISSION LINE MAINTENANCE AND OPERATIONS

Eskom will develop comprehensive planned and emergency programmes through its technical operations during the operation and maintenance phase for the OHPL. The maintenance activities will include:

- Eskom’s Maintenance Team will carry out periodic physical examination of the OHPL and its safety, security and integrity.
- Defects that are identified will be reported for repair. Such defects may include defective conductors, flashed over insulators, defective dampers, vandalised components, amongst others.
- Maintenance / repairs will then be undertaken.

3.3.3 DECOMMISSIONING PHASE

Decommissioning will be considered when the OHPL is regarded obsolete and will be subject to a separate authorisation and impact assessment process. This is not expected to occur in the near future.

3.4 NEED AND DESIRABILITY OF THE PROJECT

The DEA&DP Guideline (2013) states that the essential aim of need and desirability is to determine the suitability (i.e. is the activity proposed in the right location for the suggested land-use/activity) and timing (i.e. is it the right time to develop a given activity) of the development. Therefore, need and desirability addresses whether the development is being proposed at the right time and in the right place. Similarly, the ‘Best Practicable Environmental Option’ (BPEO) as defined in NEMA is *“the option that provides the most benefit and causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term.”*

The development of renewable energy and the associated energy infrastructure is strongly supported at a national, provincial, and local level. The development of, and investment in, renewable energy and associated energy distribution infrastructure is supported by the National Development Plan, New Growth Path Framework and National Infrastructure Plan, which all highlight the importance of energy security and investment in energy infrastructure. The development of the proposed power line is therefore supported by key policy and planning documents and is in line with South Africa’s strategic energy planning context (Refer to **Section 2**).

Furthermore, the proposed Esizayo 132 KV OHPL is located within the Komsberg REDZ and Central Strategic Transmission Corridor as per GN 114 and GN 113 of 2018. Strategic Transmission Corridors support areas where long-term electricity grid infrastructure will be developed (Refer to **Section 2** for more details). **Figure 3-5** below shows the location of the five corridors and the approximate location of the Esizayo transmission line within the Central Corridor.

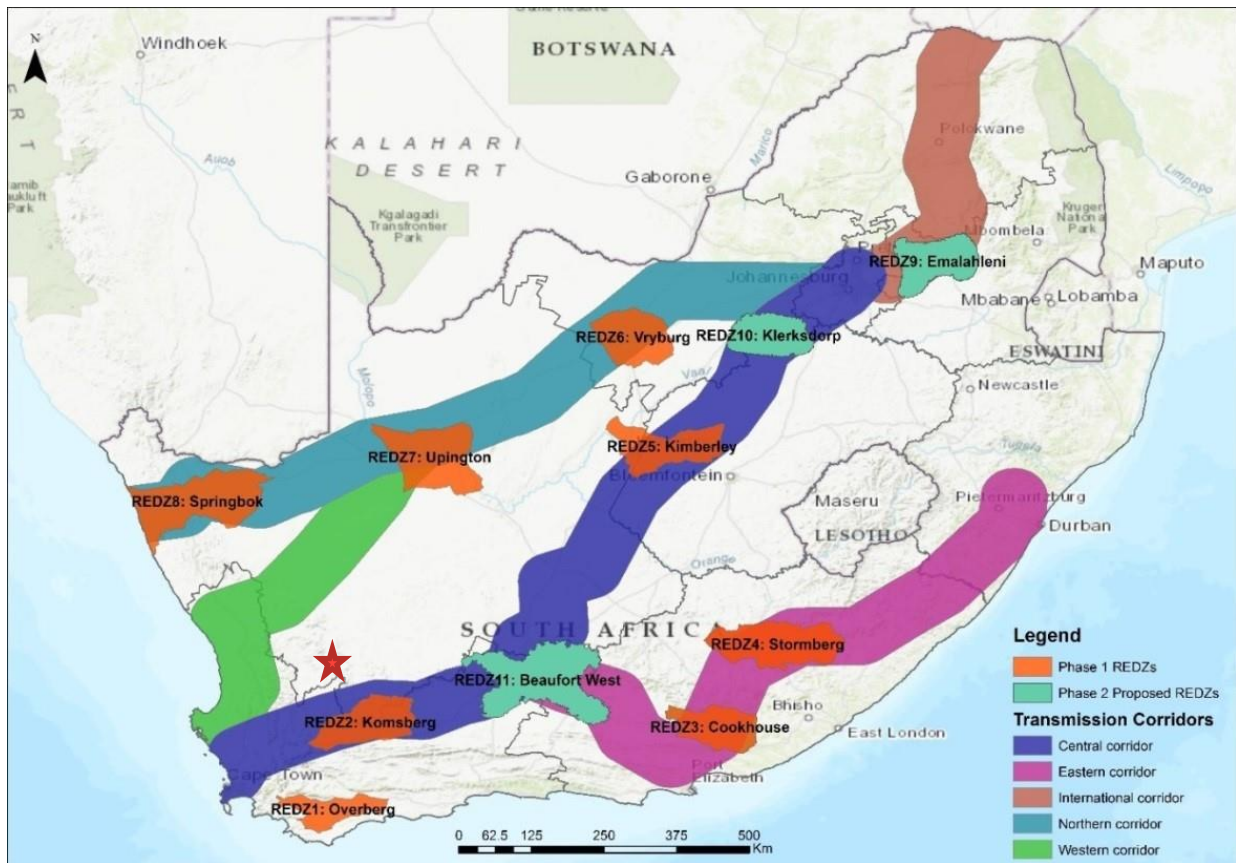


Figure 3-5: Strategic Transmission Corridors and REDZ (GN 113 and 114 of 2018) (red star is approximate location of Esizayo transmission line)

The energy security benefits associated with the proposed Esizayo WEF is dependent upon it being able to connect to the national grid via the establishment of grid connection infrastructure. The proposed OHPL is therefore essential supporting infrastructure to the wind energy development, which, once developed, will generate power from renewable energy resources.

The land on which the OHPL will be constructed is located within the extent of the authorised Esizayo WEF site and the existing Komsberg substation. No physical or economic displacement will be required along the proposed route.

3.5 ENVIRONMENTAL SENSITIVITY

The following environmental sensitivities were identified on the site, as a result of the Project location and proposed activities and will require specific applications or measures for mitigation to minimise impact.

- **Biodiversity:**
 - CBA
 - ESA
 - Critically endangered and endangered species
 - Critical habitat
- **Avifauna:**
 - High value habitat unit
 - Presence of sensitive species
- **Freshwater:**
 - Aquatic CBAs

- Wetland features
- Freshwater ecosystem priority areas
- **Palaeontology:**
 - Features with very high paleontological sensitivity

The above sensitivities are discussed in the sub-sections below. The combined environmental sensitivities of the proposed powerline Project footprint are shown in **Figure 3-6** and **Figure 3-7** below.

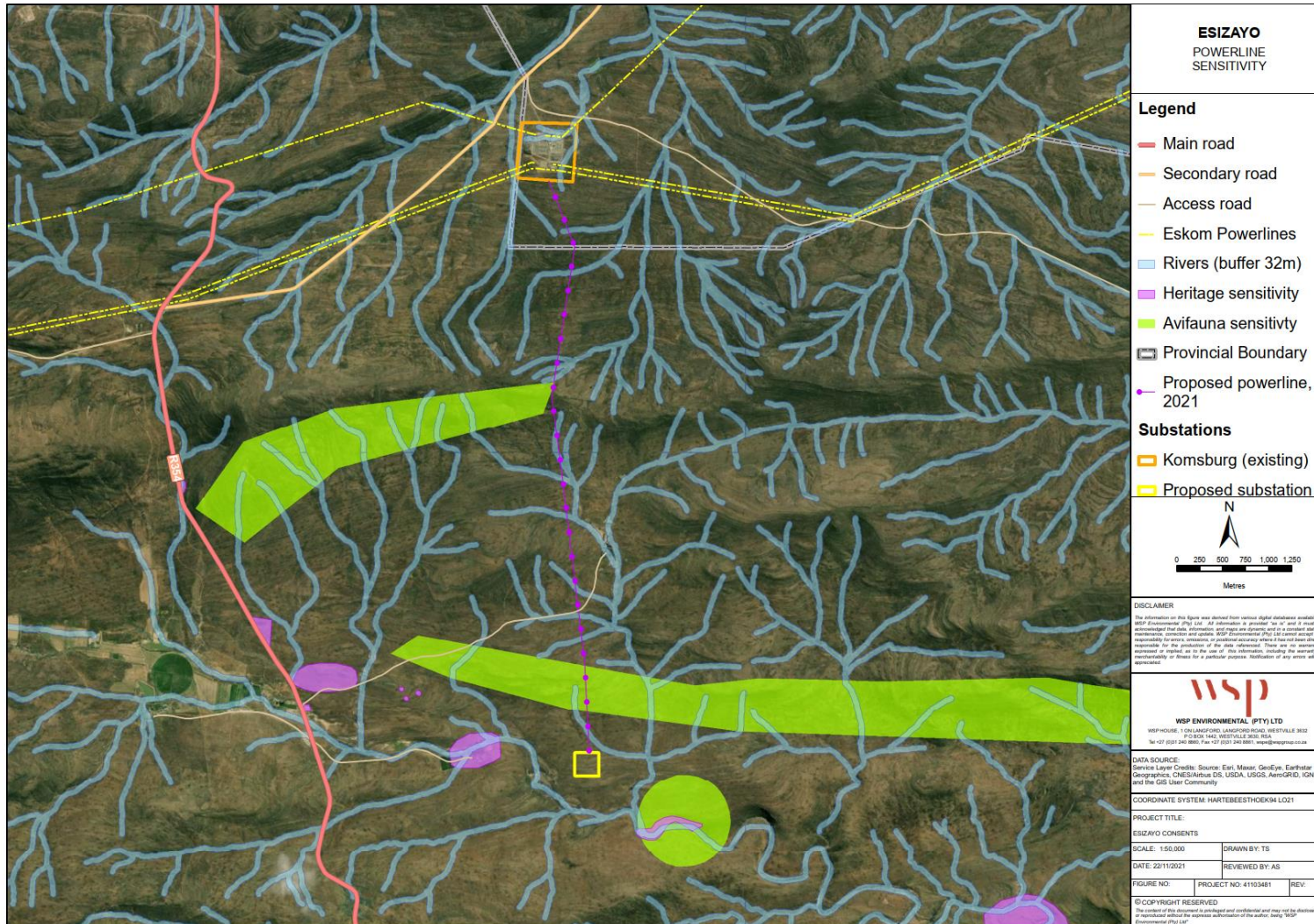


Figure 3-6: Combined Sensitivity Map

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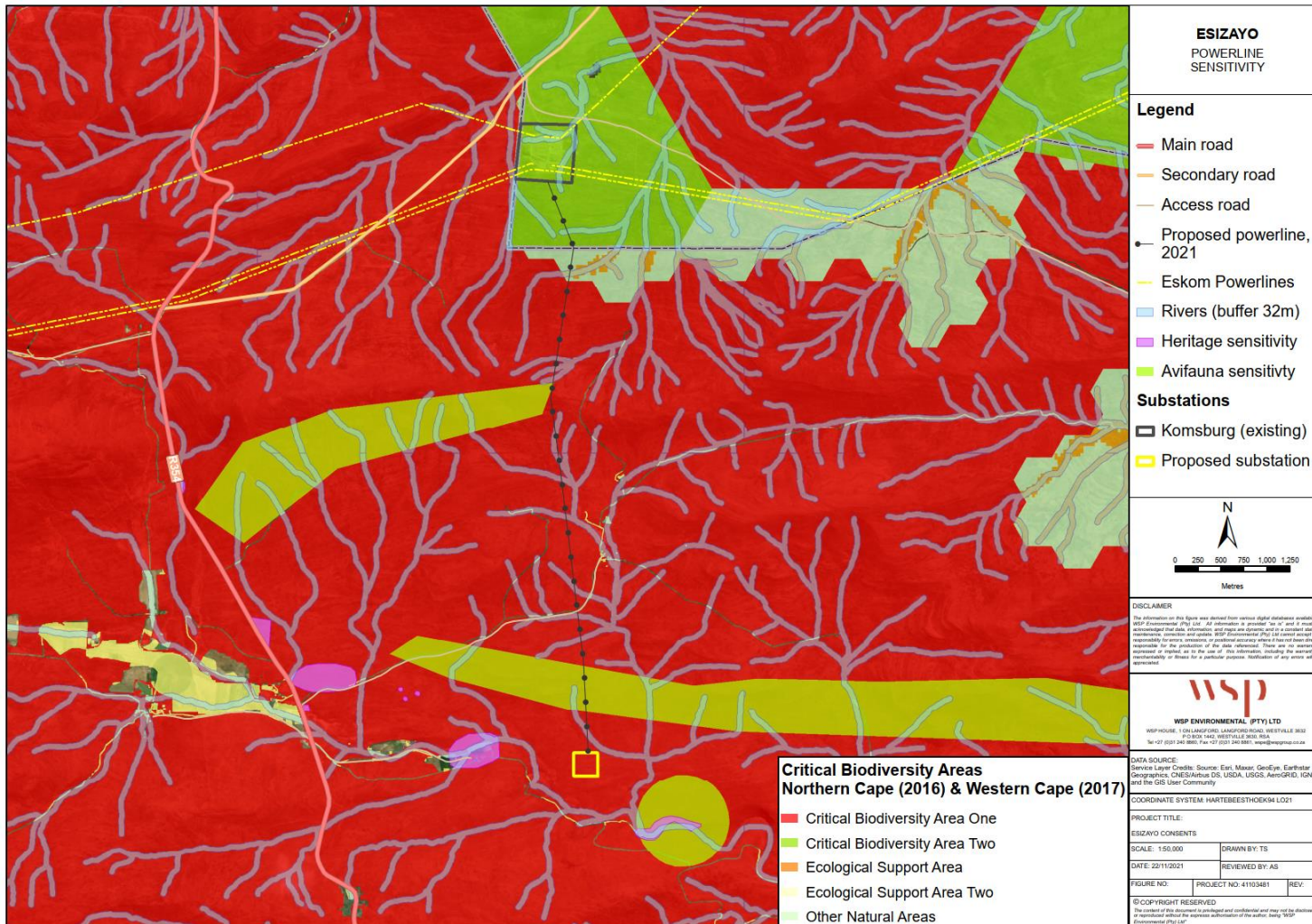


Figure 3-7: Combined Sensitivity Map (Including CBAs)

3.5.1 BIODIVERSITY

The biodiversity theme sensitivity as indicated in the screening report was derived to be Very High, mainly due to the area being CBA 1 & 2 and ESA (Figure 3-8).

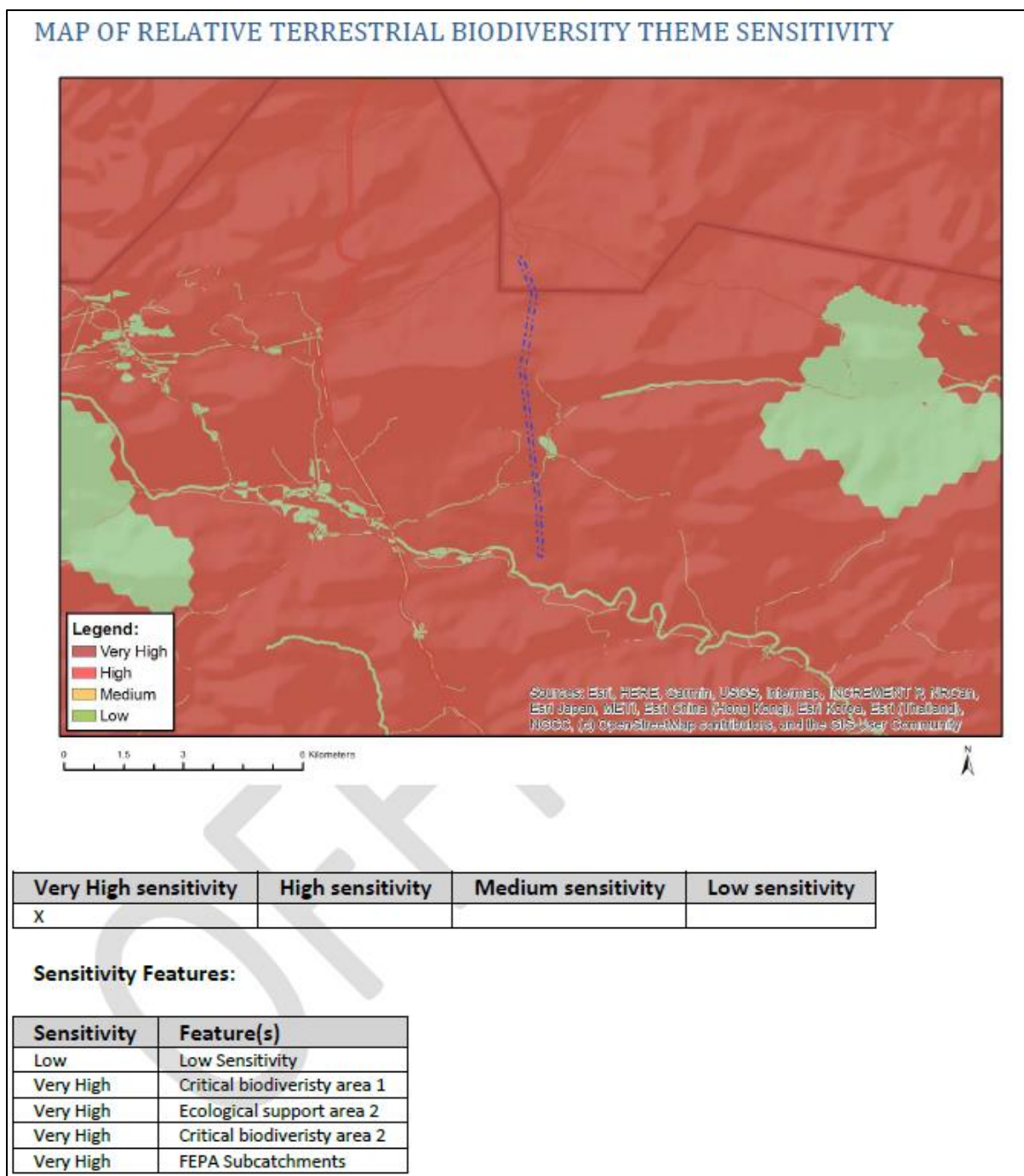


Figure 3-8: Terrestrial Biodiversity Theme Sensitivity, DEA Screening Report

The different terrestrial habitat types that were delineated within the Project area, can be seen in (Table 3-3). Interpretation of the Site Ecological Importance (SEI) in the context of the proposed development activities is provided in Table 3-4.

All habitats within the assessment area of the proposed development were allocated a sensitivity category. The sensitivities of the habitat types delineated are illustrated in **Figure 3-9**. Very High and High Sensitivity' areas are due to the following:

- Habitats within the assessment area were observed to be utilised by threatened species during the field survey. These species comprised of one (1) VU avifauna species, two (2) EN avifauna species, and 1 NT mammal and reptile;
- Unique and low resilience habitats;
- Threatened and Protected flora species were abundant and ubiquitous within; and
- A high richness of protected fauna species was present.

Table 3-3: Summary of habitat types delineated within the field assessment area of the project area.

HABITAT (AREA)	CONSERVATION IMPORTANCE	FUNCTIONAL INTEGRITY	BIODIVERSITY IMPORTANCE	RECEPTOR RESILIENCE	SITE ECOLOGICAL IMPORTANCE
Drainage features	Medium	High	High	Low	High
Shrubland	Medium	Medium	Medium	Low	High
Ridges, Rocky Slopes and Rocky Areas	Medium	Medium	Medium	Low	High
Ridges and Rocky Slopes with steep slope.	High	High	High	Low	Very High

Table 3-4: Guidelines for interpreting Site Ecological Importance (SEI) in the context of the proposed development activities

SITE ECOLOGICAL IMPORTANCE (SEI) INTERPRETATION IN RELATION TO PROPOSED DEVELOPMENT ACTIVITIES

Very High	Avoidance mitigation – no destructive development activities should be considered. Offset mitigation not acceptable/not possible (i.e., last remaining populations of species, last remaining good condition patches of ecosystems/unique species assemblages). Destructive impacts for species/ecosystems where persistence target remains.
High	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Medium	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Low	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
Very Low	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.

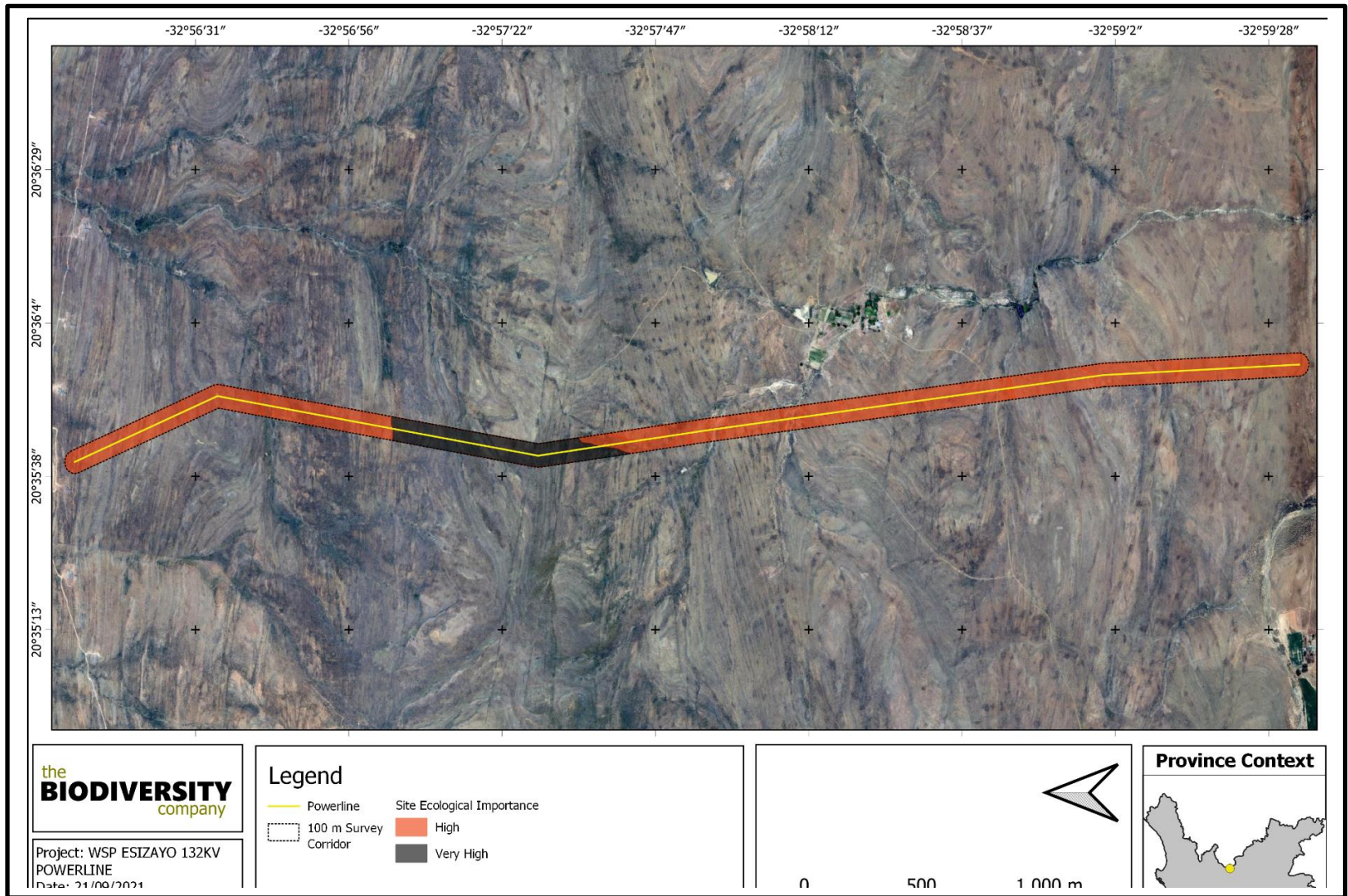


Figure 3-9: Site Ecological Importance

3.5.2 AVIFAUNA

The DFFE National Screening Tool classifies parts of the study area as highly sensitive from an animal species theme perspective, due to the potential presence of Ludwig’s Bustard *Neotis ludwigii* and Verreaux’s Eagle *Aquila verreauxii*. A site sensitivity verification was conducted through the use of both a desktop analysis and the current on-going 12-month monitoring programme. The desktop analysis and pre-construction monitoring confirmed and concur with the HIGH sensitivity rating assigned to the study area, based on the habitat available to Ludwig’s Bustard and Verreaux’s Eagle and the confirmed presence of both species within the project study area (Figure 3-10).

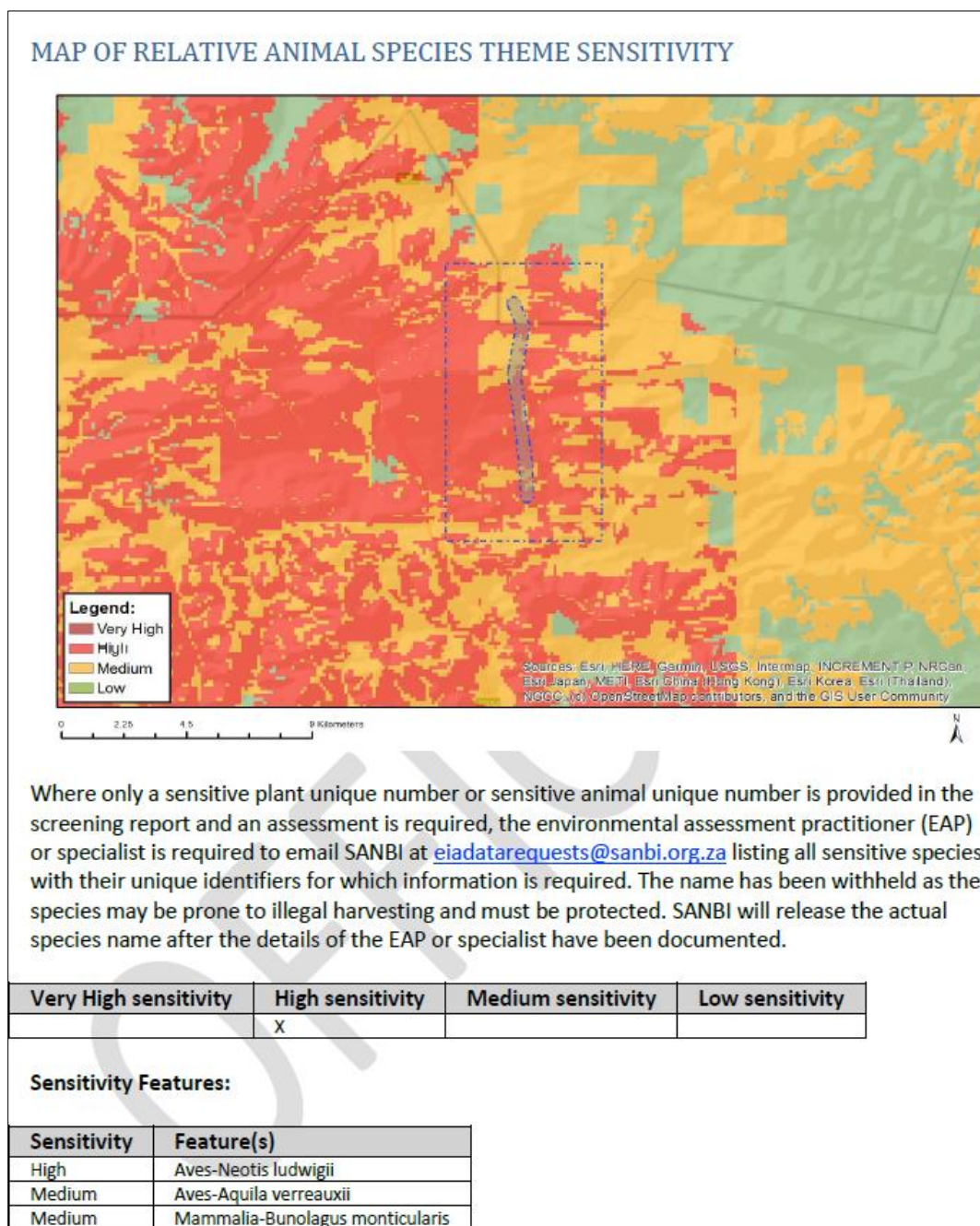
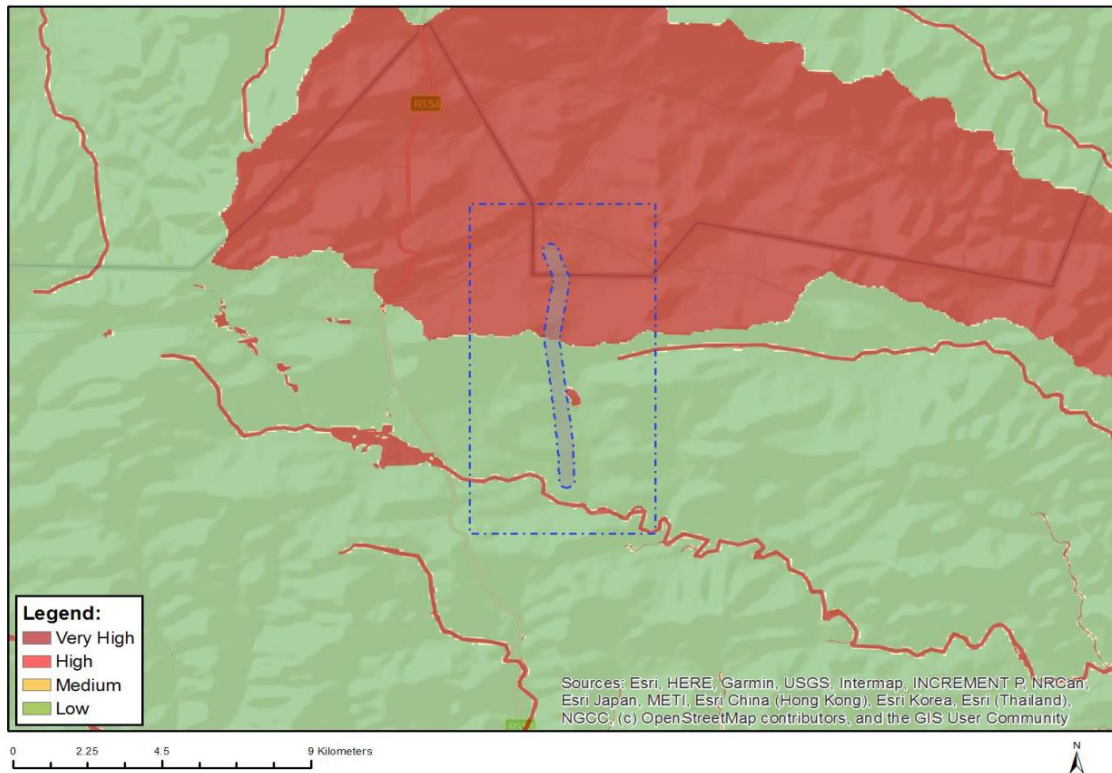


Figure 3-10: The DFFE screening tool rating for the study area. The high sensitivity rating is related to the presence of Ludwig’s Bustard (*Neotis ludwigii*) and the medium rating is related to the presence of Verreaux’s Eagle (*Aquila verreauxii*).

3.5.3 FRESHWATER

The DFFE National Screening Tool classifies parts of the study area as very high sensitivity due to the presence of aquatic CBAs and Freshwater ecosystem priority areas (**Figure 3-11**)

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity
Very High	Aquatic CBAs
Very High	Wetlands and Estuaries
Very High	Freshwater ecosystem priority area quinary catchments

Figure 3-11: The DFFE screening tool rating for the Aquatic Biodiversity Theme

According to the NFPEA database, a total of three wetland systems were identified within 500m of the proposed powerline (**Table 3-5, Figure 3-12**).

Table 3-5: NFEPA Wetlands Located within 500m buffer

HGM UNIT	NATURAL/ARTIFICIAL	NFEPA CONDITION
Seep (S1)	Natural	AB
Seep (S2)	Artificial	Z3
Seep (S3)	Artificial	Z3

During the site visit, it was observed that Seep (S1) was representative of a channelled Valley Bottom type wetland and is currently utilised for small scale agricultural practices. Seeps S2 and S3 were observed as being dams that were located on the ephemeral tributaries.

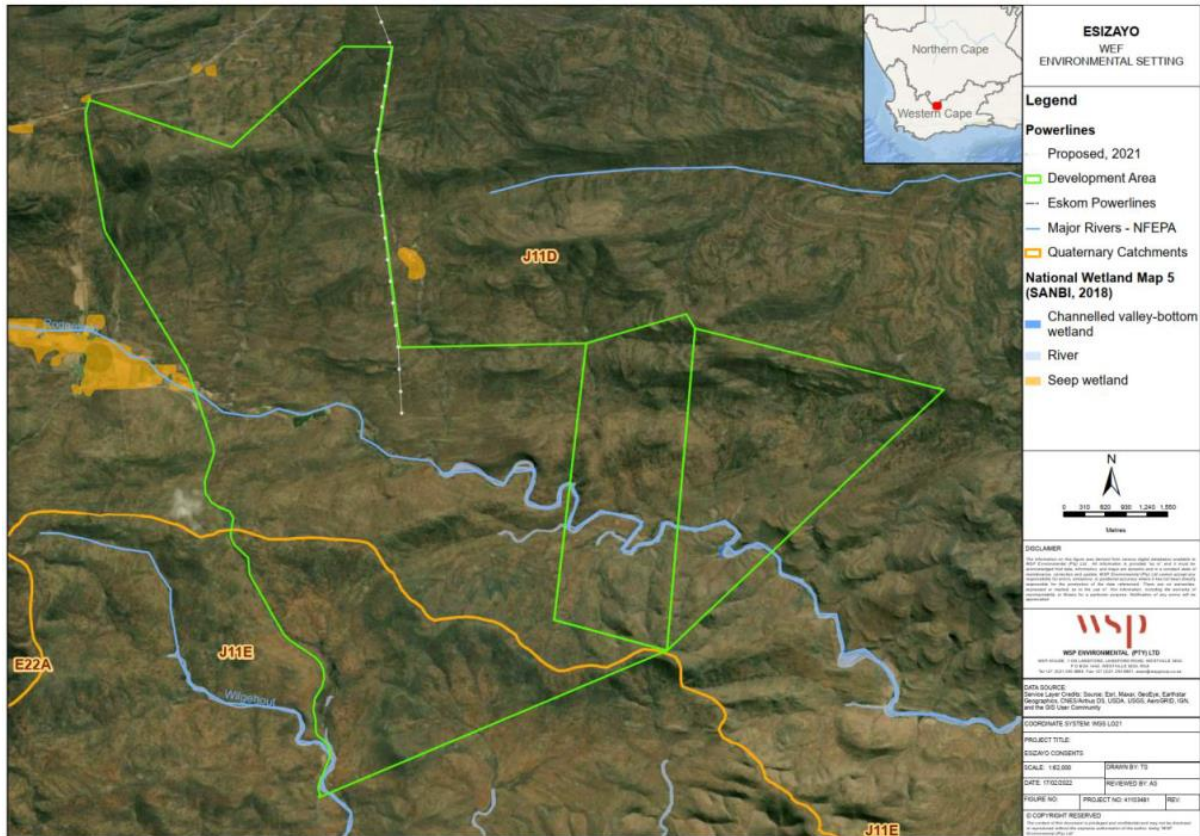
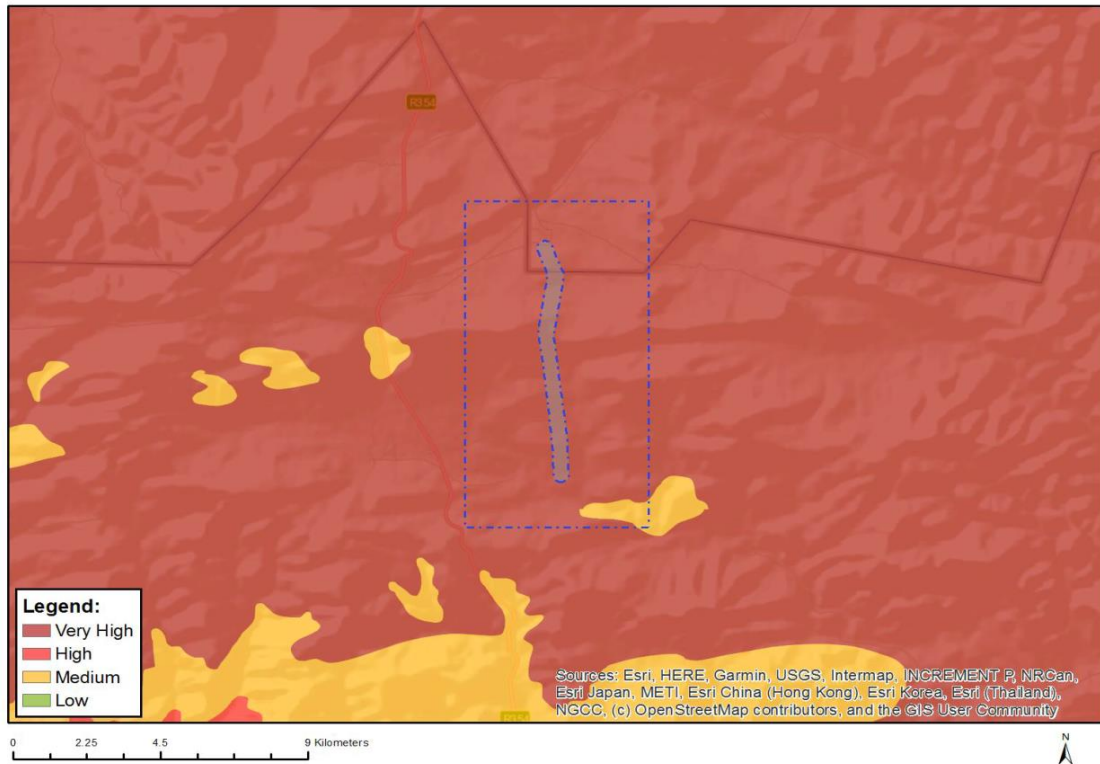


Figure 3-12: NFEPA Wetland Seeps identified within the Study area

3.5.4 PALAEOLOGY

The DFFE National Screening Tool classifies parts of the study area as very high sensitivity due to the presence of features with a very high palaeontological sensitivity (**Figure 3-13**).

MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Very High	Features with a Very High paleontological sensitivity

Figure 3-13: The DFFE screening tool rating for the Palaeontological Theme

In recent years the Middle Permian sedimentary bedrocks of the Waterford and Abrahamskraal Formations in the Klein-Roggeveldberge region of the Great Karoo have yielded sparse but scientifically-important fossils of the *Eodicynodon* Assemblage Zone. They include petrified wood, rich vascular plant and insect assemblages, lungfish burrows as well as tetrapod (terrestrial vertebrate) burrows and trackways *plus* exceedingly rare and fragmentary tetrapod skeletal remains. Well-preserved tetrapod fossils are very sparsely distributed here. The Beaufort Group sedimentary bedrocks are extensively covered by Late Cenozoic superficial sediments (*e.g.* scree, surface gravels, alluvium, skeletal soils) that are usually unfossiliferous. The overall palaeontological sensitivity of the study area is rated as low, although the potential for rare fossil sites of high palaeontological interest cannot be entirely discounted.

4 FINDING OF THE IMPACT ASSESSMENT

A summary of the identified impacts and corresponding significance ratings for the proposed powerline is provided in **Table 4-1** below.

Table 4-1: Impact Summary

REF.	IMPACT DESCRIPTION	PHASE	WITHOUT MITIGATION		WITH MITIGATION	
			SIGNIFICANCE	STATUS	SIGNIFICANCE	STATUS
Air Quality	Generation of Dust and PM	Construction	Moderate	(-)	Low	(-)
Noise	Noise Emissions	Construction	Low	(-)	Low	(-)
Soil Erosion & Contamination	Soil Erosion	Construction	Moderate	(-)	Low	(-)
	Soil Contamination	Construction	Moderate	(-)	Low	(-)
	Soil Contamination	Operation	Low	(-)	Low	(-)
Groundwater	Deterioration of Groundwater Quality	Construction	Moderate	(-)	Low	(-)
Freshwater	Alteration of the Natural Flow Regime	Construction	Moderate	(-)	Low	(-)
	Water Quality	Construction	Moderate	(-)	Low	(-)
	Loss of wetland and riparian functionality ER quality	Construction	Moderate	(-)	Low	(-)
	Increased soil erosion and sedimentation	Construction	Moderate	(-)	Low	(-)
	Alien vegetation establishment	Construction	Low	(-)	Very Low	(-)
	Water Quality	Operation	Low	(-)	Very Low	(-)
	Loss of wetland and riparian habitat	Operation	Low	(-)	Very Low	(-)
	Increased soil erosion and sedimentation	Operation	Moderate	(-)	Very Low	(-)
	Water Quality	Decommissioning	Low	(-)	Very Low	(-)
	Loss of wetland and riparian habitat	Decommissioning	Low	(-)	Very Low	(-)
	Increased soil erosion and sedimentation	Decommissioning	Moderate	(-)	Very Low	(-)

REF.	IMPACT DESCRIPTION	PHASE	WITHOUT MITIGATION		WITH MITIGATION	
			SIGNIFICANCE	STATUS	SIGNIFICANCE	STATUS
	Alien vegetation establishment	Decommissioning	Low	(-)	Very Low	(-)
Biodiversity	Destruction, Loss and Fragmentation of Habitats, Ecosystems & Vegetation Community	Construction	High	(-)	Moderate	(-)
	Introduction of Alien Species	Construction	Moderate	(-)	Low	(-)
	Destruction of Threatened Plant Species	Construction	High	(-)	Moderate	(-)
	Displacement and Fragmentation of Faunal Community due to Habitat Loss, Direct Mortalities & Disturbance	Construction	Moderate	(-)	Low	(-)
	Continued Disturbance of Vegetation Communities, especially Threatened Species and Encroachment by AIS	Operation	Moderate	(-)	Low	(-)
	Ongoing Displacement, Direct Mortalities & Disturbance of Faunal Community due to Habitat Loss and Disturbances	Operation	High	(-)	Moderate	(-)
Avifauna	Displacement due to disturbance associated with the construction	Construction	Moderate	(-)	Low	(-)
	Displacement due to habitat transformation associated with the construction	Construction	Moderate	(-)	Low	(-)
	Displacement of priority species due to habitat transformation	Operation	Low	(-)	Low	(-)
	Mortality of priority species due to collisions	Operation	Moderate	(-)	Moderate	(-)
	Electrocution of priority species on the on-site substation infrastructure	Operation	Low	(-)	Low	(-)

REF.	IMPACT DESCRIPTION	PHASE	WITHOUT MITIGATION		WITH MITIGATION	
			SIGNIFICANCE	STATUS	SIGNIFICANCE	STATUS
	Displacement of priority species due to disturbance associated with decommissioning of the on-site substation and 132kV overhead power line	Decommissioning	Moderate	(-)	Low	(-)
Visual	Potential visual impact of construction activities on sensitive visual receptors in close proximity to the proposed grid connection infrastructure	Construction	Low	(-)	Low	(-)
	Potential visual impact on sensitive visual receptors located within a 0.5km radius of the grid connection infrastructure during the operational phase	Operation	Low	(-)	Low	(-)
	Potential visual impact on sensitive visual receptors within the region (0.5 – 3km radius) during the operation of the grid connection infrastructure	Operation	Low	(-)	Low	(-)
	Visual impact of the proposed grid connection infrastructure on the sense of place of the region	Operation	Low	(-)	Low	(-)
Waste	Improper Waste Management	Construction	Moderate	(-)	Low	(-)
Traffic	Increased Local Traffic	Construction	Low	(-)	Low	(-)
Heritage	Damage to Heritage Resources	Construction	Low	(-)	Low	(-)
Palaeontology	Impacts on fossil heritage	Construction	Low	(-)	Low	(-)
Socio-economic	Creation of Employment, Business Development and Skills Development	Construction	Low	(+)	Low	(+)

REF.	IMPACT DESCRIPTION	PHASE	WITHOUT MITIGATION		WITH MITIGATION	
			SIGNIFICANCE	STATUS	SIGNIFICANCE	STATUS
	Presence of Construction Workers and Impact on Family Structures and Social Networks	Construction	Low	(-)	Low	(-)
	Risk to safety, livestock, and farm infrastructure	Construction	Moderate	(-)	Low	(-)
	Construction activities and vehicles	Construction	Low	(-)	Low	(-)
	Risk of veld fires	Construction	Low	(-)	Low	(-)
	Improve energy security and establishment of energy infrastructure	Operation	Moderate	(+)	Moderate	(+)
	Creation of Employment Opportunities	Operation	Low	(+)	Moderate	(+)
	Generate income for affected landowners	Operation	Low	(+)	Moderate	(+)
	Visual impact and impact on sense of place	Operation	Low	(-)	Moderate	(-)
	Impact on farming operations during maintenance	Operation	Low	(-)	Low	(-)
Health and Safety	Employee Health & Safety	Construction	Moderate	(-)	Low	(-)
	Employee Health & Safety	Operation	Moderate	(-)	Low	(-)

5 ENVIRONMENTAL MANAGEMENT OBJECTIVES

An EMPr is defined as “an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented or mitigated, and that the positive benefits of the projects are enhanced.”

This EMPr has been compiled in accordance with Appendix 4 of GNR 982, in compliance with section 24N of NEMA, with the purpose of ensuring that negative impacts are reduced, and positive effects are enhanced through a process of continual improvement, during both the construction and operational phases of the Esizayo 132kV OHPL project.

To facilitate compliance to the EMPr by appointed contractors and sub-contractors, it is required that all onsite personnel are aware of the requirements of the EMPr as well as the prescribed penalties should a non-conformance be identified during the construction, operation and decommissioning activities.

Further to the above, appointed contractors and sub-contractors will also be required to comply with all relevant legislation and standards.

5.1 EMPr OBJECTIVES

This EMPr has the following objectives:

- Identify mitigation measures and environmental specifications which are required to be implemented for the planning, construction and rehabilitation, operation, and decommissioning phases of the project in order to manage and minimise the extent of potential environmental impacts associated with the facility;
- Ensure that all the phases of the proposed project do not result in undue or reasonably avoidable adverse environmental impacts, and ensure that any potential environmental benefits are enhanced;
- Identify entities responsible for the implementation of the measures and outline functions and responsibilities;
- Create management structures that address the concerns and complaints of interested and affected parties (I&APs) with regards to the proposed project;
- Propose mechanisms and frequency for monitoring compliance, and preventing long-term or permanent environmental degradation; and
- Facilitate appropriate and proactive responses to unforeseen events or changes in project implementation that was not considered in the EIA process.

Please note: This EMPr is a working document and therefore subject to change depending on the requirements of the various Project phases. When applicable, these changes are to be approved in accordance with legislative requirements.

5.2 ENVIRONMENTAL OBJECTIVES AND TARGETS

To facilitate compliance to the EMPr, Esizayo must comply with all relevant legislation and standards and make all personnel aware of the requirements of the EMPr, as well as the prescribed penalties should a non-conformance be identified during the different phases of the proposed Project.

It is recommended that environmental objectives (as outlined in this document) be emphasised as minimum requirements. Objectives include:

- Encourage good management practices through planning and commitment to environmental issues; and
- Provide rational and practical environmental guidelines to:
 - Minimise disturbance of the natural environment;
 - Minimise fugitive emissions;

- Minimise impact of added traffic into the area;
- Ensure surface and groundwater resource protection;
- Prevent or minimise all forms of pollution;
- Protect indigenous flora and fauna;
- Prevent soil erosion;
- Promote sustainable use of resources;
- Adopt the best practical means available to prevent or minimise adverse environmental impacts;
- Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment;
- Promote the reduction, reuse, recycling and recovery of waste;
- Develop waste management practices based on prevention, minimisation, recycling, treatment or disposal of waste;
- Describe all monitoring procedures required to identify impacts on the environment;
- Define how the management of the environment is reported and performance evaluated; and
- Train onsite personnel with regard to their environmental obligations.

6 MANAGEMENT PROCEDURES AND ADMINISTRATIVE REQUIREMENTS

6.1 ORGANISATIONAL STRUCTURE AND RESPONSIBILITY

Formal responsibilities are necessary to ensure that key management measures/procedures are executed. Esizayo Wind (RF) (Pty) Ltd, hereafter referred to as “The Project Company”, together with the appointed EPC Contractor, will be responsible for the overall control of the project site during the pre-construction, construction, operation, decommissioning and rehabilitation phases of the project. The Project Company’s responsibilities will include the following:

- Appointing an independent environmental control officer (ECO) for the duration of the Contract and notify the DFFE of their contact details;
- Being fully familiar with the BA Report, EA conditions and the EMPr;
- Applying for an amendment of the EA from the DFFE as and when required in line with the prevailing legislation;
- The overall implementation of the EMPr;
- Ensuring compliance, by all parties, and the imposition of penalties for noncompliance;
- Implementing corrective and preventive actions, where required;
- Preventing pollution and actions that will harm or may cause harm to the environment;
- Ensuring the activity does not commence within 30 days of the EA being issued;
- Notifying the DFFE within 30 days that construction activity will commence;
- Notifying the DFFE in writing within 24 hours if any condition in the EA cannot be or is not adhered to; and
- Notifying the DFFE 14 days prior to commencement of the operational phase.

Specific roles and responsibilities for the construction phase of this project are as defined in **Table 6-1**.

Table 6-1: Roles and Responsibilities – Construction (EPC Contractor)

RESPONSIBLE PERSON	RESPONSIBILITIES
Project Manager (EPC Contractor)	<ul style="list-style-type: none"> – Ensure that the Project Company and the contractor are aware of all specifications, legal constraints pertaining to the project specifically with regards to the environment – Ensure that all stipulations within the EMPr and conditions of the environmental authorisation are communicated and adhered to by the Project Company and its contractor(s) – Monitor the implementation of the EMPr and conditions of the environmental authorisation throughout the project by means of site inspections and meetings. This will be documented as part of the site meeting minutes – Be fully conversant with the BAR for the project, the conditions of environmental authorisation and all relevant environmental legislation
Site Manager (EPC Contractor)	<ul style="list-style-type: none"> – Be fully conversant with the BAR, the conditions of environmental authorisation and the EMPr – Approve method statements – Provide support to the ECO

RESPONSIBLE PERSON RESPONSIBILITIES

	<ul style="list-style-type: none"> — Be fully conversant with all relevant environmental legislation and ensure compliance thereof — Have overall responsibility for the implementation of the EMPr and conditions of the environmental authorisation — Ensure that audits are conducted to ensure compliance to the EMPr and conditions of the environmental authorisation — Liaise with the Project Manager or his delegate, the ECO and others on matters concerning the environment — Prevent actions that will harm or may cause harm to the environment, and take steps to prevent pollution and unnecessary degradation onsite — Confine construction activities to demarcated areas
<p>Environmental Officer (EO) (EPC Contractor)</p>	<p>The EO must be appointed by the Contractor and is responsible for managing the day-to-day onsite implementation of the EMPr, and for the compilation of weekly environmental monitoring reports. In addition, the EO must act as liaison and advisor on all environmental and related issues, seek advice from the ECO when necessary, and ensure that any complaints received from I&APs are duly processed and addressed and that conflicts are resolved in an acceptable manner and timely manner. The EO shall be a full-time dedicated member of the Contractor’s team and must be approved by the Project Company.</p> <p>The following qualifications, qualities and experience are recommended for the individual appointed as the EO:</p> <ul style="list-style-type: none"> — A relevant environmental diploma or degree in natural sciences, as well as a minimum of three years’ experience in construction site monitoring, excluding health and safety; — A level-headed and firm person with above-average communication and negotiating skills. The ability to handle and address conflict management situations will be an advantage; and — Relevant experience in environmental site management and EMPr compliance monitoring. <p>The EO’s responsibilities include:</p> <ul style="list-style-type: none"> — Monitoring, on a daily basis, environmental specifications on site and compliance with the conditions of the EA, environmental legislation and EMPr; — Keeping a register of compliance / non-compliance with the environmental specifications; — Identifying and assessing previously unforeseen, actual or potential impacts on the environment; — Ensuring that a brief weekly environmental monitoring report is submitted to the ECO; — Conducting site inspections during the defects liability period, and bringing any environmental concerns to the attention of the ECO and Contractor; — Advising the Contractor on the rectification of any pollution, contamination or damage to the construction site, rights of way and adjacent land; — Attending site meetings (scheduled and ad hoc); — Presenting environmental awareness training to all staff, Contractors and Sub contractors, and monitoring the environmental awareness training for all new personnel on-site, as undertaken by the Contractor; — Ensuring that a copy of the EA and the latest version of the EMPr are available on site at all times; — Ensuring that the Contractor is made aware of all applicable changes to the EMPr that are approved by the DFFE; — Assisting the Contractor in drafting environmental method statements and/or the Environmental Policy where such knowledge/expertise is lacking;

RESPONSIBLE PERSON RESPONSIBILITIES

	<ul style="list-style-type: none"> — Undertaking daily environmental monitoring to ensure the Contractor’s activities do not impact upon the receiving environment. Such monitoring shall include dust, noise and water monitoring; and — Maintaining the following on site: <ul style="list-style-type: none"> — A weekly site diary. — A non-conformance register (NCR). — An I&AP communications register, and — A register of audits. <p>The EO will remain employed until all rehabilitation measures, as required for implementation due to construction damage, are completed and the site is handed over to the Operator.</p>
<p>ECO (Independent)</p>	<p>A suitably qualified ECO must be appointed by the Project Company to monitor the project compliance with the EMPr and conditions of the environmental authorisation on a monthly basis. The costs of the ECO shall be borne by the Project Company (proof of appointment must be maintained onsite).</p> <p>Responsibilities of the ECO include:</p> <ul style="list-style-type: none"> — Be fully conversant with the BAR, the conditions of environmental authorisation and the EMPr; — Be fully conversant with all relevant environmental legislation and ensure compliance thereof; — Approve method statements; — Remain employed until the completion of the construction activities; and — Report to the Project Manager, including all findings identified onsite. <p>In addition, the ECO will:</p> <ul style="list-style-type: none"> — Undertake monthly inspections of the site and surrounding areas in order to audit compliance with the EMPr and conditions of the environmental authorisation; — Take appropriate action if the specifications contained in the EMPr and conditions of the environmental authorisation are not followed; — Monitor and verify that environmental impacts are kept to a minimum, as far as possible; and — Ensure that activities onsite comply with all relevant environmental legislation.
<p>Contractors, Staff and Service Providers</p>	<ul style="list-style-type: none"> — Complying with the Project Company’s environmental management specifications — Be conversant with all EMPr and conditions of the environmental authorisation, and ensure compliance thereto — Adhering to any environmental instructions issued by the Site Manager/Project Manager on the advice of the ECO

Refer to: Table 1 (Part A, Section 3) of the Generic EMPr for the development of overhead transmission and distribution infrastructure, attached as Appendix C and Table 1 (Part A, Section 3) of the Generic EMPr for the development and expansion of substation infrastructure for the transmission and distribution of electricity, attached as Appendix D.

6.2 ENVIRONMENTAL AWARENESS AND COMPETENCE

Legislation (NEMA) requires that the Project Company must develop an environmental awareness plan that describes the manner in which the Project Company intends to inform employees of any environmental risks which may result from their work and the manner in which the risks must be dealt with in order to avoid pollution or the degradation of the environment. In recognition of the need to protect our environment, environmental management should not only be seen as a legal obligation but also as a moral obligation.

It is important to ensure that all relevant personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and ongoing minimisation of environmental degradation and harm.

To achieve effective environmental management, it is important that employees, contractors (including subcontractors) are aware of the responsibilities in terms of the relevant environmental legislation and the contents of the EMPr, conditions of the EA.

The Project Company will provide appropriate resources to facilitate social and environmental awareness training during the construction, operational and decommissioning phases of the project. The Project Company will require that all managers associated with the project adhere to the mitigation/management measures detailed in the EMPr and identify, evaluate, and minimise risks to the social, physical and biophysical environments. This will be implemented by educating employees in social and environmental matters and responsibilities relating to performance of their assigned tasks. Furthermore, employees will be entrusted to maintain the necessary level of environmental performance for their activities. Contractors, and their associated sub-contractors, will also need to demonstrate compliance to mitigation/ management measures included in the EMPr.

The following methodology will be used to implement and ensure environmental and social awareness and competence:

6.2.1 INTERNAL COMMUNICATION

Internal communication of environmental and social issues to ensure environmental awareness will be achieved by using any combination of the following means:

- Meetings;
- Memos;
- Notice boards;
- Briefs;
- Reports;
- Monthly themes;
- Tool box talks;
- Daily operational bulletins;
- Newsletters;
- E-mail;
- Telephone; and
- Induction training.

6.2.2 STANDARD MEETINGS

The following standard meetings will be held at specific times to ensure that environmental and social awareness; potential problems; complaints etc. are heard and addressed proactively:

- Safety, Health and Environmental Meetings will be held monthly by the Senior Management;
- Safety, Health and Environmental Meetings will be held weekly (during construction) and monthly (during operation) by the relevant personnel, environmental and social issues will form part of the agenda;

- Communication between all personnel and Senior Management will be facilitated through the appropriate reporting lines, or by using complaint and incident forms.

Minutes of all meetings must be compiled by the EPC Contractor and kept on file.

6.2.3 ENVIRONMENTAL AND SOCIAL TALK TOPICS

Monthly environmental and social talk topics will be compiled and distributed to relevant personnel and will be displayed on appropriate notice boards. As a minimum, the following topics must be covered:

- Water Quality;
- Water Use and Consumption;
- Air Quality i.e. dust;
- Power Consumption and Energy Efficiency;
- Waste Management;
- Fauna and Flora;
- Emergency Procedures;
- Incidents Reporting;
- Systems;
- Noise;
- Heritage Impacts;
- Landowner Etiquette; Speed Limits;
- Health Risks (such as HIV/ Aids and COVID-19);
- General Awareness (e.g. World Environment Day, National Arbour Day);
- Grievance Procedures;
- Policy awareness; and
- Code of Conduct.

6.2.4 GENERAL COMMUNICATIONS

Communication to the community, government, landowners, neighbouring farmers, environmental groups, non-government organisations and other stakeholders will be communicated to ensure environmental and social awareness by means of the following:

- Fax or E-mail;
- Telephone;
- Formal meetings; and
- Open days.

6.2.5 TRAINING

It is important to ensure that all personnel, contractors and their sub-contractors have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimisation of environmental harm. As a minimum environmental training must include the following:

- Employees must have a basic understanding of the key environmental features of the site and the surrounding environment;
- Employees will be thoroughly familiar with the requirements of the EMPr and the environmental specifications as they apply to the project.
- Employees must undergo training for the operation and maintenance activities associated with project and have a basic knowledge of the potential environmental impacts that could occur and how they can be minimised and mitigated.

- Awareness of any other environmental matters, which are deemed to be necessary by the Environmental Officer.
- Training must include the environment, health and safety as well as basic HIV/AIDS education.

The following facets to training form part of this Environmental and Social Awareness Plan:

- **Induction:** Environmental and social awareness training will be given at induction when personnel join the company and/or return from leave. Induction training will also be given to visitors entering the site. Induction training will include, *inter alia*:
 - A discussion on the environment concept, what does it comprise of and how do we interact with it;
 - A description on the components and phases of the specific renewable power generation facility;
 - A general account of how the facility and its associated activities can affect the environment, giving rise to what are called environmental impacts;
 - A discussion on what staff can do in order to help prevent the negative environmental impacts from degrading the environment i.e. environmental impact management.
- **Job Specific Training:** Job specific training programmes will be developed as and when required. The programs will be based on the significant environmental and social aspects/ impacts that are identified during regular audits and site inspections. Supervisory staff will be equipped with the necessary knowledge and information to guide their employees on environmental and social aspects applicable to performing a specific task.
- **Competency Training:** The Environmental Officer will be responsible for the environmental and social competency and awareness training of Middle Management and supervisors. This training will be performed both on a one-on-one basis and through workshops and presentations. Competence and the effectiveness of training and development initiatives will be determined through the following methods:
 - Trend analysis of incidents reported; and
 - Analysis of work areas during visits and audits.

The process to declare competency of personnel is documented in the ISO9001:2000 procedure. This plan will be amended periodically in light of operational changes, learning experienced during its implementation and other activities that can affect the risk profiles.

- **Training Records:** Training can be done either in a written or verbal format but will be in an appropriate format for the receiving audience. Persons having received training must indicate in writing that they have indeed attended a training session and have been notified in detail of the contents and requirements of the EMPr. The attendance registers must be kept on file.

To ensure accountable and demonstrated implementation of the EMPr, a number of reporting systems, documentation controls and compliance mechanisms must be in place. **Table 6-2** indicates the minimum requirements as set out in the generic EMPrs for the development of overhead transmission and distribution infrastructure and for the development and expansion of substation infrastructure for the transmission and distribution of electricity.

Table 6-2: Documentation Reporting and Compliance Requirements as per the generic EMPrs

ASPECT	REFER TO GENERIC EMPr (PART A)
Document control/Filing system	Section 4.1
Documentation to be available	Section 4.2
Weekly Environmental Checklist	Section 4.3
Environmental site meetings	Section 4.4
Required Method Statements	Section 4.5

ASPECT**REFER TO GENERIC EMPr (PART A)**

Environmental Incident Log (Diary)	Section 4.6
Non-compliance	Section 4.7
Corrective action records	Section 4.8
Photographic record	Section 4.9
Complaints register	Section 4.10
Claims for damages	Section 4.11
Interactions with affected parties	Section 4.12
Environmental audits	Section 4.13
Final environmental audits	Section 4.14

Refer to: Part A, Section 4 of the Generic EMPr for the development of overhead transmission and distribution infrastructure, attached as Appendix D and Part A, Section 4 of the Generic EMPr for the development and expansion of substation infrastructure for the transmission and distribution of electricity, attached as Appendix D.

7 GENERAL CONTROL MEASURES

This section refers to construction related activities that are common to most power line projects as defined within the pre-approved generic EMPs. For each activity, a set of prescribed environmental controls and associated management actions have been identified. Contractors shall implement these controls as a minimum requirement for mitigating the impact of particular construction related activities.

These control measures are defined within Part B: Section 1 of the pre-approved generic EMPs (attached as **Appendix C** and **Appendix D**). The format of a general environmental control is shown below, see **Table 7-1**. The boxes shaded in green are predefined and represent minimum standards for the management of that particular aspect. The Contractor will be required to adhere to all impact management actions (where applicable to the construction related activity) for the Project. The boxes shaded in red assign responsibility for the implementation and monitoring of the impact management actions. This implementation and monitoring information is project specific and shall be completed by the Contractor prior to commencement of construction.

Table 7-1: Format of a general environmental control illustrating aspects which are predefined versus those which still need to be completed by the contractor

Management Objective:	Predefined as part of Generic EMP					
Management Outcome:	Predefined as part of Generic EMP					
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
Predefined as part of Generic EMP	To be completed by Contractor	To be completed by Contractor	To be completed by Contractor	To be completed by Contractor	To be completed by Contractor	To be completed by Contractor

The completed template must be signed and dated on each page by both the contractor and the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template. Each method statement must also be duly signed and dated on each page by the contractor and the holder of the EA. This template, once signed and dated, is legally binding. The holder of the EA will remain responsible for its implementation.

The construction related activities addressed within Part B: Section 1 of the pre-approved generic EMPs are as follows:

Table 7-2: Activities and management measures as per generic EMP (Part B: Section 1)

ACTIVITY	REFER TO GENERIC EMP FOR THE DEVELOPMENT OF OVERHEAD TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE, ATTACHED AS APPENDIX C (PART B: SECTION 1)	REFER TO GENERIC EMP FOR THE DEVELOPMENT AND EXPANSION OF SUBSTATION INFRASTRUCTURE, ATTACHED AS APPENDIX D (PART B: SECTION 1)
Environmental awareness training	5.1	5.1
Site Establishment development	5.2	5.2
Access restricted areas	5.3	5.3
Access roads	5.4	5.4
Fencing and Gate installation	5.5	5.5
Water Supply Management	5.6	5.6

ACTIVITY

REFER TO GENERIC EMPR FOR THE DEVELOPMENT OF OVERHEAD TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE, ATTACHED AS APPENDIX C (PART B: SECTION 1)

REFER TO GENERIC EMPR FOR THE DEVELOPMENT AND EXPANSION OF SUBSTATION INFRASTRUCTURE, ATTACHED AS APPENDIX D (PART B: SECTION 1)

Storm and wastewater management	5.7	5.7
Solid and hazardous waste management	5.8	5.8
Protection of watercourses and estuaries	5.9	5.9
Vegetation clearing	5.10	5.10
Protection of fauna	5.11	5.11
Protection of heritage resources	5.12	5.12
Safety of the public	5.13	5.13
Sanitation	5.14	5.14
Prevention of disease	5.15	5.15
Emergency procedures	5.16	5.16
Hazardous substances	5.17	5.17
Workshop, equipment maintenance and storage	5.18	5.18
Batching plants	5.19	5.19
Dust emissions	5.20	5.20
Blasting	5.21	5.21
Noise	5.22	5.22
Fire prevention	5.23	5.23
Stockpiling and stockpile areas	5.24	5.24
Finalising tower positions	5.25	
Civil works		5.25
Excavation (and Installation) of foundations	5.26	5.26
Installation of foundations, cable trenching and drainage systems		5.27
Assembly and erecting towers	5.27	

ACTIVITY

REFER TO GENERIC EMPr FOR THE DEVELOPMENT OF OVERHEAD TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE, ATTACHED AS APPENDIX C (PART B: SECTION 1)

REFER TO GENERIC EMPr FOR THE DEVELOPMENT AND EXPANSION OF SUBSTATION INFRASTRUCTURE, ATTACHED AS APPENDIX D (PART B: SECTION 1)

Installation of equipment (circuit breakers, current Transformers, Isolators, Insulators, surge arresters, voltage transformers, earth switches)		5.28
Stringing (and cabling)	5.28	5.30
Testing and Commissioning (all equipment testing, earthing system, system integration)		5.31
Socio-economic	5.29	5.32
Temporary closure of site	5.30	5.33
Dismantling of old equipment		5.34
Landscaping and rehabilitation	5.31	5.35

Refer to: Part B – Section 1 of the Generic EMPr for the development of overhead transmission and distribution infrastructure, attached as Appendix C and Part B – Section 1 of the Generic EMPr for the development and expansion of substation infrastructure for the transmission and distribution of electricity, attached as Appendix D.

8 SITE SPECIFIC CONTROL MEASURES

This section refers to site specific actions or mitigation measures related to the Project and are based on findings from the BA Report and associated specialist studies.

This section identifies various actions which are undertaken throughout the construction and operational phases. Not every action will be required during the entire course of activities. Therefore, the actions identified herein have been given priority timeframes for proposed implementation. **Table 8-1** below shows the structure of the site-specific EMPr.

Table 8-1: Structure of EMPr

COLUMN	DESCRIPTION
Activity / Aspect	Highlights the various activities/aspects associated with the project i.e. the contractors' activities that will interact with the environment. Each activity / aspect is cross referenced to the impacts identified in the EIA report.
Environmental Measures and Action Plans	Indicates the actions required to prevent and/or minimise the potential impacts on the environment that are associated with the project
Responsibility	Indicates the party responsible for implementing the environmental measures and action plans laid out in the EMPr. Please note that the site manager will have authority to stop works if/as necessary
Development Phase	Indicates during which phase of development the actions for the specific aspect must be implemented and/or monitored
Condition of Authorisation	Indicates whether the specific mitigation measures should or should not be included as a condition in the Environmental authorisation
Additional Monitoring Requirements	Indicates the method and frequency of any additional monitoring requirements over and above the day-to-day monitoring undertaken by the EO and the monthly compliance monitoring undertaken by the ECO.

The following assumptions have been made in the development of the environmental specification in this EMPr:

- An electronic environmental file containing the information/documentation required by this EMPr is to remain onsite and to be made available at the request of the auditor or similar monitoring body; and
- For ease of reference, any person(s) employed to assist in the project i.e. contractors, sub-contractor and permanent and temporary staff, will be collectively referred to as 'onsite personnel'.

8.1 CONTRACTOR LAYDOWN AREA AND SITE ACCESS

8.1.1 OBJECTIVES

To implement measures to minimise impacts on the environment from the initiation of construction activities through planning, careful site access route selection and implementation of mitigation measures.

8.1.2 INDICATOR AND COMPLIANCE MECHANISMS

The following indicator and compliance mechanisms are applicable:

- Health, safety, environmental and community incident and complaints management system register;
 - Close-out on incidents, non-conformances and audit findings;
 - Monitoring and audit reports;
 - Inductions training and register; and
 - Environmental awareness programme/toolbox talks.
-

8.1.3 MITIGATION AND MANAGEMENT MEASURES

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
a) Project Initiation of Construction Activities	i. Construction activities to remain within demarcated project footprint	ECO Contractor	Construction	No	No additional monitoring required.
	ii. Site clearing and topsoil removal must be limited to the footprint of the infrastructure requirements	Project Manager			

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	iii. Clearly mark health and/or safety hazards onsite				
	iv. Locate firefighting measures onsite, such as fire extinguishers, and make personnel aware of fire prevention and firefighting measures.				
	v. Firefighting equipment must be securely placed and inspected monthly				
	vi. Undertake fuel and chemical management for storage, handling and spillages in accordance Section 6.3.				
	vii. Manage surface and groundwater impacts as per Water Management section.				

8.2 VEHICLE, EQUIPMENT AND MACHINERY MANAGEMENT

8.2.1 OBJECTIVES

To implement measures to minimise impacts on the environment from poorly maintained equipment, machinery and vehicles onsite.

8.2.2 INDICATOR AND COMPLIANCE MECHANISMS

The following indicator and compliance mechanisms are applicable:

- Health, safety, environmental and community incident and complaints management system register;

- Close-out on incidents, non-conformances and audit findings;
- Monitoring and audit reports;
- Transport route delineation;
- Daily equipment, machinery and vehicle checklists; and
- Incident classification and reporting procedure.

8.2.3 MITIGATION AND MANAGEMENT MEASURES

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
a) Vehicle and Equipment Maintenance	i. Undertake all significant vehicle maintenance work off-site at a registered workshop. Evidence of such maintenance must be recorded and maintained onsite for verification.	EO ECO Contractor	Construction Operation De-commissioning	No	No additional monitoring required.
	ii. Minor maintenance can be undertaken onsite within a designated area on a hard standing.	Operator			
	iii. Utilise drip trays under all stationary vehicles and equipment.				
b) Operation of Equipment, Machinery and Vehicles	i. Adequately maintain equipment, machinery and vehicles so as to reduce the potential for spillages of oil, diesel, fuel or hydraulic fluid, as well as to ensure road-worthiness. Evidence of such maintenance must be recorded and maintained onsite for verification.				
	ii. Do not allow machinery or plant equipment used onsite to pose a pollution hazard. The contractor must order any equipment to be repaired or withdrawn from use if evident that it is not operating optimally. The contractor shall inspect all vehicles, machinery and				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	equipment every morning for defects (indicator lights, oil leaks, etc.) and excessive emissions				
	iii. Identify and use transport routes that will least impact local road users and traffic i.e. routes which minimise right turns across traffic. Identified routes must be documented and made available for inspection on request.				
	iv. Avoid heavy vehicle use on the local road network during peak hours i.e. 07h00 – 08h00 and 16h00 – 17h00				
	v. Undertake fuel and chemical management for storage, handling and spillages in accordance with the Fuel and Chemical Management section				

8.3 FUEL AND CHEMICAL MANAGEMENT

8.3.1 OBJECTIVES

To ensure the correct storage and handling of fuels and chemicals in order to prevent impacts to the surrounding environment

8.3.2 INDICATOR AND COMPLIANCE MECHANISMS

The following indicator and compliance mechanisms are applicable:

- Maintenance records;
- Safe Disposal certificates (if applicable);
- Material safety data sheets;
- Health, safety, environmental and community incident and complaints management system register;
- Chemicals management procedure (to be developed);
- Waste management procedure (to be developed);
- Monitoring and audit reports; and
- Training records.

8.3.3 MITIGATION AND MANAGEMENT MEASURES

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
a) Fuel and Chemical Management	i. Undertake fuel and chemical management for storage, handling and spillages in accordance with an Incident Classification and Reporting Procedure	ECO Contractor Operator	Construction Operation	No	No additional monitoring required.
	ii. Indicate the location of the fuel and chemical storage area on the layout plans				
	iii. Securely fence and lock the storage areas to accommodate all hazardous substances such as fuel, oils and chemicals. The storage area must be covered and the floor must be an impermeable surface and suitably bunded as per the requirements outlined in SANS 10089-1 (2008)				
	iv. Develop and implement a procedure for the management of all hydrocarbon spillages				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	v. Label all liquids (chemicals and hydrocarbons) stored onsite for easy identification. Safety data sheets (SDS) for onsite chemicals, hydrocarbon materials and hazardous substances must be readily available. SDSs must include mitigation measures to ameliorate potential environmental impacts which may result from a spill, incorporating health and safety mitigation measures				
	vi. SDS register to be kept at the hazardous storage.				
	vii. Key personnel to be trained on management of hazardous chemical storage and management				
	viii. Keep fuels, oils or other chemicals used outside of the bunded area to a minimum and use suitable secondary containment in the form of drip trays.				
b) Health and Safety	i. Display “no smoking” and “no naked flame” signs in and around the project area, as well as near the hazardous material store	EO ECO Contractor	Construction Operation De-commissioning	No	No additional monitoring required.
	ii. Strategically place the correct types of fire extinguishers onsite and near the hazardous material store. Train key personnel on basic firefighting skills	Operator			
	iii. Frequently inspect and maintain containment facilities and retain records onsite				

8.4 WASTE MANAGEMENT

8.4.1 OBJECTIVES

To ensure the correct handling, storage, transportation and disposal of general waste and hazardous waste.

8.4.2 INDICATOR AND COMPLIANCE MECHANISMS

The following indicator and compliance mechanisms are applicable:

- Induction training and records;
- Material safety data sheets;
- Waste Management Procedure (to be developed);
- Relevant SANS Codes of Practice;
- Safety disposal certificates and waste manifests (all waste streams);
- Emergency preparedness and response procedure (to be developed);
- Incident classification and reporting management procedure (to be developed);
- Waste manifest documentation;
- Health, safety, environmental and community incident and complaints management system register; and
- Monitoring and audit reports.

8.4.3 MITIGATION AND MANAGEMENT MEASURES

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
a) General Waste Management	i. General waste generated as a result of construction and operational activities <u>must</u> be managed in accordance with a Waste Management Procedure	EO ECO Contractor	Construction Operation De-commissioning	Yes	No additional monitoring required.
	ii. Train and inform all onsite personnel regarding general waste minimisation, management and disposal as per the Waste Management Procedure	Operator		No	
	iii. Prohibit littering and burning of waste onsite				
	iv. Place an adequate number of general waste bins around the site during construction and operational activities in order to minimise littering. The bins must be suitably labelled "General Waste" to prevent mixing of waste. The bins must be removed from the site on a regular basis for disposal at a registered or licensed disposal facility				
	v. Retain records of appropriate <u>waste manifest documentation and</u> safety disposal certificates associated with general waste removal, transportation and disposal				
	vi. A minimum of one toilet must be provided per 10 persons. Ablution facilities must be located outside the riparian zone or 100m from a watercourse, whichever is greatest				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	vii. Prohibit the mixing of general waste with hazardous waste. Should general waste be mixed with hazardous waste, it will be considered hazardous waste				
	viii. It is recommended that all waste be stored in covered waste skips to prevent rodents and pests entering the site. Waste should be removed on a regular basis.				
	ix. No dumping of litter, rubble or cleared vegetation on site should be allowed. As such it is advised vegetation cuttings (especially AIP) to be carefully collected and disposed of at a separate waste facility.				
	x. Recover, recycle and reuse waste of general waste as far as possible.				
b) Hazardous Waste Management	i. Hazardous waste generated as a result of construction, operational and de-commissioning activities <u>must</u> be managed in accordance with a Waste Management Procedure.	EO ECO Contractor Operator	Construction Operation De-commissioning	Yes	No additional monitoring required.
	ii. The Waste Management Procedure must include a procedure for handling spillages.				
	iii. Train and inform all onsite personnel regarding hazardous waste minimisation, management and disposal as per the Waste Management Procedure			No	
	iv. A designated and appropriately demarcated and covered hazardous waste storage area must be				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS	
	established on a hard standing area (<u>SANS 10089-1 (2008)</u>).					
	v. Ensure that all hazardous wastes temporarily stored on site are stored in a covered skip and are placed on a hard standing					
	vi. Clean areas where hazardous waste spills have occurred utilising appropriate cleaning equipment (such as spill kits) and dispose of the hazardous material appropriately. Key personnel must be trained on handling spillages.					
	vii. Retain records of appropriate safety disposal certificates associated with hazardous waste removal, transportation and disposal					
	viii. Ensure cognisance of the following SANS codes of practice: <ul style="list-style-type: none"> — SANS 10234: Classification and Labelling of Chemicals — SANS 10228: The Identification and Classification of Dangerous Substances — SANS 10229: Packing of Dangerous Goods for Road and Rail Transportation 					
	ix. Manage all liquid hazardous waste spillages as per the Waste Management Procedure					
	x. An emergency preparedness and response plan is to be developed by the contractor/operator for any hazardous					

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	waste being removed, transported and disposed of offsite				
	xi. Ensure that waste manifest documentation (as per the draft Classification and Management Regulations, <u>GN No. R. 634 of 23 August 2013.</u>) is prepared and maintained for the generation, transportation and disposal of hazardous waste				

8.5 SOIL AND LAND MANAGEMENT

8.5.1 OBJECTIVES

To prevent any disturbance, erosion or contamination of soil resources

8.5.2 INDICATOR AND COMPLIANCE MECHANISMS

The following indicator and compliance mechanisms are applicable:

- Induction training and records;
- Waste Management Procedure (to be developed);
- Incident Classification and Reporting Management Procedure (to be developed);
- Health, safety, environmental and community incident and complaints management system register;
- Monitoring and audit reports; and
- Stormwater Management Plan.

8.5.3 MITIGATION AND MANAGEMENT MEASURES

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
a) Stockpile Management	i. Adequately maintain stockpiled material to prevent becoming the source air pollution (windblown dust)	EO ECO	Construction	No	No additional monitoring required
	ii. Level and shape the area designated for the deposition of stockpiled material to ensure the efficient drainage of the site. No general or hazardous waste may be disposed of at this site	Contractor			
	iii. Stormwater control systems must be implemented within the site and must be managed and maintained to ensure no contamination of soil reserves				
b) Soil and Land Management	i. Soils excavated during construction of the facility must be appropriately stored in stockpiles which are protected so as to limit the loss of soils. The stockpile shall be located away from seepage zones, floodlines, water courses and other ecological sensitive areas (drainage lines).	EO ECO Contractor	Construction Operation	No	
	ii. Topsoil is expected to have a higher fertility than the subsoil horizons, and contains the vegetation seeds. As a result, the topsoil must be stored separately from the subsoils. Topsoil stock piles must be designated and not higher than 2m.				
	iii. During the construction and maintenance phases sediment control measures must be adopted in order to prevent sediment entering the wetland				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	iv. Due to the potential for soil compaction due to vehicles, traffic must be limited to existing or proposed roadways as far as possible.				
	v. Where soil compaction outside of the designated development areas occurs, this needs to be rehabilitated to the pre-development soil permeability to maintain infiltration				
	vi. Vegetation removal must be kept to a minimum and limited to the area of development				
	vii. Where an impact to the vegetation outside of the development footprint occurs, rehabilitation measures must be undertaken to maintain the baseline vegetation population and health				
	viii. Once the construction activities have concluded, the stockpiled soils must be returned to the impacted land to reinstate the land capability, with topsoil being returned as the top layer. If necessary, soil amelioration in the form of fertilisers may be required to return the fertility to baseline conditions. To limit erosion, it must be ensured that the soils are rehabilitated to their pre-development characteristics as far as is practicable to ensure infiltration and vegetation rooting.	EO ECO Contractor Operator	Construction Operation Decommissioning		
	ix. The ECO or a suitably qualified ecologist <u>must</u> be appointed to monitor the rehabilitation and to ensure that the vegetation health is returned to the baseline health where practically feasible				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	x. Erosion observed (within the confines of the project footprint) must be rehabilitated, with mitigation measures adopted in high-risk areas (i.e. gabions, gabion mattresses)				
	xi. Weed and invader species growth needs to be appropriately monitored and managed, both during the site construction, operation and after decommissioning				
	xii. Gabions or Reno Mattresses should be used where evidence of erosion is present				
	xiii. The decommissioning and rehabilitation measures must be phased to limit areas of exposed soil. Vegetation must be reintroduced during rehabilitation as soon as possible to limit erosion	EO Project Manager Operator	Decommissioning		

8.6 WATER MANAGEMENT

8.6.1 OBJECTIVES

- To implement measures to prevent the contamination on surface and groundwater resources; and
- To prevent erosion and loss of topsoil.

8.6.2 INDICATOR AND COMPLIANCE MECHANISMS

The following indicator and compliance mechanisms are applicable:

- Induction training and records;
- Waste Management Procedure (to be developed);
- Incident classification and reporting management procedure (to be developed);
- Water Use License;
- Environmental awareness programme/toolbox talks; and
- Stormwater management plan (to be developed).

8.6.3 MITIGATION AND MANAGEMENT MEASURES

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
a) Alterations of flow regimes of watercourse,	i. Construction of the powerlines should, where feasibly possible, occur during the dry season and the site rehabilitated before major rainfall events occur.	ECO Contractor Operator	Planning and Design Construction Operation	No	A freshwater habitat specialist must conduct an in-depth site walkover prior to the construction phase commencing to assess the area for any freshwater habitats which may be affected by the actions conducted during the construction phase. Any identified systems must be visibly demarcated
	ii. Access roads and cables must only cross perpendicular to a watercourse and the chosen alignment must endeavour that the span across the watercourse is minimalised.	Surface Water and Aquatic Specialists	Decommissioning		
	iii. No water should be abstracted from the wetland area. Ideally water required during the construction phase must be sourced from an external source (i.e. outside of the wetland contributing area)				
	iv. It is recommended that, where possible, laydown areas and construction camps are to be developed outside				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	the riparian zone or 100m from a watercourse, whichever is greatest.				
	v. The pole sites should be contoured to allow for surface water to readily drain away (as it would under natural conditions) and to prevent ponding of water within areas where it would not have ponded before the construction activities.				
	vi. Vegetation clearing, soil stripping and major earthmoving activities must be phased to minimise the extent of bare soils surfaces exposed at any one time. Ideally, this should be undertaken during the dry season				
b) Degradation of wetland habitat due to the proposed positioning of access roads and powerline structures	i. A layout plan must be compiled indicating the limits of disturbance associated with the proposed infrastructure in relation to the identified sensitive areas (i.e. wetlands). No-go areas and any stormwater infrastructure must be indicated on this plan together with erosion and sediment, controls and measures.	ECO Contractor Operator Surface Water and Aquatic Specialists	Planning and Design Construction	No	
	ii. Stringing should make use of a running block and span, limiting intrusion into the freshwater habitat systems				
	iii. The pole sites should be contoured to allow for surface water to readily drain away (as it would under natural conditions) and to prevent ponding of water within areas where it would not have ponded before the construction activities				
	iv. The identified wetlands and riparian areas are to be designated as “highly sensitive”.				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	v. Existing access routes must be utilised, as far as possible.				
	vi. Planning the location of poles should factor in the wetlands and riparian areas, with pole placement taking place outside these systems				
	vii. Should the need for additional access routes arise, these should be perpendicular to the watercourse and developed with appropriately sized culvers.				
	viii. In the event that access roads need to be constructed, an application for a Water Use Licence (WUL) in terms of Section 21 of the National Water Act (NWA) (Act 36 of 1998) must be undertaken				
c) Spillage of hazardous substances such as oils, fuel, grease from maintenance vehicles, and sewage from on-site sanitation systems	i. Areas for waste disposal should be clearly demarcated and should be bunded and on hard standing. These areas should be located outside the riparian zone or 100m from a watercourse, whichever is greatest	Project Manager ECO Contractor Operator	Planning Construction Operation	No	No additional monitoring required.
	ii. Ensure that no equipment is washed in the streams and wetlands of the area, and if washing facilities are provided, that these are located outside the riparian zone or 100m from a watercourse, whichever is greatest				
	iii. Machinery and equipment must be inspected regularly for faults and possible leaks. If required, servicing of these should occur off outside the riparian zone or 100m from a watercourse, whichever is greatest				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
d) Groundwater Management	i. Areas with the potential to contaminate the groundwater must be underlain by hardstanding of suitable integrity.	EO ECO Contractor	Construction Operation	No	
e) Potable Water Management	i. Onsite staff are to be provided with an appropriate potable water supply, safe and healthy sanitary facilities and protection against exposure to environmentally dangerous or unhealthy situations or conditions.	Operator			
	ii. Onsite staff <u>must</u> be made aware and encouraged to use water sparingly such that there is no water wastage.				

8.7 BIODIVERSITY MANAGEMENT

8.7.1 OBJECTIVES

To ensure that impacts to the biodiversity (fauna and flora) of the surrounding environment are ameliorated

8.7.2 INDICATOR AND COMPLIANCE MECHANISMS

The following indicator and compliance mechanisms are applicable:

- Induction training and records;
- Incident Classification and Reporting Management Procedure (to be developed);

- Environmental awareness programme/toolbox talks; and
- Biodiversity monitoring procedure (to be developed).

8.7.3 MITIGATION AND MANAGEMENT MEASURES

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
a) Impacts on vegetation and habitats	i. All very high sensitivity areas must be avoided and declared an outright “No-go” area. All high sensitivity areas should be cautiously considered. Should development take place in the high sensitivity areas, the pole spacing should be extended to reduce the number of poles in these areas. The footprint area must be minimised and clearing must also be restricted to the direct impact area and the 100 m corridor may not be cleared as a whole.	EO ECO Contractor	Construction Operation	Yes	A site walk through is recommended by a suitably qualified ecologist prior to any construction activities, preferably during the correct season and any SSC should be noted
	ii. Drainage lines must be avoided for pole placement and access roads, and a no-go buffer of 20 m must be applied around them.				
	iii. Areas of indigenous vegetation, even secondary communities outside of the direct pylon footprint, should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be minimized and avoided where possible. All activities must be restricted to flat areas as far as possible. No further loss (unnecessary) of very high/high sensitivity areas should be permitted. It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon. All structure footprints are to be rehabilitated and landscaped after installation is complete. Rehabilitation of the disturbed areas existing in the project area must be made a				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	<p>priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type.</p>				
	<p>iv. Existing access routes, especially roads must be made use of. The development areas and access roads should be specifically demarcated so that during the construction phase, only the demarcated areas may be impacted upon</p>				
	<p>v. All laydown, chemical toilets etc. should be restricted offsite or away from sensitive areas . No materials may not be stored and all materials must be removed from the project area once the construction phase has been concluded. No permanent construction structures should be permitted. No storage of vehicles or equipment will be allowed outside of the designated project areas.</p>				
	<p>vi. Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood and wind events. This will also reduce the likelihood of encroachment by alien invasive plant species. All livestock must always be kept out of the project area, especially areas that have been recently re-planted.</p>				
	<p>vii. A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil</p>				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	<p>absorbent material must be placed underneath vehicles/machinery and equipment when not in use. No servicing of equipment on site unless necessary. All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers. Appropriately contain any generator diesel storage tanks, machinery spills (e.g. accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them leaking and entering the environment. Construction activities and vehicles could cause spillages of lubricants, fuels and waste material potentially negatively affecting the functioning of the ecosystem. All vehicles and equipment must be maintained, and all re-fuelling and servicing of equipment is to take place in demarcated areas outside of the project area.</p>				
	<p>viii. It should be made an offence for any staff to take/bring any plant species into/out of any portion of the project area. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants.</p>				
	<p>ix. A fire management plan needs to be complied and implemented to restrict the impact fire might have on the surrounding areas.</p>				
	<p>x. Any individual of the protected plants that are present needs a relocation or destruction permit in order for any individual that may be removed or destroyed due to the development. High visibility flags must be placed near any threatened/protected plants in order to avoid any damage or destruction of the species. If left</p>				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	<p>undisturbed the sensitivity and importance of these species needs to be part of the environmental awareness program. Pylon infrastructure, development areas and routes where protected plants cannot be avoided, these plants many being geophytes or small succulents should be removed from the soil and relocated/ re-planted in similar habitats where they should be able to resprout and flourish again. All protected and red-data plants should be relocated, and as many other geophytic species as possible.</p>				
	<p>xi. For the threatened species that may not be destroyed, it is recommended that professional service providers that deal with plant search and rescue be used to remove such plants and use them either for later rehabilitation work other conservation projects.</p>				
b) Faunal impacts	<p>i. A qualified environmental control officer must be on site when construction begins. A site walk through is recommended by a suitably qualified ecologist prior to any construction activities, preferably during the correct season and any SSC should be noted. In situations where the threatened and protected plants must be removed, the proponent may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. In the abovementioned situation the development of a search, rescue and recovery program is suggested for the protection of these species. Should animals not move out of the area on their own relevant specialists must be contacted to advise on how the species can be relocated</p>	EO ECO Contractor	Construction	Yes	A site walk through is recommended by a suitably qualified ecologist prior to any construction activities, preferably during the correct season and any SSC should be noted.

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	ii. The areas to be developed must be specifically demarcated to prevent movement of staff or any individual into the surrounding environments, (Signs must be put up to enforce this)				
	iii. The duration of the construction should be minimized to as short term as possible, to reduce the period of disturbance on fauna.				
	iv. Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances to amphibian species and nocturnal mammals				
	v. No trapping, killing, or poisoning of any wildlife is to be allowed (Signs must be put up to enforce this)				
	vi. All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must still be enforced to ensure that road killings, dust and erosion is limited, this is especially true due to the presence of the Verrox's Tent Tortoise's. The speed limits should be restricted to at least 30 km/h.				
	vii. Schedule activities and operations during least sensitive periods, to avoid migration, nesting and breeding seasons. (Driving on access roads close to very high and highly sensitive areas at night should be prevented in order to reduce or prevent wildlife road				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	mortalities which occur more frequently during this period)				
	viii. All areas to be developed must be walked through prior to any activity to ensure no nests or fauna species are found in the area. Should any Species of Conservation Concern not move out of the area or their nest be found in the area a suitably qualified specialist must be consulted to advise on the correct actions to be taken.				
	ix. Any holes/deep excavations must be dug and planted in a progressive manner and shouldn't be left open overnight (Should the holes overnight they must be covered temporarily to ensure no small fauna species fall in)				
	x. Ensure that cables and connections are insulated successfully to reduce electrocution risk.				
	xi. Any exposed parts must be covered (insulated) to reduce electrocution risk.				
	xii. Monitoring of the OHL route must be undertaken to detect bird carcasses, to enable the identification of any potential areas of high impact to be marked with bird flappers if not already done so. Monitoring should be undertaken at least once a month for the first year of operation.				
	xiii. For transmission towers in high to very high sensitivity locations, it is recommended to install bird				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	<p>guard/spike structures (close to or along drainage features especially) to prevent birds from landing on and/or nesting on the towers. This has been linked with increases in corvid populations which can impact local reptile and avifauna species. Poles: The poles should be fitted with bird perches on top of the poles to draw birds, particularly vultures, away from the potentially risky insulators.</p>				
	<p>xiv. Appropriate bird mitigation measures should be put in place to avoid bird collisions and direct impacts to the infrastructure, as SCC presence in the area is high. These mitigation measures should entail the installation of ‘bird-flappers’ and bird-friendly power line structures. This is particularly relevant to the portions of the proposed power line which crosses the drainage features. Power line: The span that crosses drainage lines should be marked with Bird Flight Diverters on the earth wire of the line, five metres apart, alternating black and white;</p>				
	<p>xv. The appropriate bird mitigation measures structures need to be monitored and serviced and should be made a top priority for the duration of the project.</p>				
c) Erosion	<p>i. Erosion management at the site <u>must</u> take place according to the Erosion and Rehabilitation Plan</p>	EO ECO	Operation	No	No additional monitoring required
	<p>ii. All roads and other hardened surfaces <u>must</u> have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk</p>	Operator			

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	<p>iii. Regular monitoring for erosion after construction to ensure that no erosion problems have developed as result of the disturbance</p> <p>iv. All erosion problems observed <u>must</u> be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques</p> <p>v. All cleared areas <u>must</u> be revegetated with indigenous perennial shrubs and grasses from the local area. These can be cut when dry and placed on the cleared areas if natural recovery is slow</p>				
d) Alien plant invasion	<p>i. Compilation of and implementation of an alien vegetation management plan for the 100 meter grid corridor.</p> <p>ii. The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Footprint of the roads must be kept to prescribed widths.</p> <p>iii. Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests from entering the site</p>	EO ECO Contractor	Construction Operation De-commissioning	No	No additional monitoring required

8.8 AVIFAUNA MANAGEMENT

8.8.1 OBJECTIVES

To ensure that impacts to avifauna are ameliorated

8.8.2 INDICATOR AND COMPLIANCE MECHANISMS

The following indicator and compliance mechanisms are applicable:

- Induction training and records;
- Incident classification and reporting management procedure (to be developed);
- Environmental awareness programme/toolbox talks; and
- Avifauna monitoring procedure (to be developed).

8.8.3 MITIGATION AND MANAGEMENT MEASURES

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
a) Avifauna Impacts during construction phase	i. Conduct a pre-construction inspection to identify Red List species that may be breeding within the project footprint to ensure that the impacts to breeding species (if any) are adequately managed.	EO ECO Contractor	Construction	Yes	Conduct a pre-construction inspection to identify Red List species that may be breeding within the project footprint to ensure that the impacts to breeding
	ii. Construction activity should be restricted to the immediate footprint of the infrastructure.	Avifaunal specialist			

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	iii. Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species.				species (if any) are adequately managed.
	iv. Measures to control noise and dust should be applied according to current best practice in the industry.				
	v. Maximum used should be made of existing access roads and the construction of new roads should be kept to a minimum.				
	vi. Bird flight diverters should be installed on the entire power line for the full span length on the earthwire (according to Eskom guidelines - five metres apart). Light and dark colour devices must be alternated to provide contrast against both dark and light backgrounds respectively. These devices must be installed as soon as the conductors are strung.				
	vii. Vegetation clearing to be kept at bare minimum as required				
b) Avifauna impacts during Operation	i. The mitigation measures proposed by the vegetation specialist must be strictly enforced.	EO ECO	Operational	No	No additional monitoring
	ii. Bird flight diverters should be maintained and replaced where necessary.	Contractor Avifaunal specialist			
	iii. The hardware within the proposed substation yard is too complex to warrant any mitigation for				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	electrocution at this stage. It is recommended that if on-going impacts are recorded once operational, site specific mitigation (insulation) be applied reactively. This is an acceptable approach because Red List priority species are unlikely to frequent the substation				
c) Avifauna Impacts during decommissioning	<ul style="list-style-type: none"> <li>i. Decommissioning activity should be restricted to the immediate footprint of the infrastructure as far as possible. <li>ii. Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. <li>iii. Measures to control noise and dust should be applied according to current best practice in the industry. <li>iv. Maximum used should be made of existing access roads and the construction of new roads should be kept to a minimum 	EO ECO Contractor Avifaunal specialist Rehabilitation specialist	Operational	No	No additional monitoring

8.9 AIR QUALITY MANAGEMENT

8.9.1 OBJECTIVES

To ensure that impacts to air quality of the surrounding environment are ameliorated.

8.9.2 INDICATOR AND COMPLIANCE MECHANISMS

The following indicator and compliance mechanisms are applicable:

- Complaints register
- Incident reporting system
- Health, safety, environmental and community incident and complaints management system register
- Incident Classification and Reporting Management Procedure (to be developed)
- Equipment, machinery and vehicle maintenance/inspection registers

8.9.3 MITIGATION AND MANAGEMENT MEASURES

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
a) Dust	i. Before the commencement of any site works and during the operation, as much vegetation as possible <u>must</u> be retained, including patches and strips to minimise dust.	EO ECO Contractor	Construction	No	No additional monitoring required.
	ii. Activities with high dust-causing potential, such as topsoil stripping, <u>must</u> not be carried out in sensitive areas during adverse wind conditions. When necessary,		De-commissioning		

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	<p>topsoil <u>must</u> be stripped in discrete sections, allowing buffer strips (windbreaks) between clearings.</p>				
	<p>iii. Earth-moving works have the potential to generate large amounts of dust. Pre-planning of earth-moving works can reduce dust emissions by limiting the time the site is exposed. Options for dust control can include the following:</p> <ul style="list-style-type: none"> - Plan earth-moving works so that they are completed just prior to the time they are needed - Observe weather conditions and do not commence or continue earth moving works if conditions are unsuitable e.g., under conditions of strong winds - Reduce off-site hauling via balanced cut and fill operations - Pre-water areas to be disturbed 				
	<p>iv. Material stockpiles are capable of generating large amounts of dust. In particular, fine materials stored in stockpiles can be subject to dust pick-up. Materials being loaded onto conveyor belts or into trucks are also potential sources of dust emissions. Dust emissions from material stockpiles can be minimised through the use of the following procedures:</p> <ul style="list-style-type: none"> - Locate stockpiles in sheltered areas. Otherwise, stockpiles <u>must</u> be covered - Where stockpiles are located in open areas, limit the height and slope of the stockpiles to reduce wind pick up, orient stockpiles lengthwise into the wind so they offer the minimum cross-sectional area to prevailing winds, install wind barriers on three sides of the stockpile 				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	<ul style="list-style-type: none"> - Limit activity to the downwind side of the stockpile - Limit drop heights from loading facilities and use closed conveyors where possible - Transfer points <u>must</u> also be minimised 				
	<p>v. Watering is a very effective short-term measure. However, its efficiency decreases as wind velocity and evaporation rate increase. Dust emissions can be minimised using the following watering procedures:</p> <ul style="list-style-type: none"> - The surface <u>must</u> be dampened to prevent dust from becoming airborne but <u>must</u> not be wet to the extent of producing run-off. Alternatively, wetting agents could be used, particularly for non-wetting soils - Watering is more effective when undertaken prior to strong breezes - Use watering sprays on materials to be loaded and during loading <p>vi. In cases where severe water restrictions are imposed, other measures like the use of wetting agents such as chemical stabilisation or hydromulch, could be considered</p>				
	<p>vii. Vehicles bearing open loads of potentially wind-borne materials must be covered or wet down in order to minimise dust entrainment</p>				
	<p>i. All equipment, machinery and vehicles <u>must</u> be fitted with appropriate emission control equipment, are</p>				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
b) Volatile Organic Compounds and Other Emissions	maintained frequently and serviced to the manufacturers' specifications	ECO Contractor	Operation De-commissioning		
	ii. Ensure incident and complaint registers are established and maintained	Operator			
	iii. Prohibit burning of waste or vegetation onsite				

8.10 NOISE MANAGEMENT

8.10.1 OBJECTIVES

To ensure that noise impacts to the surrounding environment are minimal or mitigated.

8.10.2 INDICATOR AND COMPLIANCE MECHANISMS

The following indicator and compliance mechanisms are applicable:

- Complaints register;
- Incident reporting system;
- Health, safety, environmental and community incident and complaints management system register;
- Incident classification and reporting management procedure (to be developed); and
- Equipment, machinery and vehicle maintenance/inspection registers.

8.10.3 MITIGATION AND MANAGEMENT MEASURES

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
c) General Noise Management	i. Fit equipment, machinery and vehicles generating excessive noise with appropriate noise abatement measures and undergo regular maintenance to ensure optimum efficiency during operation	EO ECO Contractor	Construction Operation	No	No additional monitoring required.
	ii. Provide a complaints register to report any excessive noise incidents. Manage all complaints as per the Incident Classification and Reporting Management Procedure	Operator			
	iii. Regular maintenance of equipment to reduce the generation of additional unwanted noise				

8.11 SITE OF CULTURAL, HERITAGE OR PALAEOLOGICAL SIGNIFICANCE

8.11.1 OBJECTIVES

To ensure that sites/artefacts of heritage or palaeontological value are identified and protected.

8.11.2 INDICATOR AND COMPLIANCE MECHANISMS

The following indicator and compliance mechanisms are applicable:

- Health, safety, environmental and community incident and complaints management system register;

- Chance Find Procedure (to be developed);
- Incident Classification and Reporting Management Procedure (to be developed); and
- Monitoring and audit reports

8.11.3 MITIGATION AND MANAGEMENT MEASURES

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
a) Impacts on the built environment	i. Alignment of proposed new OHL route to the Komsberg substation must be amended to avoid impacts on the line of boundary markers. This can be accomplished by adjusting the route alignment either slightly westwards or eastwards to ensure that the OHL does not overprint or overlies this feature.	EO ECO Project Manager Contractor	Planning Construction Operation	Yes	No additional monitoring required
	ii. The line of boundary markers must also be demarcated as a no-go area during the construction of the line				
b) Chance Finds	i. If human remains are uncovered during construction, work must stop in that area, the remains must be secured in situ, and HWC must be alerted immediately	EO ECO Project Manager	Construction	Yes	Monitor incident register as to whether there have been any chance finds
	ii. If archaeological and/or historical sites, features or artefacts are discovered during construction, a suitably qualified archaeologist must be called in to investigate the occurrence, and the find must be reported to HWC	Contractor			
	iii. A Chance find procedure is to be drafted and implemented before the start of construction				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
c) Palaeontological Finds	i. Monitoring of all surface clearance and substantial excavations (>1 m deep) by the ECO / ESO for fossil material (<i>e.g.</i> bones, teeth, fossil wood) on an on-going basis during the construction phase.	EO ECO Project Manager Contractor	Construction	NO	Monitor incident register as to whether there have been any chance finds
	ii. Safeguarding of chance fossil finds (preferably <i>in situ</i>) during the construction phase by the responsible ECO / ESO, followed by reporting of finds to Heritage Western Cape (HWC) for the Western Cape / SAHRA for the Northern Cape.				
	iii. Recording and judicious sampling of significant chance fossil finds by a qualified palaeontologist, together with pertinent contextual data (stratigraphy, sedimentology, taphonomy) (Phase 2 mitigation).				
	iv. Curation of fossil material within an approved repository (museum / university fossil collection) and submission of a Phase 2 palaeontological heritage report to HWC / SAHRA by a qualified palaeontologist				

8.12 VISUAL IMPACT MANAGEMENT

8.12.1 OBJECTIVES

To ensure that the changes to the landscape character of the area are mitigated to minimise the negative impact.

8.12.2 INDICATOR AND COMPLIANCE MECHANISMS

The following indicator and compliance mechanisms are applicable:

- Health, safety, environmental and community incident and complaints management system register;
- Incident classification and reporting management procedure (to be developed); and
- Monitoring and audit reports.

8.12.3 MITIGATION AND MANAGEMENT MEASURES

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
a) Presence of the grid connection infrastructure in the landscape.	i. Implement an environmentally responsive planning approach for the development of roads and infrastructure to limit cut and fill requirements. Plan with due cognisance of the topography.	ECO Contractor	Construction	No	No additional monitoring required.
	ii. Consolidate infrastructure and make use of already disturbed sites rather than natural areas, as far as practically feasible.				
b) General construction activities, and the	i. Ensure that vegetation is not unnecessarily cleared or removed during the construction period.	ECO	Construction		

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
potential scarring of the landscape due to vegetation clearing	ii. Plan the placement of laydown areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e. in already disturbed areas) wherever possible.	Contractor			
	iii. Restrict the activities and movement of construction workers and vehicles to the immediate construction area and existing access roads.				
	iv. Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.				
	v. Reduce and control construction dust through the use of appropriate and effective dust suppression techniques as and when required (i.e. whenever dust becomes apparent).				
	vi. Restrict construction activities to daylight hours, as far as possible, in order to negate or reduce the visual impacts associated with lighting.				
	vii. Rehabilitate all disturbed areas, construction areas, servitudes etc. immediately after the completion of construction works. If necessary, consult an ecologist to give input into rehabilitation specifications.				
	c) Operations				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	ii. Monitor rehabilitated areas, and implement remedial action as and when required.	Contractor		No (only if acceptable to neighbouring land owner).	
d) Rehabilitation	i. Remove infrastructure not required for the post-decommissioning use of the site/servitude.	ECO Contractor	Decommissioning	No	
	ii. Rehabilitate access roads and servitudes not required for the post-decommissioning use of the sites. If necessary, consult an ecologist to give input into rehabilitation specifications.				
	iii. Monitor rehabilitated areas quarterly for at least a year following decommissioning, and implement remedial action as and when required.				

8.13 HEALTH AND SAFETY

8.13.1 OBJECTIVES

- To ensure communication with members of the public to promote safety awareness;
- To prevent public access to construction sites and storage areas; and
- To ensure safety for all onsite personnel.

8.13.2 INDICATOR AND COMPLIANCE MECHANISMS

The following indicator and compliance mechanisms are applicable:

- Induction training and records
- Health, safety, environmental and community incident and complaints management system register
- Monitoring and audit reports
- Incident classification and reporting management procedure (to be developed)
- PPE register
- Occupational health and safety plan (to be developed)
- Health and safety protocol (to be developed)

8.13.3 MITIGATION AND MANAGEMENT MEASURES

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
a) Health and Safety	i. All onsite personnel are required to undergo induction training and regular toolbox talks in order to raise awareness of the conditions contained herein	SHE Officer Contractor Operator	Construction Operation	No	No additional monitoring required.
	ii. Safety conditions are to be monitored during construction. Continuous monitoring will be undertaken by the SHE Officer will audit monthly.	SHE Officer	Construction		
	iii. Develop and implement an occupational health and safety plan	SHE Officer Operator	Construction Operation		

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	iv. The appointed contractor will be responsible for the development of a comprehensive health and safety protocol which must be adhered to	Contractor	Construction		
	v. Provide and wear appropriate PPE onsite	SHE Officer	Construction		
	vi. Train all onsite personnel handling chemical or hazardous substances in the use of such substances and the environmental, health and safety consequences of incidents	Contractor Operator	Operation		
	vii. Provide onsite personnel with sufficient potable water for drinking				
b) Public Safety	i. Restrict public access through the use of relevant signage	Contractor Operator	Construction Operation		

8.14 SOCIO-ECONOMIC IMPACT MANAGEMENT

8.14.1 OBJECTIVES

- To ensure that the negative socio-economic impacts are mitigated and managed; and
- To ensure that the positive economic impacts are enhanced.

8.14.2 INDICATOR AND COMPLIANCE MECHANISMS

The following general indicator and compliance mechanisms are applicable:

- Induction training and records;
- Health, safety, environmental and community incident and complaints management system register;
- Monitoring and audit reports;
- Incident classification and reporting management procedure (to be developed);
- PPE register;
- Occupational health and safety plan;
- Health and safety protocol;
- HIV/AIDS and COVID-19 awareness and prevention program;
- Business and skills development plan (to be developed);
- Grievance mechanism.
- .

8.14.3 MITIGATION AND MANAGEMENT MEASURES

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
a) Maximise local employment and business opportunities	i. Stakeholder engagement processes should be put in place to make sure that all interested and affected party have buy in in the process which will be designed and followed for employment and local procurement opportunities	Project Manager Contractor ECO	Construction Operational Decommissioning	Yes	No additional monitoring required
	ii. Where reasonable and practical, the proponent should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories. However, due to the low skills levels in				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	the area, the majority of skilled posts are likely to be filled by people from outside the area.				
	iii. Where feasible, efforts should be made to employ local contactors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria.				
	iv. Before the construction phase commences the proponent should meet with representatives from the LM to establish the existence of a skills database for the area. If such as database exists it should be made available to the contractors appointed for the construction phase.				
	v. The local authorities, community representatives, and organisations on the interested and affected party database should be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that the proponent intends following for the construction phase of the project.				
	vi. Where feasible, training and skills development programmes for locals should be initiated prior to the initiation of the construction phase.				
	vii. The recruitment selection process should seek to promote gender equality and the employment of women wherever possible				
	viii. The proponent should liaise with the LM with regards the establishment of a database of local companies,				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	specifically BBBEE companies, which qualify as potential service providers (e.g., construction companies, catering companies, waste collection companies, security companies etc.) prior to the commencement of the tender process for construction service providers. These companies should be notified of the tender process and invited to bid for project-related work				
b) Minimise disruption caused by influx of job seekers	<p>i. Where possible, the proponent should make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically for semi and low-skilled job categories.</p> <p>ii. The proponent and the contractor(s) should develop a code of conduct for the construction phase. The code should identify which types of behaviour and activities are not acceptable. Construction workers in breach of the code should be subject to appropriate disciplinary action and/or dismissed. All dismissals must comply with the South African labour legislation.</p> <p>iii. The proponent and the contractor should implement an HIV/AIDS awareness programme for all construction workers at the outset of the construction phase.</p> <p>iv. The contractor should provide transport for workers to and from the site on a daily basis. This will enable the contractor to effectively manage and monitor the movement of construction workers on and off the site.</p> <p>v. The contractor must ensure that all construction workers from outside the area are transported back to</p>	Project Manager Contractor ECO	Construction Operational Decommissioning	No	

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	their place of residence within 2 days for their contract coming to an end.				
	vi. No construction workers, with the exception of security personnel, should be permitted to stay overnight on the site				
c) Risk to safety, livestock, and farm infrastructure	i. The proponent should enter into an agreement with the local farmers in the area whereby damages to farm property etc. during the construction phase will be compensated for. The agreement should be signed before the construction phase commences.	Project Manager Contractor ECO	Construction Decommissioning	No	
	ii. Preparation of a project specific stakeholder management plan in order to establish clear communication lines between the contractor, the developer and the landowners				
	iii. Ensure pre-construction communication to establish communication lines and landowner requirements.				
	iv. All farm gates must be closed after passing through.				
	v. Contractors appointed by the proponent should provide daily transport for low and semi-skilled workers to and from the site.				
	vi. The proponent should consider the option of establishing a MF (see above) that includes local farmers and develop a Code of Conduct for construction workers. This committee should be established prior to commencement of the construction				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	<p>phase. The Code of Conduct should be signed by the proponent and the contractors before the contractors move onto site.</p>				
	<p>vii. The proponent should hold contractors liable for compensating farmers and communities in full for any stock losses and/or damage to farm infrastructure that can be linked to construction workers. This should be contained in the Code of Conduct to be signed between the proponent, the contractors, and neighbouring landowners. The agreement should also cover losses and costs associated with fires caused by construction workers or construction related activities (see below).</p>				
	<p>viii. The Environmental Management Plan (EMP) must outline procedures for managing and storing waste on site, specifically plastic waste that poses a threat to livestock if ingested.</p>				
	<p>ix. Contractors appointed by the proponent must ensure that all workers are informed at the outset of the construction phase of the conditions contained in the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms.</p>				
	<p>x. Contractors appointed by the proponent must ensure that construction workers who are found guilty of stealing livestock and/or damaging farm infrastructure are dismissed and charged. This should be contained in the Code of Conduct. All dismissals must be in accordance with South African labour legislation.</p>				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	xi. It is recommended that no construction workers, with the exception of security personnel, should be permitted to stay over-night on the site				
d) Impacts associated with construction related activities	i. As indicated above, the proponent should consider the establishment of a Monitoring Forum (MF) to monitor the construction phase and the implementation of the recommended mitigation measures. The MF should be established before the construction phase commences, and should include key stakeholders, including representatives from local farmers and the contractor(s). The MF should also address issues associated with damage to roads and other construction related impacts.	Project Manager Contractor ECO	Construction	No	
	ii. Ongoing communication with land owners and road users during construction period.				
	iii. Establishment of a Grievance Mechanism that provides local farmers and other road users with an effective and efficient mechanism to address issues related to construction related impacts, including damage to local gravel farm roads.				
	iv. Implementation of a road maintenance programme throughout the construction phase to ensure that the affected roads maintained in a good condition and repaired once the construction phase is completed.				
	v. Repair of all affected road portions at the end of construction period where required.				

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	<p>vi. Dust suppression measures must be implemented on un-surfaced roads, such as wetting on a regular basis and ensuring that vehicles used to transport building materials are fitted with tarpaulins or covers.</p> <p>vii. All vehicles must be roadworthy, and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits</p>				
e) Risk of veld fires	<p>i. The proponent should enter into an agreement with the local farmers in the area whereby damages to farm property etc., during the construction phase will be compensated for. The agreement should be signed before the construction phase commences.</p> <p>ii. Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas.</p> <p>iii. Smoking on site should be confined to designated areas.</p> <p>iv. Contractor should ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high risk dry, windy summer months.</p>	Project Manager Contractor ECO	Construction Operation Decommissioning	No	

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	<ul style="list-style-type: none"> v. Contractor should provide adequate fire-fighting equipment on-site, including a fire fighting vehicle. vi. Contractor should provide fire-fighting training to selected construction staff. vii. No construction staff, with the exception of security staff, to be accommodated on site overnight. viii. As per the conditions of the Code of Conduct, in the advent of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor should also compensate the fire-fighting costs borne by farmers and local authorities 				
f) Risk to farming operations and damage to farm infrastructure	<ul style="list-style-type: none"> i. The proponent must ensure that any landowner concerns are addressed timeously.. ii. Affected property owners should be notified in advance of the timing and duration of maintenance activities. iii. Maintenance teams must ensure that all farm gates must be closed after passing through. iv. Property owners should be compensated for damage to farm property and or loss of livestock or game associated maintenance related activities. 	Project Manager Contractor ECO	Operational	No	

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	v. Movement of traffic and maintenance related activities should be strictly contained within designated areas associated with transmission lines and substations.				
	vi. Strict traffic speed limits must be enforced on the farm.				
	vii. No maintenance workers should be allowed to stay over-night on the affected properties				

8.15 TRAFFIC MANAGEMENT

8.15.1 OBJECTIVES

To ensure that the traffic impacts of the project are mitigated and managed.


8.15.2 INDICATOR AND COMPLIANCE MECHANISMS

The following indicator and compliance mechanisms are applicable:

- Induction training and records;
- Health, safety, environmental and community incident and complaints management system register;
- Monitoring and audit reports;
- Incident classification and reporting management procedure (to be developed);
- PPE register;
- Occupational health and safety plan;

- Health and safety protocol; and
- Traffic and transportation management plan.

8.15.3 MITIGATION AND MANAGEMENT MEASURES

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
Traffic Management	The posted speed limit on the R354 in the vicinity of the proposed development is currently 120km/h. It is suggested that the speed limit <u>must</u> be reduced to 60km/h in advance of the site access roads, <u>if permitted by the relevant authority.</u>	Project Manager Contractor ECO	Construction Decommissioning	No	No additional monitoring required.
	Intersection warning signs must be erected either side of the access roads in accordance with the requirements of the South African Road Traffic Signs Manual and it is recommended that supplementary warning plates be added to these warning signs indicating the presence of heavy vehicles at the intersection. The aforementioned road signs are shown below:				
					
	The additional loading due to the project is not very high, but is likely to accelerate the deterioration of the existing surfacing.				
	The transport route/s of the construction materials, components and any oversized/weight components may be National, Provincial or Local roads; and approval will have to be obtained from each authority for the transportation of any oversized or abnormally heavy components.				No additional monitoring required.

ACTIVITY / ASPECT	ENVIRONMENTAL MEASURES AND ACTION PLANS	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	ADDITIONAL MONITORING REQUIREMENTS
	Construction vehicles must only use the roads during daylight hours. No construction vehicles must be operational from 6pm to 6am, unless permission is obtained from the surrounding landowners				
	All heavy vehicles must ensure that their headlights are on to increase their visibility to other vehicles and pedestrians				
	All drivers must comply with the relevant traffic laws and regulations				

9 MANAGEMENT PLANS

A defined in the generic EMPr various method statements are to be compiled and implemented throughout the construction phase (refer to Part A: Section 4.5 of the generic EMPs attached as **Appendix C** and **Appendix D**).

This section provides an overview of various aspects / thematic areas and requirements whereby the Method Statements / management plans must be developed and followed throughout the proposed construction and operation of the 132kV OHPL. It must be noted that these method statement / management plans can be updated at any stage depending on any changes that may occur on the site.

9.1 ALIEN INVASIVE MANAGEMENT PLAN

Invasive alien species pose the second largest threat to biodiversity after direct habitat destruction. The purpose of this Alien Plant Management Plan is to provide a framework for the management of alien and invasive plant species during the construction and operation of the facility. The broad objectives of the plan include the following:

- Ensure alien plants do not become dominant in parts or the whole site through the control and management of alien and invasive species presence, dispersal and encroachment.
- Managing and maintaining the ecosystem in a near-natural state and restoring and/or rehabilitating the ecosystems to such a state.
- Develop and implement a monitoring and eradication programme for alien and invasive species.
- Promote the natural re-establishment and planting of indigenous species in order to retard erosion and alien plant invasion.

9.1.1 LEGISLATIVE

Conservation of Agricultural Resources Act (Act No. 43 of 1983)

In terms of the amendments to the regulations under the Conservation of Agricultural Resources Act (Act No. 43 of 1983), all declared aliens must be effectively controlled. Landowners are legally responsible for the control of invasive alien plants on their properties. In terms of this Act, 198 alien species were listed as declared weeds and invaders and ascribed to one of the following categories:

- Category 1: Prohibited and must be controlled.
- Category 2 (commercially used plants): May be grown in demarcated areas provided that there is a permit and that steps are taken to prevent their spread.
- Category 3 (ornamentally used plants): May no longer be planted. Existing plants may be retained as long as all reasonable steps are taken to prevent the spreading thereof, except within the flood line of watercourses and wetlands.

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

The National Environmental Management: Biodiversity Act (NEM:BA) regulates all invasive organisms in South Africa, including a wide range of fauna and flora. Regulations have been published in Government Notices R.506, R.507, R.508 and R.509 of 2013 under NEMBA. According to this Act and the regulations, any species designated under Section 70 cannot be propagated, grown, bought or sold without a permit. Below is an explanation of the three categories:

- Category 1a: Invasive species requiring compulsory control. Any specimens of Category 1a listed species need, by law, to be eradicated from the environment. No permits will be issued.
- Category 1b: Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme. No permits will be issued.

- Category 2: Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy or accept as a gift any plants listed as Category 2 plants. No permits will be issued for Category 2 plants to exist in riparian zones.
- Category 3: Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities (import, possess, grow, breed, move, sell, buy or accept as a gift) involving a Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones.

Plants listed under the categories above are detailed within Notice 1 of the Alien and Invasive Species published in GNR599 of 01 August 2014. The following guide is a useful starting point for the identification of alien species: Bromilow, C. 2010. Problem Plants and Alien Weeds of South Africa. Briza, Pretoria.

It is important to note that alien species that are regulated in terms of the Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA) as weeds and invader plants are exempted from NEM:BA. This implies that the provisions of the CARA in respect of listed weed and invader plants supersede those NEM:BA.

The site specific Invasive Alien Plant Management Programme for the Esizayo WEF is included in **Appendix E**

9.2 PLANT RESCUE AND PROTECTION PLAN

The purpose of the plant rescue and protection plan is to implement avoidance and mitigation measures, in addition to the mitigation measures included in the EMP_r to reduce the impact of the development of the project on listed and protected plant species and their habitats, and to provide guidance on search and rescue of species of conservation concern.

The site-specific Plant Rescue and Protection Plan for the Esizayo WEF is included in **Appendix F**

9.3 RE-VEGETATION AND HABITAT REHABILITATION PLAN

The purpose of the rehabilitation plan is to ensure that areas cleared or impacted during construction activities are rehabilitated with a plant cover that reduces the risk of erosion from these areas as well as restores some ecosystem function. The purpose of the rehabilitation plan for the site can be summarised as follows:

- Achieve long-term stabilisation of all disturbed areas to minimise erosion potential.
- Re-vegetate all disturbed areas with suitable local plant species.
- Minimise visual impact of disturbed areas.
- Ensure that disturbed areas are safe for future uses

The rehabilitation plan must be closely aligned with other site-specific plans for the project, including the erosion management plan, soil management plan, alien plant management plan, and plant rescue and protection plan. Prior to commencement of construction, a detailed rehabilitation plan and Method Statement for the site must be compiled by the EPC Contractor.

The site-specific Re-vegetation and Habitat Rehabilitation Plan for the Esizayo WEF is included in **Appendix G**.

9.4 OPEN SPACE MANAGEMENT PLAN

Open space management measures include, but are not limited to the following:

- A buffer zone must be established in areas where construction will not take place to ensure that construction activities do not extend into these areas.
- Vehicle movement must be restricted to authorised access roads.
- Before construction begins, all areas to be developed must be clearly demarcated.
- All construction camps are to be fenced off in such a manner that unlawful entry is prevented, and access is controlled.

- Signage shall be erected at all access points in compliance with all applicable occupational health and safety requirements. All access points to the construction camp must be controlled by a guard or otherwise monitored, to prevent unlawful access.
- The contractor and ECO must ensure compliance with conditions described in the EA.
- Records of compliance/ non-compliance with the conditions of the authorisation must be kept and be available on request.
- Records of all environmental incidents must be maintained, and a copy of these records be made available to provincial department on request throughout the project execution.
- All construction equipment must be stored within the construction camp.
- An area for the storage of hazardous materials must be established that conforms to the relevant safety requirements and that provides for spillage prevention and containment
- The Contractor must provide sufficient ablution facilities, in the form of portable / VIP toilets, at the construction camps, and shall conform to all relevant health and safety standards and codes. A sufficient number of toilets shall be provided to accommodate the number of personnel working in the area.
- No fires will be allowed
- The Contractor shall take specific measures to prevent the spread of veld fires, caused by activities at the campsites. These measures may include appropriate instruction of employees about fire risks and the construction of firebreaks around the site perimeter.
- Environmental awareness training for construction staff, concerning the prevention of accidental spillage of hazardous chemicals and oil; pollution of water resources (both surface and groundwater), air pollution and litter control and identification of archaeological artefacts.
- Staff must be educated as to the need to refrain from indiscriminate waste disposal and/or pollution of local soil and water resources and receive the necessary safety training.

9.5 STORM WATER MANAGEMENT AND SURFACE WATER PROTECTION PLAN

The main principles in stormwater management include:

- Confine or divert any unpolluted water to a ‘clean’ water system, and polluted water to a ‘dirty’ water system;
- ‘Clean’ and ‘dirty’ water systems must be designed and constructed to prevent cross-contamination between the ‘clean’ and ‘dirty’ water systems; and
- Appropriate maintenance and management of storm water related infrastructure.

The proposed water systems or infrastructure are to be designed to prevent any potential contamination of natural water resources in the area.

Currently, there is no existing water management system at the proposed powerline route as it is bare ground

9.6 FIRE MANAGEMENT PLAN

The purpose of this plan is to address firefighting requirements throughout the construction of the project and to preserve and protect human life as well as tangible goods and equipment in the event of a fire.

Mitigation and management measures include, but are not limited to the following:

- All construction camps shall be provided with portable fire extinguishing equipment, in accordance with all relevant legislation and must be readily accessible.
- The Contractor shall take specific measures to prevent the spread of veld fires, caused by activities at the campsites. These measures may include appropriate instruction of employees about fire risks and the construction of firebreaks around the site perimeter.
- Fire prevention facilities must be present at all storage facilities.

- No open fires shall be allowed on site under any circumstance. All cooking shall be done in demarcated areas that are safe and cannot cause runaway fires.
- The Contractor shall have operational fire-fighting equipment available on site at all times. The level of firefighting equipment must be assessed and evaluated through a typical risk assessment process.
- Emergency numbers for local police and fire department etc. must be placed in a prominent area.
- Firefighting equipment must be placed in prominent positions across the site where it is easily accessible. This includes fire extinguishers, a fire blanket as well as a water tank.
- All construction staff must be trained in fire hazard control and firefighting techniques. Translators are to be used where necessary.
- All flammable substances must be stored in dry areas which do not pose an ignition risk to the said substances.
- Smoking may only be conducted in demarcated areas.
- Firefighting equipment must be regularly maintained by an appropriate company.

9.7 EMERGENCY RESPONSE PLAN

The Project Company will provide appropriate resources to respond to process upset, accidental, and emergency situations for operations and activities during construction, operation and decommissioning phases. The procedures will include plans for addressing training, resources, responsibilities, communication and all other aspects required to effectively respond to emergencies associated with their respective hazards.

The purpose of emergency preparedness and response plan (EPRP) / method statement is to ensure that the relevant parties are adequately prepared and able to respond effectively to potential emergency situations that may arise during project activities. These potential emergency situations include medical emergencies and fires

All operations/ activities associated with the project will require site-specific emergency response plans to mitigate impacts, which meet or exceed all applicable regulations.

The objectives of this plan are as follows:

- Protect the communities and the environment through the development of emergency response strategies and capabilities;
- Set out the framework for hazard identification in order to define procedures for response to the situations including the development of contingency measures;
- Structure a process for rapid and efficient response to and manage emergency situations during the construction, operational and decommissioning phases of the project; and
- Assign responsibilities for responding to emergency situations.

The Emergency Response Plan must take the incident procedures referred to in Section 30 of the NEMA into account.

9.7.1 ROLES AND RESPONSIBILITIES

Roles, responsibility, and authority shall be defined, documented and communicated in order to facilitate effective emergency response through implementation of the EPRP. The table below outlines roles and responsibilities related to each position.

<ul style="list-style-type: none"> – Emergency Response representative(s)
<ul style="list-style-type: none"> – Actively participate in the facilities planning, implementation and reviewing of the sites EPRP. – Ensure all staff members are aware of the procedures outlined in the EPRP. – Setting up regular practical training schedules (drills) to ensure that all staff are prepared in case of an emergency. – Report any incidents that occur to senior management staff and/or the relevant authorities. – Appoint an Emergency Response (ER) team which includes an appropriate first aid representative and a fire warden.

<ul style="list-style-type: none"> – Ensure that the appointed ER team undergo the correct training. – Appoint an appropriate Emergency Coordinator.
<ul style="list-style-type: none"> – First Aid representative(s)
<ul style="list-style-type: none"> – Ensuring the first aid box is properly stocked to meet all foreseeable incidents which may occur. – Ensure that the boxes are properly safeguarded, and that First Aiders name appears on the box. – Should any activity involve hazardous chemical substances, or any other specific first aid emergencies, this must be brought to the attention of the emergency coordinator. – Ensure the first aid certificate is current. – Ensure that there is always a first aider available at each shift.
<ul style="list-style-type: none"> – Fire warden(s)
<ul style="list-style-type: none"> – Ensure that the firefighting equipment is regularly serviced. – Attend the relevant firefighting training. – Report any unserviceable or damaged fire-fighting equipment to the ER. – Ensure the firefighting certificate is current. – Ensure that there is always a firefighter available at each shift.
<ul style="list-style-type: none"> – Emergency Co-ordinator
<ul style="list-style-type: none"> – Ensure that an update of the EPRP is kept on file and is easily accessible in case of an emergency. – Ensure that all staff have been issued with the correct Personal Protective Equipment (PPE). – Ensure that a list of emergency telephone numbers, including those of the Emergency Response team, are visible to all staff at a number of locations around the facility. – In the case of an emergency, the emergency coordinator is responsible for undertaking roll call at the designated Assembly points.

9.7.2 EMERGENCY COMMUNICATIONS AND COORDINATION PLAN

In an emergency situation where there is an immediate threat to communities, personnel or the environment, the Project Manager will be notified immediately. The Project Manager will dispatch the Emergency Response Coordinator who will determine the appropriate plan of action depending on the severity of the emergency, the people affected, and the need to evacuate.

If there is a developing emergency or unusual situation, where an emergency is not imminent, but could occur if no action is taken, the Project Manager (or if the Project Manager is absent the Environmental Manager) is to be informed immediately. Once the emergency or unusual situation has been managed, the correct incident/near miss must be reported to the General Manager.

If an emergency situation poses a direct threat to communities in the area, the Environmental Officer and/or Social Officer will advise persons in the vicinity of the emergency to evacuate due to the potential risk. The appropriate government authorities will immediately be notified of such an emergency evacuation. The Emergency Response Coordinator will be tasked with responding to the potential risk. Should the emergency situation be such that it can be managed by the Project Company, equipment and personnel will be deployed to the maximum extent necessary, so as to prevent/minimise potential risks.

9.7.3 RESPONSE TO INCIDENTS

An incident is any occurrence that has caused, or has the potential to cause, a negative impact on people, the environment or property (or a combination thereof). It also includes any significant departure from standard operating procedures. The reporting and investigation of all potential and actual incidents that could have a detrimental impact on human health, the natural environment or property is required so that remedial and preventive steps can be taken to reduce the potential or actual impacts because of all such incidents.

In the event of a significant spill or leak of hazardous substances (e.g., petrol and diesel), such incident(s) must be reported to all relevant authorities, including the Directorate: Pollution and Chemicals Management, in accordance with section 30(5) of the NEMA. All the necessary documentation must be completed and submitted to the relevant authorities within the prescribed timeframes.

The actions resulting from any formal or informal investigations will be used to update the EMPr.

9.7.4 VERIFICATION

An HSE emergency response system will be developed for the execution of emergency drills that will include the following, inter alia:

- Fire Drills;
- Emergency Evacuation Drills; and
- Medical and Environmental Drills.

Reporting and monitoring requirements for the plan will include:

- Monthly inspections and audits;
- Quarterly reporting of accidents/ incidents;
- Reporting at the time of the incident and monthly spill reporting developed by the Environmental and Quality, Health and Safety departments;
- Bi-annual emergency response drills; and
- Annual reporting on training.

Emergency response drills and reporting will be maintained by the Project Manager and will provide information regarding required revisions to training or the emergency response actions. Each incident reported will be reviewed and investigated upon occurring. Actions will be identified where possible to improve the site's overall response to emergencies. Updates/revisions that are necessary to protect worker or community health and safety will be implemented immediately after approval by the General Manager. On a bi-annual basis, Key Performance Indicators (KPIs) will be compared against past-performance and analysed for trends to determine if there are areas for improvement. Changes because of the trend analysis and identified areas for improvement will be implemented following the project's change management system as required.

This plan will be amended periodically in light of operational changes, learning experienced during its implementation and other activities that can affect the risk profiles.

9.8 COVID-19

PREVENTION AND RESPONSE

A dedicated team with responsibilities to identify and implement actions to mitigate the effects of COVID-19 on the company and community should be appointed.

INFORMATION

Information dissemination and training are an effective way to reduce the risk for both the company and the general public.

COVID-19 symptoms include: fever, tiredness, difficulty breathing, dry cough, chills, repeated shaking with chills, muscle pain, headache, sore throat, and new loss of taste or smell. Some patients may have nasal congestion, runny nose, or diarrhoea. Symptoms may appear two to 14 days after exposure to the virus.

EMPLOYEE QUESTIONNAIRE

To prevent potentially infected staff from entering the workplace and infecting co-workers, a short questionnaire could be used. Workers should only report to work if they answer “no” to all the questions.

The following is an example:

- Have you, in the last two weeks, been in close contact with a person who has COVID-19?
- Have you, in the last two weeks, been in a country/region with a high number of cases of COVID-19?
- Do you have a fever?
- Have you used medications such as paracetamol or aspirin to suppress fever in the last 24 hours?
- Are you coughing (even mildly)?
- Do you currently experience shortness of breath?

PREVENTION METHODS

SICK PERSONS TO STAY HOME

Workers requested to stay away from work in cases where they exhibit any COVID-19 symptoms or have been in close contact with a confirmed COVID-19 patient during the previous 14 days.

Workers who do not feel well should seek immediate medical advice. An employee who works while evidencing mild COVID-19 symptoms can risk spreading this infectious disease to others.

COUGH HYGIENE

To reduce the risk of infected persons spreading the virus by coughing and sneezing, workers are to be instructed to follow the cough etiquette outlined below:

- Cover the mouth and nose with a tissue when coughing or sneezing and dispose of the used tissue in a wastebasket.
- When no tissue is available, cough or sneeze into the upper sleeve or elbow, not into the hands.
- Clean hands after coughing or sneezing, preferably by thorough water-soap handwashing, following the recommendations of health organizations. If soap and water are not available, use a hand sanitizing gel.

SOCIAL DISTANCING

To prevent person-to-person infection, it is important to minimize direct contact as much as possible. The contractor is to inform workers about the hazards of close contacts, including with direct co-workers, and promote alternative behaviours, such as maintaining safe distances and using alternatives for handshakes.

HAND SANITATION

Promote frequent and thorough water-soap hand washing and provide enough places for workers to wash their hands. If soap and running water are not immediately available, provide alcohol-based hand rubs containing at least 60% alcohol. Ensure that these facilities are sufficient in number and are available close to the work area.

CLEANING AND DISINFECTING

Frequently – and at least daily - clean touched surfaces, such as tables, light switches, appliances, countertops, handles, desks, phones, keyboards, toilets, taps, sinks, and so forth. Use the cleaning agents that are routinely used in these areas and follow the directions on the labels. For multiuse equipment, clean after every use.

Workers are to be instructed to clean their work areas and equipment at the end of each shift. Equipment and instructions on how to do this are to be provided

9.9 EROSION MANAGEMENT

Exposed and unprotected soils are the main cause of erosion in most situations. Therefore, this erosion management plan and the revegetation and rehabilitation plan are closely linked to one another and must not operate independently but should rather be seen as complementary activities within the broader environmental management of the site and must therefore be managed together. This Erosion Management Plan addresses the management and mitigation of potential impacts relating to soil erosion.

The objective of the plan is to provide:

- Introduce measures to reduce the erosion potential;
- Reduce the susceptibility of the area;
- Develop and implement monitoring and rehabilitation measures;

- Manage runoff and reduce the impact on sensitive areas;
- Achieve long-term stabilisation of all disturbed areas and
- Promote the natural re-establishment and planting of indigenous species to reduce erosion.

9.9.1 EROSION CONTROL PRINCIPLES

In the design phase, various stormwater management principles should be considered, including:

- Protect the land surface from erosion.
- Minimise the area of exposure of bare soils to minimise the erosive forces of wind, water and all forms of traffic.
- Contain soil erosion, whether induced by wind or water forces, by constructing protective works to trap sediment at appropriate locations. This applies particularly during construction.
- Avoid situations where slopes may become saturated and unstable (during and after construction process).
- All roads and other hardened surfaces should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk.
- Regular monitoring for erosion after construction to ensure that no erosion problems have developed as result of the disturbance.
- All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and re-vegetation techniques.
- A cover of indigenous species should be established in disturbed areas to bind the soil and prevent erosion.
- Construction activities must be restricted and carefully monitored to keep disturbance to a minimum and disturbed areas must be appropriately rehabilitated and managed.
- Planting of vegetation should commence as soon as possible after construction is completed to minimise the potential for erosion.
- Progressive rehabilitation is an important element of the rehabilitation strategy and should be implemented where feasible. Re-vegetation of disturbed surfaces must occur immediately after construction activities are completed
- Once revegetated, areas should be protected to prevent trampling and erosion.
- No construction equipment, vehicles or unauthorised personnel should be allowed onto areas that have been vegetated

Regular audits and maintenance programmers to ensure that plants are growing and serving the purpose for which they were planted. This erosion control can be achieved by:

- Integrating project design with site constraints.
- Planning and integrating erosion and sediment control with construction activities.
- Minimising the extent and duration of disturbance.
- Using erosion controls to prevent on-site damage.

These goals can be achieved by applying the management practices outlined in the following sections.

ONSITE EROSION MANAGEMENT

General factors to consider regarding erosion risk at the site includes the following:

- Any eroded areas observed should be rehabilitated as soon as possible.
 - Reinstatement as much of the eroded area to its pre-disturbed geometry.
 - Install protective works (gabions, reno-mattresses) to stabilise and protect unstable banks.

- Earthen berms or plugs, rock packs or gabions can be used for the plugging of erosion gullies.
- The area should then be allowed to re-vegetate itself.
- Any activities within these areas should be avoided as far as possible.
- Soil loss will be greater on steeper slopes. Ensure that steep slopes are not de-vegetated unnecessarily and subsequently becomes hydrophobic, which will increase erosion potential.
- All bare areas should be revegetated with appropriate locally occurring species, to bind the soil and limit the erosion potential.
- Gabions and other stabilisation features should be used on steep slopes and other areas vulnerable to erosion minimise the erosion risk as far as possible.

EROSION CONTROL MECHANISM

The contractor may use the following mechanisms to combat erosion when necessary:

- Reno mattresses
- Slope attenuation
- Hessian material
- Shade catch nets
- Gabion baskets
- Silt fences
- Storm water channels and catch pits
- Soil bindings
- Geofabrics
- Hydro-seeding and/or re-vegetating
- Mulching over cleared areas
- Boulders and size varied rocks
- Tilling

MONITORING

To monitor the impact of construction activities, follow-ups and rehabilitation efforts, monitoring must be undertaken. This section provides a description of a possible monitoring programme that will provide assessment of the erosion on site as well as an assessment of the success of the management programme.

In general, the following principles apply for monitoring:

- Photographic records must be kept of areas to be cleared prior to work starting and at regular intervals during initial clearing activities. Similarly, photographic records should be kept of the area from immediately before and after follow-up clearing activities. Rehabilitation processes must also be recorded.
- The cause of soil erosion must be determined.
- Simple records must be kept of daily operations (location cleared and labour units).
- It is important that, if monitoring results in detection of invasive alien plants, that this leads to immediate action.

9.10 HAZARDOUS SUBSTANCES MANAGEMENT PLAN

Hazardous substances are chemicals or materials that can cause acute or chronic harm to health, be it humans or the environment. The key potential sources of impact related to the management of hazardous chemical substances (HCS) and fuel during construction relate to the risk of accidental release of hydrocarbons to the environment, accidental exposure to workers, and fire and explosion risks.

Potential impacts associated with these risks, if poorly managed, include:

- Impact to soil and/or groundwater, which may result in degradation of the resource and requirement for remedial action;

- Impacts on pastoralist livelihoods due to contamination of pasture or water resources and consequent impacts to their, health, livelihood and animals;
- Impacts on human health & safety due to either direct exposure or through fire/explosion;
- Gas emissions associated with the combustion of fuel, are mainly compounds of nitrogen, carbon including very small traces of sulphur and particulate matter; and
- Fugitive emissions from HCS & fuel storage.

The purpose of this Hazardous Substances Management Plan (HSMP) is to provide a framework for the management of hazardous substances onsite during the construction and operation of the Esizayo West WEF:

- Ensure the handling and storage of hazardous substances are in accordance with relevant standards;
- To ensure that the storage and handling of chemicals and hydrocarbons on-site does not cause pollution to the environment or harm to persons;
- To ensure that the storage and maintenance of machinery onsite does not cause pollution of the environment or harm to persons.

9.10.1 HAZARDOUS SUBSTANCES MANAGEMENT PROCEDURE

A plan for managing the transportation, delivery, storage and handling of hazardous substances onsite is detailed below. A method statement detailing the specific storage and handling practices during construction must be prepared by the Contractor prior to the commencement of construction.

REGISTER OF HAZARDOUS SUBSTANCES

Contractors shall establish inventories or registers of hazardous substances on site. The inventory is to be updated when new hazardous substances are introduced to the workplace or the use of existing hazardous substances is discontinued. Both the chemicals' register and the Material Safety Data Sheets (MSDSs) must be readily available at a central location or near where the chemicals are being stored or used.

MSDS

It is standard practice that an MSDS is provided by the manufacturer or supplier of all hazardous substances. An MSDS is required for all chemicals and substances on site. These MSDSs are to be made available to all parties affected by the use or storage of the chemical. MSDSs are the key to communicating hazards and safe handling practices for chemicals. In addition, MSDS information is to be made available to all employees.

DELIVERIES

Transport of all hazardous substances must be in accordance with the relevant legislation and regulations. Contractors are responsible for identifying and securing any necessary permits for any proposed bulk fuel storage arrangements. The supplier will fill contractors fuel tanks; fuelling is the responsibility of the licensed contractor who will be supervised by the storage/work area supervisor. No 'black-market' or 'grey-import' fuels shall be used. All fuels purchased must be legitimate and subject to required duties and taxes.

Prior to fuel transfer the operator will verify that: all fuel transfer hoses have been connected properly and couplings are tight; transfer hoses are not obviously damaged; fuel transfer personnel are familiar with procedures; for fuelling stations, personnel are located at both the fuel truck and fuel transfer tank(s) and have the ability to shut off fuel flow manually; a means of communication has been established between the two people transferring fuel; and a high liquid level shutoff device can be substituted for the person at the delivery tank, in which case operation of the shutoff will be verified each time it is used;

The fuel contractor will clean up and report any accidents or spills immediately to the project ESHS team.

ENVIRONMENT AND OCCUPATIONAL HEALTH AND SAFETY

The following requirements are additional to any applicable requirements established in other LTWP management plans such as the Occupational Health & Safety Management Plan:

- Storage facilities will have the applicable Material Safety Data Sheets (MSDS) available;

- Smoking will be strictly prohibited from any areas where fuel loading operations take place;
- Appropriate signage will be used to identify potential spill risks;
- Any accidental damage to containment structures will be inspected immediately and appropriate repairs undertaken. The extent of damage will be reported in writing to WP as well as remedial repairs effected together with the date of repairs and any follow up inspection. Any release of fuels or other substance will be cleaned up;
- All used fuel / oil products will be collected in tanks marked “Waste Oil”; and
- All hydrocarbon associated wastes will be managed in line with the Waste Management Plan.

MATERIALS STORAGE

- All temporary hydrocarbon storage will be situated above ground. There will be no buried storage tanks permitted.
- All chemicals, fuels and other hazardous materials are to be stored in designated and bunded areas, where the bunded area is impermeable and is impervious to the stored substance as per the requirements of SABS 089:1999 Part 1. The bunded area will contain 110% volume of the largest container stored.
- Bunds and service area platforms to be cleaned and maintained regularly.
- SABS approved Spill kits must be made available on-site for the clean-up of spills and leaks of contaminants. The relevant construction crew members must be trained in their use.
- Keep a record of all hazardous substances stored on site. Clearly label all the containers storing hazardous waste.
- The storage of flammable and combustible liquids such as oils will be in designated areas which are appropriately bunded and stored in compliance with Material Safety Data Sheets (MSDS) files and applicable regulations and safety instructions.
- Chemical and hydrocarbon storage facilities shall be covered to prevent rainfall ingress into secondary containment units and well-ventilated
- Any storage and disposal permits/approvals which may be required must be obtained, and the conditions attached to such permits and approvals will be compiled with.
- An effective monitoring system must be put in place to detect any leakage or spillage of all hazardous substances during their transportation, handling, installation and storage.

SPILL AND LEAK MANAGEMENT AND PREVENTION

- In the event of a major spill or leak of contaminants, the relevant authorities of contaminants. (Please list with contact details) The relevant construction crew members must be trained in their use.
- Spilled cement must be cleaned up immediately and, stored as hazardous waste and disposed of at a suitably licensed hazardous waste disposal facility.
- Routine servicing and maintenance of vehicles must not be undertaken onsite (except for emergencies). If repairs of vehicles must take place, an appropriate drip tray must be used to contain any fuel or oils.
- Any water that collects in bunds must not be allowed to stand. Should the water be contaminated, it is to be removed and treated prior to discharge, or disposed of as hazardous waste. Clean stormwater contained within the bunds may be reused.
- No chemicals must be stored or vehicle maintenance undertaken within 100m of wetlands or drainage lines.
- Construction machinery must be stored in an appropriately sealed area. If machinery cannot be stored in a sealed area then a drip tray must be used to prevent spillage from any leaks.
- As far as practicable, all equipment servicing / maintenance shall be undertaken within designated workshop areas.
- All generators on site, including generators that are not in use must be located in a bunded area or on a drip tray.
- Bunded areas and drip trays must be maintained on a regular basis.
- Diesel generators and water pumps shall be located in secondary containment areas or shall be self-contained to prevent loss of fuels and oils;

- Precautions must be in place to limit the possibility of oil and other toxic liquids from entering the soil or clean stormwater system.
 - Upon completion of construction, the area must be cleared of potentially polluting materials.
 - Emergency response planning will be managed via the Emergency Preparedness and Response Plan.
-

9.10.2 OPERATIONAL PHASE

During the operational phase of the project limited hazardous substances and chemicals will be stored onsite. During maintenance activities, contractors will need to produce a method statement detailing the specific storage and handling practices. The following measures need to be implemented onsite during the operational phase of the project.

- Hazardous substances must be stored in sealed containers within a clearly demarcated designated area.
 - Care must be taken to ensure that spillage of oils and other hazardous substances are limited during maintenance. Handling of these materials must take place within an appropriately sealed and bunded area. Should any accidental spillage take place, it must be cleaned up according to specified standards regarding bioremediation.
 - The storage of flammable and combustible liquids such as oils will be in designated areas which are appropriately bunded and stored in compliance with Material Safety Data Sheets (MSDS) files and applicable regulations and safety instructions.
 - Used oils and chemicals:
 - Appropriate disposal must be arranged with a licensed facility in consultation with the administering authority;
 - Waste must be stored and handled according to the relevant legislation and regulations.
-

9.10.3 INSPECTION AND MONITORING

Fuel storage areas must be inspected regularly to ensure bund stability, integrity, and function.

9.10.4 TRAINING

The contents of the Hazardous Substances Management Plan must be communicated to the staff through the induction training. On the job training can also be undertaken through the use of Environmental Toolbox Talks. All training must be undertaken as outlined in the Training Procedure (Document Number: EX-PR-004).

Examples of Toolbox Talks include:

- Storage of hazardous substances
 - Working with hazardous substances
 - Management of hazardous waste
 - Spill Prevention
-

9.11 GRIEVANCE MECHANISM

This Grievance Mechanism has been developed to receive and facilitate grievances and provide a solution to these concerns and grievances. The aim of the grievance mechanism is to ensure that grievances or concerns raised by local landowners, staff and or communities are addressed in a manner that:

- Provides accessible avenues for all internal and external stakeholders to contact the Project Company;
- Provides a predictable, transparent, and credible process to all parties, resulting in outcomes that are seen as fair, effective, lasting and dealt with in a timely manner;
- Builds trust as an integral component of staff and broader community relations activities; and
- Enables more systematic identification of issues and trends affecting a project, facilitating corrective action and pre-emptive engagement.

The aim of this Grievance Mechanism is to address grievances in a manner that does not require a potentially costly and time consuming legal process. This grievance mechanism also ensures alignment with local and international best practices in human resources development and stakeholder engagement.

9.11.1 RESPONSIBILITIES

Figure 9-1 outlines the reporting structure with regards to grievances.



Figure 9-1: Reporting Structure with regards to Grievances

9.11.2 PROCEDURES

INTERNAL GRIEVANCE MECHANISM

The following process relates directly to the corporate human resources policy and seeks to resolve matters that have arisen within the corporate structure. This applies directly to staff that are located at corporate offices or on site and applies to any phase of the project, that is, during construction and operations. **Figure 9-2** illustrates the prescribed process for internal grievances.

All anonymous grievances received from the grievance box will be recorded and be dealt with according to the procedures set out in this document.

The following best practice guidelines when engaging with internal stakeholders:

- IFC Performance Standards;
- IFC Performance standard 2 – Labour and Working conditions;
- King III;
- Emerging governance trends incorporated in the report, Alternate Dispute Resolution;
- South African Legislation;

- Employment Equity Act No. 55 of 1998;
- Labour Relations Act No. 66 of 1995; and
- Occupational Health and Safety Act No. 85 1993.



Figure 9-2: Process for Internal Grievances

EXTERNAL GRIEVANCE MECHANISM

A key element of this improvement is the implementation of the external grievance mechanism. This process is applicable through all projects and seeks to resolve issues raised by stakeholders during construction and operations. A formal systematic review of the mechanism will be undertaken every year if and when necessary. **Figure 9-3** illustrates the process that is followed for external grievances.

The following best practice guidelines when engaging with external stakeholders:

- IFC Performance Standards;
- IFC Performance standard 1, 4 and 7;
- King III;
- King III recommends the stakeholder inclusive approach to corporate governance;
- South African Legislation; and
- National Environmental Management Act (NEMA) and other relevant legislation.

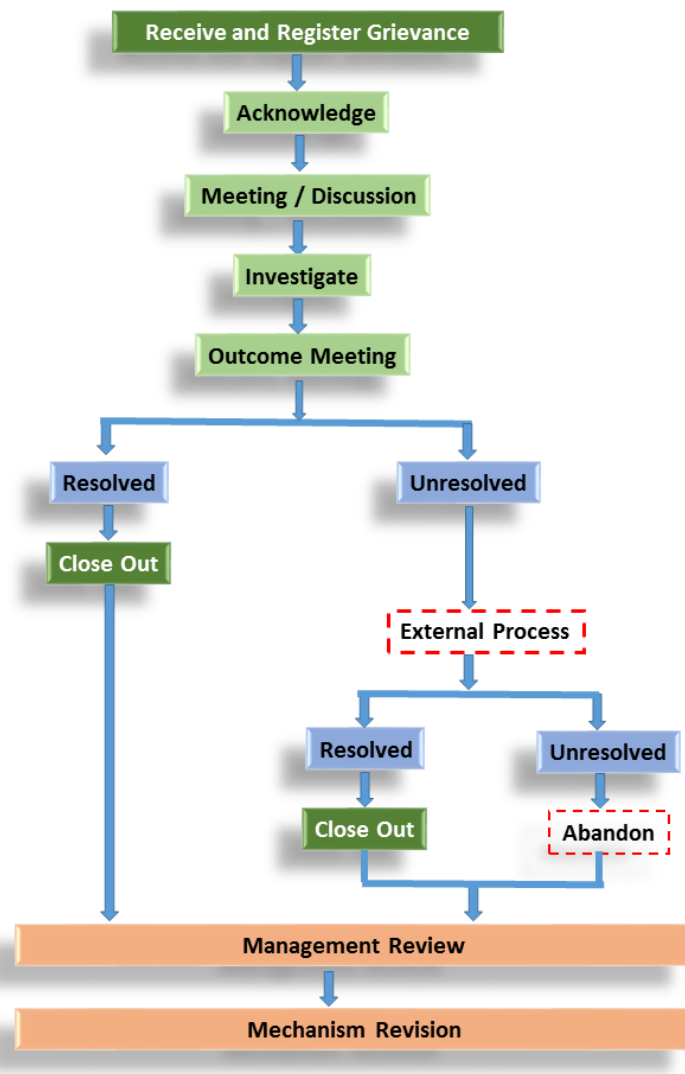


Figure 9-3: Process for External Grievances

GENERAL PROCEDURE FOR RECEIVING AND RESOLVING GRIEVANCES

- Local landowners, communities and authorities must be informed of the grievance mechanism and the process by which grievances can be brought to the attention of the Project Company through its designated representative.
- A company representative must be appointed as the contact person for grievances to be addressed to. The name and contact details of the contact person must be provided to local landowners, communities and authorities.
- Project related grievances relating to the construction, operational and or decommissioning phase must be addressed in writing to the contact person. The contact person should assist local landowners and or communities who may lack resources to submit/prepare written grievances.
- The grievance must be registered with the contact person who, within 2 working days of receipt of the grievance, must contact the complainant to discuss the grievance and agree on suitable date and venue for a meeting in order to discuss the grievances raised. Unless otherwise agreed, the meeting must be held within 2 weeks of receipt of the grievance.
- The contact person must draft a letter to be sent to the complainant acknowledging receipt of the grievance, the name and contact details of complainant, the nature of the grievance, the date that the grievance was raised, and the date and venue for the meeting (once agreed).

- Prior to the meeting being held the contact person must contact the complainant to discuss and agree on the parties who should attend the meeting. The people who will be required to attend the meeting will depend on the nature of the grievance. While the complainant and or proponent are entitled to invite their legal representatives to attend the meeting/s, it should be made clear that to all the parties involved in the process that the grievance mechanism process is not a legal process. It is therefore recommended that the involvement of legal representatives be limited.
- The meeting must be chaired by the company representative appointed to address grievances. A person must be provided to take minutes of and record the meeting/s. Any costs associated with hiring venues must be covered by the Project Company.
- Draft copies of the minutes must be made available to the complainant and the proponent within 4 working days of the meeting being held. Unless otherwise agreed, comments on the draft minutes must be forwarded to the company representative appointed to manage the grievance mechanism within 4 working days of receipt of the draft minutes.
- In the event of the grievance being resolved to the satisfaction of all the parties concerned, the outcome must recorded and signed off by the relevant parties. The record must provide details of the date of the meeting/s, the names of the people that attended the meeting/s, the outcome of the meeting/s, and where relevant, the measures identified to address the grievance, the party responsible for implementing the required measures, and the agreed upon timeframes for the measures to be implemented.
- In the event of a dispute between the complainant and the proponent regarding the grievance, the option of appointing an independent mediator to assist with resolving the issue should be discussed. The record of the meeting/s must note that a dispute has arisen and that the grievance has not been resolved to the satisfaction of all the parties concerned.
- In the event that the parties agree to appoint a mediator, the Project Company will be required to identify three (3) mediators and forward the names and CVs to the complainant within 2 weeks of the dispute being declared. The complainant, in consultation with the Project Company, must identify the preferred mediator and agree on a date for the next meeting. The cost of the mediator must be borne by the Project Company. A person must be provided to take minutes of and record the meeting/s.
- In the event of the grievance, with the assistance of the mediator, being resolved to the satisfaction of all the parties concerned, the outcome must be recorded and signed off by the relevant parties, including the mediator. The record must provide details on the date of the meeting/s, the names of the people that attended the meeting/s, the outcome of the meeting/s, and where relevant, the measures identified to address the grievance, the party responsible for implementing the required measures, and the agreed upon timeframes for the measures to be implemented.
- In the event of the dispute not being resolved, the mediator must prepare a draft report that summaries the nature of the grievance and the dispute. The report must include a recommendation by the mediator on the proposed way forward with regard to the addressing the grievance.
- The draft report must be made available to the complainant and the Project Company for comment before being finalised and signed by all parties. Unless otherwise agreed, comments on the draft report must be forwarded to the company representative appointed to manage the grievance mechanism within 4 working days. The way forward will be informed by the recommendations of the mediator and the nature of the grievance.

A complaint is closed out when no further action can be or needs to be taken. Closure status will be classified in the complaints register as follows:

- Resolved: Complaints where a resolution has been agreed and implemented and the complainant has signed the confirmation form.
- Unresolved: Complaints where it has not been possible to reach an agreed resolution and the case has been authorised for close out by the appeals committee.
- Abandoned: Complaints where the complainant is not contactable after one month following receipt of a complaint and efforts to trace his or her whereabouts have been unsuccessful.

The grievance mechanism does not replace the right of an individual, community, group or organization to take legal action should they so wish. In the event of the grievance not being resolved to the satisfaction of complainant and or the proponent, either party may be of the opinion that legal action may be the most appropriate option.

9.11.3 INSPECTION AND MONITORING

All grievances will be recorded in the Grievance Register and Guideline and be reviewed on a weekly basis.

A key element of this improvement will be evaluating the effectiveness of this mechanism through internal auditing processes and, if necessary, amend and add to this document. This will include feedback from staff and relevant stakeholders. A formal systematic review will be undertaken every year if considered necessary.

9.11.4 TRAINING

The contents of the Grievance Mechanism must be communicated to the staff through the induction training. On the job training can also be undertaken through the use of Environmental Toolbox Talks. Training must also be provided to neighbouring communities to ensure that they are aware that the grievance process exists and how the process works.

9.12 HIV/AIDS MANAGEMENT PLAN

The HIV/AIDS management plan will be compiled in the event that the project is identified as a preferred bidder as part of the REIPPPP. This plan must be compiled in consultation with the Laingsburg Local Municipality.

The measures must be implemented on site during the construction and operational phases:

- Promote a non-discriminatory and supportive environment for people affected by HIV & AIDS.
 - HIV-positive employees must be protected against unfair discrimination, victimisation or harassment.
 - Sensitive issues surround HIV & AIDS and it is important to handle matters in a discreet and private manner
 - Promote awareness and education programmes to inform employees about HIV & AIDS which will enable them to protect themselves and others against infection by HIV.
 - Involve employees and their representatives in the planning and implementation of awareness and counselling programmes, especially as peer educators and counsellors.
-

9.13 HERITAGE MANAGEMENT PLAN

The purpose of this document is to provide a response guideline should archaeological sites, palaeontological sites or graves become exposed during ground altering activities within the Esizayo WEF project area. Heritage resources are protected in terms of the National Heritage Resources Act, Act 25 of 1999 (NHRA).

9.13.1 CHANCE FIND PROCEDURE

The following procedural guidelines must be considered in the event that previously unknown heritage resources are exposed or found during the construction of the Esizayo WEF project area.

GENERAL REQUIREMENTS

The Contractor or other person discovering a potentially significant site or artefact will initiate the following actions:

- Stop work in the immediate area and take digital photographs to record the find;
- Install temporary site protection measures (e.g. delineate a 'no-go' area using warning tape, stakes and signage / deploy worker and give instructions to prevent access or further disturbance) and take all reasonable steps to avoid any further disturbance or damage from excavation, vibration, plant or machinery;
- Inform site supervisor/foreman;

- Inform all relevant staff /Contractor personnel of the chance find and whether access to work area or along the right-of-way is being restricted;
- Strictly enforce any no-go area needed to protect the site;
- Notify the Project Company who will advise on any additional measures such as deployment of security guard and consultation or a visit from archaeologist / other heritage specialist. In the event of the latter, the specialist/archaeologist will be responsible for evaluating whether the chance find needs to be classified as cultural heritage and if so, whether it is isolated or part of a larger site or feature. The Project Company will notify the relevant authorities;
- The supervisor must then inform the relevant ECO;
- The ECO shall contact the SAHRA and the Heritage Western Cape (HWC) and appoint an archaeological consultant to record the site and excavate if necessary;
- Artefacts are to be left in place for recording by the specialist/archaeologist. It is important they are not disturbed or moved as their setting is as important as the artefact/fossil; if materials are to be collected they will be placed in bags and labelled by the specialist/archaeologist and forwarded to the authorities in a manner that ensures the integrity of the ‘chain of custody’. Project personnel are not permitted to take or keep artefacts as personal possessions as that is a crime;
- Any damage, accidental or otherwise, must be investigated by the site foreman, ESHS Team and the details recorded in an interim Incident Report and, if necessary, an Incident (Chance Find) Investigation Report;
- Appropriate mitigation / treatment strategies will be developed according to the specific circumstances of each find and, as appropriate, take account of the degree of cultural importance of the find –
- Stakeholder engagement may be needed with affected communities to determine the correct mitigation actions or, if applicable, suitable compensation (e.g. reburial costs). Site treatment scenarios may include:
 - Preservation in place through avoidance or re-routing or specialized construction techniques, and/or
 - Rescue excavations to remove, record and relocate in advance of further construction work if avoidance is not possible.
- If the Chance Find is an isolated artefact/site or is not classed as cultural heritage, the Project Company must approve the removal of site protection measures and activity can resume only with consultation and approval of the local authorities;
- If the heritage specialist and/or archaeologist confirms the chance find to be cultural heritage he/she will inform the Project Company and initiate discussions about the handling process;
- If a chance find is a verified cultural heritage site, prepare a final Chance Finds report once required treatment has been completed;
- While required treatment is ongoing, the Project Company will coordinate with the relevant staff / contractor, keeping them informed as to status and schedule of investigations / actions, and informing them when activities may resume;
- The Grievance Procedure and Guidance will apply to any stakeholder complaints relating to cultural heritage and chance finds;
- Chance find recording shall include the following:
 - Incident Notification;
 - Incident Report;
 - Incident (Chance Find) Investigation Report – e.g. detailing corrective actions, with digital images, maps and plans showing any locations that are no-go, limited access or present risks of further chance finds.

9.13.2 INSPECTION AND MONITORING

Since it is not practical to have a regular monitoring presence over the construction period by either an archaeologist or palaeontologist, environmental awareness training must be conducted by the ECO for all contractors and subcontractors. The training must include, as a minimum, the following:

- Identifying potential features of heritage significance;
- Procedures for dealing with heritage resources discovered on site;

- Applicable Legislation pertaining to the protection of heritage resources; and
 - The importance of protecting heritage resources.
-

9.13.3 TRAINING

The contents of the Heritage Management Plan must be communicated to the staff through the induction training. On the job training can also be undertaken through the use of Environmental Toolbox Talks.

9.14 FAUNA MANAGEMENT PLAN

The purpose of this fauna management plan is to protect species, habitats and eco-system services, ensuring no net reduction to any critically endangered / endangered species and no net loss of any critical habitats (as defined by IFC Performance Standard 6) whilst minimising disturbance to other species and habitats to the extent practicable. This plan provides a strategy to control potential impacts on fauna during the construction and operation of the Esizayo West WEF.

9.14.1 PRINCIPLES FOR MANAGING IMPACTS ON FAUNA

SNAKE FIND AND HANDLING:

During construction, especially clearing of vegetation, it is likely that snakes will be encountered onsite. The following steps need to be undertaken in the event of a snake onsite:

- All work in that area is to cease;
- The site foreman/ site supervisor is to be notified;
- Snake handling will be outsourced in the event that a qualified snake handler is not available onsite. The site supervisor or foreman needs to contact the appointed service provider, who will safely remove and release the snake at a suitable habitat.

The following measures need to be communicated to all staff to ensure both human and snake safety:

- Under no circumstances may any site staff handle snakes without the proper snake handling training.
- All staff are to be provided with the correct Personal Protective Equipment (PPE) (e.g. snake gaiters and safety boots) to limit the potential for snake bites.
- Signage identifying the service provider appointed for snake handling must be erected around site. It is recommended that an individual onsite undergoes snake handling training to ensure that if an emergency arises it can be dealt with immediately.
- Intentional harming of snakes is prohibited onsite.

MAMMALS AND REPTILES

During the construction phase of the project the following mitigation measures need to be implemented and adhered to at all times to ensure that the impacts to fauna is managed and mitigated where possible.

WALK DOWN PRIOR TO CONSTRUCTION

Prior to the start of any construction or associated activities in areas of potential biodiversity concern, the Contractors will carry out a walk-through over the area accompanied by the ECO. The objective is to identify any sensitive habitats including potential for species of conservation interest (i.e. to consider the presence of any rare species of fauna, but establish possible risk of snake bites; inspect tree cavities for bats, etc.) that may be directly or indirectly affected by the proposed works.

Any important and significant habitats must be suitably demarcated and made a no-go area. An appropriate level of mitigation needs to be implemented prior to starting construction.

LIMIT THE DEVELOPMENT FOOTPRINT

- The development area must be clearly defined and marked off accordingly. All No- Go areas must be demarcated and warning signs prohibiting access erected.

- Areas to be cleared must be clearly marked in the field to eliminate unnecessary clearing/ disturbance.

LIMIT DISTURBANCE

- The extent of clearing and disturbance to the native vegetation must be kept to a minimum so that the impact on fauna and their habitats is restricted.
- Where roads pass right next to major water bodies provisions must be made for the fauna such as toads to pass under the roads by using culverts or something similar.
- Vehicles to adhere to speed limits at all times.
- The intentional harming and killing of animals will be prohibited through on-site supervision and worksite rules.
- Any litter onsite needs to be cleaned up immediately to prevent it being blown into the environment surrounding the development site.

INSPECTIONS AND MONITORING

The following inspections and monitoring need to be undertaken during the construction phase:

- Observation of vegetation clearing activities by the Environmental Control Officer (ECO).
- Recording faunal fatalities to monitor success of relocation efforts.
- Regular monitoring of construction activities by the designated onsite personnel and the ECO.
- The ESHS team will collate details and investigate all Project-related wildlife complaints and incidents including instances of unauthorised hunting, poaching, bush trade, disturbance of breeding sites and injuries / fatalities. Corrective actions will be instigated where needed to avoid recurrence.

TRAINING

The contents of the Fauna Management Plan must be communicated to the staff through the induction training. On the job training can also be undertaken through the use of Environmental Toolbox Talks. All training must be undertaken as outlined in the Training Procedure (Document Number: EX-PR-004).

Examples of Toolbox Talks include:

- Snakes bites
- Snake handling
- No-Go areas
- Encountering fauna onsite
- Poaching

9.15 WASTE MANAGEMENT PLAN

9.15.1 WASTE HIERARCHY

A waste is any solid, liquid or contained gaseous material that is being discarded by, disposal, recycling, burning or incineration. Waste management options for a particular waste need to be considered according to the Waste Management Hierarchy (**Figure 9-4**) which reflects the relative sustainability of each of the options. One of the key principles underlying the waste management hierarchy is to ensure that waste is dealt with as high up the waste hierarchy as possible. Since all waste disposal options have some impact on the environment, the only way to avoid impact is not to produce waste in the first place, and waste reduction is therefore at the top of the hierarchy. Re-use, followed by recovery techniques (recycling, composting and generating energy from waste) follow, while disposal to landfill or by incineration (the worst options) are at the bottom of the hierarchy.

In deciding on the most appropriate disposal route, both environmental and economic costs and benefits need to be considered. This decision must be reached taking into account all the costs and impacts associated with waste disposal, including those associated with the movement of waste.

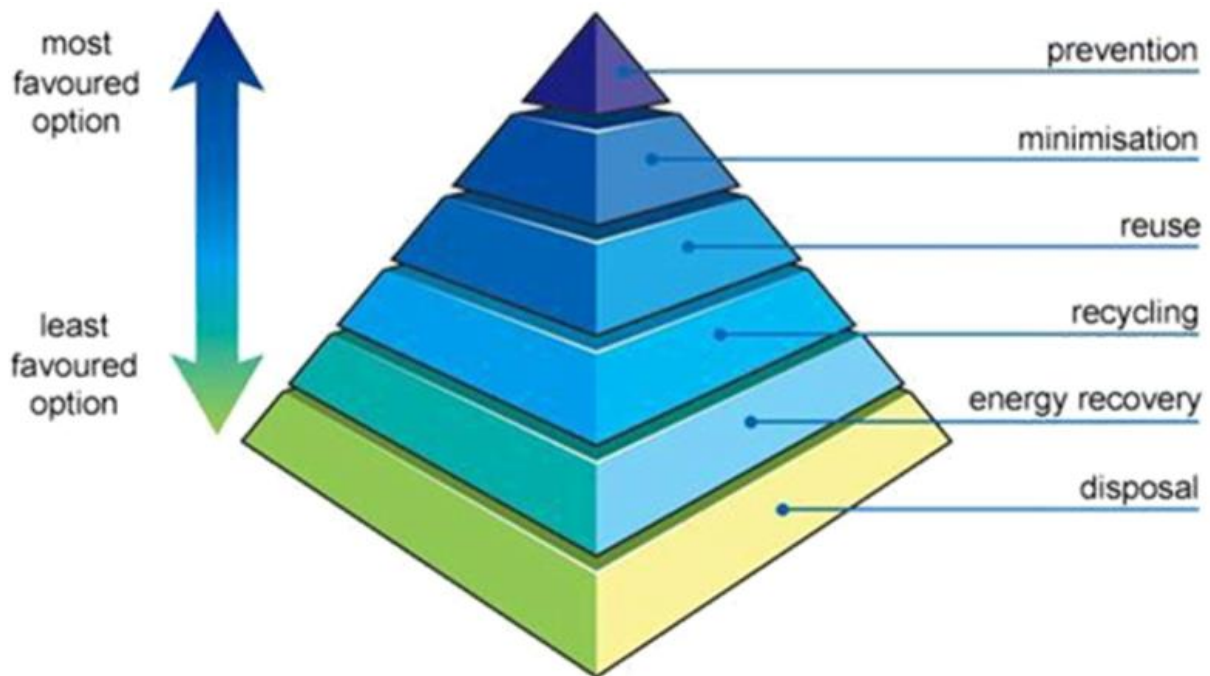


Figure 9-4: Waste Hierarchy

9.15.2 PROJECT STAGES

The purpose of this section is to assess the construction and operational processes of the Esizayo OHPL in order to identify short comings, like raw materials procurement, infrastructure, employee training, health and safety, transportation, storage, compliance with legislative requirements, emergency preparedness and waste streams arising from an operation and its related activities, as well as the current waste management practices per waste stream. The assessment serves as the baseline against which any problem areas or gaps in waste management practises, process technology and environmental authorisations are identified and against which future performance objectives, activities and targets can be set.

The project stages are described below with the waste generation and management methods described in the corresponding tables below them including:

- Details on how waste will be managed during the construction and operational phases taking into consideration the waste management hierarchy;
- Details of the procedure for the separation of non-recyclable and recyclable waste;
- Details of the management of non-recyclable waste i.e. how waste will be stored on site during construction and operational phases, including the frequency for the removal of waste from the site and an indication of the landfill site where it will be disposed;
- Details for the management of recyclable waste e.g. the type of waste materials that will be recycled on site and the details pertaining to the offloading, sorting, handling, storage and collection procedures for the waste types (e.g. compaction and bailing, breaking of glass etc.); and
- The frequency for the removal of waste from the proposed development to where it will be finally managed must be included.

Waste Management at the project site is to be undertaken in line with the EMP to consider the correct disposal of general and hazardous waste generated on the project. **Table 9-1** describes different waste products that the proposed project will likely produce, as well as the various options to dispose of them. Waste will mainly be generated during the construction phase. During operation, contractors are anticipated to only be on the site for limited amounts of time, as and when maintenance is required.

Table 9-1: Waste Management Options

WASTE	TYPE OF WASTE	MANAGEMENT OPTIONS
Hydrocarbons / Contaminated soils / water	Hazardous	<p>Fuel and oil spillages can be a source of contamination of water sources and the soil. Management options include:</p> <ul style="list-style-type: none"> — Using spill kits to clean any spillages; — Ensure storage facilities are maintained and meet industry regulations; — Transportation and storage of fuel must be regulated and correctly managed according to the EMPr; — Waste generated along servitude to be taken to the contractor laydown area at the end of each day; — Co-ordinate waste removal with the removal of waste from the contractor laydown area; and — All hazardous waste is to be disposed of at a registered hazardous landfill (safe disposal certificates must be obtained).
Contaminated Personal Protective Equipment (PPE)	Hazardous	<p>PPE can be contaminated during handling of hydrocarbons. Management options include:</p> <ul style="list-style-type: none"> — Store contaminated PPE in hazardous waste skips along the servitude; — Waste generated along servitude to be taken to the contractor laydown area at the end of each day; — Co-ordinate waste removal with the removal of waste from the contractor laydown area; and — Ensure contaminated PPE is disposed of at a registered hazardous landfill (safe disposal certificates must be obtained).
General waste	General	<p>General waste (inorganic matter) can be disposed of as per normal and form part of the municipal waste management system. Management options include:</p> <ul style="list-style-type: none"> — Ensure waste is stored securely in covered / sealable refuse bins; — Waste generated along servitude to be taken to the contractor laydown area at the end of each day; — Co-ordinate waste removal with the general removal of waste from the contractor laydown area.
Food waste	General	<p>Food waste is generated as site personnel take their meals on the construction site. Management options include:</p> <ul style="list-style-type: none"> — Store any waste and packaging into a sealable, labelled food waste bin; — Waste generated along servitude to be taken to the contractor laydown area at the end of each day; — Co-ordinate waste removal with the removal of waste from the contractor laydown area.

10 CONCLUSION

In terms of NEMA, everyone (i.e. all persons engaging in any component of this project) is required to take reasonable measures to ensure that they do not pollute the environment. 'Reasonable measures' includes informing and educating employees about the environmental risks associated with their work and training them to operate in an environmentally responsible manner.

The Proponent also recognises that, in terms of NEMA, the cost to repair any environmental damage will be borne by the person responsible for the damage. Should the above-mentioned environmental guidelines and mitigation measures be adopted, it is anticipated that the negative environmental impacts of the proposed OHPL will be mitigated adequately. The Proponent and the selected Contractor shall appoint relevant personnel, as well as an independent ECO, to monitor the site periodically throughout construction to ensure that the required environmental controls are in place and working effectively. During operation and maintenance, the area specific Environmental Manager and EO, with the support of the maintenance supervisor, will monitor environmental controls.

If you have any further enquiries, please feel free to contact:

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APPENDIX

A EAP CV





ASHLEA STRONG, MEM, EAP

*Principal Consultant (Planning & Advisory Services),
Environment & Energy*



Years with the firm

8

Years of experience

18

Professional qualifications

EAPASA

Areas of expertise

Auditing

ESIR

Energy

Environmental Control

Infrastructure

Mining

Training

Waste Management

CAREER SUMMARY

Ashlea is a Principal Consultant with 18 years' experience in the environmental field. She currently provides technical and strategic expertise on a diverse range projects in the environmental management field, including environmental scoping and impact assessment studies, environmental management plans, waste and water management, as well as the provision of environmental management solutions and mitigation measures

Ashlea has been involved in the management of a number of large EIAs specifically within the energy sector such as the Medupi Power Station, and Pebble-Bed Modular Reactor (PBMR) and numerous Transmission Powerlines. She also has significant environmental auditing experience and expertise having undertaken over 70 compliance audits.

Ashlea holds a Masters in Environmental Management; a BTech (Nature Conservation), and a National Diploma (Nature Conservation). She is also a Registered Environmental Assessment Practitioner.

EDUCATION

Masters in Environmental Management, University of the Free State, South Africa	2006
B Tech, Nature Conservation, Technikon SA, South Africa	2001
National Diploma in Nature Conservation, Technikon SA, South Africa	1999

ADDITIONAL TRAINING

Conduct outcomes based assessment (NQF Level 5), South African Qualifications Authority (SAQA)	2009
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PROFESSIONAL MEMBERSHIPS

Registered Environmental Assessment Practitioner (Registration Number: 2019/1005)	2020
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PROFESSIONAL EXPERIENCE

Energy Sector

- 100MW Solar Photovoltaic (PV) Plant (2021). Project Director. This project involved the compilation of a Basic Assessment and Environmental Management Plan for a 100MW Solar PV Plant near Springs in Gauteng, South Africa. Client: Calodex (Pty) Ltd.
- Erica 400kV Loop-in-Loop-out (LILO) Powerline (2020). Compilation of an environmental screening assessment for the Erica 400kV LILO Powerline in Cape Town, Western Cape, South Africa. Client: Eskom Holdings SOC Limited.
- Maralla East and West Wind Energy Facilities (2019). Project Manager. Compilation of two Part 2 Amendment Process for the changes in technical scope of the Wind Energy Facilities near Sutherland in the Northern and Western Cape, South Africa. Client: BioTherm Energies (Pty) Ltd.
- Ruigtevallei 132kV Powerline (2019): Project Manager. Compilation of a Part 2 Amendment Process for the deviation of the Ruigtevallei – Dreunberg 132 kV powerline near Gariep in the Free State, South Africa. Client: Eskom Holdings SOC Limited.



ASHLEA STRONG, MEM, EAP

Principal Consultant (Environmental Services), Environment & Energy

- Nakonde and Mpika Wind Energy Projects (2018): Project Manager. Compilation of two Environmental Project Briefs for the establishment of meteorological masts at the Proposed Nakonde and Mpika Wind Project Sites in Zambia. Client: Globeleq
- Rietkloof Wind Energy Facility Project (2018): Project Director. Compilation of a Basic Assessment and Environmental Management Programme for a 140MW Wind Energy Facility, Matjiesfontein, Western Cape. Client: G7 Renewable Energies
- Mozambique – Zambia Interconnector Powerline (2018): Project Manager. This project involved the compilation of the Environmental and Social Impact Assessment and Environmental and Social Management Plan for a 300km 400kV powerline between Tete, in Mozambique, and Chipata, in Zambia. Client: Southern African Power Pool (SAPP).
- Ankerlig – Koeberg 132kV powerline walkdown (2017): Project Manager. This project involved the compilation of a Construction and Operation Environmental Management Plans for the Ankerlig – Koeberg 132kV powerline. Client: Eskom Holdings SOC Limited.
- Gwanda 100MW Solar Project (2018): Project Manager. This project involved the high-level review of the Environmental Impact Assessment for a 100MW Photovoltaic (PV) Solar Project near the town of Gwanda, Matebeleland South Province of Zimbabwe against relevant legislation and international standards. Client: WSP | Parsons Brinckerhoff.
- Southern Energy Coal Fired Power Station (2016): Project Manager. This project involved the high-level review of the Environmental Impact Assessment for the Southern Energy Coal Fired Power Station near Hwange in Zimbabwe against relevant legislation and standards. Client: WSP | Parsons Brinckerhoff.
- Proposed Solar and Wind Projects located in the Northern and Western Cape Provinces (2015) Project Manager. This project involved the compilation of 15 Environmental Impact Assessments and Environmental Management Plans for 2 Solar and 2 Wind energy Projects near Aggenys and Sutherland respectively. Client: BioTherm Energy (Pty) Ltd.
- Proposed Solar Park, Northern Cape Province, South Africa (2012): Strategic Environmental Advisor. This project involved the provision of process expertise for the compilation of an Environmental Impact Assessment and Environmental Management Plan for the proposed Solar Park in the Northern Cape Province. Client: Central Energy Fund (CEF).
- Proposed Tabor - Nzhelele 400kV Transmission Lines and associated infrastructure, Limpopo Province, South Africa (2012): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for a 100km 400kV powerline between Louis Trichardt and Musina in the Limpopo Province. Client: Eskom Transmission.
- Retrofitting of the existing Electrostatic Precipitators with Fabric Filter Plants at Units 2, 3 and 4 at the Grootvlei Power Station, South Africa (2012): Project Manager. This project involved the compilation of a Basic Assessment Report and Environmental Management Plan for the proposed retrofitting of the existing Electrostatic Precipitators with Fabric Filter Plants at the Grootvlei Power Station. Client: Eskom Holdings SOC Limited.
- Proposed Mulilo Coal Fired Power Station and associated infrastructure as well as associated power lines and substations, Musina, Limpopo, South Africa (2008): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for the proposed Mulilo Coal Fired Power Station and associated infrastructure as well as associated power lines and substations in the Musina area of the Limpopo Province. Client: Parsons Brinckerhoff Africa and Mulilo Power.

- Pebble Bed Modular Reactor Demonstration Plant and Associated Infrastructure, Western Cape, South Africa (2008): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for the proposed Pebble Bed Modular Reactor Demonstration Plant and Associated Infrastructure in the Western Cape Province. Client: Eskom Generation.
- Proposed Bantamsklip – Kappa 765 kV Transmission Lines and associated infrastructure, Western and Northern Cape, South Africa (2008): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for four 260km 765kV powerlines between the Bantamsklip Nuclear Power Station Site and the proposed new Kappa Substation in the Karoo, Western Cape Province. Client: Eskom Transmissions.
- Proposed Bantamsklip – Bacchus, Bacchus - Kappa and Bacchus – Muldersvlei 400 kV Transmission Lines and associated infrastructure, Western and Northern Cape, South Africa (2008): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for a number of 400kV powerlines between the Bantamsklip Nuclear Power Station Site and a number of substations, including Bacchus, Kappa and Muldersvlei, in the Western Cape Province. Client: Eskom Transmission.
- Westgate – Tarlton – Kromdraai 132 kV Sub-Transmission line and associated infrastructure, Gauteng, South Africa (2008): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for the Westgate – Tarlton – Kromdraai 132 kV Sub-Transmission line and associated infrastructure in the Gauteng Province. Client: Eskom Distribution – Central region.
- Environmental Scoping Study for the proposed new distribution line and substation for Eskom, Dundonald, Mpumalanga (also involved in the Public Participation Process), Mpumalanga, South Africa (2008): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for a 132kV powerline as well as a new substation in the Tarlton area of Gauteng.
- The proposed new 132 kV sub-transmission line between the Dinaledi and GaRankuwa substations for Eskom, GaRankuwa, North West, South Africa (2008): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for a 132kV powerline between the Dinaledi and GaRankuwa substations in the GaRankuwa area of the North West Province. Client: Eskom Distribution.
- Expansion of the Transmission powerline network and associated infrastructure between the Perseus substation and the Beta substation, Free State, South Africa (2008): Project Manager. This project involved the compilation of an alignment specific construction Environmental Management Plan for the 13km 765kV Perseus Beta Turn-ins. Eskom Transmission
- Tarlton – Kromdraai 132 kV Sub-Transmission line and associated infrastructure, Gauteng, South Africa (2008): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for a 132kV powerline as well as a new substation in the Tarlton area of Gauteng. Client: Eskom Distribution – Central Region.
- Basic Assessment for the proposed Watershed – Mmabatho 88kV Power line. North West, South Africa (2008): Project Manager. This project involved the compilation of a Basic Assessment and Environmental Management Plan for a new 88kV powerline near Mmabatho in the North West Province. Client: Eskom Distribution – Central Region.

- Proposed Watershed – Mmabatho 88kV Power line. North West, South Africa (2007): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for the Watershed – Mmabatho 88kV Power line in the North West Province. Client: Eskom Distribution – Central Region.
- Proposed Combined Cycle Gas Turbine Plant and Associated Infrastructure near Majuba, Mpumalanga, South Africa (2007): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for the proposed Combined Cycle Gas Turbine Plant and Associated Infrastructure near Majuba in the Mpumalanga Province. Client: Eskom Holdings SOC Limited.
- Proposed Capacity Increase of the Atlantis OCGT Plant and Associated Infrastructure, Western Cape, South Africa (2006): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for the proposed Capacity Increase of the Atlantis OCGT Plant and Associated Infrastructure in the Western Cape Province. Client: Eskom Generation.
- Proposed Concentrated Solar Thermal Plant in the Northern Cape, South Africa (2006): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for the proposed Concentrated Solar Thermal Plant near Upington in the Northern Cape Province. Client: Eskom Holdings SOC Limited.
- Proposed Underground Coal Gasification plant, Eskom, Mpumalanga, South Africa (2006): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for the proposed Underground Coal Gasification plant near the Majuba Power Station in the Mpumalanga Province. Client: Eskom Holdings SOC Limited.
- Proposed new Coal-fired Power Station in the Lephalale Area for Eskom, Limpopo, South Africa (2005): Project Manager. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for the proposed new Coal-fired Power Station in the Lephalale Area in the Limpopo Province. Client: Eskom Generation.
- Proposed Open Cycle. Gas Turbine Power Station at Atlantis for Eskom, Western Cape, South Africa (2005): Environmental Consultant. This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for the proposed Open Cycle. Gas Turbine Power Station at Atlantis in the Western Cape Province. Client: Eskom Generation.

Infrastructure Sector

- Emalahleni Water Treatment Plant Amendment Project (EWRP) (2020). Project Manager. Compilation of a Part 1 Amendment Process for the changes to the EWRP Environmental Authorisation as well as an update of the Environmental Management Programme for the EWRP near Emalahleni in Mpumalanga, South Africa. Client: Anglo American
- Hendrina Leachate Dam (2018): Project Manager. This project involves the compilation of a Basic Assessment and Environmental Management Plan for a leachate Dam at the Domestic Waste Landfill Site at the Hendrina Power Station. Client: Eskom Holdings SOC Limited.
- Rehabilitation of the R34 between Vryburg and Schweizer-Reneke, North West, South Africa (2016): Project Manager. This project involved the compilation of a Basic Assessment and Environmental Management Plan for the upgrading of the R34 between Vryburg and Schweizer-Reneke. Client: SANRAL
- Proposed Expansion of the Cremation Facilities at the Envirocin Pet Crematorium, Gauteng, South Africa (2013): Project Manager. This project involves the compilation of a basic assessment for the expansion of the cremation facilities at

the Envirocin Pet Crematorium in Kyasands, Gauteng Province. Client: Envirocin Incineration Systems CC.

- Proposed Kraft Paper Mill in Frankfort, Frankfort, Free State, South Africa (2013): Project Manager. This project involved the undertaking of an Environmental Impact Assessment, including the compilation of an Environmental Management Programme, for the proposed establishment of a KRAFT paper mill in Frankfort in the Free State Province. Client: Industrial Development Corporation of SA (Pty) Ltd.
- Rehabilitation of the N14 between Delerayville and Sannieshof, North West, South Africa (2011): Project Manager. This project involved the compilation of a Basic Assessment and Environmental Management Plan for the upgrading of the N14 between Sannieshof and Delerayville as well as the construction of a new bridge over the Hartsriver. This project also included the compilation of Water Use License and Mining Permit Applications. Client: SANRAL.
- Proposed new Waterfall Cemetery, Limpopo, South Africa (2011): Project Manager. This project involved the compilation of a Basic Assessment and Environmental Management Plan for the new Waterfall Cemetery, Limpopo Province. Client: Makhado Municipality.
- Route determination of the proposed Metro Boulevard, Gauteng, South Africa (2008): Project Manager. This project involved the undertaking of an Environmental Impact Assessment for the route determination of the proposed Metro Boulevard in the Weltevreden Park Area of the Gauteng Province. Client: Johannesburg Roads Agency.
- Proposed new fuel supply pipeline between Milnerton and Atlantis, Western Cape, South Africa (2007): Project Manager. This project involved undertaking an Environmental Impact Assessment for the proposed new fuel supply pipeline between Milnerton and Atlantis to supply the Ankerlig Power Station in the Western Cape Province. Client: Eskom Generation.

Mining Sector

- Establishment of the Proposed Rietvlei Opencast Coal Mine, Mpumalanga, South Africa (2013): Project Manager. This project involves the undertaking of an integrated environmental authorisation process, including an Environmental Impact Assessment, Environmental Management Programme Report, Waste Management License Application and Water Use License Application, for the establishment of an opencast coal mine north of Middelburg. Client: Rietvlei Mining Company.
- Decommissioning of Redundant Infrastructure at the Vaal River Operations, North West and Free State, South Africa (2013): Project Manager. This project involves undertaking an integrated Environmental Authorisation and Waste Management License process for the proposed decommissioning of redundant infrastructure at AngloGold Ashanti's Vaal River Operations. Client: AngloGold Ashanti.
- Decommissioning of Redundant Infrastructure at the West Wits Operations, Gauteng, South Africa (2013): Project Manager. This project involves undertaking a Basic Assessment process for the proposed decommissioning of redundant infrastructure at AngloGold Ashanti's West Wits Operations. Client: AngloGold Ashanti (Pty) Ltd.
- Inyanda Mine Pegasus South Expansion, Mpumalanga, South Africa (2011): Project Manager. This project included the compilation of an Environmental Impact Assessment, Environmental Management Plan, the Amendment of the existing Environmental Management Programme Report and the amendment of the existing Water Use License for the Inyanda Mine Pegasus South Expansion project, north of Middelburg in the Mpumalanga Province. Client: Exxaro Coal (Pty) Ltd.

- Sishen Infrastructure Program, Northern Cape, South Africa (2010): Project Manager. This project involved the compilation of an Environmental Impact Assessment and an Environmental Management Plan for the infrastructure expansion programme proposed by the Sishen Mine in the Northern Cape. Client: Sishen Iron Ore (Pty) Ltd.
- Prospecting Permit Applications in the Kuruman area of the Northern Cape, South Africa (2011): Project Manager. This project involved the compilation of Environmental Management plans as part of six applications for Prospecting Permits in the Kuruman area of the Northern Cape. Client: Sound Mining Solutions.
- Borrow pits required by the Limpopo Department of Roads and Transport, Limpopo, South Africa (2010): Project Manager. This project involved the compilation of Environmental Management plans as part of the applications for Mining Permits for borrow pits required for the rehabilitation of provincial roads in the Limpopo Province. Client: Limpopo Department of Roads and Transport.
- Borrow pits required for the Medupi Coal Fired Power Station, Limpopo, South Africa (2008): Project Manager. This project involved the compilation of Environmental Management plans as part of the applications for Mining Permits for borrow pits required for the Medupi Coal Fired Power Station in the Limpopo Province. Client: Eskom Generation.
- Borrow pits required for the Ingula Pumped Storage Scheme, KwaZulu-Natal, South Africa (2008): Project Manager. This project involved the compilation of Environmental Management plans as part of the applications for Mining Permits for borrow pits required for the Ingula Pumped Storage Scheme in the Kwa-Zulu Natal Province. Client: Eskom Generation.
- Project Manager, Mining Right Application for a 23 Hectare Borrow Pit required for the Steelpoort Pumped Storage Scheme, Mpumalanga, South Africa (2007): Project Manager. This project entailed the compilation of the required Environmental Management Programme Report in support of a Mining Right Application for a 23 Hectare Borrow Pit required for the Steelpoort Pumped Storage Scheme in the Mpumalanga Province. Client: Eskom Generation.
- Renewed Mining and Prospecting Activities on the farm Quaggaskop 215, Vanrhynsdorp, Western Cape, South Africa (2004): Environmental Consultant. This project involved the compilation of an Environmental Management Programme Report for the recommencement of mining and prospecting activities on the farm Quaggaskop 215 outside Vanrhynsdorp in Western Cape Province. Client: Minexpo.

Waste Management Projects

- Sasol Waste Management Environmental Management Programme (2019). Compilation of an operational Environmental Management Programme for the Sasol Waste Ash Facility, Charlie 1 Disposal Facility and the Waste Recycling Facility. Client: Sasol Secunda Operations.
- Proposed continuous Ashing at Majuba Power Station, Mpumalanga, South Africa (2012): Project Manager. This project entailed the compilation Environmental Impact Assessment and Waste Management License Application for the proposed continuous ashing project at the Majuba Power Station in Mpumalanga. Client: Eskom Holdings SOC Limited.
- Proposed continuous Ashing at Tutuka Power Station, Mpumalanga, South Africa (2012): Project Manager. This project entailed the compilation Environmental Impact Assessment and Waste Management License Application for the proposed continuous ashing project at the Tutuka Power Station in Mpumalanga. Client: Eskom Holdings SOC Limited.
- Proposed extension of Ash Dams at Hendrina Power Station, Mpumalanga, South Africa (2011): Project Manager. This project entailed the compilation

Environmental Impact Assessment and Waste Management License Application for the proposed extension of the ash dams at the Hendrina Power Station in Mpumalanga. Client: Hendrina Power Station.

- Phase 1 of the Environmental Impact Assessment for the Proposed Regional General and Hazardous Waste Processing Facility, Eastern Cape (2005). Project Manager. This project entailed the compilation Environmental Impact Assessment for the Proposed Regional General and Hazardous Waste Processing Facility in the Eastern Cape. Client: Coega Development Corporation.

Specialist Projects

- Strategic Environmental Assessment for the Development. Master Plan Greater Port Harcourt, Rivers State, Nigeria, Africa (2008): Senior Environmental Consultant. This project entailed the compilation of a Strategic Environmental Assessment for the City of Port Harcourt as part of the development of the Master Plan for the Greater Port Harcourt Area. Client: Port Harcourt Government
- Development of an Environmental Policy, Gauteng, South Africa (2006): Environmental Consultant. This project entailed the development and compilation of an environmental policy for the Ekurhuleni Metropolitan Municipality. Client: Ekurhuleni Metropolitan Municipality.
- Environmental Input into the National Transport Master Plan, South Africa (2007): Environmental Consultant. This project included the provision of strategic environmental input in to the Draft National Transport Plan. Client: Department of Transport.
- Development of the Development Corridors, Ekurhuleni, Gauteng, South Africa (2006): Environmental Consultant. This project included the provision of strategic environmental input in to the Ekurhuleni Metropolitan Municipalities Development Corridor Study. Client: Ekurhuleni Metropolitan Municipality.

Auditing

- Compliance Audits at South 32 (2016 – 2020): Project Manager. This project involved the environmental compliance audits of the Water Use Licenses for the BMK, Douglas, Klipfontein and Middelburg Mine North and South Sections at South 32 in Mpumalanga. Client: South 32.
- Compliance Audits at Middelburg Water Reclamation Plant (MWRP) (2016 – 2020): Project Manager. This project involved the environmental compliance audits of the Water Use License and Waste Management License for the MWRP at South 32 in Mpumalanga. Client: South 32.
- BioTherm Round 4 Lenders Technical Advisor (2018 - 2021). Project Manager – Environmental. Environmental monitoring of the construction of the Konkoonsies II and Aggeneys Photovoltaic Solar Plants against the IFC Performance Standards. Client: Nedbank.
- Water Use Licence Audits (2019): Lead Auditor: External compliance audits of the water use licences for the Delmas and Argent Powerlines in Mpumalanga. Client: Eskom Holdings SOC Limited.
- Sasol Alrode and Pretoria West Depot Audits (2016 - 2020): Lead Auditor. Environmental compliance audits for environmental authorisations and environmental management plans for the Sasol Alrode and Pretoria West Depots. Client: Sasol Oil (Pty) Ltd
- Sasol Regulation 34 Audits (2019): Lead Auditor. Environmental compliance audits for 13 authorisations for the Sasol Owned Petrol Filling Stations. Client: Sasol Oil (Pty) Ltd
- Regulation 34 Audits at Mogalakwena Mine (2019). Project Manager. Environmental compliance audits of the EMPR and various environmental



ASHLEA STRONG, MEM, EAP

Principal Consultant (Environmental Services), Environment & Energy

- authorisations at the Mogalakwena Mine in the Limpopo Province. Client: Anglo American Platinum.
- Sasol Environmental Authorisations and Environmental Management Plans for the Secunda Operations (2019): Lead Auditor. Environmental compliance audits for 49 authorisations for the Sasol Secunda. Client: Sasol Secunda Operations
 - Waste Management Licence Compliance Audit and PCB Plan Close Out Audit, Phalaborwa, Limpopo, South Africa (2019): Project Manager. Environmental compliance audit of a WML and the PCB Plan for the Palabora Mine. Client: Palabora Company
 - Sasol Mining Water Use Licence Compliance, South Africa (2018): Project Manager. Environmental compliance audit of six WULs held by mining operations in Secunda. Client: Sasol Mining
 - Waste Management License Audits for the Sasol Waste Ash Site, Secunda, Mpumalanga, South Africa (2014 - 2019): Lead Auditor. These projects involve the annual and biannual environmental compliance auditing of the Waste Management licenses for various waste facilities at the Secunda Site in Mpumalanga Province. Client: Sasol Chemical Industries: Secunda Synfuels Operations
 - Legal Assessment at South 32 (2019): Project Manager and Lead Auditor. This project involved the assessment of legal compliance against the mine's legal register for the Klipfontein and Middelburg Mine North and South Sections at South 32 in Mpumalanga. Client: South 32
 - InvestChem Annual Environmental Compliance Monitoring, Kempton Park, Gauteng, South Africa (2013 - 2019): Lead Auditor. This project involved the annual environmental compliance auditing for InvestChem's Sulphonation Plant in Kempton Park, Gauteng Province. The monitoring included InvestChem's compliance to various commitments contained in their environmental management programmes and conditions within their environmental authorisations (records of decision). Client: Investchem (Pty) Ltd.
 - Compliance Audits at Sasol Alrode and Pretoria West Depots (2015-2019). Project Manager and Lead Auditor. Annual Environmental compliance auditing of the Environmental authorisations at the Alrode and Pretoria West Depots in Gauteng. Client: Sasol Oil (Pty) Ltd
 - Water Use Licence for the Letabo Power Station (2018): Project Manager. Environmental compliance audit of the WUL held by Eskom Letabo Power Station, Free State, South Africa. Client: Eskom Holdings
 - Compliance Audits at Kriel Colliery (2018): Project Manager. This project involved the environmental compliance audits of the Water Use Licenses held by Kriel Colliery in Mpumalanga. Client: Seriti Coal
 - Legal Assessment at South 32 (2017): Project Manager and Lead Auditor. This project involved the assessment of legal compliance against the mine's legal register for the BMK, Douglas, Klipfontein and Middelburg Mine North and South Sections at South 32 in Mpumalanga. Client: South 32
 - EMPR Performance Assessment Report at South 32 (2016): Project Manager. This project involved the formal assessment and verification of the Environmental Management Programme Report for the BMK, Douglas, Klipfontein and Middelburg Mine North and South Sections at South 32 in Mpumalanga. Client: South 32
 - Compliance Audit for the Bokpoort Concentrating Solar Power (CSP) Facility, Groblershoop, Northern Cape, South Africa (2016): Lead Auditor. This project involved the environmental compliance auditing of the Waste Management License, Environmental Authorisation and Water Use License for the Bokpoort

CSP Facility near Groblershoop in the Northern Cape Province. Client: ACWA Power Solafrika Bokpoort CSP Power Plant (Pty) Ltd.

- EMPR Performance Assessment Report for the Landau Colliery, Mpumalanga, South Africa (2013): Auditor. This project involved the formal assessment and verification of the Landau Colliery Environmental Management Programme Report, conducted in accordance with Regulation 55 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002). Client: Anglo Thermal Coal.
- Waste Management License Audit for the Slagment Operation, Vanderbijlpark, Gauteng, South Africa (2013): Lead Auditor. This project involved the annual environmental compliance auditing for AfriSam's Slagment Operation in Vanderbijlpark in Gauteng Province. The audit included AfriSam's compliance to the conditions of their waste management license. Client: AfriSam Southern Africa (Pty) Ltd.
- EMPR Performance Assessment Report for the New Vaal Colliery, Free State, South Africa (2006-2007): Auditor. This project involved the formal assessment and verification of the New Vaal Colliery Environmental Management Programme Report, conducted in accordance with Regulation 55 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002). Client: Anglo American Thermal Coal.

Environmental Control Projects

- N14 rehabilitation between Sannieshof and Delareyville, North West, South Africa (2012): Environmental Control Officer. This project involved the monthly auditing of the contractor's compliance with the conditions of the approved Environmental Management Plan as well as ad hoc environmental advise to the Project Engineer and SANRAL. Client: SANRAL.
- Delmas and Bontlang Waste Water Treatment Works, Mpumalanga, South Africa (2009): Environmental Control Officer. This project involved a once off compliance audit of the above-mentioned Waste Water Treatment Works. Client: Victor Khanye Municipality.
- Nkonjaneni Water Borne Sewer Project in Piet Retief, Mpumalanga, South Africa (2009): Environmental Control Officer. This project involved the monthly auditing of the contractor's compliance with the conditions of the approved Environmental Management Plan as well as ad hoc environmental advise to the Project Engineer. Client: Mkhondo Local Municipality.
- Upgrading of the Waterval Water Care Works, Gauteng, South Africa (2005-2007): Environmental Control Officer. This project involved the monthly auditing of the contractor's compliance with the conditions of the approved Environmental Management Plan. Client: ERWAT.
- Lotus Gardens Ext 2 Township establishment, Gauteng, South Africa (2003): Environmental Control Officer. This project involved the monthly auditing of the contractor's compliance with the conditions of the approved Environmental Management Plan. Client: City of Tshwane.

Training

- N14 rehabilitation between Sannieshof and Delareyville, North West, South Africa (2012): Project Manager. This project involved the provision of training for the staff of the N14 rehabilitation project with regards to the contents of the environmental management plan. Client: SANRAL.
- Training in Environmental Aspects and Rehabilitation for the Small Scale Mining Division of Mintek, City, Province, South Africa (2004): Trainer. This project involved the provision of environmental awareness training for delegates involved in the small scale miner training programme run by the Mintek small scale mining division. Client: Mintek



ASHLEA STRONG, MEM, EAP

Principal Consultant (Environmental Services), Environment & Energy

- Training in Environmental Aspects and Impacts, Germiston, Gauteng, South Africa (2004): Trainer. This project involved the provision of environmental aspects and impacts training for the staff of Transwerk in Germiston. Client: Transwerk Germiston.

APPENDIX

B

A3 MAPS



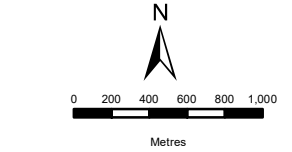


**ESIZAYO
POWERLINE
LOCALITY**

Legend

- Main road
- Secondary road
- Access road
- Eskom Powerlines
- Farm Portions (CSG, 2018)
- Assessment Corridor
- Provincial Boundary
- Original Alignment
- Post Consultation Alignment
- Komsburg (existing)
- Proposed substation

Substations



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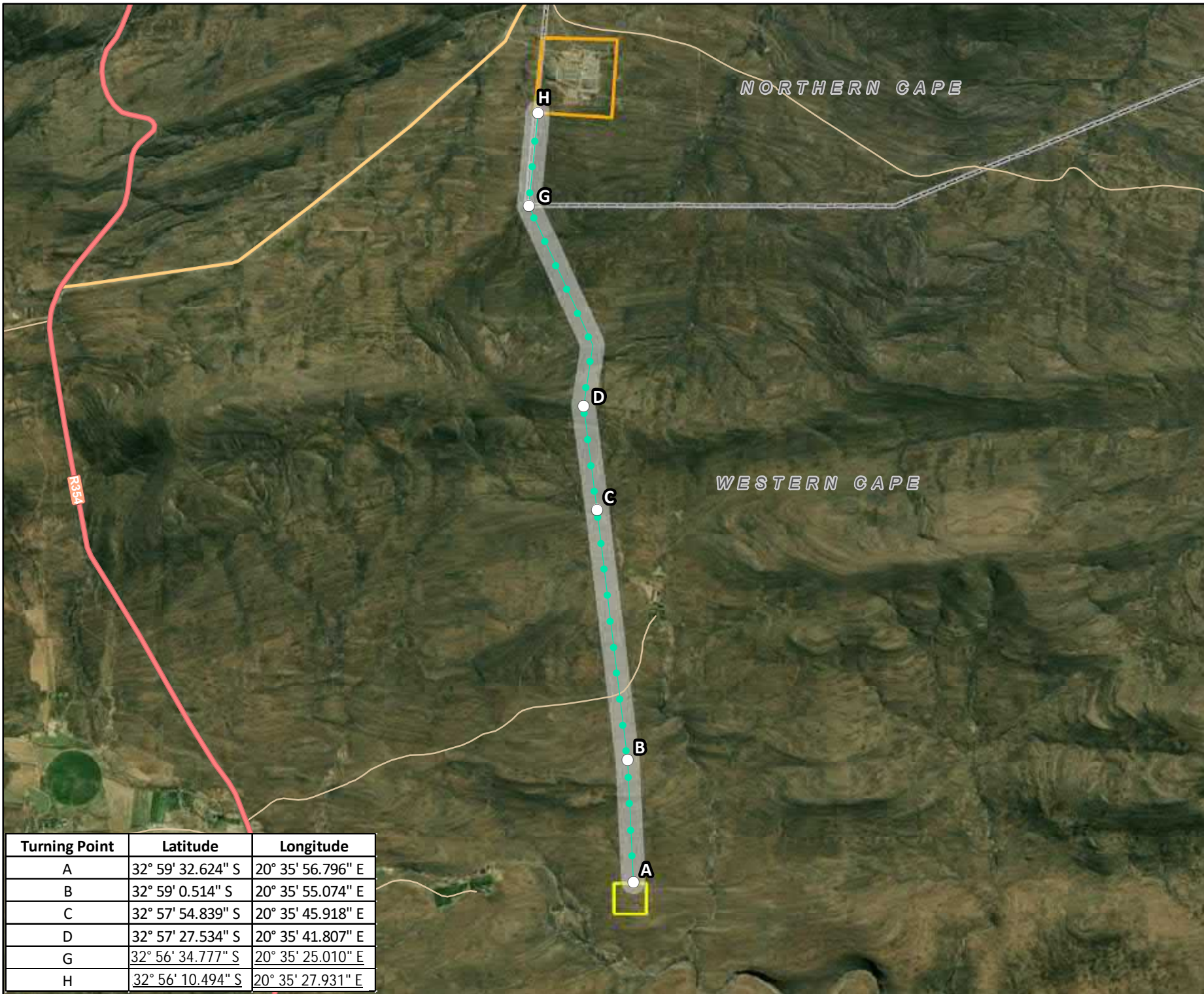
COORDINATE SYSTEM: WGS LO21

PROJECT TITLE:
 ESIZAYO CONSENTS

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DATE: 6/04/2022	REVIEWED BY: AS

FIGURE NO:	PROJECT NO: 41103481	REV:
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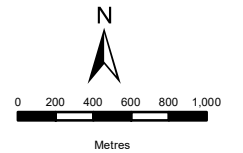
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**ESIZAYO
POWERLINE
LOCALITY**

Legend

- - - Post Consultation Alignment
- Main road
- Secondary road
- Access road
- Assessment Corridor
- Provincial Boundary
- Turning Points
- Substations**
- Komsburg (existing)
- Proposed substation



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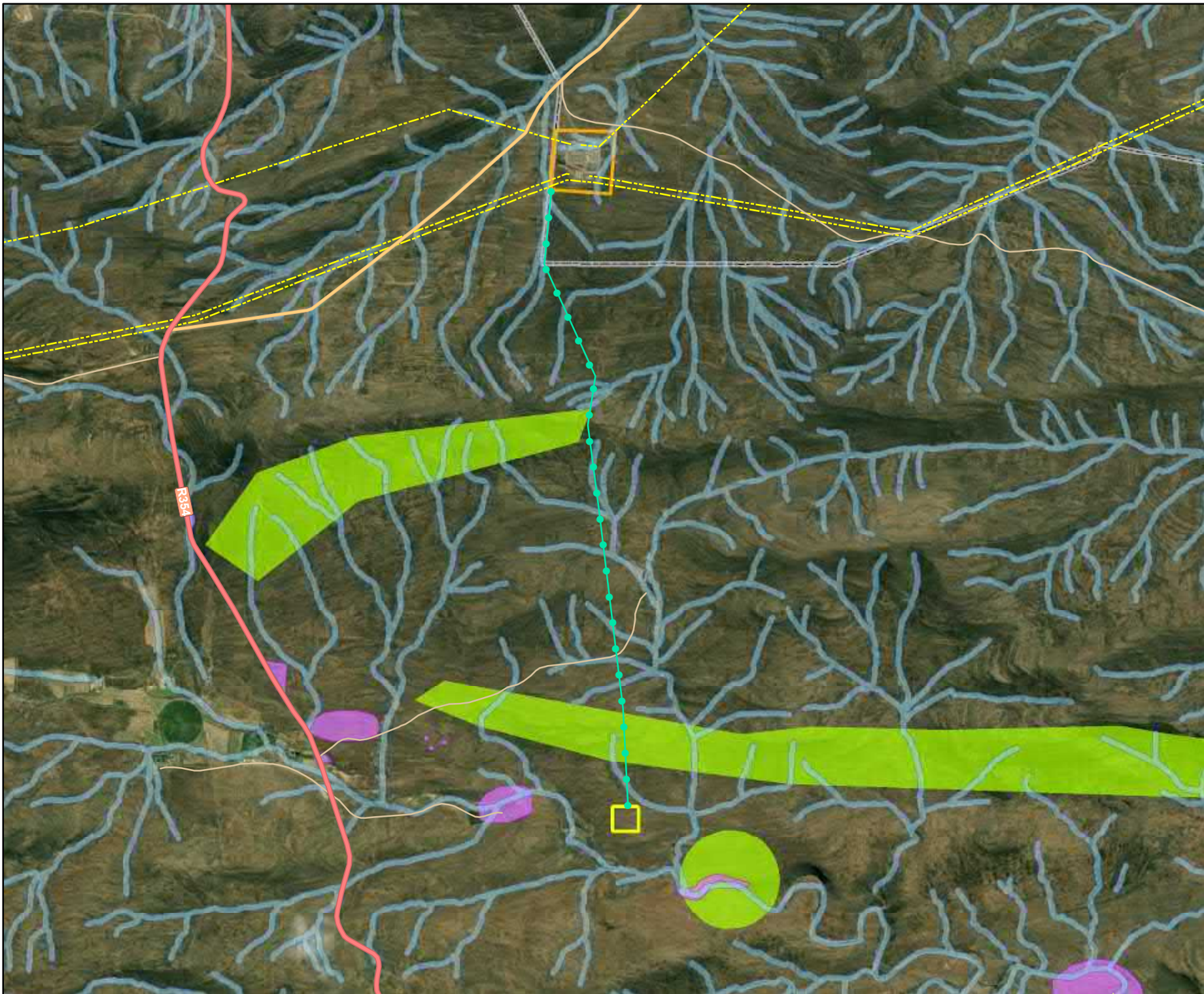
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Turning Point	Latitude	Longitude
A	32° 59' 32.624" S	20° 35' 56.796" E
B	32° 59' 0.514" S	20° 35' 55.074" E
C	32° 57' 54.839" S	20° 35' 45.918" E
D	32° 57' 27.534" S	20° 35' 41.807" E
G	32° 56' 34.777" S	20° 35' 25.010" E
H	32° 56' 10.494" S	20° 35' 27.931" E



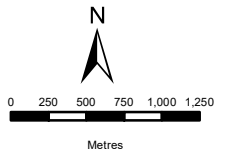
**ESIZAYO
POWERLINE
SENSITIVITY**

Legend

- Post Consultation Alignment
- Main road
- Secondary road
- Access road
- - - Eskom Powerlines
- Rivers (buffer 32m)
- Heritage sensitivity
- Avifauna sensitivity
- Provincial Boundary

Substations

- Komsburg (existing)
- Proposed substation



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PROJECT TITLE:
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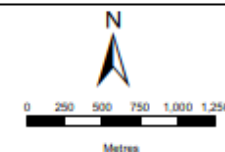
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**ESIZAYO
POWERLINE
SENSITIVITY**

Legend

- Main road
 - Secondary road
 - Access road
 - Post Consultation Alignment
 - Eskom Powerlines
 - Rivers (buffer 32m)
 - Heritage sensitivity
 - Avifauna sensitivity
- Substations**
- Komsburg (existing)
 - Proposed substation



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COORDINATE SYSTEM: HARTEBEESTHOEK94 LQ21

PROJECT TITLE:
ESIZAYO CONSENTS

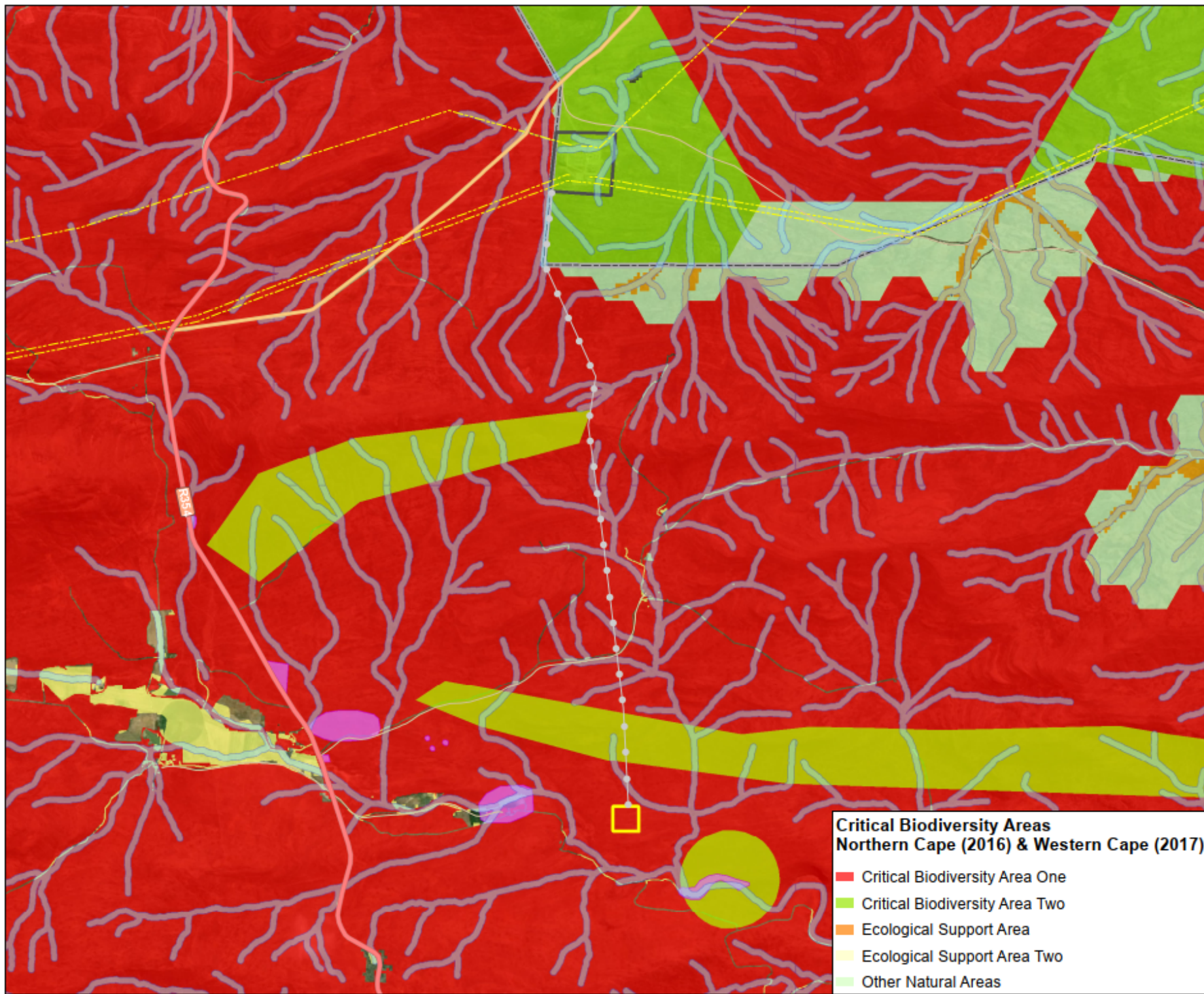
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**Critical Biodiversity Areas
Northern Cape (2016) & Western Cape (2017)**

- Critical Biodiversity Area One
- Critical Biodiversity Area Two
- Ecological Support Area
- Ecological Support Area Two
- Other Natural Areas



APPENDIX

C GENERIC EMPR FOR THE DEVELOPMENT AND EXPANSION FOR OVERHEAD ELECTRICITY TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE

APPENDIX 1
GENERIC ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) FOR THE
DEVELOPMENT AND EXPANSION FOR OVERHEAD ELECTRICITY
TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE

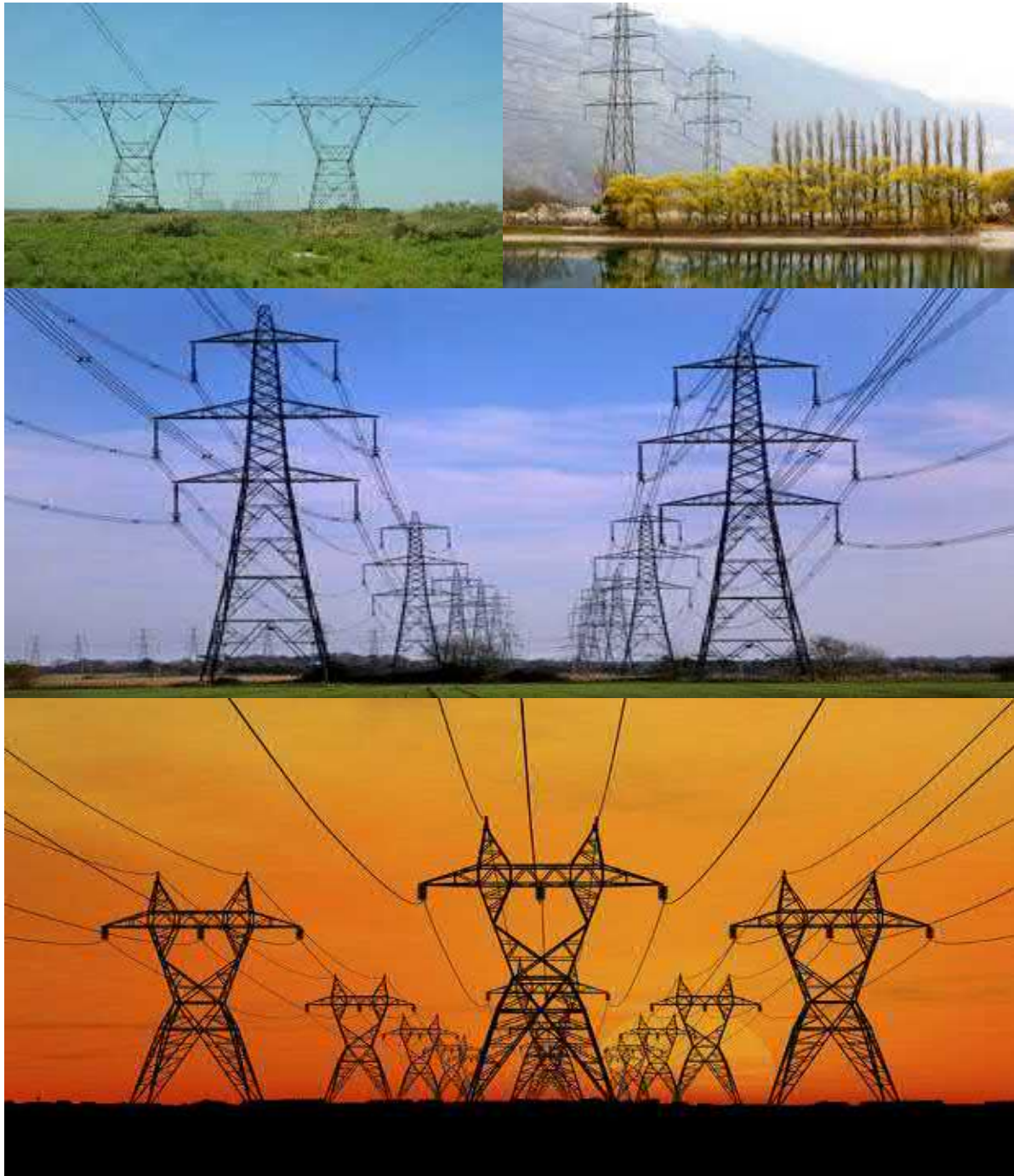


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INTRODUCTION

1. Background

The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) requires that an environmental management programme (EMPr) be submitted where an environmental impact assessment (EIA) has been identified as the environmental instrument to be utilised as the basis for a decision on an application for environmental authorisation (EA). The content of an EMPr must either contain the information set out in Appendix 4 of the Environmental Impact Assessment Regulations, 2014, as amended, (EIA Regulations) or must be a generic EMPr relevant to an application as identified and gazetted by the Minister in a government notice. Once the Minister has identified, through a government notice, that a generic EMPr is relevant to an application for EA, that generic EMPr must be applied by all parties involved in the EA process, including, but not limited to, the applicant and the competent authority (CA).

2. Purpose

This document constitutes a generic EMPr relevant to applications for the development or expansion of overhead electricity transmission and distribution infrastructure, and all listed and specified activities necessary for the realisation of such infrastructure.

3. Objective

The objective of this generic EMPr is to prescribe and pre-approve generally accepted impact management outcomes and impact management actions, which can commonly and repeatedly be used for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of overhead electricity transmission and distribution infrastructure. The use of a generic EMPr is intended to reduce the need to prepare and review individual EMPrs for applications of a similar nature.

4. Scope

The scope of this generic EMPr applies to the development or expansion of overhead electricity transmission and distribution infrastructure requiring EA in terms of NEMA, i.e. with a capacity of 33 kilovolts or more. This generic EMPr applies to activities requiring EA, mainly activity 11 and 47 of the Environmental Impact Assessment Regulations Listing Notice 1 of 2014, as amended, and activity 9 of the Environmental Impact Assessment Regulations Listing Notice 2 of 2014, as amended, and all associated listed or specified activities necessary for the realisation of such infrastructure.

5. Structure of this document

This document is structured in three parts with an Appendix as indicated in the table below:

Part	Section	Heading	Content
A		Provides general and guidance	Definitions, acronyms, roles & responsibilities and documentation and reporting.

Part	Section	Heading	Content
		information and is not legally binding	
B	1	Pre-approved generic EMPr template	<p>Contains generally accepted impact management outcomes and impact management actions required for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of overhead electricity transmission and distribution infrastructure, which are presented in the form of a template that has been pre-approved.</p> <p>The template in this section is to be completed by the contractor, with each completed page signed and dated by the holder of the EA prior to commencement of the activity.</p> <p>Where an impact management outcome is not relevant, the words “not applicable” can be inserted in the template under the “responsible persons” column.</p> <p>Once completed and signed, the template represents the EMPr for the activity approved by the CA and is legally binding. The template is not required to be submitted to the CA as once the generic EMPr is gazetted for implementation, it has been approved by the CA.</p> <p>To allow interested and affected parties access to the pre-approved EMPr template for consideration through the decision-making process, the EAP on behalf of the applicant /proponent must make the hard copy of this EMPr available at a public location and where the applicant has a website, the EMPr should also be made available on such publicly accessible website.</p>
	2	Site specific information	<p>Contains preliminary infrastructure layout and a declaration that the applicant/holder of the EA will comply with the pre-approved generic EMPr template contained in <u>Part B: Section 1</u>, and understands that the impact management outcomes and impact management actions are legally binding. The preliminary infrastructure layout must be finalized to inform the final EMPr that is to be submitted with the basic assessment</p>

Part	Section	Heading	Content
			<p>report (BAR) or environmental impact assessment report (EIAR), ensuring that all impact management outcomes and actions have been either pre-approved or approved in terms of <u>Part C</u>.</p> <p>This section must be submitted to the CA together with the final BAR or EIAR. The information submitted to the CA will be considered to be incomplete should a signed copy of <u>Part B: section 2</u> not be submitted. Once approved, this Section forms part of the EMPr for the development and is legally binding.</p>
C		Site specific sensitivities/ attributes	<p>If any specific environmental sensitivities/ attributes are present on the site which require site specific impact management outcomes and impact management actions, not included in the pre-approved generic EMPr, to manage impacts, these specific impact management outcomes and impact management actions must be included in this section. These specific environmental attributes must be referenced spatially and impact management outcomes and impact management actions must be provided. These specific impact management outcomes and impact management actions must be presented in the format of the pre-approved EMPr template (<u>Part B: section 1</u>)</p> <p>This section will not be required should the site contain no specific environmental sensitivities or attributes. However, if <u>Part C</u> is applicable to the site, it is required to be submitted together with the BAR or EIAR, for consideration of, and decision on, the application for EA. The information in this section must be prepared by an EAP, and must contain his/her name and expertise including a curriculum vitae. Once approved, Part C forms part of the EMPr for the site and is legally binding.</p> <p>This section applies only to additional impact management outcomes and impact management actions that are necessary for the avoidance, management and mitigation of impacts and risks associated with the specific development or expansion and which are not</p>

Part	Section	Heading	Content
			already included in <u>Part B: section 1</u> .
		Appendix 1	Contains the method statements to be prepared prior to commencement of the activity. The method statements are not required to be submitted to the competent authority.

6. Completion of part B: section 1: the pre-approved generic EMPr template

The template is to be completed prior to commencement of the activity, by providing the following information for each environmental impact management action:

- For implementation
 - a 'responsible person',
 - a method for implementation,
 - a timeframe for implementation
- For monitoring
 - a responsible person
 - frequency
 - evidence of compliance.

The completed template must be signed and dated by the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as Appendix 1. Each method statement must be signed and dated on each page by the holder of the EA. This template, once signed and dated, is legally binding. The holder of the EA will remain responsible for its implementation.

7. Amendments of the impact management outcomes and impact management actions

Once the activity has commenced, a holder of an EA may make amendments to the impact management outcomes and impact management actions in the following manner:

- Amendment of the impact management outcomes: in line with the process contemplated in regulation 37 of the EIA Regulations; and
- Amendment of the impact management actions: in line with the process contemplated in regulation 36 of the EIA Regulations.

8. Documents to be submitted as part of part B: section 2 site specific information and declaration

Part B: Section 2 has three distinct sub-sections. The first and third sub-sections are in a template format. Sub-section two requires a map to be produced.

Sub-section 1 contains the project name, the applicant's name and contact details, the site information, which includes coordinates of the corridor in which the proposed overhead

electricity transmission and distribution infrastructure is proposed as well as the 21-digit Surveyor General code of each cadastral land parcel and, where available, the farm name.

Sub-section 2 is to be prepared by an EAP and must contain his/her name and expertise including a curriculum vitae. This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout using the national web based environmental screening tool, when available for compulsory use at: <https://screening.environment.gov.za/screeningtool>. The sensitivity map shall identify the nature of each sensitive feature e.g. raptor nest, threatened plant species, archaeological site, etc. Sensitivity maps must identify features both within the planned working area and any known sensitive features in the surrounding landscape within 50m from the development footprint. The overhead transmission and distribution profile must be illustrated at an appropriate resolution to enable fine scale interrogation. It is recommended that <20 km of overhead transmission and distribution length is illustrated per page in A3 landscape format. Where considered appropriate, photographs of sensitive features in the context of tower positions must be used.

Sub-section 3 is the declaration that the applicant/proponent or holder of the EA in the case of a change of ownership must complete, which confirms that the applicant/EA holder will comply with the pre-approved generic EMPr template in Section 1 and understands that the impact management outcomes and actions are legally binding.

(a) Amendments to Part B: Section 2 – site specific information and declaration

Should the EA be transferred, Part B: Section 2 must be completed by the new applicant/proponent and submitted with the application for an amendment of the EA in terms of Regulations 29 or 31 of the EIA Regulations, whichever applies. The information submitted as part of such an application for an amendment to an EA will be considered to be incomplete should a signed copy of Part B: Section 2 not be submitted. Once approved, Part B: Section 2 forms part of the EMPr for the development and the EMPr becomes legally binding to the new EA holder.

PART A – GENERAL INFORMATION

1. DEFINITIONS

In this EMPr any word or expression to which a meaning has been assigned in the NEMA or EIA Regulations has that meaning, and unless the context requires otherwise –

"clearing" means the clearing and removal of vegetation, whether partially or in whole, including trees and shrubs, as specified;

"construction camp" is the area designated for key construction infrastructure and services, including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management;

"contractor" - The Contractor has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract, are in line with the Environmental Management Programme and that Method Statements are implemented as described.

"hazardous substance" is a substance governed by the Hazardous Substances Act, 1973 (Act No. 15 of 1973) as well as the Hazardous Chemical and Substances Regulations, 1995;

"method statement" means a written submission by the Contractor to the Project Manager in response to this EMPr or a request by the Project Manager and ECO. The method statement must set out the equipment, materials, labour and method(s) the Contractor proposes using to carry out an activity identified by the Project Manager when requesting the Method Statement. This must be done in such detail that the Project Manager and ECO is able to assess whether the Contractor's proposal is in accordance with this specification and/or will produce results in accordance with this specification;

The method statement must cover applicable details with regard to:

- (i) Construction procedures;
- (ii) Plant, materials and equipment to be used;
- (iii) Transporting the equipment to and from site;
- (iv) How the plant/ material/ equipment will be moved while on site;
- (v) How and where the plant/ material/ equipment will be stored;
- (vi) The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- (vii) Timing and location of activities;
- (viii) Compliance/ non-compliance; and
- (ix) Any other information deemed necessary by the Project Manager.

"slope" means the inclination of a surface expressed as one unit of rise or fall for so many horizontal units;

“**solid waste**” means all solid waste, including construction debris, hazardous waste, excess cement/ concrete, wrapping materials, timber, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers);

“**spoil**” means excavated material which is unsuitable for use as material in the construction works or is material which is surplus to the requirements of the construction works;

“**topsoil**” means a varying depth (up to 300 mm) of the soil profile irrespective of the fertility, appearance, structure, agricultural potential, fertility and composition of the soil; and

“**works**” means the works to be executed in terms of the Contract

2. ACRONYMS and ABBREVIATIONS

CA	Competent Authority
cEO	Contractors Environmental Officer
dEO	Developer Environmental Officer
DPM	Developer Project Manager
DSS	Developer Site Supervisor
EAR	Environmental Audit Report
ECA	Environmental Conservation Act No. 73 of 1989
ECO	Environmental Control Officer
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
ERAP	Emergency Response Action Plan
EMPr	Environmental Management Programme Report
EAP	Environmental Assessment Practitioner
FPA	Fire Protection Agency
HCS	Hazardous chemical Substance
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act ,2004 (Act No. 10 of 2004)
NEMWA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
MSDS	Material Safety Data Sheet
RI&AP's	Registered interested and affected parties

3. ROLES AND RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) IMPLEMENTATION

The effective implementation of this generic EMPr is dependent on established and clear roles, responsibilities and reporting lines within an institutional framework. This section of the EMPr gives guidance to the various environmental roles and reporting lines, however, project specific requirements will ultimately determine the need for the appointment of specific person(s) to undertake specific roles and or responsibilities. As such, it must be noted that in the event that no specific person, for example, an environmental control officer (ECO) is appointed, the holder of the EA remains responsible for ensuring that the duties indicated in this document for action by the ECO are undertaken.

Table 1: Guide to roles and responsibilities for implementation of an EMPr

Responsible Person (s)	Role and Responsibilities
Developer's Project Manager (DPM)	<p><u>Role</u> The Project Developer is accountable for ensuring compliance with the EMPr and any conditions of approval from the competent authority (CA). Where required, an environmental control officer (ECO) must be contracted by the Project Developer to objectively monitor the implementation of the EMPr according to relevant environmental legislation, and the conditions of the environmental authorisation (EA). The Project Developer is further responsible for providing and giving mandate to enable the ECO to perform responsibilities, and he must ensure that the ECO is integrated as part of the project team while remaining independent.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - Be fully conversant with the conditions of the EA; - Ensure that all stipulations within the EMPr are communicated and adhered to by the Developer and its Contractor(s); - Issuing of site instructions to the Contractor for corrective actions required; - Monitor the implementation of the EMPr throughout the project by means of site inspections and meetings. Overall management of the project and EMPr implementation; and - Ensure that periodic environmental performance audits are undertaken on the project implementation.
Developer Site Supervisor (DSS)	<p><u>Role</u> The DSS reports directly to the DPM, oversees site works, liaises with the contractor(s) and the ECO. The DSS</p>

Responsible Person (s)	Role and Responsibilities
	<p>is responsible for the day to day implementation of the EMPr and for ensuring the compliance of all contractors with the conditions and requirements stipulated in the EMPr.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - Ensure that all contractors identify a contractor's Environmental Officer (cEO); - Must be fully conversant with the conditions of the EA. Oversees site works, liaison with Contractor, DPM and ECO; - Must ensure that all landowners have the relevant contact details of the site staff, ECO and cEO; - Issuing of site instructions to the Contractor for corrective actions required; - Will issue all non-compliances to contractors; and - Ratify the Monthly Environmental Report.
Environmental Control Officer (ECO)	<p><u>Role</u></p> <p>The ECO should have appropriate training and experience in the implementation of environmental management specifications. The primary role of the ECO is to act as an independent quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts. In this respect, the ECO is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation and be available to advise on incidental issues that arise. The ECO is also required to conduct compliance audits, verifying the monitoring reports submitted by the cEO. The ECO provides feedback to the DSS and Project Manager regarding all environmental matters. The Contractor, cEO and dEO are answerable to the Environmental Control Officer for non-compliance with the Performance Specifications as set out in the EA and EMPr.</p> <p>The ECO provides feedback to the DSS and Project Manager, who in turn reports back to the Contractor and potential and Registered Interested & Affected Parties' (RI&AP's), as required. Issues of non-compliance raised by the ECO must be taken up by the Project Manager, and resolved with the Contractor as per the conditions of his contract. Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a variation, not allowed for in the Performance Specification) must be endorsed by the Project Manager. The ECO must also, as specified by the EA, report to the relevant CA as and when required.</p>

Responsible Person (s)	Role and Responsibilities
	<p><u>Responsibilities</u></p> <p>The responsibilities of the ECO will include the following:</p> <ul style="list-style-type: none"> - Be aware of the findings and conclusions of all EA related to the development; - Be familiar with the recommendations and mitigation measures of this EMPr; - Be conversant with relevant environmental legislation, policies and procedures, and ensure compliance with them; - Undertake regular and comprehensive site inspections / audits of the construction site according to the generic EMPr and applicable licenses in order to monitor compliance as required; - Educate the construction team about the management measures contained in the EMPr and environmental licenses; - Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective; - Monitoring the performance of the Contractors and ensuring compliance with the EMPr and associated Method Statements; - In consultation with the Developer Site Supervisor order the removal of person(s) and/or equipment which are in contravention of the specifications of the EMPr and/or environmental licenses; - Liaison between the DPM, Contractors, authorities and other lead stakeholders on all environmental concerns; - Compile a regular environmental audit report highlighting any non-compliance issues as well as satisfactory or exceptional compliance with the EMPr; - Validating the regular site inspection reports, which are to be prepared by the contractor Environmental Officer (cEO); - Checking the cEO's record of environmental incidents (spills, impacts, legal transgressions etc) as well as corrective and preventive actions taken; - Checking the cEO's public complaints register in which all complaints are recorded, as well as action taken; - Assisting in the resolution of conflicts; - Facilitate training for all personnel on the site – this may range from carrying out the training, to reviewing the training programmes of the Contractor; - In case of non-compliances, the ECO must first communicate this to the Senior Site Supervisor, who has the power to ensure this matter is addressed. Should no action or insufficient action be taken, the ECO may report this matter to the authorities as non-compliance; - Maintenance, update and review of the EMPr; - Communication of all modifications to the EMPr to the relevant stakeholders.

Responsible Person (s)	Role and Responsibilities
developer Environmental Officer (dEO)	<p><u>Role</u></p> <p>The dEOs will report to the Project Manager and are responsible for implementation of the EMPr, environmental monitoring and reporting, providing environmental input to the Project Manager and Contractor's Manager, liaising with contractors and the landowners as well as a range of environmental coordination responsibilities.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - Be fully conversant with the EMPr; - Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures; - Ensure that all stipulations within the EMPr are communicated and adhered to by the Employees, Contractor(s) ; - Confine the development site to the demarcated area; - Conduct environmental internal audits with regards to EMPr and authorisation compliance (on cEO); - Assist the contractors in addressing environmental challenges on site; - Assist in incident management; - Reporting environmental incidents to developer and ensuring that corrective action is taken, and lessons learnt shared; - Assist the contractor in investigating environmental incidents and compile investigation reports; - Follow-up on pre-warnings, defects, non-conformance reports; - Measure and communicate environmental performance to the Contractor; - Conduct environmental awareness training on site together with ECO and cEO; - Ensure that the necessary legal permits and / or licenses are in place and up to date; - Acting as Developer's Environmental Representative on site and work together with the ECO and contractor;
Contractor	<p><u>Role</u></p> <p>The Contractor appoints the cEO and has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the EMPr and that Method Statements are implemented as described. External contractors must ensure compliance with this EMPr while performing</p>

Responsible Person (s)	Role and Responsibilities
	<p>the onsite activities as per their contract with the Project Developer. The contractors are required, where specified, to provide Method Statements setting out in detail how the impact management actions contained in the EMPr will be implemented during the development or expansion for overhead electricity transmission and distribution infrastructure activities.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - project delivery and quality control for the development services as per appointment; - employ a suitably qualified person to monitor and report to the Project Developer's appointed person on the daily activities on-site during the construction period; - ensure that safe, environmentally acceptable working methods and practices are implemented and that equipment is properly operated and maintained, to facilitate proper access and enable any operation to be carried out safely; - attend on site meeting(s) prior to the commencement of activities to confirm the procedure and designated activity zones; - ensure that contractors' staff repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in EMPr, to the satisfaction of the ECO.
<p>contractor Environmental Officer (cEO)</p>	<p><u>Role</u></p> <p>Each Contractor affected by the EMPr should appoint a cEO, who is responsible for the on-site implementation of the EMPr (or relevant sections of the EMPr). The Contractor's representative can be the site agent; site engineer; a dedicated environmental officer; or an independent consultant. The Contractor must ensure that the Contractor's Representative is suitably qualified to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the Environmental Control Officer and the public. As a minimum the cEO shall meet the following criteria:</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - Be on site throughout the duration of the project and be dedicated to the project; - Ensure all their staff are aware of the environmental requirements, conditions and constraints with respect to all of their activities on site;

Responsible Person (s)	Role and Responsibilities
	<ul style="list-style-type: none"> - Implementing the environmental conditions, guidelines and requirements as stipulated within the EA, EMPr and Method Statements; - Attend the Environmental Site Meeting; - Undertaking corrective actions where non-compliances are registered within the stipulated timeframes; - Report back formally on the completion of corrective actions; - Assist the ECO in maintaining all the site documentation; - Prepare the site inspection reports and corrective action reports for submission to the ECO; - Assist the ECO with the preparing of the monthly report; and - Where more than one Contractor is undertaking work on site, each company appointed as a Contractor will appoint a cEO representing that company.

4. ENVIRONMENTAL DOCUMENTATION REPORTING AND COMPLIANCE

To ensure accountable and demonstrated implementation of the EMPr, a number of reporting systems, documentation controls and compliance mechanisms must be in place for all overhead electricity transmission and distribution infrastructure projects as a minimum requirement.

4.1 Document control/Filing system

The holder of the EA is solely responsible for the upkeep and management of the EMPr file. At a minimum, all documentation detailed below will be stored in the EMPr file. A hard copy of all documentation shall be filed, while an electronic copy may be kept where relevant. A duplicate file will be maintained in the office of the DSS (where applicable). This duplicate file must remain current and up-to-date. The filing system must be updated and relevant documents added as required. The EMPr file must be made available at all times on request by the CA or other relevant authorities. The EMPr file will form part of any environmental audits undertaken as prescribed in the EIA Regulations.

4.2 Documentation to be available

At the outset of the project the following preliminary list of documents shall be placed in the filing system and be accessible at all times:

- Full copy of the signed EA from the CA in terms of NEMA, granting approval for the development or expansion;
- Copy of the generic and site specific EMPr as well as any amendments thereof;
- Copy of declaration of implementing generic EMPr and subsequent approval of site specific EMPr and amendments thereof;
- All method statements;
- Completed environmental checklists;
- Minutes and attendance register of environmental site meetings;
- An up-to-date environmental incident log;
- A copy of all instructions or directives issued;
- A copy of all corrective actions signed off. The corrective actions must be filed in such a way that a clear reference is made to the non-compliance record;
- Complaints register.

4.3 Weekly Environmental Checklist

The ECOs are required to complete a Weekly Environmental Checklist, the format of which is to be agreed prior to commencement of the activity. The ECOs are required to sign and date the checklist, retain a copy in the EMPr file and submit a copy of the completed checklist to the DSS on a weekly basis.

The checklists will form the basis for the Monthly Environmental Reports. Copies of all completed checklists will be attached as Annexures to the Environmental Audit Report as required in terms of the EIA Regulations.

4.4 Environmental site meetings

Minutes of the environmental site meetings shall be kept. The minutes must include an attendance register and will be attached to the Monthly Report that is distributed to attendees. Each set of minutes must clearly record "Matters for Attention" that will be reviewed at the next meeting.

4.5 Required Method Statements

The method statement will be done in such detail that the ECOs are enabled to assess whether the contractor's proposal is in accordance with the EMPr.

The method statement must cover applicable details with regard to:

- development procedures;
- materials and equipment to be used;
- getting the equipment to and from site;
- how the equipment/ material will be moved while on site;
- how and where material will be stored;
- the containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- timing and location of activities;
- compliance/ non-compliance with the EMPr; and
- any other information deemed necessary by the ECOs.

Unless indicated otherwise by the Project Manager, the Contractor shall provide the following method statements to the Project Manager no less than 14 days prior to the commencement date of the activity:

- Site establishment – Camps, Lay-down or storage areas, satellite camps, infrastructure;
- Batch plants;
- Workshop or plant servicing;
- Handling, transport and storage of Hazardous Chemical Substance's;
- Vegetation management – Protected, clearing, aliens, felling;
- Access management – Roads, gates, crossings etc.;
- Fire plan;
- Waste management – transport, storage, segregation, classification, disposal (all waste streams);
- Social interaction – complaints management, compensation claims, access to properties etc.;
- Water – use (source, abstraction and disposal), access and all related information, crossings and mitigation;
- Emergency preparedness – Spills, training, other environmental emergencies;
- Dust and noise management methodologies;
- Fauna interaction and risk management – only if the risk was identified – wildlife interaction especially on game farms; and
- Heritage and palaeontology management.

The ECOs shall monitor and ensure that the contractors perform in accordance with these method statements. Completed and agreed method statements between the holder of the EA and the contractor shall be captured in Appendix 1.

4.6 Environmental Incident Log (Diary)

The ECOs are required to maintain an up-to-date and current Environmental Incident Log (environmental diary). The Environmental Incident Log is a means to record all environmental incidents and/or all non-compliance notice would not be issued. An environmental incident is defined as:

- Any deviation from the listed impact management actions (listed in this EMPr) that may be addressed immediately by the ECOs. (For example a contractor's staff member littering or a drip tray that has not been emptied);
- Any environmental impact resulting from an action or activity by a contractor in contravention of the environmental stipulations and guidelines listed in the EMPr which as a single event would have a minor impact but which if cumulative and continuous would have a significant effect (for example no toilet paper available in the ablutions for an afternoon); and
- General environmental information such as road kills or injured wildlife.

The ECOs are to record all environmental incidents in the Environmental Incident Log. All incidents regardless of severity must be reported to the Developer. The Log is to be kept in the EMPr file and at a minimum the following will be recorded for each environmental incident:

- The date and time of the incident;
- Description of the incident;
- The name of the Contractor responsible;
- The incident must be listed as significant or minor;
- If the incident is listed as significant, a non-compliance notice must be issued, and recorded in the log;
- Remedial or corrective action taken to mitigate the incident; and
- Record of repeat minor offences by the same contractor or staff member.

The Environmental Incident Log will be captured in the EAR.

4.7 Non-compliance

A non-compliance notice will be issued to the responsible contractor by the ECOs via the DSS or Project Manager. The non-compliance notice will be issued in writing; a copy filed in the EMPr file and will at a minimum include the following:

- Time and date of the non-compliance;
- Name of the contractor responsible;
- Nature and description of the non-compliance;
- Recommended / required corrective action; and
- Date by which the corrective action to be completed.
- The contractors shall act immediately when a notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the development site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken. The ECO should be made aware of any complaints. Any non-compliance with the agreed procedures of the EMPr is a transgression of the

various statutes and laws that define the manner by which the environment is managed. Failure to redress the cause shall be reported to the relevant CA for them to deal with the transgression, as it deems fit. The contractor is deemed not to have complied with the EMPr if, inter alia, There is a deviation from the environmental conditions, impact management outcomes and impact management actions , as approved in generic and site specific EMPr as relevant as set out in the EMPr, which deviation has, or may cause, an environmental impact.

4.8 Corrective action records

For each non-compliance notice issued, a documented corrective action must be recorded. On receiving a non-compliance notice from the DSS, the contractor's cEO will ensure that the corrective actions required take place within the stipulated timeframe. On completion of the corrective action the cEO is to issue a Corrective Action Report in writing to the ECOs. If satisfied that the corrective action has been completed, the ECOs are to sign-off on the Corrective Action Report, and attach the report to the non-compliance notice in the EMPr file. A corrective action is considered complete once the report has signed off by the ECOs.

4.9 Photographic record

A digital photographic record will be kept. The photographic record will be used to show before, during and post rehabilitation evidence of the project as well used in cases of damages claims if they arise. Each image must be dated and a brief description note attached.

The Contractor shall:

1. Allow the ECOs access to take photographs of all areas, activities and actions.

The ECOs shall keep an electronic database of photographic records which will include:

1. Pictures of all areas designated as work areas, camp areas, development sites and storage areas taken before these areas are set up;
2. All bunding and fencing;
3. Road conditions and road verges;
4. Condition of all farm fences;
5. Topsoil storage areas;
6. All areas to be cordoned off during construction;
7. Waste management sites;
8. Ablution facilities (inside and out);
9. Any non-conformances deemed to be "significant";
10. All completed corrective actions for non-compliances;
11. All required signage;
12. Photographic recordings of incidents;
13. All areas before, during and post rehabilitation; and
14. Include relevant photographs in the Final Environmental Audit Report.

4.10 Complaints register

The ECOs shall keep a current and up-to-date complaints register. The complaints register is to be a record of all complaints received from communities, stakeholders and individuals. The Complaints Record shall:

1. Record the name and contact details of the complainant;
2. Record the time and date of the complaint;
3. Contain a detailed description of the complaint;
4. Where relevant and appropriate, contain photographic evidence of the complaint or damage (ECOs to take relevant photographs); and
5. Contain a copy of the ECOs written response to each complaint received and keep a record of any further correspondence with the complainant. The ECO's written response will include a description of any corrective action to be taken and must be signed by the Contractor, ECO and affected party. Where a damage claim is issued by the complainant, the ECOs shall respond as described in **(section 4.11)** below.

4.11 Claims for damages

In the event that a Claim for Damages is submitted by a community, landowner or individual, the ECOs shall:

1. Record the full detail of the complaint as described in **(section 4.10)** above;
2. The DPM will evaluate the claim and associated damage and submit the evaluation to the Senior Site Representative for approval;
3. Following consideration by the DPM, the claim is to be resolved and settled immediately, or the reason for not accepting the claim communicated in writing to the claimant. Should the claimant not accept this, the ECO shall, in writing report the incident to the Developer's negotiator and legal department; and
4. A formal record of the response by the ECOs to the claimant as well as the rectification of the method of making payments not amount will be recorded in the EMPr file.

4.12 Interactions with affected parties

Open, transparent and good relations with affected landowners, communities and regional staff are an essential aspect to the successful management and mitigation of environmental impacts.

The ECOs shall:

1. Ensure that all queries, complaints and claims are dealt within an agreed timeframe;
2. Ensure that any or all agreements are documented, signed by all parties and a record of the agreement kept in the EMPr file;
3. Ensure that a complaints telephone numbers are made available to all landowners and affected parties; and
4. Ensure that contact with affected parties is courteous at all times;

4.13 Environmental audits

Internal environmental audits of the activity and implementation of the EMPr must be undertaken. The findings and outcomes must be included in the EMPr file and be submitted to the CA at intervals as indicated in the EA.

An Environmental Audit Report must be prepared monthly. The report will be tabled as the key point on the agenda of the Environmental Site Meeting. The Report is submitted for acceptance at the meeting and the final report will be circulated to the Project Manager and filed in the EMPr file. At a frequency determined by the EA, the ECOs shall submit the monthly reports to the CA. At a minimum the monthly report is to cover the following:

- Weekly Environmental Checklists;
- Deviations and non-compliances with the checklists;
- Non-compliances issued;
- Completed and reported corrective actions;
- Environmental Monitoring;
- General environmental findings and actions; and
- Minutes of the Bi-monthly Environmental Site Meetings.

4.14 Final environmental audits

On final completion of the rehabilitation and/or requirements of the EA a final EAR is to be prepared and submitted to the CA. The EAR must comply with Appendix 7 of the EIA Regulations.

PART B: SECTION 1: Pre-approved generic EMPr template

5. IMPACT MANAGEMENT OUTCOMES AND IMPACT MANAGEMENT ACTIONS

This section provides a pre-approved generic EMPr template with aspects that are common to the development of overhead electricity transmission and distribution infrastructure. There is a list of aspects identified for the development or expansion of overhead electricity transmission and distribution infrastructure, and for each aspect a set of prescribed impact management outcomes and associated impact management actions have been identified. Holders of EAs are responsible to ensure the implementation of these outcomes and actions for all projects as a minimum requirement, in order to mitigate the impact of such aspects identified for the development or expansion of overhead electricity transmission and distribution infrastructure.

The template provided below is to be completed by providing the information under each heading for each environmental impact management action.

The completed template must be signed and dated on each page by both the contractor and the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as Appendix 1. Each method statement must also be duly signed and dated on each page by the contractor and the holder of the EA. This template, once signed and dated, is legally binding. The holder of the EA will remain responsible for its implementation.

5.1 Environmental awareness training

Impact management outcome: All onsite staff are aware and understands the individual responsibilities in terms of this EMPr.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - All staff must receive environmental awareness training prior to commencement of the activities; - The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course; - Refresher environmental awareness training is available as and when required; - All staff are aware of the conditions and controls linked to the EA and within the EMPr and made aware of their individual roles and responsibilities in achieving compliance with the EA and EMPr; - The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum: <ul style="list-style-type: none"> a) Safety notifications; and b) No littering. - Environmental awareness training must include as a minimum the following: <ul style="list-style-type: none"> a) Description of significant environmental impacts, actual or potential, related to their work activities; b) Mitigation measures to be implemented when carrying out specific activities; c) Emergency preparedness and response procedures; 						

<ul style="list-style-type: none"> d) Emergency procedures; e) Procedures to be followed when working near or within sensitive areas; f) Wastewater management procedures; g) Water usage and conservation; h) Solid waste management procedures; i) Sanitation procedures; j) Fire prevention; and k) Disease prevention. <ul style="list-style-type: none"> – A record of all environmental awareness training courses undertaken as part of the EMPr must be available; – Educate workers on the dangers of open and/or unattended fires; – A staff attendance register of all staff to have received environmental awareness training must be available. – Course material must be available and presented in appropriate languages that all staff can understand. 						
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5.2 Site Establishment development

Impact management outcome: Impacts on the environment are minimised during site establishment and the development footprint are kept to demarcated development area.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> – A method statement must be provided by the contractor prior to any onsite activity that includes the layout of the construction camp in the form of a plan showing the location 						

<p>of key infrastructure and services (where applicable), including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous materials storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management;</p> <ul style="list-style-type: none"> - Location of camps must be within approved area to ensure that the site does not impact on sensitive areas identified in the environmental assessment or site walk through; - Sites must be located where possible on previously disturbed areas; - The camp must be fenced in accordance with Section 5.5: Fencing and gate installation; and - The use of existing accommodation for contractor staff, where possible, is encouraged. 						
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5.3 Access restricted areas

Impact management outcome: Access to restricted areas prevented.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Identification of access restricted areas is to be informed by the environmental assessment, site walk through and any additional areas identified during development; - Erect, demarcate and maintain a temporary barrier with clear signage around the perimeter of any access restricted 						

<p>area, colour coding could be used if appropriate; and</p> <ul style="list-style-type: none"> – Unauthorised access and development related activity inside access restricted areas is prohibited. 						
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5.4 Access roads

<p>Impact management outcome: Minimise impact to the environment through the planned and restricted movement of vehicles on site.</p>						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> – Access to the servitude and tower positions must be negotiated with the relevant landowner and must fall within the assessed and authorised area; – An access agreement must be formalised and signed by the DPM, Contractor and landowner before commencing with the activities; – The access roads to tower positions must be signposted after access has been negotiated and before the commencement of the activities; – All private roads used for access to the servitude must be maintained and upon completion of the works, be left in at least the original condition – All contractors must be made aware of all these access routes. – Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the contractor's expense; – Maximum use of both existing servitudes and existing roads must be made to minimize further disturbance through the 						

<p>development of new roads;</p> <ul style="list-style-type: none"> - In circumstances where private roads must be used, the condition of the said roads must be recorded in accordance with section 4.9: photographic record; prior to use and the condition thereof agreed by the landowner, the DPM, and the contractor; - Access roads in flattish areas must follow fence lines and tree belts to avoid fragmentation of vegetated areas or croplands - Access roads must only be developed on pre-planned and approved roads. 						
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5.5 Fencing and Gate installation

Impact management outcome: Minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Use existing gates provided to gain access to all parts of the area authorised for development, where possible; - Existing and new gates to be recorded and documented in accordance with section 4.9: photographic record; - All gates must be fitted with locks and be kept locked at all times during the development phase, unless otherwise agreed with the landowner; - At points where the line crosses a fence in which there is no suitable gate within the extent of the line servitude, on the instruction of the DPM, a gate must be installed at the approval of the landowner; 						

<ul style="list-style-type: none"> - Care must be taken that the gates must be so erected that there is a gap of no more than 100 mm between the bottom of the gate and the ground; - Where gates are installed in jackal proof fencing, a suitable reinforced concrete sill must be provided beneath the gate; - Original tension must be maintained in the fence wires; - All gates installed in electrified fencing must be re-electrified; - All demarcation fencing and barriers must be maintained in good working order for the duration of overhead transmission and distribution electricity infrastructure development activities; - Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas, where appropriate and would not cause harm to the sensitive flora; - Any temporary fencing to restrict the movement of life-stock must only be erected with the permission of the land owner. - All fencing must be developed of high quality material bearing the SABS mark; - The use of razor wire as fencing must be avoided; - Fenced areas with gate access must remain locked after hours, during weekends and on holidays if staff is away from site. Site security will be required at all times; - On completion of the development phase all temporary fences are to be removed; - The contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground level but rather removed completely. 						
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5.6 Water Supply Management

Impact management outcome: Undertake responsible water usage.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - All abstraction points or bore holes must be registered with the DWS and suitable water meters installed to ensure that the abstracted volumes are measured on a daily basis; - The Contractor must ensure the following: <ul style="list-style-type: none"> a. The vehicle abstracting water from a river does not enter or cross it and does not operate from within the river; b. No damage occurs to the river bed or banks and that the abstraction of water does not entail stream diversion activities; and c. All reasonable measures to limit pollution or sedimentation of the downstream watercourse are implemented. - Ensure water conservation is being practiced by: <ul style="list-style-type: none"> a. Minimising water use during cleaning of equipment; b. Undertaking regular audits of water systems; and c. Including a discussion on water usage and conservation during environmental awareness training. d. The use of grey water is encouraged. 						

5.7 Storm and waste water management

Impact management outcome: Impacts to the environment caused by storm water and wastewater discharges during construction are avoided.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Runoff from the cement/ concrete batching areas must be strictly controlled, and contaminated water must be collected, stored and either treated or disposed of off-site, at a location approved by the project manager; - All spillage of oil onto concrete surfaces must be controlled by the use of an approved absorbent material and the used absorbent material disposed of at an appropriate waste disposal facility; - Natural storm water runoff not contaminated during the development and clean water can be discharged directly to watercourses and water bodies, subject to the Project Manager's approval and support by the ECO; - Water that has been contaminated with suspended solids, such as soils and silt, may be released into watercourses or water bodies only once all suspended solids have been removed from the water by settling out these solids in settlement ponds. The release of settled water back into the environment must be subject to the Project Manager's approval and support by the ECO. 						

5.8 Solid and hazardous waste management

Impact management outcome: Waste is appropriately stored, handled and safely disposed of at a recognised waste facility.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - All measures regarding waste management must be undertaken using an integrated waste management approach; - Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided; - A suitably positioned and clearly demarcated waste collection site must be identified and provided; - The waste collection site must be maintained in a clean and orderly manner; - Waste must be segregated into separate bins and clearly marked for each waste type for recycling and safe disposal; - Staff must be trained in waste segregation; - Bins must be emptied regularly; - General waste produced onsite must be disposed of at registered waste disposal sites/ recycling company; - Hazardous waste must be disposed of at a registered waste disposal site; - Certificates of safe disposal for general, hazardous and recycled waste must be maintained. 						

5.9 Protection of watercourses and estuaries

Impact management outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - All watercourses must be protected from direct or indirect spills of pollutants such as solid waste, sewage, cement, oils, fuels, chemicals, aggregate tailings, wash and contaminated water or organic material resulting from the Contractor's activities; - In the event of a spill, prompt action must be taken to clear the polluted or affected areas; - Where possible, no development equipment must traverse any seasonal or permanent wetland - No return flow into the estuaries must be allowed and no disturbance of the Estuarine Functional Zone should occur; - Development of permanent watercourse or estuary crossing must only be undertaken where no alternative access to tower position is available; - There must not be any impact on the long term morphological dynamics of watercourses or estuaries; - Existing crossing points must be favored over the creation of new crossings (including temporary access) - When working in or near any watercourse or estuary, the following environmental controls and consideration must be taken: <ul style="list-style-type: none"> a) Water levels during the period of construction; No altering of the bed, banks, course or characteristics of a watercourse 						

<p>b) During the execution of the works, appropriate measures to prevent pollution and contamination of the riparian environment must be implemented e.g. including ensuring that construction equipment is well maintained;</p> <p>c) Where earthwork is being undertaken in close proximity to any watercourse, slopes must be stabilised using suitable materials, i.e. sandbags or geotextile fabric, to prevent sand and rock from entering the channel; and</p> <p>d) Appropriate rehabilitation and re-vegetation measures for the watercourse banks must be implemented timeously. In this regard, the banks should be appropriately and incrementally stabilised as soon as development allows.</p>						
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5.10 Vegetation clearing

<p>Impact management outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.</p>						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<p>General:</p> <ul style="list-style-type: none"> - Indigenous vegetation which does not interfere with the development must be left undisturbed; - Protected or endangered species may occur on or near the development site. Special care should be taken not to damage such species; - Search, rescue and replanting of all protected and endangered species likely to be damaged during project development must be identified by the relevant specialist and completed prior to any development or clearing; 						

<ul style="list-style-type: none"> - Permits for removal must be obtained from the Department of Agriculture, Forestry and Fisheries prior to the cutting or clearing of the affected species, and they must be filed; - The Environmental Audit Report must confirm that all identified species have been rescued and replanted and that the location of replanting is compliant with conditions of approvals; - Trees felled due to construction must be documented and form part of the Environmental Audit Report; - Rivers and watercourses must be kept clear of felled trees, vegetation cuttings and debris; - Only a registered pest control operator may apply herbicides on a commercial basis and commercial application must be carried out under the supervision of a registered pest control operator, supervision of a registered pest control operator or is appropriately trained; - A daily register must be kept of all relevant details of herbicide usage; - No herbicides must be used in estuaries; - All protected species and sensitive vegetation not removed must be clearly marked and such areas fenced off in accordance to Section 5.3: Access restricted areas. <p>Servitude:</p> <ul style="list-style-type: none"> - Vegetation that does not grow high enough to cause interference with overhead transmission and distribution infrastructures, or cause a fire hazard to any plantation, must not be cut or trimmed unless it is growing in the road access area, and then only at the discretion of the Project Manager; - Where clearing for access purposes is essential, the maximum width to be cleared within the servitude must be in accordance to distance as agreed between the land 						
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<p>owner and the EA holder</p> <ul style="list-style-type: none"> - Alien invasive vegetation must be removed according to a plan (in line with relevant municipal and provincial procedures, guidelines and recommendations) and disposed of at a recognised waste disposal facility; - Vegetation must be trimmed where it is likely to intrude on the minimum vegetation clearance distance (MVCD) or will intrude on this distance before the next scheduled clearance. MVCD is determined from SANS 10280; - Debris resulting from clearing and pruning must be disposed of at a recognised waste disposal facility, unless the landowners wish to retain the cut vegetation; - In the case of the development of new overhead transmission and distribution infrastructures, a one metre "trace-line" must be cut through the vegetation for stringing purposes only and no vehicle access must be cleared along the "trace-line". Alternative methods of stringing which limit impact to the environment must always be considered. 						
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5.11 Protection of fauna

Impact management outcome: Minimise disturbance to fauna.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - No interference with livestock must occur without the landowner's written consent and with the landowner or a person representing the landowner being present; - The breeding sites of raptors and other wild birds species must be taken into consideration during the planning of the 						

<p>development programme;</p> <ul style="list-style-type: none"> - Breeding sites must be kept intact and disturbance to breeding birds must be avoided. Special care must be taken where nestlings or fledglings are present; - Nesting sites on existing parallel lines must be documented; - Special recommendations of the avian specialist must be adhered to at all times to prevent unnecessary disturbance of birds; - Bird guards and diverters must be installed on the new line as per the recommendations of the specialist; - No poaching must be tolerated under any circumstances. All animal dens in close proximity to the works areas must be marked as Access restricted areas; - No deliberate or intentional killing of fauna is allowed; - In areas where snakes are abundant, snake deterrents to be deployed on the pylons to prevent snakes climbing up, being electrocuted and causing power outages; and - No Threatened or Protected species (ToPs) and/or protected fauna as listed according NEMBA (Act No. 10 of 2004) and relevant provincial ordinances may be removed and/or relocated without appropriate authorisations/permits. 						
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5.12 Protection of heritage resources

<p>Impact management outcome: Minimise impact to heritage resources.</p>						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Identify, demarcate and prevent impact to all known 						

<p>sensitive heritage features on site in accordance with the No-Go procedure in Section 5.3: Access restricted areas;</p> <ul style="list-style-type: none"> - Carry out general monitoring of excavations for potential fossils, artefacts and material of heritage importance; - All work must cease immediately, if any human remains and/or other archaeological, palaeontological and historical material are uncovered. Such material, if exposed, must be reported to the nearest museum, archaeologist/palaeontologist (or the South African Police Services), so that a systematic and professional investigation can be undertaken. Sufficient time must be allowed to remove/collect such material before development recommences. 						
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5.13 Safety of the public

<p>Impact management outcome: All precautions are taken to minimise the risk of injury, harm or complaints.</p>						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Identify fire hazards, demarcate and restrict public access to these areas as well as notify the local authority of any potential threats e.g. large brush stockpiles, fuels etc.; - All unattended open excavations must be adequately fenced or demarcated; - Adequate protective measures must be implemented to prevent unauthorised access to and climbing of partly constructed towers and protective scaffolding; - Ensure structures vulnerable to high winds are secured; - Maintain an incidents and complaints register in which all 						

incidents or complaints involving the public are logged.						
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5.14 Sanitation

Impact management outcome: Clean and well maintained toilet facilities are available to all staff in an effort to minimise the risk of disease and impact to the environment.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Mobile chemical toilets are installed onsite if no other ablution facilities are available; - The use of ablution facilities and or mobile toilets must be used at all times and no indiscriminate use of the veld for the purposes of ablutions must be permitted under any circumstances; - Where mobile chemical toilets are required, the following must be ensured: <ul style="list-style-type: none"> a) Toilets are located no closer than 100 m to any watercourse or water body; b) Toilets are secured to the ground to prevent them from toppling due to wind or any other cause; c) No spillage occurs when the toilets are cleaned or emptied and the contents are managed in accordance with the EMPr; d) Toilets have an external closing mechanism and are closed and secured from the outside when not in use to prevent toilet paper from being blown out; e) Toilets are emptied before long weekends and workers holidays, and must be locked after working hours; f) Toilets are serviced regularly and the ECO must inspect 						

toilets to ensure compliance to health standards; – A copy of the waste disposal certificates must be maintained.						
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5.15 Prevention of disease

Impact Management outcome: All necessary precautions linked to the spread of disease are taken.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> – Undertake environmentally-friendly pest control in the camp area; – Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV AIDS; – The Contractor must ensure that information posters on AIDS are displayed in the Contractor Camp area; – Information and education relating to sexually transmitted diseases to be made available to both construction workers and local community, where applicable; – Free condoms must be made available to all staff on site at central points; – Medical support must be made available; – Provide access to Voluntary HIV Testing and Counselling Services. 						

5.16 Emergency procedures

Impact management outcome: Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Compile an Emergency Response Action Plan (ERAP) prior to the commencement of the proposed project; - The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation; - All staff must be made aware of emergency procedures as part of environmental awareness training; - The relevant local authority must be made aware of a fire as soon as it starts; - In the event of emergency necessary mitigation measures to contain the spill or leak must be implemented (see Hazardous Substances section 5.17). 						

5.17 Hazardous substances

Impact management outcome: Safe storage, handling, use and disposal of hazardous substances.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - The use and storage of hazardous substances to be minimised and non-hazardous and non-toxic alternatives substituted where possible; - All hazardous substances must be stored in suitable 						

<p>containers as defined in the Method Statement;</p> <ul style="list-style-type: none"> - Containers must be clearly marked to indicate contents, quantities and safety requirements; - All storage areas must be bunded. The bunded area must be of sufficient capacity to contain a spill / leak from the stored containers; - Bunded areas to be suitably lined with a SABS approved liner; - An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date on a continuous basis; - All hazardous chemicals that will be used on site must have Material Safety Data Sheets (MSDS); - All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet; - Employees handling hazardous substances / materials must be aware of the potential impacts and follow appropriate safety measures. Appropriate personal protective equipment must be made available; - The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowsers; - The tanks/ bowsers must be situated on a smooth impermeable surface (concrete) with a permanent bund. The impermeable lining must extend to the crest of the bund and the volume inside the bund must be 130% of the total capacity of all the storage tanks/ bowsers (110% statutory requirement plus an allowance for rainfall); - The floor of the bund must be sloped, draining to an oil separator; 					
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<ul style="list-style-type: none"> - Provision must be made for refueling at the storage area by protecting the soil with an impermeable groundcover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained; - All empty externally dirty drums must be stored on a drip tray or within a bunded area; - No unauthorised access into the hazardous substances storage areas must be permitted; - No smoking must be allowed within the vicinity of the hazardous storage areas; - Adequate fire-fighting equipment must be made available at all hazardous storage areas; - Where refueling away from the dedicated refueling station is required, a mobile refueling unit must be used. Appropriate ground protection such as drip trays must be used; - An appropriately sized spill kit kept onsite relevant to the scale of the activity/s involving the use of hazardous substance must be available at all times; - The responsible operator must have the required training to make use of the spill kit in emergency situations; - An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken; - In the event of a spill, contaminated soil must be collected in containers and stored in a central location and disposed of according to the National Environmental Management: Waste Act 59 of 2008. Refer to Section 5.7 for procedures concerning storm and waste water management and 5.8 for solid and hazardous waste management. 						
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5.18 Workshop, equipment maintenance and storage

Impact management outcome: Soil, surface water and groundwater contamination is minimised.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Where possible and practical all maintenance of vehicles and equipment must take place in the workshop area; - During servicing of vehicles or equipment, especially where emergency repairs are effected outside the workshop area, a suitable drip tray must be used to prevent spills onto the soil. The relevant local authority must be made aware of a fire as soon as it starts; - Leaking equipment must be repaired immediately or be removed from site to facilitate repair; - Workshop areas must be monitored for oil and fuel spills; - Appropriately sized spill kit kept onsite relevant to the scale of the activity taking place must be available; - The workshop area must have a bunded concrete slab that is sloped to facilitate runoff into a collection sump or suitable oil / water separator where maintenance work on vehicles and equipment can be performed; - Water drainage from the workshop must be contained and managed in accordance Section 5.7: storm and waste water management. 						

5.19 Batching plants

Impact management outcome: Minimise spillages and contamination of soil, surface water and groundwater.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Concrete mixing must be carried out on an impermeable surface; - Batching plants areas must be fitted with a containment facility for the collection of cement laden water. - Dirty water from the batching plant must be contained to prevent soil and groundwater contamination - Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains; - A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted; - Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility; - Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site; - Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to Section 5.20: Dust emissions) - Any excess sand, stone and cement must be removed or reused from site on completion of construction period and disposed at a registered disposal facility; - Temporary fencing must be erected around batching plants 						

in accordance with Section 5.5: Fencing and gate installation.						
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5.20 Dust emissions

Impact management outcome: Dust prevention measures are applied to minimise the generation of dust.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO; - Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be re- vegetated or stabilised as soon as is practically possible; - Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present; - During high wind conditions, the ECO must evaluate the situation and make recommendations as to whether dust-damping measures are adequate, or whether working will cease altogether until the wind speed drops to an acceptable level; - Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind; - Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO; 						

<ul style="list-style-type: none"> - Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas; - Straw stabilisation must be applied at a rate of one bale/10 m² and harrowed into the top 100 mm of top material, for all completed earthworks; - For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust. 						
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5.21 Blasting

Impact management outcome: Impact to the environment is minimised through a safe blasting practice.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Any blasting activity must be conducted by a suitably licensed blasting contractor; and - Notification of surrounding landowners, emergency services site personnel of blasting activity 24 hours prior to such activity taking place on Site. 						

5.22 Noise

Impact Management outcome: Unnecessary noise is prevented by ensuring that noise from construction activities is mitigated.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance

<ul style="list-style-type: none"> - The Contractor must keep noise level within acceptable limits, Restrict the use of sound amplification equipment for communication and emergency only; - All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained; - Any complaints received by the Contractor regarding noise must be recorded and communicated. Where possible or applicable, provide transport to and from the site on a daily basis for construction workers; - Develop a Code of Conduct for the construction phase in terms of behaviour of construction staff. Operating hours as determined by the environmental authorisation are adhered to during the development phase. Where not defined, it must be ensured that development activities must still meet the impact management outcome related to noise management. 						
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5.23 Fire prevention

Impact management outcome: Prevention of uncontrollable fires.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Designate smoking areas where the fire hazard could be regarded as insignificant; - Firefighting equipment must be available on all vehicles located on site; - The local Fire Protection Agency (FPA) must be informed of construction activities; - Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site; 						

- Two way swop of contact details between ECO and FPA.						
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5.24 Stockpiling and stockpile areas

Impact management outcome: Erosion and sedimentation as a result of stockpiling are reduced.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - All material that is excavated during the project development phase (either during piling (if required) or earthworks) must be stored appropriately on site in order to minimise impacts to watercourses, watercourses and water bodies; - All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods; - Topsoil stockpiles must not exceed 2 m in height; - During periods of strong winds and heavy rain, the stockpiles must be covered with appropriate material (e.g. cloth, tarpaulin etc.); - Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material in order to prevent erosion of the material. 						

5.25 Finalising tower positions

Impact management outcome: No environmental degradation occurs as a result of the survey and pegging operations.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - No vegetation clearing must occur during survey and pegging operations; - No new access roads must be developed to facilitate access for survey and pegging purposes; - Project manager, botanical specialist and contractor to agree on final tower positions based on survey within assessed and approved areas; - The surveyor is to demarcate (peg) access roads/tracks in consultation with ECO. No deviations will be allowed without the prior written consent from the ECO. 						

5.26 Excavation and Installation of foundations

Impact management outcome: No environmental degradation occurs as a result of excavation or installation of foundations.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - All excess spoil generated during foundation excavation must be disposed of in an appropriate manner and at a recognised disposal site, if not used for backfilling purposes; - Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes; - Management of equipment for excavation purposes must 						

<p>be undertaken in accordance with Section 5.18: Workshop equipment maintenance and storage; and</p> <ul style="list-style-type: none"> – Hazardous substances spills from equipment must be managed in accordance with Section 5.17: Hazardous substances. – Batching of cement to be undertaken in accordance with Section 5.19 : Batching plants; – Residual cement must be disposed of in accordance with Section 5.8: Solid and hazardous waste management. 						
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5.27 Assembly and erecting towers

Impact management outcome: No environmental degradation occurs as a result of assembly and erecting of towers.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> – Prior to erection, assembled towers and tower sections must be stored on elevated surface (suggest wooden blocks) to minimise damage to the underlying vegetation; – In sensitive areas, tower assembly must take place off-site or away from sensitive positions; – The crane used for tower assembly must be operated in a manner which minimises impact to the environment; – The number of crane trips to each site must be minimised; – Wheeled cranes must be utilised in preference to tracked cranes; – Consideration must be given to erecting towers by helicopter or by hand where it is warranted to limit the extent of environmental impact; – Access to tower positions to be undertaken in accordance 						

<p>with access requirements in specified in Section 8.4: Access Roads;</p> <ul style="list-style-type: none"> - Vegetation clearance to be undertaken in accordance with general vegetation clearance requirements specified in Section 8.10: Vegetation clearing; - No levelling at tower sites must be permitted unless approved by the Development Project Manager or Developer Site Supervisor; - Topsoil must be removed separately from subsoil material and stored for later use during rehabilitation of such tower sites; - Topsoil must be stored in heaps not higher than 1m to prevent destruction of the seed bank within the topsoil; - Excavated slopes must be no greater than 1:3, but where this is unavoidable, appropriate measures must be undertaken to stabilise the slopes; - Fly rock from blasting activity must be minimised and any pieces greater than 150 mm falling beyond the Working Area, must be collected and removed; - Only existing disturbed areas are utilised as spoil areas; - Drainage is provided to control groundwater exit gradient with the spill areas such that migration of fines is kept to a minimum; - Surface water runoff is appropriately channeled through or around spoil areas; - During backfilling operations, care must be taken not to dump the topsoil at the bottom of the foundation and then put spoil on top of that; - The surface of the spoil is appropriately rehabilitated in accordance with the requirements specified in Section 5.29: Landscaping and rehabilitation; 						
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<ul style="list-style-type: none"> - The retained topsoil must be spread evenly over areas to be rehabilitated and suitably compacted to effect re-vegetation of such areas to prevent erosion as soon as construction activities on the site is complete. Spreading of topsoil must not be undertaken at the beginning of the dry season. 						
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5.28 Stringing

Impact management outcome: No environmental degradation occurs as a result of stringing.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Where possible, previously disturbed areas must be used for the siting of winch and tensioner stations. In all other instances, the siting of the winch and tensioner must avoid Access restricted areas and other sensitive areas; - The winch and tensioner station must be equipped with drip trays in order to contain any fuel, hydraulic fuel or oil spills and leaks; - Refueling of the winch and tensioner stations must be undertaken in accordance with Section 5.17: Hazardous substances; - In the case of the development of overhead transmission and distribution infrastructure, a one metre "trace-line" may be cut through the vegetation for stringing purposes only and no vehicle access must be cleared along "trace-lines". Vegetation clearing must be undertaken by hand, using chainsaws and hand held implements, with vegetation being cut off at ground level. No tracked or wheeled 						

<p>mechanised equipment must be used;</p> <ul style="list-style-type: none"> - Alternative methods of stringing which limit impact to the environment must always be considered e.g. by hand or by using a helicopter; - Where the stringing operation crosses a public or private road or railway line, the necessary scaffolding/ protection measures must be installed to facilitate access. If, for any reason, such access has to be closed for any period(s) during development, the persons affected must be given reasonable notice, in writing; - No services (electrical distribution lines, telephone lines, roads, railways lines, pipelines fences etc.) must be damaged because of stringing operations. Where disruption to services is unavoidable, persons affected must be given reasonable notice, in writing; - Where stringing operations cross cultivated land, damage to crops is restricted to the minimum required to conduct stringing operations, and reasonable notice (10 work days minimum), in writing, must be provided to the landowner; - Necessary scaffolding protection measures must be installed to prevent damage to the structures supporting certain high value agricultural areas such as vineyards, orchards, nurseries. 						
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5.29 Socio-economic

Impact management outcome: Socio-economic development is enhanced.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance

<ul style="list-style-type: none"> - Develop and implement communication strategies to facilitate public participation; - Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process; - Sustain continuous communication and liaison with neighboring owners and residents - Create work and training opportunities for local stakeholders; and - Where feasible, no workers, with the exception of security personnel, must be permitted to stay over-night on the site. This would reduce the risk to local farmers. 						
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5.30 Temporary closure of site

Impact management outcome: Minimise the risk of environmental impact during periods of site closure greater than five days.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Bunds must be emptied (where applicable) and need to be undertaken in accordance with the impact management actions included in sections 5.17: management of hazardous substances and 5.18 workshop, equipment maintenance and storage; - Hazardous storage areas must be well ventilated; - Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service; - Emergency and contact details displayed must be displayed; - Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and 						

<p>emergency personnel;</p> <ul style="list-style-type: none"> - Night hazards such as reflectors, lighting, traffic signage etc. must have been checked; - Fire hazards identified and the local authority must have been notified of any potential threats e.g. large brush stockpiles, fuels etc.; - Structures vulnerable to high winds must be secured; - Wind and dust mitigation must be implemented; - Cement and materials stores must have been secured; - Toilets must have been emptied and secured; - Refuse bins must have been emptied and secured; - Drip trays must have been emptied and secured. 						
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5.31 Landscaping and rehabilitation

Impact management outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - All areas disturbed by construction activities must be subject to landscaping and rehabilitation; All spoil and waste must be disposed to a registered waste site and certificates of disposal provided; - All slopes must be assessed for contouring, and to contour only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983 - All slopes must be assessed for terracing, and to terrace only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983; - Berms that have been created must have a slope of 1:4 and 						

<p>be replanted with indigenous species and grasses that approximates the original condition;</p> <ul style="list-style-type: none"> - Where new access roads have crossed cultivated farmlands, that lands must be rehabilitated by ripping which must be agreed to by the holder of the EA and the landowners; - Rehabilitation of tower sites and access roads outside of farmland; - Indigenous species must be used for with species and/grasses to where it compliments or approximates the original condition; - Stockpiled topsoil must be used for rehabilitation (refer to Section 5.24: Stockpiling and stockpiled areas); - Stockpiled topsoil must be evenly spread so as to facilitate seeding and minimise loss of soil due to erosion; - Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed; - Subsoil must be ripped before topsoil is placed; - The rehabilitation must be timed so that rehabilitation can take place at the optimal time for vegetation establishment; - Where impacted through construction related activity, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled ; - Sloped areas stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly; - Spoil can be used for backfilling or landscaping as long as it is covered by a minimum of 150 mm of topsoil. - Where required, re-vegetation including hydro-seeding can be enhanced using a vegetation seed mixture as described below. A mixture of seed can be used provided the mixture 						
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is carefully selected to ensure the following: a) Annual and perennial plants are chosen; b) Pioneer species are included; c) Species chosen must be indigenous to the area with the seeds used coming from the area; d) Root systems must have a binding effect on the soil; e) The final product must not cause an ecological imbalance in the area						
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6 ACCESS TO THE GENERIC EMPr

Once completed and signed, to allow the public access to the generic EMPr, the holder of the EA must make the EMPr available to the public in accordance with the requirements of regulation 26(h) of the EIA Regulations.

PART B: SECTION 2

7 SITE SPECIFIC INFORMATION AND DECLARATION

7.1 Sub-section 1: contact details and description of the project

7.1.1 Details of the applicant:

COMPANY

NAME: ESIZAYO WIND (RF) (PTY) LTD

Contact Person:	Werner Engelbrecht
Postal Address	Building 1, Leslie Ave East Design Quarter District, Fourways P O Box 69408, Bryanston 2021
Telephone:	011 367 4644
Email:	eiaadmin@biothermenergy.com

7.1.2 Details and expertise of the EAP:

NAME OF THE EAP WSP GROUP AFRICA (PTY) LTD

Company Registration:	1999/008928/07
Contact Person:	Ashlea Strong
Physical Address:	Building C, Knightsbridge, 33 Sloane Street, Bryanston, Johannesburg
Postal Address:	P.O. Box 98867, Sloane Park 2151, Johannesburg
Telephone:	011 361 1392
Fax:	011 361 1301
Email:	Ashlea.Strong@wsp.com

7.1.3 Project name:

Proposed Esizayo 132kV Overhead Powerline, near Matjiesfontein in the Western and Northern Cape

7.1.4 Description of the project:

Esizayo Wind (RF) (Pty) Ltd (Esizayo) proposes an alternative transmission integration option which entails the construction of a 132kV overhead powerline (OHPL), approximately 6.5km in length, from the onsite substation at the authorised Esizayo Wind Energy Facility (WEF) to connect to the national grid at the existing Komsberg substation. The transmission line alignment will run in a northerly direction for approximately 6.5km. The Komsberg substation and proposed transmission powerline

are situated near Matjiesfontein in the Laingsburg and Karoo Hoogland Local Municipalities within the Central Karoo and Namaqua District Municipalities of the Western Cape and Northern Cape Provinces, South Africa

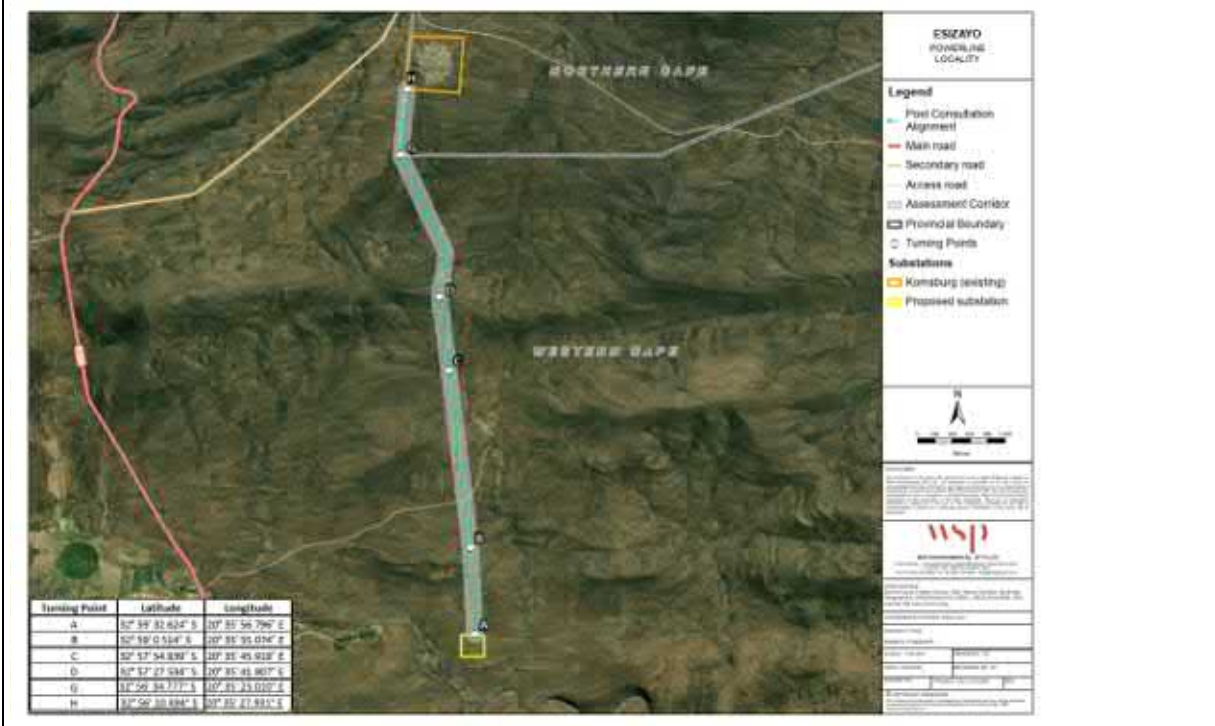
More detail is available in Section 3 of the bespoke EMPr

7.1.5 Project location:

The proposed Project is located in the Ward 2 of the Laingsburg Local Municipality in the Central Karoo District Municipality in the Western Cape Province and ending at the Komsberg substation in Ward 4 of the Karoo Hoogland Local Municipality in the Namakwa District Municipality in the Northern Cape Province. The Project area is located approximately 30km Northeast of Laingsburg in the Western Cape (Figure 3 1).

The proposed OHPL project entails the construction of a 132 kV transmission line from the onsite substation at the authorised Esizayo WEF to connect to the existing Komsberg substation. The transmission line route runs in a northerly direction to the existing Komsberg MTS Substation located approximately 6.5km north of the substation

Refer to Section 3.1 of the bespoke EMPr for additional information



7.16 Preliminary technical specification of the overhead transmission and distribution:

TRANSMISSION LINE

The transmission line will be a 132kV steel single or double structure with kingbird conductor. The powerline towers will either be steel lattice or monopole structures.

Pole positions will only be available once the powerline design has started. It is anticipated that towers will be located approximately 200m to 250m apart.

SERVITUDE

A 200m corridor around the OHPL (100m on either side of the centreline) has been assessed for the purposes of this BAR. The registered servitude will fall within this 200m corridor and will likely be between 36 and 40m. The length of the transmission line is approximately 6.5km, which will result in a servitude area of approximately 26ha.

The servitude is required to ensure safe construction, maintenance and operation of the powerline. Registration of the servitude grants Esizayo the right to erect, operate and maintain the powerline and to access the land to carry out such activities, but it does not constitute full ownership of the land. It should be noted that the OHPL will be ceded to Eskom post-construction. Construction and operation activities and access to the powerline must be carried out with due respect to the affected landowners. The servitude required for the Project will be registered at the Deeds Office and will form part of the title deed of the relevant properties once the environmental authorisation has been obtained.

SUBSTATIONS

An onsite substation will be established within the extent of the authorised Esizayo WEF. The site itself is very homogenous and there are no significant features in the immediate vicinity of the substation location that might be affected by the development. The following infrastructure is proposed:

- A high voltage substation yard to allow for multiple 132 kV feeder bays and transformers;
- The control building, telecommunication infrastructure, oil dams(s) etc; and
- All the access road infrastructure to and within the substation.

The Eskom 400kV Komsberg substation is operational.

SITE ACCESS

The Esizayo WEF and surrounding areas are already easily accessible. The preferred powerline route is accessible via the service roads associated with the authorised Esizayo WEF. New access roads or tracks may be required to provide access to sections of the powerline route. Access roads will be approximately 4m in width and will be mostly a two-track gravel road under the OHPL in order to access pylons for construction and maintenance purposes.

7.2 Sub-section 2: Development footprint site map

This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout. The sensitivity map must be prepared from the national web based environmental screening tool, when available for compulsory use at: <https://screening.environment.gov.za/screeningtool>. The sensitivity map shall identify the nature of each sensitive feature e.g. raptor nest, threatened plant species, archaeological site, etc. Sensitivity maps shall identify features both within the planned working area and any known sensitive features in the surrounding landscape. The overhead transmission and distribution profile shall be illustrated at an appropriate resolution to enable fine scale interrogation. It is recommended that <20 km of overhead transmission and distribution length is illustrated per page in A3 landscape format. Where considered appropriate, photographs of sensitive features in the context of tower positions shall be used.

7.4 Sub-section 4: amendments to site specific information (Part B; section 2)

Should the EA be transferred to a new holder, Part B: Section 2 must be completed by the new holder and submitted with the application for an amendment of the EA in terms of Regulations 29 or 31 of the EIA Regulations, whichever applies. The information submitted for an amendment to an environmental authorisation will be considered to be incomplete should a signed copy of Part B: Section 2 not be submitted. Once approved, Part B: Section 2 forms part of the EMPr for the development and the EMPr becomes legally binding to the new EA holder.

PART C

8 SITE SPECIFIC ENVIRONMENTAL ATTRIBUTES

If any specific environmental sensitivities/attributes are present on the site which require more specific impact management outcomes and impact management actions, not included in the pre-approved generic EMPr template, to manage impacts, those impact management outcomes and actions must be included in this section. These specific management controls must be referenced spatially, and must include impact management outcomes and impact management actions. The management controls including impact management outcomes and impact management actions must be presented in the format of the pre-approved generic EMPr template. This applies only to additional impact management outcomes and impact management actions that are necessary.

If Part C is applicable to the development as authorised in the EA, it is required to be submitted to the CA together with the BAR or EIAR, for consideration of, and decision on, the application for EA. The information in this section must be prepared by an EAP and the name and expertise of the EAP, including the curriculum vitae are to be included. Once approved, Part C forms part of the EMPr for the site and is legally binding.

This section will **not be required** should the site contain no specific environmental sensitivities or attributes.

Sensitivities have been identified on site. Site Specific management outcomes are outlined in Section 8 of the Bespoke EMPr

APPENDIX 1: METHOD STATEMENTS

To be prepared by the contractor prior to commencement of the activity. The method statements are **not required** to be submitted to the CA.

APPENDIX

D GENERIC EMPR FOR THE DEVELOPMENT AND EXPANSION OF SUBSTATION INFRASTRUCTURE FOR THE TRANSMISSION AND DISTRIBUTION OF ELECTRICITY

GENERIC ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) FOR THE DEVELOPMENT AND EXPANSION OF SUBSTATION INFRASTRUCTURE FOR THE TRANSMISSION AND DISTRIBUTION OF ELECTRICITY



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INTRODUCTION

1. Background

The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) requires that an environmental management programme (EMPr) be submitted where an environmental impact assessment (EIA) has been identified as the environmental instrument to be utilised as the basis for a decision on an application for environmental authorisation (EA). The content of an EMPr must either contain the information set out in Appendix 4 of the Environmental Impact Assessment Regulations, 2014, as amended (EIA Regulations) or must be a generic EMPr relevant to an application as identified and gazetted by the Minister in a government notice. Once the Minister has identified, through a government notice that a generic EMPr is relevant to an application for EA, that generic EMPr must be applied by all parties involved in the EA process, including but not limited to the applicant and the competent authority (CA).

2. Purpose

This document constitutes a generic EMPr relevant to applications for the development or expansion of substation infrastructure for the transmission and distribution of electricity, and all listed and specified activities necessary for the realisation of such infrastructure.

3. Objective

The objective of this generic EMPr is to prescribe and pre-approve generally accepted impact management outcomes and impact management actions, which can commonly and repeatedly be used for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of substation infrastructure for the transmission and distribution of electricity. The use of a generic EMPr is intended to reduce the need to prepare and review individual EMPrs for applications of a similar nature.

4. Scope

The scope of this generic EMPr applies to the development or expansion of substation infrastructure for the transmission and distribution of electricity requiring EA in terms of NEMA. This generic EMPr applies to activities requiring EA, mainly activity 11 and 47 of the Environmental Impact Assessment Regulations Listing Notice 1 of 2014, as amended, and activity 9 of the Environmental Impact Assessment Regulations Listing Notice 2 of 2014, as amended, and all associated listed or specified activities necessary for the realization of such infrastructure.

5. Structure of this document

This document is structured in three parts with an Appendix as indicated in the table below:

Part	Section	Heading	Content
A		Provides general guidance and information	Definitions, acronyms, roles & responsibilities and documentation and reporting.

Part	Section	Heading	Content
		and is not legally binding	
B	1	Pre-approved generic EMPr template	<p>Contains generally accepted impact management outcomes and impact management actions required for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of substation infrastructure for the transmission and distribution of electricity, which are presented in the form of a template that has been pre-approved.</p> <p>The template in this section is to be completed by the contractor, with each completed page signed and dated by the holder of the EA prior to commencement of the activity.</p> <p>Where an impact management outcome is not relevant, the words “not applicable” can be inserted in the template under the “responsible persons” column.</p> <p>Once completed and signed, the template represents the EMPr for the activity approved by the CA and is legally binding. The template is not required to be submitted to the CA as once the generic EMPr is gazetted for implementation, it has been approved by the CA.</p> <p>To allow interested and affected parties access to the pre-approved EMPr template for consideration through the decision-making process, the EAP on behalf of the applicant /proponent must make the hard copy of this EMPr available at a public location and where the applicant has a website, the EMPr should also be made available on such publicly accessible website.</p>
	2	Site specific information	<p>Contains preliminary infrastructure layout and a declaration that the applicant/holder of the EA will comply with the pre-approved generic EMPr template contained in <u>Part B: Section 1</u>, and understands that the impact management outcomes and impact management actions are legally binding. The preliminary infrastructure layout must be</p>

Part	Section	Heading	Content
			<p>finalized to inform the final EMPr that is to be submitted with the basic assessment report (BAR) or environmental impact assessment report (EIAR), ensuring that all impact management outcomes and impact management actions have been either pre-approved or approved in terms of <u>Part C</u>.</p> <p>This section must be submitted to the CA together with the final BAR or EIAR. The information submitted to the CA will be considered to be incomplete should a signed copy of <u>Part B: section 2</u> not be submitted. Once approved, this Section forms part of the EMPr for the development and is legally binding.</p>
C		Site specific sensitivities/ attributes	<p>If any specific environmental sensitivities/ attributes are present on the site which require site specific impact management outcomes and impact management actions, not included in the pre-approved generic EMPr, to manage impacts, these specific impact management outcomes and impact management actions must be included in this section. These specific environmental attributes must be referenced spatially and impact management outcomes and impact management actions must be provided. These specific impact management outcomes and impact management actions must be presented in the format of the pre-approved EMPr template (<u>Part B: section 1</u>)</p> <p>This section will not be required should the site contain no specific environmental sensitivities or attributes. However, if <u>Part C</u> is applicable to the site, it is required to be submitted together with the BAR or EIAR, for consideration of, and decision on, the application for EA. The information in this section must be prepared by an EAP and must contain his/her name and expertise including a curriculum vitae. Once approved, Part C forms part of the EMPr for the site and is legally binding.</p> <p>This section applies only to additional impact management outcomes and impact</p>

Part	Section	Heading	Content
			management actions that are necessary for the avoidance, management and mitigation of impacts and risks associated with the specific development or expansion and which are not already included in <u>Part B: section 1</u> .
Appendix 1			Contains the method statements to be prepared prior to commencement of the activity. The method statements are not required to be submitted to the competent authority.

6. Completion of part B: section 1: the pre-approved generic EMPr template

The template is to be completed prior to commencement of the activity, by providing the following information for each environmental impact management action:

- For implementation
 - a 'responsible person',
 - a method for implementation,
 - a timeframe for implementation
- For monitoring
 - a responsible person
 - frequency
 - evidence of compliance.

The completed template must be signed and dated by the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as Appendix 1. Each method statement must be signed and dated on each page by the holder of the EA. This template once signed and dated is legally binding. The holder of the EA will remain responsible for its implementation.

7. Amendments of the impact management outcomes and impact management actions

Once the activity has commenced, a holder of an EA may make amendments to the impact management outcomes and impact management actions in the following manner:

- Amendment of the impact management outcomes: in line with the process contemplated in Regulation 37 of the EIA Regulations; and
- Amendment of the impact management actions: in line with the process contemplated in Regulation 36 of the EIA Regulations.

8. Documents to be submitted as part of part B: section 2 site specific information and declaration

Part B: Section 2 has three distinct sub-sections. The first and third sub-sections are in a template format. Sub-section two requires a map to be produced.

Sub-section 1 contains the project name, the applicant's name and contact details, the site information, which includes coordinates of the property or farm in which the proposed substation infrastructure is proposed as well as the 21-digit Surveyor General code of each cadastral land parcel and, where available, the farm name.

Sub-section 2 is to be prepared by an EAP and must contain his/her name and expertise including a curriculum vitae. This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout using the national web based environmental screening tool, when available for compulsory use at: <https://screening.environment.gov.za/screeningtool>. The sensitivity map shall identify the nature of each sensitive feature e.g. threatened plant species, archaeological site, etc. Sensitivity maps shall identify features both within the planned working area and any known sensitive features and within 50 m from the development footprint.

Sub-section 3 is the declaration that the applicant (s)/proponent (s) or holder of the EA in the case of a change of ownership must complete which confirms that the applicant/EA holder will comply with the pre-approved 'generic EMP' template in Section 1 and understands that the impact management outcomes and impact management actions are legally binding.

(a) Amendments to Part B: Section 2 – site specific information and declaration

Should the EA be transferred, Part B: Section 2 must be completed by the new applicant/proponent and submitted with the application for an amendment of the EA in terms of regulations 29 or 31 of the EIA Regulations, whichever applies. The information submitted as part of such an application for an amendment to an EA will be considered to be incomplete should a signed copy of Part B: Section 2 not be submitted. Once approved, Part B: Section 2 forms part of the EMP for the development and the EMP becomes legally binding to the new EA holder.

PART A – GENERAL INFORMATION

1. DEFINITIONS

In this EMPr any word or expression to which a meaning has been assigned in the NEMA or EIA Regulations has that meaning, and unless the context requires otherwise –

"clearing" means the clearing and removal of vegetation, whether partially or in whole, including trees and shrubs, as specified;

"construction camp" is the area designated for key construction infrastructure and services, including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management;

"contractor" - The Contractor has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract, are in line with the Environmental Management Programme and that Method Statements are implemented as described.

"hazardous substance" is a substance governed by the Hazardous Substances Act, 1973 (Act No. 15 of 1973) as well as the Hazardous Chemical and Substances Regulations, 1995;

"method statement" means a written submission by the Contractor to the Project Manager in response to this EMPr or a request by the Project Manager and ECO. The method statement must set out the equipment, materials, labour and method(s) the Contractor proposes using to carry out an activity identified by the Project Manager when requesting the Method Statement. This must be done in such detail that the Project Manager and ECO is able to assess whether the Contractor's proposal is in accordance with this specification and/or will produce results in accordance with this specification;

The method statement must cover as a minimum applicable details with regard to:

- (i) Construction procedures;
- (ii) Plant, materials and equipment to be used;
- (iii) Transporting the equipment to and from site;
- (iv) How the plant/ material/ equipment will be moved while on site;
- (v) How and where the plant/ material/ equipment will be stored;
- (vi) The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- (vii) Timing and location of activities;
- (viii) Compliance/ non-compliance; and
- (ix) Any other information deemed necessary by the Project Manager.

“**slope**” means the inclination of a surface expressed as one unit of rise or fall for so many horizontal units;

“**solid waste**” means all solid waste, including construction debris, hazardous waste, excess cement/ concrete, wrapping materials, timber, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers);

“**spoil**” means excavated material which is unsuitable for use as material in the construction works or is material which is surplus to the requirements of the construction works;

“**topsoil**” means a varying depth (up to 300 mm) of the soil profile irrespective of the fertility, appearance, structure, agricultural potential, fertility and composition of the soil;

“**works**” means the works to be executed in terms of the Contract

2. ACRONYMS and ABBREVIATIONS

CA	Competent Authority
cEO	Contractors Environmental Officer
dEO	Developer Environmental Officer
DPM	Developer Project Manager
DSS	Developer Site Supervisor
EAR	Environmental Audit Report
ECA	Environmental Conservation Act No. 73 of 1989
ECO	Environmental Control Officer
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
ERAP	Emergency Response Action Plan
EMPr	Environmental Management Programme Report
EAP	Environmental Assessment Practitioner
FPA	Fire Protection Agency
HCS	Hazardous chemical Substance
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act ,2004 (Act No. 10 of 2004)
NEMWA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
MSDS	Material Safety Data Sheet
RI&AP's	Registered Interested and affected parties

3. ROLES AND RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) IMPLEMENTATION

The effective implementation of this generic EMPr is dependent on established and clear roles, responsibilities and reporting lines within an institutional framework. This section of the EMPr gives guidance to the various environmental roles and reporting lines, however, project specific requirements will ultimately determine the need for the appointment of specific person(s) to undertake specific roles and or responsibilities. As such, it must be noted that in the event that no specific person, for example, an environmental control officer (ECO) is appointed, the holder of the EA remains responsible for ensuring that the duties indicated in this document for action by the ECO are undertaken.

Table 1: Guide to roles and responsibilities for implementation of an EMPr

Responsible Person(s)	Role and Responsibilities
Project Manager <u>(EPC Contractor)</u>	<ul style="list-style-type: none"> - Ensure that the Project Company and the contractor are aware of all specifications, legal constraints pertaining to the project specifically with regards to the environment - Ensure that all stipulations within the EMPr and conditions of the environmental authorisation are communicated and adhered to by the Project Company and its contractor(s) - Monitor the implementation of the EMPr and conditions of the environmental authorisation throughout the project by means of site inspections and meetings. This will be documented as part of the site meeting minutes - Be fully conversant with the BAR for the project, the conditions of environmental authorisation and all relevant environmental legislation
Site Manager <u>(EPC Contractor)</u>	<ul style="list-style-type: none"> - Be fully conversant with the BAR, the conditions of environmental authorisation and the EMPr - Approve method statements - Provide support to the ECO

Responsible Person(s)	Role and Responsibilities
	<ul style="list-style-type: none"> - Be fully conversant with all relevant environmental legislation and ensure compliance thereof - Have overall responsibility for the implementation of the EMPr and conditions of the environmental authorisation - Ensure that audits are conducted to ensure compliance to the EMPr and conditions of the environmental authorisation - Liaise with the Project Manager or his delegate, the ECO and others on matters concerning the environment - Prevent actions that will harm or may cause harm to the environment, and take steps to prevent pollution and unnecessary degradation onsite - Confine construction activities to demarcated areas
<p>Environmental Officer (EO) <u>(EPC Contractor)</u></p>	<p>The EO must be appointed by the Contractor and is responsible for managing the day-to-day onsite implementation of the EMPr, and for the compilation of weekly environmental monitoring reports. In addition, the EO must act as liaison and advisor on all environmental and related issues, seek advice from the ECO when necessary, and ensure that any complaints received from I&APs are duly processed and addressed and that conflicts are resolved in an acceptable manner and timely manner. The EO shall be a full-time dedicated member of the Contractor’s team and must be approved by the Project Company.</p> <p>The following qualifications, qualities and experience are recommended for the individual appointed as the EO:</p> <ul style="list-style-type: none"> - A relevant environmental diploma or degree in natural sciences, as well as a minimum of three years’ experience in construction site monitoring, excluding health and safety; - A level-headed and firm person with above-average communication and negotiating skills. The ability to

Responsible Person(s)	Role and Responsibilities
	<p>handle and address conflict management situations will be an advantage; and</p> <ul style="list-style-type: none"> - Relevant experience in environmental site management and EMPr compliance monitoring. <p>The EO's responsibilities include:</p> <ul style="list-style-type: none"> - Monitoring, on a daily basis, environmental specifications on site and compliance with the conditions of the EA, environmental legislation and EMPr; - Keeping a register of compliance / non-compliance with the environmental specifications; - Identifying and assessing previously unforeseen, actual or potential impacts on the environment; - Ensuring that a brief weekly environmental monitoring report is submitted to the ECO; - Conducting site inspections during the defects liability period, and bringing any environmental concerns to the attention of the ECO and Contractor; - Advising the Contractor on the rectification of any pollution, contamination or damage to the construction site, rights of way and adjacent land; - Attending site meetings (scheduled and ad hoc); - Presenting environmental awareness training to all staff, Contractors and Sub contractors, and monitoring the environmental awareness training for all new personnel on-site, as undertaken by the Contractor; - Ensuring that a copy of the EA and the latest version of the EMPr are available on site at all times; - Ensuring that the Contractor is made aware of all applicable changes to the EMPr that are approved by the

Responsible Person(s)	Role and Responsibilities
	<p>DFFE;</p> <ul style="list-style-type: none"> - Assisting the Contractor in drafting environmental method statements and/or the Environmental Policy where such knowledge/expertise is lacking; - Undertaking daily environmental monitoring to ensure the Contractor’s activities do not impact upon the receiving environment. Such monitoring shall include dust, noise and water monitoring; and - Maintaining the following on site: <ul style="list-style-type: none"> o A weekly site diary. o A non-conformance register (NCR). o An I&AP communications register, and o A register of audits. <p>The EO will remain employed until all rehabilitation measures, as required for implementation due to construction damage, are completed and the site is handed over to the Operator.</p>
<p>ECO (Independent)</p>	<p>A suitably qualified ECO must be appointed by the Project Company to monitor the project compliance with the EMPr and conditions of the environmental authorisation on a monthly basis. The costs of the ECO shall be borne by the Project Company (proof of appointment must be maintained onsite).</p> <p>Responsibilities of the ECO include:</p> <ul style="list-style-type: none"> - Be fully conversant with the BAR, the conditions of environmental authorisation and the EMPr;

Responsible Person(s)	Role and Responsibilities
	<ul style="list-style-type: none"> - Be fully conversant with all relevant environmental legislation and ensure compliance thereof; - Approve method statements; - Remain employed until the completion of the construction activities; and - Report to the Project Manager, including all findings identified onsite. <p>In addition, the ECO will:</p> <ul style="list-style-type: none"> - Undertake monthly inspections of the site and surrounding areas in order to audit compliance with the EMPr and conditions of the environmental authorisation; - Take appropriate action if the specifications contained in the EMPr and conditions of the environmental authorisation are not followed; - Monitor and verify that environmental impacts are kept to a minimum, as far as possible; and - Ensure that activities onsite comply with all relevant environmental legislation.
Contractors, Staff and Service Providers	<ul style="list-style-type: none"> - Complying with the Project Company's environmental management specifications - Be conversant with all EMPr and conditions of the environmental authorisation, and ensure compliance thereto - Adhering to any environmental instructions issued by the Site Manager/Project Manager on the advice of the ECO

4. ENVIRONMENTAL DOCUMENTATION REPORTING AND COMPLIANCE

To ensure accountable and demonstrated implementation of the EMPr, a number of reporting systems, documentation controls and compliance mechanisms must be in place for all substation infrastructure projects as a minimum requirement.

4.1 Document control/Filing system

The holder of the EA is solely responsible for the upkeep and management of the EMPr file. As a minimum, all documentation detailed below will be stored in the EMPr file. A hard copy of all documentation shall be filed, while an electronic copy may be kept where relevant. A duplicate file will be maintained in the office of the DSS (where applicable). This duplicate file must remain current and up-to-date. The filing system must be updated and relevant documents added as required. The EMPr file must be made available at all times on request by the CA or other relevant authorities. The EMPr file will form part of any environmental audits undertaken as prescribed in the EIA Regulations.

4.2 Documentation to be available

At the outset of the project the following preliminary list of documents shall be placed in the filing system and be accessible at all times:

- Full copy of the signed EA from the CA in terms of NEMA, granting approval for the development or expansion;
- Copy of the generic and site specific EMPr as well as any amendments thereof;
- Copy of declaration of implementing generic EMPr and subsequent approval of site specific EMPr and amendments thereof;
- All method statements;
- Completed environmental checklists;
- Minutes and attendance register of environmental site meetings;
- An up-to-date environmental incident log;
- A copy of all instructions or directives issued;
- A copy of all corrective actions signed off. The corrective actions must be filed in such a way that a clear reference is made to the non-compliance record;
- Complaints register.

4.3 Weekly Environmental Checklist

The ECOs are required to complete a Weekly Environmental Checklist, the format of which is to be agreed prior to commencement of the activity. The ECOs are required to sign and date the checklist, retain a copy in the EMPr file and submit a copy of the completed checklist to the DSS on a weekly basis.

The checklists will form the basis for the Monthly Environmental Reports. Copies of all completed checklists will be attached as Annexures to the Environmental Audit Report as required in terms of the EIA Regulations.

4.4 Environmental site meetings

Minutes of the environmental site meetings shall be kept. The minutes must include an attendance register and will be attached to the Monthly Report that is distributed to attendees. Each set of minutes must clearly record "Matters for Attention" that will be reviewed at the next meeting.

4.5 Required Method Statements

The method statement will be done in such detail that the ECOs are enabled to assess whether the contractor's proposal is in accordance with the EMPr.

The method statement must cover applicable details with regard to:

- development procedures;
- materials and equipment to be used;
- getting the equipment to and from site;
- how the equipment/ material will be moved while on site;
- how and where material will be stored;
- the containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- timing and location of activities;
- compliance/ non-compliance with the EMPr; and
- any other information deemed necessary by the ECOs.

Unless indicated otherwise by the Project Manager, the Contractor shall provide the following method statements to the Project Manager no less than 14 days prior to the commencement date of the activity:

- Site establishment – Camps, Lay-down or storage areas, satellite camps, infrastructure;
- Batch plants;
- Workshop or plant servicing;
- Handling, transport and storage of Hazardous Chemical Substance's;
- Vegetation management – Protected, clearing, aliens, felling;
- Access management – Roads, gates, crossings etc.;
- Fire plan;
- Waste management – transport, storage, segregation, classification, disposal (all waste streams);
- Social interaction – complaints management, compensation claims, access to properties etc.;
- Water – use (source, abstraction and disposal), access and all related information, crossings and mitigation;
- Emergency preparedness – Spills, training, other environmental emergencies;
- Dust and noise management methodologies;
- Fauna interaction and risk management – only if the risk was identified – wildlife interaction especially on game farms; and
- Heritage and palaeontology management.

The ECOs shall monitor and ensure that the contractors perform in accordance with these method statements. Completed and agreed method statements between the holder of the EA and the contractor shall be captured in Appendix 1.

4.6 Environmental Incident Log (Diary)

The ECOs are required to maintain an up-to-date and current Environmental Incident Log (environmental diary). The Environmental Incident Log is a means to record all environmental incidents and/or all non-compliance notice would not be issued. An environmental incident is defined as:

- Any deviation from the listed impact management actions (listed in this EMPr) that may be addressed immediately by the ECOs. (For example a contractor's staff member littering or a drip tray that has not been emptied);
- Any environmental impact resulting from an action or activity by a contractor in contravention of the environmental stipulations and guidelines listed in the EMPr which as a single event would have a minor impact but which if cumulative and continuous would have a significant effect (for example no toilet paper available in the ablutions for an afternoon); and
- General environmental information such as road kills or injured wildlife.

The ECOs are to record all environmental incidents in the Environmental Incident Log. All incidents regardless of severity must be reported to the Developer. The Log is to be kept in the EMPr file and at a minimum the following will be recorded for each environmental incident:

- The date and time of the incident;
- Description of the incident;
- The name of the Contractor responsible;
- The incident must be listed as significant or minor;
- If the incident is listed as significant, a non-compliance notice must be issued, and recorded in the log;
- Remedial or corrective action taken to mitigate the incident; and
- Record of repeat minor offences by the same contractor or staff member.

The Environmental Incident Log will be captured in the EAR.

4.7 Non-compliance

A non-compliance notice will be issued to the responsible contractor by the ECOs via the DSS or Project Manager. The non-compliance notice will be issued in writing; a copy filed in the EMPr file and will at a minimum include the following:

- Time and date of the non-compliance;
- Name of the contractor responsible;
- Nature and description of the non-compliance;
- Recommended / required corrective action; and
- Date by which the corrective action to be completed.
- The contractors shall act immediately when a notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the development site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken. The ECO should be made aware of any complaints. Any non-compliance with the agreed procedures of the EMPr is a transgression

of the various statutes and laws that define the manner by which the environment is managed. Failure to redress the cause shall be reported to the relevant CA for them to deal with the transgression, as it deems fit. The contractor is deemed not to have complied with the EMPr if, inter alia, There is a deviation from the environmental conditions, impact management outcomes and impact management actions activities, as approved in generic and site specific EMPr as relevant as set out in the EMPr, which deviation has, or may cause, an environmental impact.

4.8 Corrective action records

For each non-compliance notice issued, a documented corrective action must be recorded. On receiving a non-compliance notice from the DSS, the contractor's cEO will ensure that the corrective actions required take place within the stipulated timeframe. On completion of the corrective action the cEO is to issue a Corrective Action Report in writing to the ECOs. If satisfied that the corrective action has been completed, the ECOs are to sign-off on the Corrective Action Report, and attach the report to the non-compliance notice in the EMPr file. A corrective action is considered complete once the report has signed off by the ECOs.

4.9 Photographic record

A digital photographic record will be kept. The photographic record will be used to show before, during and post rehabilitation evidence of the project as well used in cases of damages claims if they arise. Each image must be dated and a brief description note attached.

The Contractor shall:

1. Allow the ECOs access to take photographs of all areas, activities and actions.

The ECOs shall keep an electronic database of photographic records which will include:

1. Pictures of all areas designated as work areas, camp areas, development sites and storage areas taken before these areas are set up;
2. All bunding and fencing;
3. Road conditions and road verges;
4. Condition of all farm fences;
5. Topsoil storage areas;
6. All areas to be cordoned off during construction;
7. Waste management sites;
8. Ablution facilities (inside and out);
9. Any non-conformances deemed to be "significant";
10. All completed corrective actions for non-compliances;
11. All required signage;
12. Photographic recordings of incidents;
13. All areas before, during and post rehabilitation; and
14. Include relevant photographs in the Final Environmental Audit Report.

4.10 Complaints register

The ECOs shall keep a current and up-to-date complaints register. The complaints register is to be a record of all complaints received from communities, stakeholders and individuals. The Complaints Record shall:

1. Record the name and contact details of the complainant;
2. Record the time and date of the complaint;
3. Contain a detailed description of the complaint;
4. Where relevant and appropriate, contain photographic evidence of the complaint or damage (ECOs to take relevant photographs); and
5. Contain a copy of the ECOs written response to each complaint received and keep a record of any further correspondence with the complainant. The ECO's written response will include a description of any corrective action to be taken and must be signed by the Contractor, ECO and affected party. Where a damage claim is issued by the complainant, the ECOs shall respond as described in **(section 4.11)** below.

4.11 Claims for damages

In the event that a Claim for Damages is submitted by a community, landowner or individual, the ECOs shall:

1. Record the full detail of the complaint as described in **(section 4.10)** above;
2. The DPM will evaluate the claim and associated damage and submit the evaluation to the Senior Site Representative for approval;
3. Following consideration by the DPM, the claim is to be resolved and settled immediately, or the reason for not accepting the claim communicated in writing to the claimant. Should the claimant not accept this, the ECO shall, in writing report the incident to the Developer's negotiator and legal department; and
4. A formal record of the response by the ECOs to the claimant as well as the rectification of the method of making payments not amount will be recorded in the EMPr file.

4.12 Interactions with affected parties

Open, transparent and good relations with affected landowners, communities and regional staff are an essential aspect to the successful management and mitigation of environmental impacts.

The ECOs shall:

1. Ensure that all queries, complaints and claims are dealt within an agreed timeframe;
2. Ensure that any or all agreements are documented, signed by all parties and a record of the agreement kept in the EMPr file;
3. Ensure that a complaints telephone numbers are made available to all landowners and affected parties; and
4. Ensure that contact with affected parties is courteous at all times;

4.13 Environmental audits

Internal environmental audits of the activity and implementation of the EMPr must be undertaken. The findings and outcomes included in the EMPr file and submitted to the CA at intervals as indicated in the EA.

The ECOs must prepare a monthly EAR. The report will be tabled as the key point on the agenda of the Environmental Site Meeting. The Report is submitted for acceptance at the meeting and the final report will be circulated to the Project Manager and filed in the EMPr file. At a frequency determined by the EA, the ECOs shall submit the monthly reports to the CA. At a minimum the monthly report is to cover the following:

- Weekly Environmental Checklists;
- Deviations and non-compliances with the checklists;
- Non-compliances issued;
- Completed and reported corrective actions;
- Environmental Monitoring;
- General environmental findings and actions; and
- Minutes of the Bi-monthly Environmental Site Meetings.

4.14 Final environmental audits

On final completion of the rehabilitation and/or requirements of the EA a final EAR is to be prepared and submitted to the CA. The EAR must comply with Appendix 7 of the EIA Regulations.

PART B: SECTION 1: Pre-approved generic EMPr template

5. IMPACT MANAGEMENT OUTCOMES AND IMPACT MANAGEMENT ACTIONS

This section provides a pre-approved generic EMPr template with aspects that are common to the development of substation infrastructure for the transmission and distribution of electricity. There is a list of aspects identified for the development or expansion of substation infrastructure for the transmission and distribution of electricity, and for each aspect a set of prescribed impact management outcomes and associated impact management actions have been identified. Holders of EAs are responsible to ensure the implementation of these outcomes and actions for all projects as a minimum requirement, in order to mitigate the impact of such aspects identified for the development or expansion of substation infrastructure for the transmission and distribution of electricity.

The template provided below is to be completed by providing the information under each heading for each environmental impact management action.

The completed template must be signed and dated on each page by both the contractor and the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as Appendix 1. Each method statement must also be duly signed and dated on each page by the contractor and the holder of the EA. This template, once signed and dated, is legally binding. The holder of the EA will remain responsible for its implementation.

5.1 Environmental awareness training

Impact management outcome: All onsite staff are aware and understands the individual responsibilities in terms of this EMPr.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - All staff must receive environmental awareness training prior to commencement of the activities; - The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course; - Refresher environmental awareness training is available as and when required; - All staff are aware of the conditions and controls linked to the EA and within the EMPr and made aware of their individual roles and responsibilities in achieving compliance with the EA and EMPr; - The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum: <ul style="list-style-type: none"> a) Safety notifications; and b) No littering. - Environmental awareness training must include as a minimum the following: <ul style="list-style-type: none"> a) Description of significant environmental impacts, actual or potential, related to their work activities; b) Mitigation measures to be implemented when carrying out specific activities; c) Emergency preparedness and response procedures; 						

<ul style="list-style-type: none"> d) Emergency procedures; e) Procedures to be followed when working near or within sensitive areas; f) Wastewater management procedures; g) Water usage and conservation; h) Solid waste management procedures; i) Sanitation procedures; j) Fire prevention; and k) Disease prevention. <ul style="list-style-type: none"> – A record of all environmental awareness training courses undertaken as part of the EMPr must be available; – Educate workers on the dangers of open and/or unattended fires; – A staff attendance register of all staff to have received environmental awareness training must be available. – Course material must be available and presented in appropriate languages that all staff can understand. 						
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5.2 Site Establishment development

Impact management outcome: Impacts on the environment are minimised during site establishment and the development footprint are kept to demarcated development area.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> – A method statement must be provided by the contractor prior to any onsite activity that includes the layout of the construction camp in the form of a plan showing the location of key infrastructure and services (where applicable), including 						

<p>but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous materials storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management;</p> <ul style="list-style-type: none"> - Location of camps must be within approved area to ensure that the site does not impact on sensitive areas identified in the environmental assessment or site walk through; - Sites must be located where possible on previously disturbed areas; - The camp must be fenced in accordance with Section 5.5: Fencing and gate installation; and - The use of existing accommodation for contractor staff, where possible, is encouraged. 						
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5.3 Access restricted areas

Impact management outcome: Access to restricted areas prevented.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Identification of access restricted areas is to be informed by the environmental assessment, site walk through and any additional areas identified during development; - Erect, demarcate and maintain a temporary barrier with clear signage around the perimeter of any access restricted area, colour coding could be used if appropriate; and 						

– Unauthorised access and development related activity inside access restricted areas is prohibited.						
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5.4 Access roads

Impact management outcome: Minimise impact to the environment through the planned and restricted movement of vehicles on site.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> – An access agreement must be formalised and signed by the DPM, Contractor and landowner before commencing with the activities; – All private roads used for access to the servitude must be maintained and upon completion of the works, be left in at least the original condition – All contractors must be made aware of all these access routes. – Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the contractor's expense; – Maximum use of both existing servitudes and existing roads must be made to minimize further disturbance through the development of new roads; – In circumstances where private roads must be used, the condition of the said roads must be recorded in accordance with section 4.9: photographic record; prior to use and the condition thereof agreed by the landowner, the DPM, and the contractor; – Access roads in flattish areas must follow fence lines and tree belts to avoid fragmentation of vegetated areas or 						

croplands – Access roads must only be developed on a pre-planned and approved roads.						
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5.5 Fencing and Gate installation

Impact management outcome: Minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> – Use existing gates provided to gain access to all parts of the area authorised for development, where possible; – Existing and new gates to be recorded and documented in accordance with section 4.9: photographic record; – All gates must be fitted with locks and be kept locked at all times during the development phase, unless otherwise agreed with the landowner; – At points where the line crosses a fence in which there is no suitable gate within the extent of the line servitude, on the instruction of the DPM, a gate must be installed at the approval of the landowner; – Care must be taken that the gates must be so erected that there is a gap of no more than 100 mm between the bottom of the gate and the ground; – Where gates are installed in jackal proof fencing, a suitable reinforced concrete sill must be provided beneath the gate; – Original tension must be maintained in the fence wires; – All gates installed in electrified fencing must be re-electrified; – All demarcation fencing and barriers must be maintained in 						

<p>good working order for the duration of the development activities;</p> <ul style="list-style-type: none"> - Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas, where applicable; - Any temporary fencing to restrict the movement of life-stock must only be erected with the permission of the land owner. - All fencing must be developed of high quality material bearing the SABS mark; - The use of razor wire as fencing must be avoided; - Fenced areas with gate access must remain locked after hours, during weekends and on holidays if staff is away from site. Site security will be required at all times; - On completion of the development phase all temporary fences are to be removed; - The contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground level but rather removed completely. 						
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5.6 Water Supply Management

Impact management outcome: Undertake responsible water usage.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - All abstraction points or bore holes must be registered with the DWS and suitable water meters installed to ensure that the abstracted volumes are measured on a daily basis; - The Contractor must ensure the following: <ul style="list-style-type: none"> a. The vehicle abstracting water from a river does not 						

<p>enter or cross it and does not operate from within the river;</p> <p>b. No damage occurs to the river bed or banks and that the abstraction of water does not entail stream diversion activities; and</p> <p>c. All reasonable measures to limit pollution or sedimentation of the downstream watercourse are implemented.</p> <p>– Ensure water conservation is being practiced by:</p> <p>a. Minimising water use during cleaning of equipment;</p> <p>b. Undertaking regular audits of water systems; and</p> <p>c. Including a discussion on water usage and conservation during environmental awareness training.</p> <p>d. The use of grey water is encouraged.</p>						
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5.7 Storm and waste water management

<p>Impact management outcome: Impacts to the environment caused by storm water and wastewater discharges during construction are avoided.</p>						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<p>– Runoff from the cement/ concrete batching areas must be strictly controlled, and contaminated water must be collected, stored and either treated or disposed of off-site, at a location approved by the project manager;</p> <p>– All spillage of oil onto concrete surfaces must be controlled by the use of an approved absorbent material and the used absorbent material disposed of at an appropriate waste disposal facility;</p> <p>– Natural storm water runoff not contaminated during the</p>						

<p>development and clean water can be discharged directly to watercourses and water bodies, subject to the Project Manager's approval and support by the ECO;</p> <ul style="list-style-type: none"> - Water that has been contaminated with suspended solids, such as soils and silt, may be released into watercourses or water bodies only once all suspended solids have been removed from the water by settling out these solids in settlement ponds. The release of settled water back into the environment must be subject to the Project Manager's approval and support by the ECO. 						
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5.8 Solid and hazardous waste management

<p>Impact management outcome: Wastes are appropriately stored, handled and safely disposed of at a recognised waste facility.</p>						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - All measures regarding waste management must be undertaken using an integrated waste management approach; - Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided; - A suitably positioned and clearly demarcated waste collection site must be identified and provided; - The waste collection site must be maintained in a clean and orderly manner; - Waste must be segregated into separate bins and clearly marked for each waste type for recycling and safe disposal; - Staff must be trained in waste segregation; - Bins must be emptied regularly; 						

<ul style="list-style-type: none"> - General waste produced onsite must be disposed of at registered waste disposal sites/ recycling company; - Hazardous waste must be disposed of at a registered waste disposal site; - Certificates of safe disposal for general, hazardous and recycled waste must be maintained. 						
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5.9 Protection of watercourses and estuaries

Impact management outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - All watercourses must be protected from direct or indirect spills of pollutants such as solid waste, sewage, cement, oils, fuels, chemicals, aggregate tailings, wash and contaminated water or organic material resulting from the Contractor's activities; - In the event of a spill, prompt action must be taken to clear the polluted or affected areas; - Where possible, no development equipment must traverse any seasonal or permanent wetland - No return flow into the estuaries must be allowed and no disturbance of the Estuarine functional Zone should occur; - Development of permanent watercourse or estuary crossing must only be undertaken where no alternative access to tower position is available; - There must not be any impact on the long term morphological dynamics of watercourses or estuaries; - Existing crossing points must be favored over the creation of 						

<p>new crossings (including temporary access)</p> <ul style="list-style-type: none"> - When working in or near any watercourse or estuary, the following environmental controls and consideration must be taken: <ul style="list-style-type: none"> a) Water levels during the period of construction; No altering of the bed, banks, course or characteristics of a watercourse b) During the execution of the works, appropriate measures to prevent pollution and contamination of the riparian environment must be implemented e.g. including ensuring that construction equipment is well maintained; c) Where earthwork is being undertaken in close proximity to any watercourse, slopes must be stabilised using suitable materials, i.e. sandbags or geotextile fabric, to prevent sand and rock from entering the channel; and d) Appropriate rehabilitation and re-vegetation measures for the watercourse banks must be implemented timeously. In this regard, the banks should be appropriately and incrementally stabilised as soon as development allows. 						
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5.10 Vegetation clearing

<p>Impact management outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.</p>						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<p>General:</p> <ul style="list-style-type: none"> - Indigenous vegetation which does not interfere with the development must be left undisturbed; - Protected or endangered species may occur on or near the 						

<p>development site. Special care should be taken not to damage such species;</p> <ul style="list-style-type: none"> - Search, rescue and replanting of all protected and endangered species likely to be damaged during project development must be identified by the relevant specialist and completed prior to any development or clearing; - Permits for removal must be obtained from the relevant CA prior to the cutting or clearing of the affected species, and they must be filed; - The Environmental Audit Report must confirm that all identified species have been rescued and replanted and that the location of replanting is compliant with conditions of approvals; - Trees felled due to construction must be documented and form part of the Environmental Audit Report; - Rivers and watercourses must be kept clear of felled trees, vegetation cuttings and debris; - Only a registered pest control operator may apply herbicides on a commercial basis and commercial application must be carried out under the supervision of a registered pest control operator, supervision of a registered pest control operator or is appropriately trained; - A daily register must be kept of all relevant details of herbicide usage; - No herbicides must be used in estuaries; - All protected species and sensitive vegetation not removed must be clearly marked and such areas fenced off in accordance to Section 5.3: Access restricted areas. <p>Alien invasive vegetation must be removed and disposed of at a licensed waste management facility.</p>						
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5.11 Protection of fauna

Impact management outcome: Disturbance to fauna is minimised.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - No interference with livestock must occur without the landowner's written consent and with the landowner or a person representing the landowner being present; - The breeding sites of raptors and other wild birds species must be taken into consideration during the planning of the development programme; - Breeding sites must be kept intact and disturbance to breeding birds must be avoided. Special care must be taken where nestlings or fledglings are present; - Special recommendations of the avian specialist must be adhered to at all times to prevent unnecessary disturbance of birds; - No poaching must be tolerated under any circumstances. All animal dens in close proximity to the works areas must be marked as Access restricted areas; - No deliberate or intentional killing of fauna is allowed; - In areas where snakes are abundant, snake deterrents to be deployed on the pylons to prevent snakes climbing up, being electrocuted and causing power outages; and - No Threatened or Protected species (ToPs) and/or protected fauna as listed according NEMBA (Act No. 10 of 2004) and relevant provincial ordinances may be removed and/or relocated without appropriate authorisations/permits. 						

5.12 Protection of heritage resources

Impact management outcome: Impact to heritage resources is minimised.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Identify, demarcate and prevent impact to all known sensitive heritage features on site in accordance with the No-Go procedure in Section 5.3: Access restricted areas; Carry out general monitoring of excavations for potential fossils, artefacts and material of heritage importance; All work must cease immediately, if any human remains and/or other archaeological, palaeontological and historical material are uncovered. Such material, if exposed, must be reported to the nearest museum, archaeologist/palaeontologist (or the South African Police Services), so that a systematic and professional investigation can be undertaken. Sufficient time must be allowed to remove/collect such material before development recommences. 						

5.13 Safety of the public

Impact management outcome: All precautions are taken to minimise the risk of injury, harm or complaints.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Identify fire hazards, demarcate and restrict public access to these areas as well as notify the local authority of any potential threats e.g. large brush stockpiles, fuels etc.; 						

<ul style="list-style-type: none"> - All unattended open excavations must be adequately fenced or demarcated; - Adequate protective measures must be implemented to prevent unauthorised access to and climbing of partly constructed towers and protective scaffolding; - Ensure structures vulnerable to high winds are secured; - Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged. 						
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5.14 Sanitation

Impact management outcome: Clean and well maintained toilet facilities are available to all staff in an effort to minimise the risk of disease and impact to the environment.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Mobile chemical toilets are installed onsite if no other ablution facilities are available; - The use of ablution facilities and or mobile toilets must be used at all times and no indiscriminate use of the veld for the purposes of ablutions must be permitted under any circumstances; - Where mobile chemical toilets are required, the following must be ensured: <ul style="list-style-type: none"> a) Toilets are located no closer than 100 m to any watercourse or water body; b) Toilets are secured to the ground to prevent them from toppling due to wind or any other cause; c) No spillage occurs when the toilets are cleaned or emptied and the contents are managed in accordance 						

<p>with the EMPr; d) Toilets have an external closing mechanism and are closed and secured from the outside when not in use to prevent toilet paper from being blown out; e) Toilets are emptied before long weekends and workers holidays, and must be locked after working hours; f) Toilets are serviced regularly and the ECO must inspect toilets to ensure compliance to health standards; – A copy of the waste disposal certificates must be maintained.</p>						
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5.15 Prevention of disease

<p>Impact Management outcome: All necessary precautions linked to the spread of disease are taken.</p>						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> – Undertake environmentally-friendly pest control in the camp area; – Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV AIDS; – The Contractor must ensure that information posters on AIDS are displayed in the Contractor Camp area; – Information and education relating to sexually transmitted diseases to be made available to both construction workers and local community, where applicable; – Free condoms must be made available to all staff on site at central points; – Medical support must be made available; – Provide access to Voluntary HIV Testing and Counselling 						

Services.						
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5.16 Emergency procedures

Impact management outcome: Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Compile an Emergency Response Action Plan (ERAP) prior to the commencement of the proposed project; - The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation; - All staff must be made aware of emergency procedures as part of environmental awareness training; - The relevant local authority must be made aware of a fire as soon as it starts; - In the event of emergency necessary mitigation measures to contain the spill or leak must be implemented (see Hazardous Substances section 5.17). 						

5.17 Hazardous substances

Impact management outcome: Safe storage, handling, use and disposal of hazardous substances.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - The use and storage of hazardous substances to be minimised and non-hazardous and non-toxic alternatives 						

<p>substituted where possible;</p> <ul style="list-style-type: none"> - All hazardous substances must be stored in suitable containers as defined in the Method Statement; - Containers must be clearly marked to indicate contents, quantities and safety requirements; - All storage areas must be bunded. The bunded area must be of sufficient capacity to contain a spill / leak from the stored containers; - Bunded areas to be suitably lined with a SABS approved liner; - An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date on a continuous basis; - All hazardous chemicals that will be used on site must have Material Safety Data Sheets (MSDS); - All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet; - Employees handling hazardous substances / materials must be aware of the potential impacts and follow appropriate safety measures. Appropriate personal protective equipment must be made available; - The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowsers; - The tanks/ bowsers must be situated on a smooth impermeable surface (concrete) with a permanent bund. The impermeable lining must extend to the crest of the bund and the volume inside the bund must be 130% of the total capacity of all the storage tanks/ bowsers (110% statutory requirement plus an allowance for rainfall); 						
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<ul style="list-style-type: none"> - The floor of the bund must be sloped, draining to an oil separator; - Provision must be made for refueling at the storage area by protecting the soil with an impermeable groundcover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained; - All empty externally dirty drums must be stored on a drip tray or within a bunded area; - No unauthorised access into the hazardous substances storage areas must be permitted; - No smoking must be allowed within the vicinity of the hazardous storage areas; - Adequate fire-fighting equipment must be made available at all hazardous storage areas; - Where refueling away from the dedicated refueling station is required, a mobile refueling unit must be used. Appropriate ground protection such as drip trays must be used; - An appropriately sized spill kit kept onsite relevant to the scale of the activity/s involving the use of hazardous substance must be available at all times; - The responsible operator must have the required training to make use of the spill kit in emergency situations; - An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken; - In the event of a spill, contaminated soil must be collected in containers and stored in a central location and disposed of according to the National Environmental Management: Waste Act 59 of 2008. Refer to Section 5.7 for procedures concerning storm and waste water management and 5.8 for solid and hazardous waste management. 						
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5.18 Workshop, equipment maintenance and storage

Impact management outcome: Soil, surface water and groundwater contamination is minimised.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Where possible and practical all maintenance of vehicles and equipment must take place in the workshop area; - During servicing of vehicles or equipment, especially where emergency repairs are effected outside the workshop area, a suitable drip tray must be used to prevent spills onto the soil. The relevant local authority must be made aware of a fire as soon as it starts; - Leaking equipment must be repaired immediately or be removed from site to facilitate repair; - Workshop areas must be monitored for oil and fuel spills; - Appropriately sized spill kit kept onsite relevant to the scale of the activity taking place must be available; - The workshop area must have a bunded concrete slab that is sloped to facilitate runoff into a collection sump or suitable oil / water separator where maintenance work on vehicles and equipment can be performed; - Water drainage from the workshop must be contained and managed in accordance Section 5.7: Storm and waste water management. 						

5.19 Batching plants

Impact management outcome: Minimise spillages and contamination of soil, surface water and groundwater.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Concrete mixing must be carried out on an impermeable surface; - Batching plants areas must be fitted with a containment facility for the collection of cement laden water. - Dirty water from the batching plant must be contained to prevent soil and groundwater contamination - Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains; - A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted; - Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility; - Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site; - Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to Section 5.20: Dust emissions) - Any excess sand, stone and cement must be removed or reused from site on completion of construction period and disposed at a registered disposal facility; - Temporary fencing must be erected around batching plants in accordance with Section 5.5: Fencing and gate 						

<i>installation.</i>						
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5.20 Dust emissions

Impact management outcome: Dust prevention measures are applied to minimise the generation of dust.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO; - Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be re- vegetated or stabilised as soon as is practically possible; - Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present; - During high wind conditions, the ECO must evaluate the situation and make recommendations as to whether dust-damping measures are adequate, or whether working will cease altogether until the wind speed drops to an acceptable level; - Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind; - Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO; - Vehicle speeds must not exceed 40 km/h along dust roads 						

<p>or 20 km/h when traversing unconsolidated and non-vegetated areas;</p> <ul style="list-style-type: none"> - Straw stabilisation must be applied at a rate of one bale/10 m² and harrowed into the top 100 mm of top material, for all completed earthworks; - For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust. 						
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5.21 Blasting

<p>Impact management outcome: Impact to the environment is minimised through a safe blasting practice.</p>						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Any blasting activity must be conducted by a suitably licensed blasting contractor; and - Notification of surrounding landowners, emergency services site personnel of blasting activity 24 hours prior to such activity taking place on Site. 						

5.22 Noise

<p>Impact Management outcome: Prevent unnecessary noise to the environment by ensuring that noise from development activity is mitigated.</p>						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - The Contractor must keep noise level within acceptable limits, Restrict the use of sound amplification equipment for 						

<p>communication and emergency only;</p> <ul style="list-style-type: none"> - All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained; - Any complaints received by the Contractor regarding noise must be recorded and communicated. Where possible or applicable, provide transport to and from the site on a daily basis for construction workers; - Develop a Code of Conduct for the construction phase in terms of behaviour of construction staff. Operating hours as determined by the environmental authorisation are adhered to during the development phase. Where not defined, it must be ensured that development activities must still meet the impact management outcome related to noise management. 						
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5.23 Fire prevention

Impact management outcome: Prevention of uncontrollable fires.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Designate smoking areas where the fire hazard could be regarded as insignificant; - Firefighting equipment must be available on all vehicles located on site; - The local Fire Protection Agency (FPA) must be informed of construction activities; - Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site; 						

- Two way swop of contact details between ECO and FPA.						
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5.24 Stockpiling and stockpile areas

Impact management outcome: Reduce erosion and sedimentation as a result of stockpiling.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - All material that is excavated during the project development phase (either during piling (if required) or earthworks) must be stored appropriately on site in order to minimise impacts to watercourses, watercourses and water bodies; - All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods; - Topsoil stockpiles must not exceed 2 m in height; - During periods of strong winds and heavy rain, the stockpiles must be covered with appropriate material (e.g. cloth, tarpaulin etc.); - Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material in order to prevent erosion of the material. 						

5.25 Civil works

Impact management outcome: Impact to the environment minimised during civil works to create the substation terrace.

Impact Management Actions	Implementation			Monitoring		
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of

	person	implementation	implementation	person		compliance
<ul style="list-style-type: none"> - Where terracing is required, topsoil must be collected and retained for the purpose of re-use later to rehabilitate disturbed areas not covered by yard stone; - Areas to be rehabilitated include terrace embankments and areas outside the high voltage yards; - Where required, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled; - These areas can be stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly; - Rehabilitation of the disturbed areas must be managed in accordance with Section 5.35: Landscaping and rehabilitation; - All excess spoil generated during terracing activities must be disposed of in an appropriate manner and at a recognised landfill site; and - Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes. 						

5.26 Excavation of foundation, cable trenching and drainage systems

Impact management outcome: No environmental degradation occurs as a result of excavation of foundation, cable trenching and drainage systems.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - All excess spoil generated during foundation excavation must be disposed of in an appropriate manner and at a 						

<p>licensed landfill site, if not used for backfilling purposes;</p> <ul style="list-style-type: none"> - Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes; - Management of equipment for excavation purposes must be undertaken in accordance with Section 5.18: Workshop, equipment maintenance and storage; and - Hazardous substances spills from equipment must be managed in accordance with Section 5.17: Hazardous substances. 						
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5.27 Installation of foundations, cable trenching and drainage systems

<p>Impact management outcome: No environmental degradation occurs during the installation of foundation, cable trenching and drainage system.</p>						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Batching of cement to be undertaken in accordance with Section 5.19: Batching plants; and - Residual solid waste must be disposed of in accordance with Section 5.8: Solid waste and hazardous management. 						

5.28 Installation of equipment (circuit breakers, current Transformers, Isolators, Insulators, surge arresters, voltage transformers, earth switches)

<p>Impact management outcome: No environmental degradation occurs as a result of installation of equipment.</p>						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance

<ul style="list-style-type: none"> - Management of dust must be conducted in accordance with Section 5.20: Dust emissions; - Management of equipment used for installation must be conducted in accordance with Section 5.18: Workshop, equipment maintenance and storage; - Management hazardous substances and any associated spills must be conducted in accordance with Section 5.17: Hazardous substances; and - Residual solid waste must be recycled or disposed of in accordance with Section 5.8: Solid waste and hazardous management. 						
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5.29 Steelwork Assembly and Erection

Impact management outcome: No environmental degradation occurs as a result of steelwork assembly and erection.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - During assembly, care must be taken to ensure that no wasted/unused materials are left on site e.g. bolts and nuts - Emergency repairs due to breakages of equipment must be managed in accordance with Section 5.18: Workshop, equipment maintenance and storage and Section 5.16: Emergency procedures. 						

5.30 Cabling and Stringing

Impact management outcome: No environmental degradation occurs as a result of stringing.		
Impact Management Actions	Implementation	Monitoring

	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Residual solid waste (off cuts etc.) shall be recycled or disposed of in accordance with Section 6.8: Solid waste and hazardous Management; - Management of equipment used for installation shall be conducted in accordance with Section 5.18: Workshop, equipment maintenance and storage; - Management hazardous substances and any associated spills shall be conducted in accordance with Section 5.17: Hazardous substances. 						

5.31 Testing and Commissioning (all equipment testing, earthing system, system integration)

Impact management outcome: No environmental degradation occurs as a result of Testing and Commissioning.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Residual solid waste must be recycled or disposed of in accordance with Section 5.8: Solid waste and hazardous management. 						

5.32 Socio-economic

Impact management outcome: enhanced socio-economic development.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance

<ul style="list-style-type: none"> - Develop and implement communication strategies to facilitate public participation; - Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process; - Sustain continuous communication and liaison with neighboring owners and residents - Create work and training opportunities for local stakeholders; and - Where feasible, no workers, with the exception of security personnel, must be permitted to stay over-night on the site. This would reduce the risk to local farmers. 						
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5.33 Temporary closure of site

Impact management outcome: Minimise the risk of environmental impact during periods of site closure greater than five days.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Bunds must be emptied (where applicable) and need to be undertaken in accordance with the impact management actions included in sections 5.17: Hazardous substances and 5.18: Workshop, equipment maintenance and storage; - Hazardous storage areas must be well ventilated; - Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service; - Emergency and contact details displayed must be displayed; - Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and 						

<p>emergency personnel;</p> <ul style="list-style-type: none"> – Night hazards such as reflectors, lighting, traffic signage etc. must have been checked; – Fire hazards identified and the local authority must have been notified of any potential threats e.g. large brush stockpiles, fuels etc.; – Structures vulnerable to high winds must be secured; – Wind and dust mitigation must be implemented; – Cement and materials stores must have been secured; – Toilets must have been emptied and secured; – Refuse bins must have been emptied and secured; – Drip trays must have been emptied and secured. 						
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5.34 Dismantling of old equipment

<p>Impact management outcome: Impact to the environment to be minimised during the dismantling, storage and disposal of old equipment commissioning.</p>						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> – All old equipment removed during the project must be stored in such a way as to prevent pollution of the environment; – Oil containing equipment must be stored to prevent leaking or be stored on drip trays; – All scrap steel must be stacked neatly and any disused and broken insulators must be stored in containers; – Once material has been scrapped and the contract has been placed for removal, the disposal Contractor must ensure that any equipment containing pollution causing substances is dismantled and transported in such a way as 						

<p>to prevent spillage and pollution of the environment;</p> <ul style="list-style-type: none"> - The Contractor must also be equipped to contain and clean up any pollution causing spills; and - Disposal of unusable material must be at a licensed waste disposal site. 						
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5.35 Landscaping and rehabilitation

Impact management outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - All areas disturbed by construction activities must be subject to landscaping and rehabilitation; All spoil and waste must be disposed of to a registered waste site; - All slopes must be assessed for contouring, and to contour only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983 - All slopes must be assessed for terracing, and to terrace only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983; - Berms that have been created must have a slope of 1:4 and be replanted with indigenous species and grasses that approximates the original condition; - Where new access roads have crossed cultivated farmlands, that lands must be rehabilitated by ripping which must be agreed to by the holder of the EA and the landowners; - Rehabilitation of access roads outside of farmland; - Indigenous species must be used for with species and/grasses to where it compliments or approximates the 						

<p>original condition;</p> <ul style="list-style-type: none"> – Stockpiled topsoil must be used for rehabilitation (refer to Section 5.24: Stockpiling and stockpiled areas); – Stockpiled topsoil must be evenly spread so as to facilitate seeding and minimise loss of soil due to erosion; – Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed; – Subsoil must be ripped before topsoil is placed; – The rehabilitation must be timed so that rehabilitation can take place at the optimal time for vegetation establishment; – Where impacted through construction related activity, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled; – Sloped areas stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly; – Spoil can be used for backfilling or landscaping as long as it is covered by a minimum of 150 mm of topsoil. – Where required, re-vegetation including hydro-seeding can be enhanced using a vegetation seed mixture as described below. A mixture of seed can be used provided the mixture is carefully selected to ensure the following: <ul style="list-style-type: none"> a) Annual and perennial plants are chosen; b) Pioneer species are included; c) Species chosen must be indigenous to the area with the seeds used coming from the area; d) Root systems must have a binding effect on the soil; e) The final product must not cause an ecological imbalance in the area 					
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6 ACCESS TO THE GENERIC EMPr

Once completed and signed, to allow the public access to the generic EMPr, the holder of the EA must make the EMPr available to the public in accordance with the requirements of Regulation 26(h) of the EIA Regulations.

PART B: SECTION 2

7 SITE SPECIFIC INFORMATION AND DECLARATION

7.1 Sub-section 1: contact details and description of the project

7.1.1 Details of the applicant:

COMPANY

NAME: ESIZAYO WIND (RF) (PTY) LTD

Contact Person:	Werner Engelbrecht
Postal Address	Building 1, Leslie Ave East Design Quarter District, Fourways P O Box 69408, Bryanston 2021
Telephone:	011 367 4644
Email:	eiaadmin@biothermenergy.com

7.1.2 Details and expertise of the EAP:

NAME OF THE EAP WSP GROUP AFRICA (PTY) LTD

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7.1.3 Project name:

Proposed Esizayo 132kV Overhead Powerline, near Matjiesfontein in the Western and Northern Cape.

7.1.4 Description of the project:

Esizayo Wind (RF) (Pty) Ltd (Esizayo) proposes an alternative transmission integration option which entails the construction of a 132kV overhead powerline (OHPL), approximately 6.5km in length, from the onsite substation at the authorised Esizayo Wind Energy Facility (WEF) to connect to the national grid at the existing Komsberg substation. The transmission line alignment will run in a northerly direction for approximately 6.5km. The Komsberg substation and proposed transmission powerline are situated near Matjiesfontein in the Laingsburg and Karoo Hoogland Local Municipalities within the Central Karoo and Namaqua District Municipalities of the Western Cape and Northern Cape Provinces, South Africa

More detail is available in Section 3 of the bespoke EMPr

7.1.5 Project location:

The proposed Project is located in the Ward 2 of the Laingsburg Local Municipality in the Central Karoo District Municipality in the Western Cape Province and ending at the Komsberg substation in Ward 4 of the Karoo Hoogland Local Municipality in the Namakwa District Municipality in the Northern Cape Province. The Project area is located approximately 30km Northeast of Laingsburg in the Western Cape (Figure 3 1).

The proposed OHPL project entails the construction of a 132 kV transmission line from the onsite substation at the authorised Esizayo WEF to connect to the existing Komsberg substation. The transmission line route runs in a northerly direction to the existing Komsberg MTS Substation located approximately 6.5km north of the substation

Refer to Section 3.1 of the bespoke EMPr for additional information



7.2 Sub-section 2: Development footprint site map

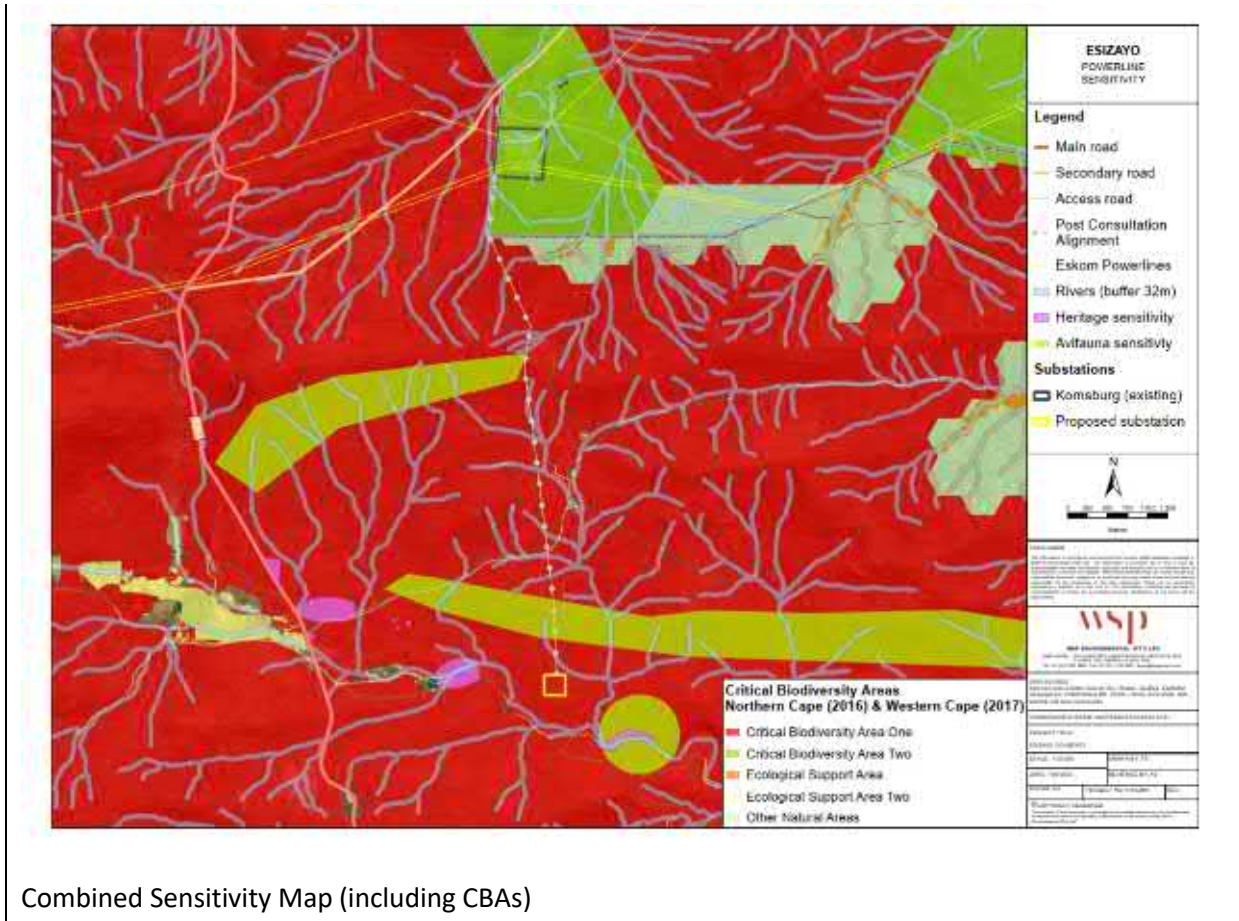
This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout. The sensitivity map must be prepared from the national web based environmental screening tool, when available for compulsory use at: <https://screening.environment.gov.zg/screeningtool>. The sensitivity map shall identify the nature of each sensitive feature e.g. threatened plant species, archaeological site, etc. Sensitivity maps shall identify features both within the planned working area and any known sensitive features within 50 m from the development footprint.

Refer to Section 3.4 of the bespoke EMPr for more detail regarding environmental sensitivities.

The maps are as follows:



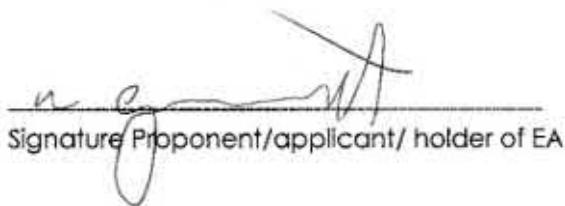
Combined Sensitivity Map

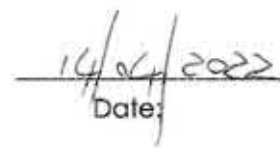


Combined Sensitivity Map (including CBAs)

7.3 Sub-section 3: Declaration

The proponent/applicant or holder of the EA affirms that he/she will abide and comply with the prescribed impact management outcomes and impact management actions as stipulated in part B: section 1 of the generic EMPr and have the understanding that the impact management outcomes and impact management actions are legally binding. The proponent/applicant or holder of the EA affirms that he/she will provide written notice to the CA 14 day prior to the date on which the activity will commence of commencement of construction to facilitate compliance inspections.


Signature Proponent/applicant/ holder of EA


Date:

7.4 Sub-section 4: amendments to site specific information (Part B; section 2)

Should the EA be transferred to a new holder, Part B: Section 2 must be completed by the new holder and submitted with the application for an amendment of the EA in terms of Regulations 29 or 31 of the EIA Regulations, whichever applies. The information submitted for an amendment to an environmental authorisation will be considered to be incomplete should a signed copy of Part B: Section 2 not be submitted. Once approved, Part B: Section 2 forms part of the EMPr for the development and the EMPr becomes legally binding to the new EA holder.

PART C

8 SITE SPECIFIC ENVIRONMENTAL ATTRIBUTES

If any specific environmental sensitivities/attributes are present on the site which require more specific impact management outcomes and actions, not included in the pre-approved generic EMPr template, to manage impacts, those impact management outcomes and impact management actions must be included in this section. These specific management controls must be referenced spatially, and must include impact management outcomes and impact management actions. The management controls including impact management outcomes and impact management actions must be presented in the format of the pre-approved generic EMPr template. This applies only to additional impact management outcomes and impact management actions that are necessary.

If Part C is applicable to the development as authorised in the EA, it is required to be submitted to the CA together with the BAR or EIAR, for consideration of, and decision on, the application for EA. The information in this section must be prepared by an EAP and the name and expertise of the EAP, including the curriculum vitae are to be included. Once approved, Part C forms part of the EMPr for the site and is legally binding.

This section will **not be required** should the site contain no specific environmental sensitivities or attributes.

Sensitivities have been identified on site. Site Specific management outcomes are outlined in Section 8 of the Bespoke EMPr.
--

APPENDIX 1: METHOD STATEMENTS

To be prepared by the contractor prior to commencement of the activity. The method statements are **not required** to be submitted to the CA.

APPENDIX

E INVASIVE ALIEN PLANT MANAGEMENT PROGRAMME FOR THE ESIZAYO WEF





Esiyazo Wind Farm Invasive Alien Plant Management Programme

Matjiesfontein, Western Cape

September 2021

CLIENT



Prepared by:





The Biodiversity Company

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Report Name	Esiyazo Wind Farm – Invasive Alien Plant Management Programme
Reference	Esiyazo Wind Farm
Submitted to	
Report Writer	<p style="text-align: center;">Lindi Steyn </p> <p>Dr Lindi Steyn has completed her PhD in Biodiversity and Conservation from the University of Johannesburg. Lindi is a terrestrial ecologist with a special interest in ornithology. She has completed numerous studies ranging from Basic Assessments to Environmental Impact Assessments following IFC standards.</p>
Report Writer	<p style="text-align: center;">Marnus Erasmus </p> <p>Martinus Erasmus obtained his B-Tech degree in Nature Conservation in 2016 at the Tshwane University of Technology. Martinus has been conducting EIAs, basic assessments and assisting specialists in field during his studies since 2015. Martinus is a specialist terrestrial ecologist and botanist which conducts floral surveys faunal surveys which include mammals, birds, amphibians and reptiles.</p>
Reviewer	<p style="text-align: center;">Andrew Husted </p> <p>Andrew Husted is Pr Sci Nat registered (400213/11) in the following fields of practice: Ecological Science, Environmental Science and Aquatic Science. Andrew is an Aquatic, Wetland and Biodiversity Specialist with more than 12 years' experience in the environmental consulting field. Andrew has completed numerous wetland training courses, and is an accredited wetland practitioner, recognised by the DWS, and also the Mondi Wetlands programme as a competent wetland consultant.</p>
Declaration	<p>The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2017. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.</p>

DECLARATION

I, Lindi Steyn, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Lindi Steyn

Biodiversity Specialist

The Biodiversity Company

August 2021

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1 Introduction

Biotherm Energy (Pty) Ltd holds an Environmental Authorisation (EA) (DEA Reference: 14/12/16/3/3/2/967), dated 14/07/2017 to develop the Esiyazo Wind Farm near Matjiesfontein, Western Cape Province. The authorised Esiyazo Wind Energy Facility (WEF) falls between Matjiesfontein and Sutherland in the Laingsburg Local Municipality, Western Cape. The energy facility comprises of the following:

- A total of 56 wind turbines initially, now 28 turbines;
- An on-site 132 kV substation;
- A powerline linking to the existing Eskom transmission infrastructure;
- Underground cables linking the turbines to the substations;
- Crane platforms;
- Operations and maintenance compound area, car park, storage area; and
- Internal access roads (4-6 m wide) to each turbine.

The Biodiversity Company was commissioned to development of an Invasive Alien Plant (IAP) Management Programme and Monitoring Plan to meet the requirement of the issued EA as per the Regulations (No. R. 982-985, Department of Environmental Affairs, 4 December 2014) emanating from the National Environmental Management Act (Act No. 107 of 1998) with specific reference to the Esiyazo Wind Energy facility.

The requirement of the EA is the development of an IAP Management Programme and Monitoring Plan. This is because IAPs tend to dominate or replace indigenous flora, thereby transforming the structure, composition and functioning of ecosystems. Therefore, it is important that these plants are controlled by means of an eradication and monitoring programme. Some invader plants may also degrade ecosystems through superior competitive capabilities to exclude native plant species.

1.1 Terms of Reference

The Terms of Reference (ToR) for this assessment include the following:

- Review of existing information related to the development;
- A site visit to confirm the presence of IAPs within the project area;
- Compilation of a report detailing the results of the site visit; and
- Provide recommendations for the control of IAPs and monitoring measures.

1.2 Assumptions and Limitations

The following assumptions and limitations should be noted for the assessment:

- The assessment area was based on the spatial file provided by the client and any alterations to the development area subsequent to the site visit may affect the results;

- As per the scope of work, the fieldwork component of the assessment comprised one brief assessment only and therefore, this study has not assessed any temporal trends; and
- The biodiversity assessments associated with the approved EIA did not list the alien species recorded in the area.

1.3 Legislation Framework

The National Environmental Management: Biodiversity Act (NEMBA) is the most recent legislation pertaining to alien invasive plant species. In August 2014, the list of Alien Invasive Species was published in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (Government Gazette No 78 of 2014). The Alien and Invasive Species Regulations were published in the Government Gazette No. 43726, 18 September 2020. The legislation calls for the removal and / or control of alien invasive plant species (Category 1 species). In addition, unless authorised thereto in terms of the National Water Act, 1998 (Act No. 36 of 1998), no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring within proximity to a watercourse. Below is a brief explanation of the three categories in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA):

- Category 1a: Invasive species requiring compulsory control. Remove and destroy. Any specimens of Category 1a listed species need, by law, to be eradicated from the environment. No permits will be issued;
- Category 1b: Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme. No permits will be issued;
- Category 2: Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy or accept as a gift any plants listed as Category 2 plants. No permits will be issued for Category 2 plants to exist in riparian zones; and
- Category 3: Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities (import, possess, grow, breed, move, sell, buy or accept as a gift) involving a Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones.

Note that according to the regulations, a person who has under his or her control a category 1b listed invasive species must immediately:

- Notify the competent authority in writing
- Take steps to manage the listed invasive species in compliance with:
 - Section 75 of the Act;

- The relevant invasive species management programme developed in terms of regulation 4; and
- Any directive issued in terms of section 73(3) of the Act.

2 Guidelines for Controlling Invasive Alien Plants

This section provides details on the general control of IAPs and should therefore be read before Section 4 of this report.

2.1 Area Prioritisation

The following are recommended when considering priority areas:

- The initial clearing should be focused in areas where follow-ups can be guaranteed;
- Lighter infested areas should be cleared first to prevent the build-up of seedbanks, followed by riparian systems. Dense infestations should be cleared;
- Consider leaving areas that require active restoration until the restoration materials are available to avoid soil loss or re-invasion; and
- Areas should be cleared before plants have a chance to set seed.

2.2 Control Methods

2.2.1 Mechanical Control

Mechanical control involves the physical destruction or total removal of plants. Mechanical techniques include hand-pulling, felling, uprooting, ringbarking, cutting/slashing, strip-barking or mowing. Mechanical methods are not feasible in dense infestations as these can be labour intensive and time-consuming. Removing all IAPs using mechanical control methods in a densely infested area can also lead to severe soil disturbance and erosion. These methods are generally more appropriate for sparse infestations and for species that do not coppice after cutting.

Hand-pulling is the removal of plants by hand, ensuring that the root is also removed. Hand pulling is only recommended when an area is sparsely invaded, has a high sensitivity and the plants are small enough to be pulled out successfully with the roots intact. Hand pulling does create soil disturbance, but if the area is sparsely invaded such disturbances are unlikely to be damaging. The immediate area from where the plant was pulled should be pressed to ensure levelling with the surrounding soil.

Manual removal using hand tools can be used to remove IAPs. The use of hand tools is often the most effective method in areas with low infestations. Ring-barking using an axe is useful for killing large trees. The tool is used to remove the bark in complete horizontal band 300 mm in width about 500 mm from the ground. Small trees can be frilled by cutting an angled groove into the bark and cambium, right the way around the tree trunk. This can be achieved with either a cane knife or axe, depending on how hard the bark and cambium layers of the tree are. The seed stalks/branches of annuals can be slashed with a slasher before the seeds have matured. This is an effective method significantly reducing the presence of viable seeds that will germinate in the new season.

Manual removal using mechanised tools is also an effective means of controlling IAPs. Heavy duty motorised brush-cutters are useful for controlling low-growing thickets of IAPs. Importantly, a suitable blade must be fitted to the brush-cutter as using standard nylon cutter for clearing vegetation can lead to machine damage in the long-term. A chainsaw is ideal for felling large trees and can be used to cut logs and branches into shorter lengths.

2.2.2 Chemical Control

Chemical control of IAPs involves the use of herbicides to kill targeted species. It is important that the appropriate herbicide is used in the appropriate manner as using the inappropriate herbicides is wasteful and costly. Herbicide use is especially problematic in aquatic systems as they can be transported downstream and may remain active in the ecosystem. Herbicides are classified as either selective or non-selective. Selective herbicides are usually specific to a particular group of plants and non-selective herbicides can kill any plant. Therefore, non-selective herbicides are not suitable for use in areas where indigenous plants are present. It is important that herbicide applicators complete a certified training course.

Each herbicide has a chemical compound that is the active ingredient to kill the plants of interest. It is therefore critical that a herbicide with the correct active ingredient is selected and the advised dilution be adhered to. Dye is often mixed with herbicides to ensure a clear visual indication of which plants have been treated and which have not. This allows workers to see where they have applied the herbicide and allows for easy inspection of work a few days later. Herbicides also have a residual effect and is the time that they will remain active in the soil. The shorter the residual effect, the less likely that non-target species will be killed. The residual effect of an herbicide must be checked, especially in areas where re-vegetation will occur. Herbicides require a carrier, which can be either water or diesel. Water is preferred due to the negative impacts to the surrounding environment from diesel, cost of diesel and the risk of theft. Diesel should never be used for foliar applications and must only be used for cut-stump treatment.

Foliar spraying is when leaves are sprayed with herbicide to the point of run-off. Correct training and certification are essential. It is recommended to invest in high quality knapsack sprayers and ensure replacement parts can be purchased. This approach requires large quantities of clean water for herbicide-mixing. Handheld spraying is a technique to apply herbicide accurately after cut stumping, ring-barking, frilling and strip-barking. Handheld sprayers are cheap, but workers must receive training on how to maintain handheld sprayers properly. A novel technique of delivering herbicide is Ecoplugs. It is essentially the herbicide encapsulated in a plastic plug and, due to its design, present practically no risk of non-target drift or operator contamination. It is claimed that Ecoplugs can be used in all weathers at any time of year.

2.2.3 Biological Control

Biological control, or biocontrol, is the introduction of an invasive species' natural enemies to remove the plants' competitive advantage and reduce population vigour. The advantages of biocontrol are that it is the most sustainable of all IAP control methods, usually does not require high or long-term maintenance and has a relatively low cost-implication over the long term. The disadvantages are that it is a generally slow process and low levels of infestation, with occasional outbreaks, will remain in the project area.

2.2.4 Clearing Method Recommendations

The recommended clearing method guidelines based on the size class of the plant are summarised in [Table 2-1](#).

Table 2-1 Summary of recommended control methods for various plant size classes

Size Class	Density/Environment	Control Method	Technique
Seedling	Sparse/Sensitive Environments	Hand pulling/Hoeing	Plants pulled by hand or using a tree-popper. Roots removed and soil disturbance to be kept to a minimum.
	Dense or open stands (< 1 m high)	Foliar spraying	Use fan nozzles in dense stands. Use selective herbicides.
Sapling	Sparse/Sensitive Environments	Hand pulling/Hoeing	Plants pulled by hand or using a tree-popper. Roots removed and soil disturbance to be kept to a minimum.
	Dense (< 1 m high)	Foliar spraying	Use fan nozzles in dense stands. Use selective herbicides.
	Dense or open stands	Basal stem	Apply herbicide to the bottom 250mm of the stem. Apply by means of a low pressure, coarse droplet spray from a narrow angle cone nozzle.
	Saplings (1-2 cm diameter)	Cut stump	Cut stumps, including all side stems and suckers, as low to the ground as possible. Apply herbicide to the cut area as recommended on the label.
Mature Trees	Large diameter trees	Ring barking Frilling	Remove the bark in complete horizontal band 300 mm in width about 500 mm from the ground. Trees can be left to stand but where there is a danger of trees falling into watercourses they should be cut down and removed. Treat stumps with herbicide.
			Frilling will involve making cuts into the sapwood around the circumference of the tree. Apply herbicide to the inside of the frill within 3 minutes. Ecoplugs can be used in place of herbicide. Treat up to 50 mm diameter stems to a height of 250mm & stems from 50mm to 100mm to a height of 500 mm.
	Thinly barked trees (maximum diameter 100 mm)	Basal stem	Spray the full circumference of the stem with a low-pressure coarse droplet spray from a narrow angle, solid cone nozzle. Trees must be reasonably free of mud and dust, and somewhat dry. Method is also effective to destroy saplings, regrowth and multi-stemmed trees and shrubs.
	Medium to large diameter trees	Cut stump	Cut stem, including all side stems and suckers, as low to the ground as possible. Apply herbicide or ecoplugs within 3 minutes of the cut.
	Succulents	Herbicide injection	Inject herbicide directly into pre-made holes in the stem and cladodes with a syringe. Plants can also be chopped down to ground level. If the stump is sufficiently low no herbicide is required. All plant material must be removed and disposed of properly as vegetative reproduction can occur.

2.2.5 Site Management Recommendations

The following recommendations are important to the environmental management of the site wherein clearing is being undertaken:

- Avoid damage to indigenous vegetation during clearing efforts by ensuring the proper placement of equipment and herbicide and stacking areas;
- Ablution facilities should be provided where possible and all litter must be removed on a daily basis;
- No decanting of herbicide or fuel or cleaning of equipment should take place in areas of natural vegetation or aquatic systems. This should take place within a designated area on a drip sheet to prevent spillage;
- In the case of spillage, the spill must be contained immediately and cleaned up with absorbent material such as fine dry soil. Contaminated material should be disposed of as per manufacturer's instructions. Spillages should be reported to the ECO;
- Prevent environmental contamination by accurate application and using the minimum amount of herbicide needed to achieve the desired level of control. The use of coarse droplet nozzles to avoid overspray or spray drift onto adjacent vegetation is recommended. Herbicide must not be applied in windy conditions;
- Cleared alien vegetation must not be dumped on adjacent intact vegetation during clearing but must be temporarily stored in a demarcated area;
- Removal of alien invasive species or vegetation and follow-up procedures must be in accordance with the Conservation of Agricultural Resource Act, 1983 (Act 43 of 1983);
- Remove plant biomass wherever possible and never stack in wetlands or riparian areas. Finer material can be stacked in designated areas. Based on the fire prone vegetation within the project area, it was advised that the plant biomass rather be disposed with garden refuse; and
- Where possible harvest and remove wood that can be utilised for manufacturing.

2.2.6 Rehabilitation Recommendations

This plan must be read in conjunction with the rehabilitation plan to ensure the area is rehabilitated successfully after the alien invasive species have been removed.

3 Assessment Method

3.1 Project Area

The Esiyazo WEF is located approximately 19 km North of Matjiesfontein and 60 km South of Sutherland in the Western Cape Province. The development is located South of the Great Escarpment and the Klein Roggeveldberge traverses in an approximately North-South trajectory. The climate is arid to semi-arid and precipitation occurs throughout the year with a peak in Autumn/Winter within the lowland areas and early Autumn (March) at higher altitudes.

The WEF is located within the Cape Floristic Region (CFR) Biodiversity Hotspot. The CFR is an exceptionally important region for plant biodiversity globally. Approximately 69% of the estimated 9 000 plant species in the CFR are restricted (endemic). Diversity and endemism are also high at the genus and family, as the CFR possesses five families that are endemic to South Africa. The CFR comprises of several vegetation types, and the two overlapping the development area comprise of Renosterveld and Succulent Karoo. In congruency with other Biodiversity Hotspots on a global scale, the wellbeing of the CFR has been negatively affected by climate change, landcover change and invasions by alien species (Bellard *et al*, 2014). Moreover, the CFR has been identified as being particularly vulnerable to all three global changes. Accordingly, the management of the remaining natural vegetation within CFR must be taken into consideration for development projects. The control of IAPs within the WEF is therefore considered particularly pertinent.

The Esiyazo WEF is located on the border of the Western and Northern Cape ([Figure 3-1](#)).

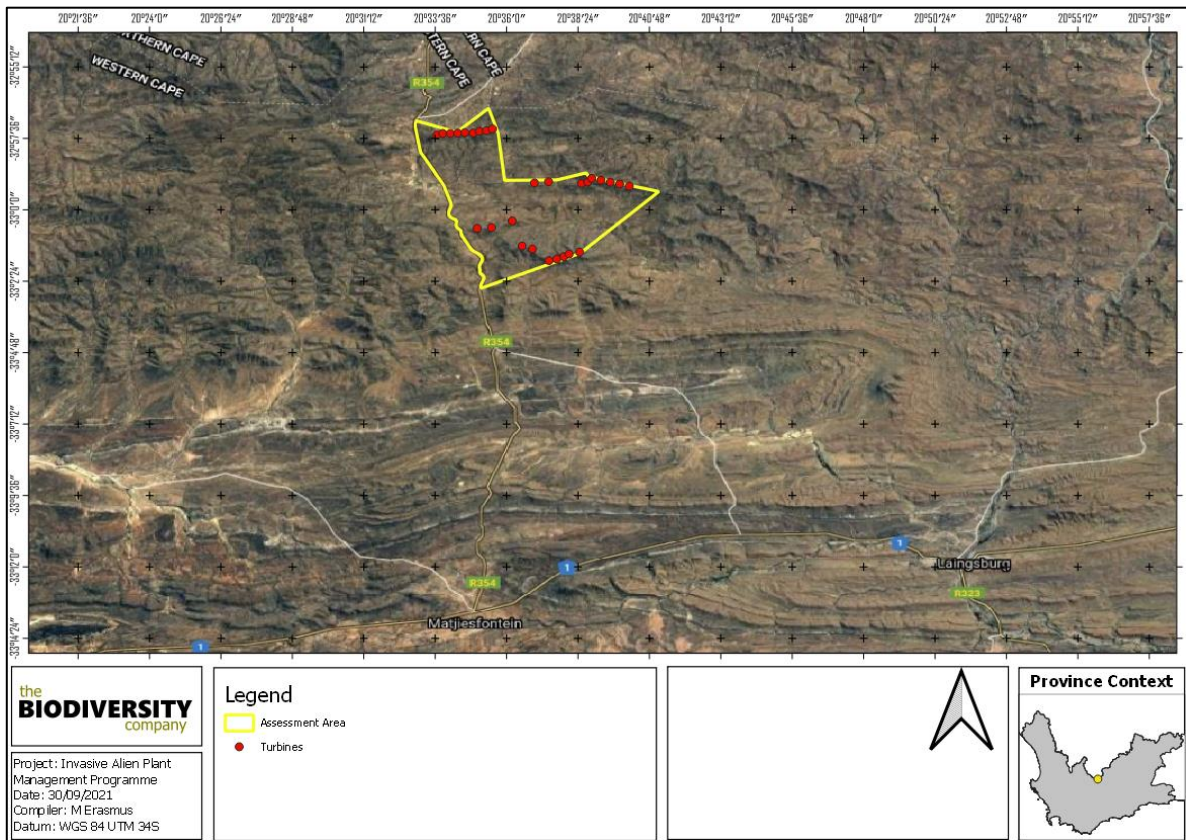


Figure 3-1 Map illustrating the location of the Esiyazo Wind Farm

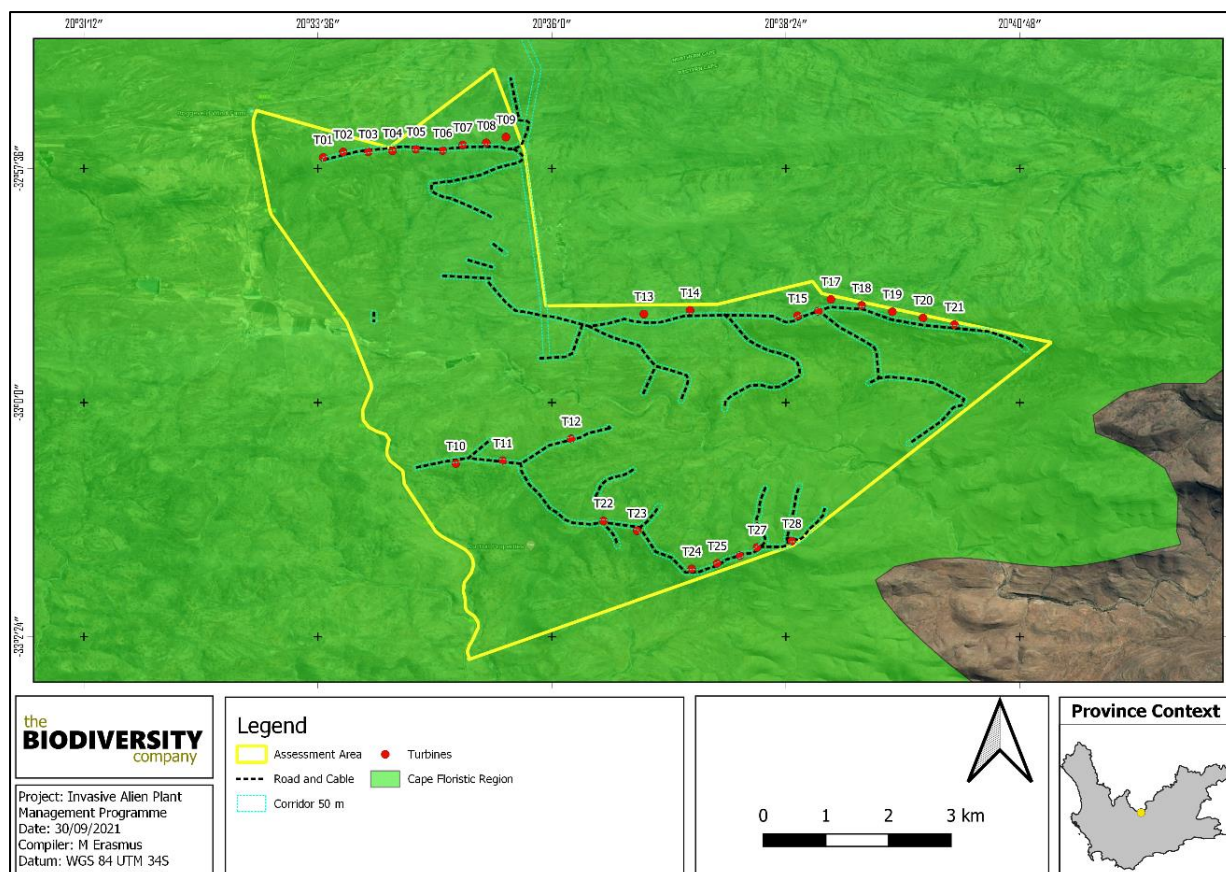


Figure 3-2 The project area in relation to the Cape Floristic Region (CFR) Biodiversity Hotspot

3.2 Habitat Vulnerabilities to Invasion

Invasive Alien Plants (IAPs) are a substantial challenge in South Africa. They have invaded almost 10 million hectares (8.28%) of the country, and are spreading rapidly (Pierce *et al*, 2002). These invasions are a considerable cost to the economy and the environment. IAPs encroach into new areas as a result of regular disturbance such as improper fire regimes, agriculture, road building, forestry and development. Impacts to biodiversity from IAP encroachment is especially concerning in the Cape Floral Region (CFR). This area region covers only 4% of the land surface of southern Africa but contains 45% of the subcontinent's plant species, of which almost 70% (5 850 species) are endemic. One of the few detailed studies calculated the value of a hypothetical (400 ha) mountain fynbos ecosystem at between US\$3 million (with no management of alien plants), and US\$50 million (with effective management of alien plants), based on water production, wild flower harvest, hiker visitation, ecotourist visitation, endemic species and genetic storage. Consequently, the control of IAPs is an imperative action that is required to maintain environmental and economic wellbeing.

Invasive alien plants threaten four main components of the landscape:

- Agriculture potential of the land;
- Biodiversity value of the land;
- Water quality; and
- Water quantity.

The susceptibility to invasion by alien species varies between habitats, this is further influenced by the level of disturbance on the site, as disturbance promotes conditions suitable for invasion by alien plants. Even though the whole site can be invested with alien plant species, the following areas are more likely to be influenced:

- Drainage lines and Roggeveld River;
- Areas with deeper soils, including the four depression pans identified by the WSP (2017) freshwater report; and
- Areas disturbed during construction and adjacent to the footprint (as a result of activities such as water runoff).

These risks will need to be mitigated through the management and monitoring plan.

3.3 Desktop Assessment

The desktop assessment was principally undertaken using a Geographic Information System (GIS) to access datasets in order to develop digital cartographs and species lists. The data sets used comprise of the following:

- Plants of Southern Africa (POSA) website (SANBI, 2021). The extent of the filter area applied is illustrated in [Figure 3-3](#). Specimen records were filtered for species that were identified as alien or invasive.

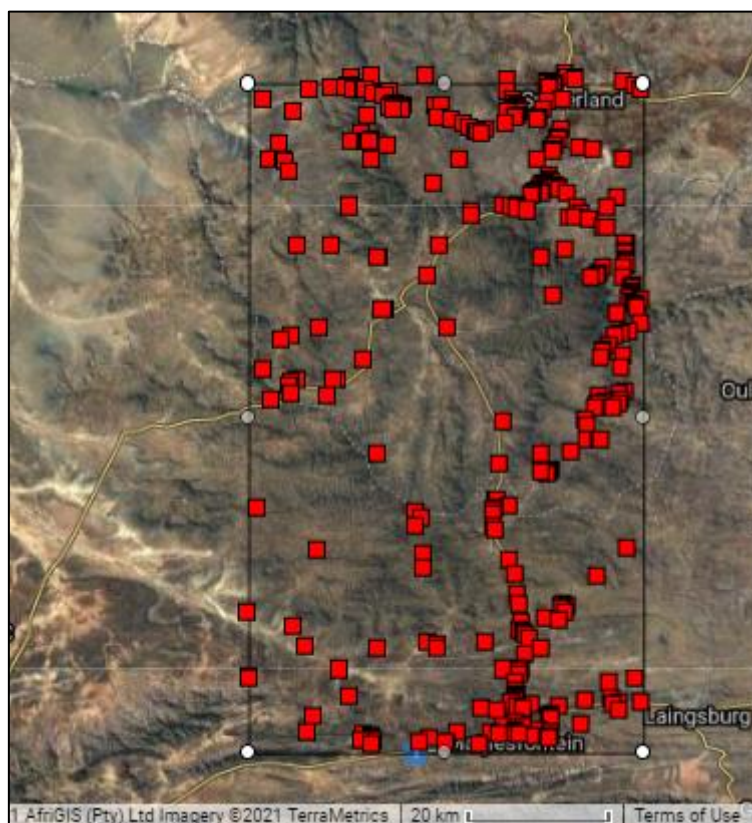


Figure 3-3 Map illustrating extent of area used to obtain the expected Invasive Alien Plant species list from the Plants of Southern Africa (POSA) database

3.4 Field Assessment

A single field survey was undertaken between 30th August until 3rd September 2021 to confirm the presence and extent of IAPs. The area surveyed comprised of a turbine and road positions that were supplied by the client. A 50 m corridor width was considered for the routes. These corridors were used as guidelines during the survey.

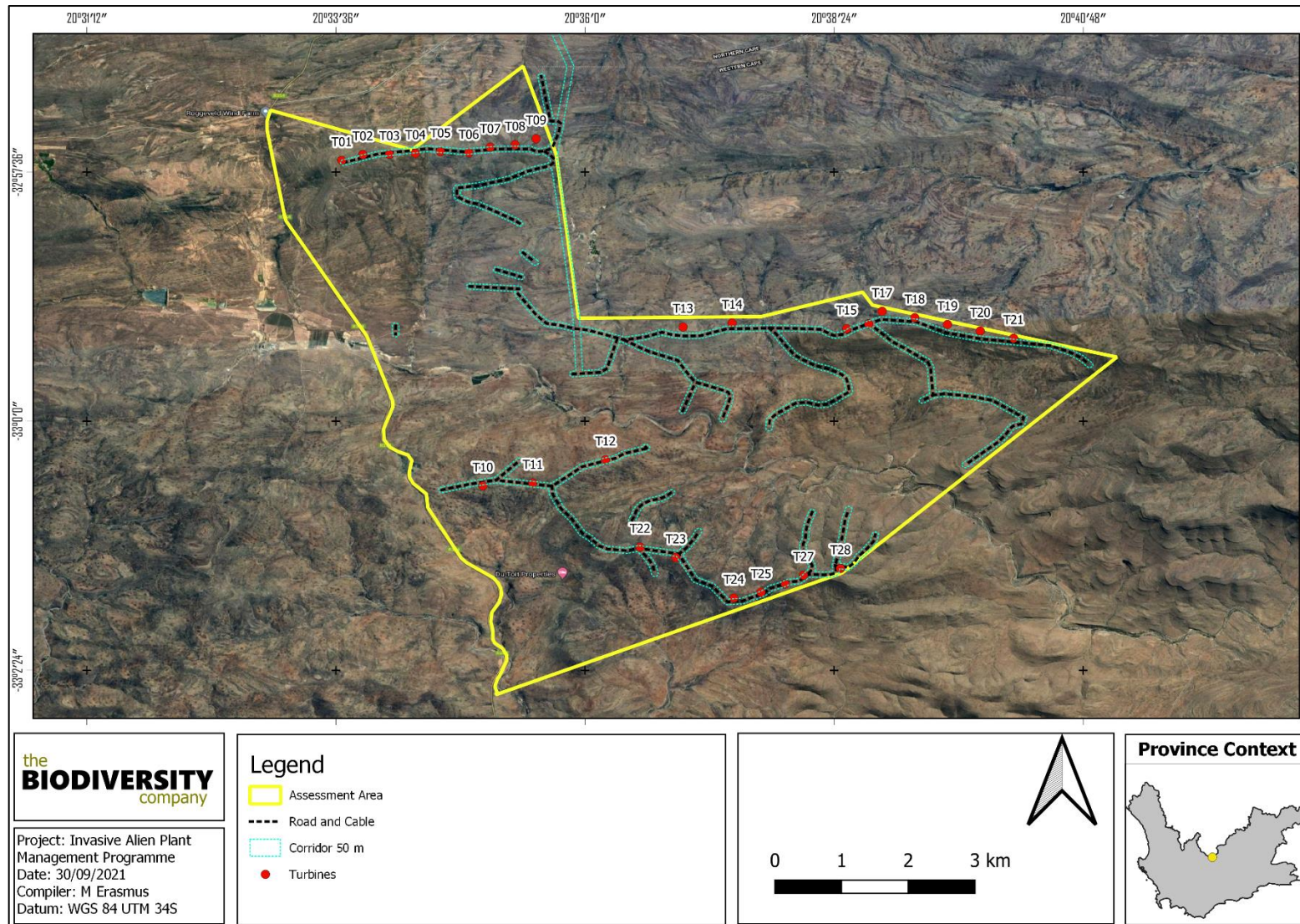


Figure 3-4 Map illustrating the assessment area regarding the Invasive Alien Plant Management Programme for the Karusa and Soetwater Wind Farms

4 Invasive Alien Plants of the Project Area

4.1 Desktop Assessment

The POSA database indicates that 36 species of IAPs are recorded within the broader landscape ([Table 4-1](#)). One (1) of these expected species and three (3) of these species are listed as 1b and must therefore be controlled should they encroach into the disturbed areas of the WEF.

Table 4-1 Summary of Invasive Alien Plants (IAPs) extracted from the Plants of South Africa (POSA) database for the assessment area

Family	Species Name	NEMBA Category
Agavaceae	<i>Agave vivipara</i>	-
Amaranthaceae	<i>Atriplex lindleyi</i>	1b
Amaranthaceae	<i>Chenopodium murale</i>	-
Apiaceae	<i>Torilis arvensis</i>	-
Boraginaceae	<i>Amsinckia menziesii</i>	-
Boraginaceae	<i>Buglossoides arvensis</i>	-
Brassicaceae	<i>Alyssum minutum</i>	-
Brassicaceae	<i>Diplotaxis muralis</i>	-
Brassicaceae	<i>Hornungia procumbens</i>	-
Brassicaceae	<i>Sisymbrium orientale</i>	-
Cactaceae	<i>Cylindropuntia fulgida</i>	1b
Cactaceae	<i>Opuntia microdasys</i>	1b
Cactaceae	<i>Tephrocactus articulatus</i>	1a
Caryophyllaceae	<i>Scleranthus annuus</i>	-
Caryophyllaceae	<i>Stellaria apetala</i>	-
Caryophyllaceae	<i>Stellaria media</i>	a. 1a Prince Edward Island. b. 1b Marion Island. c. Not listed on mainland or other offshore islands.
Crassulaceae	<i>Crassula vaillantii</i>	-
Fabaceae	<i>Medicago laciniata</i>	-
Fabaceae	<i>Medicago polymorpha</i>	-
Fabaceae	<i>Trifolium suffocatum</i>	-
Geraniaceae	<i>Erodium cicutarium</i>	-
Poaceae	<i>Brachypodium distachyon</i>	-
Poaceae	<i>Bromus diandrus</i>	-
Poaceae	<i>Bromus tectorum</i>	-
Poaceae	<i>Cynosurus coloratus</i>	-
Poaceae	<i>Cynosurus echinatus</i>	-
Poaceae	<i>Hordeum murinum</i>	-
Poaceae	<i>Lolium rigidum</i>	-
Poaceae	<i>Lolium temulentum</i>	-

Poaceae	<i>Lophochloa cristata</i>	-
Poaceae	<i>Lophochloa pumila</i>	-
Poaceae	<i>Parapholis incurva</i>	-
Poaceae	<i>Polypogon monspeliensis</i>	-
Poaceae	<i>Polypogon viridis</i>	-
Poaceae	<i>Vulpia bromoides</i>	-
Salicaceae	<i>Salix babylonica</i>	-

Table 4-2 Summary of NEMBA Category 1 Invasive Alien Plants that potentially occur within the broader landscape of the Esiyazo WEF

Atriplex lindleyi



Annual or short-lived perennial forb to 40cm tall or sprawling. Leaves 1-4cm long, 3-15mm wide, flat, mealy, margins toothed to entire. Flowers tiny (less than 3mm across).

In *Atriplex lindleyi* ssp. *conduplicata* the leaves are roundish, and the fruiting bodies are flattened, with two broad rounded wings arising from near the base.

In *Atriplex lindleyi* ssp. *inflata* the fruiting bodies are almost wingless and almost spherical.

Physical removal ensuring that the root system is removed.

Photo credit – keys.lucidcentral.org

Cylindropuntia fulgida* var. *mamillata



Succulent that consists of varying proportions of cylindrical to club-shaped stem segments. Stems are grey-green and strongly tuberculate. Young branches are covered 3 cm long, silvery-yellow spines, which darken to a grey colour. Spines form a dense layer.

No herbicides have been registered in South Africa, and manual or mechanical control is not feasible, due to the detachable stem segments that drop off the plant and grow into new plants. Biological control is, however, extremely effective using the cochineal insect, *Dactylopius tomentosus*.

Photo credit – www.arc.agric.za

Opuntia microdasys



Succulent evergreen shrub, forming thickets (0.4–0.6 m or taller); modified stems green, velvety, somewhat elongated with almost parallel sides, egg-shaped to almost round (6–15 cm long and 6–12 cm wide); 8–13 (–16) areoles with yellow to reddish brown glochidea (barbed hairs or bristles), prominent in diagonal rows across mid-stem sections.

Physical control is effective. All parts of plants need to be removed because plant readily drops segments that will start new colonies. Physical removal involves removing all plant material for destruction. Once removed, plants need to be left to dry, then burnt or deep buried.

Photo credit – www.public.asu.edu



Dwarf shrub, erect, up to 20–30 cm tall. Cladodes/stem segments usually 2.5–5 x 2.5–5 cm, easily detached; glochidia dark brown or maroon, conspicuous; spines lacking or in groups of 1–4, up to 50 x 7 mm, flat, papery or raffia-like, pale brown or white.



Herbicide treatment is effective.

Photo credit – www.arc.agric.za

4.2 Field Assessment

Three (3) IAP species were identified within the assessment area ([Table 4-3](#)~~Table 4-3~~). Many of these species are not assigned an invasive species category and can be regarded as general 'weeds'. Nevertheless, there was one (1) species that are Category 1b. The categorised species was only recorded within and around the existing farmhouse areas where they exist as wind breaks.

Table 4-3 Summary of Invasive Alien Plants (IAPs) recorded within the assessment area.

Species Name (NEMBA Category)	Photograph	Description	Control Methods
<i>Erodium moschatum</i>		Small herb with decumbent stem. Compound leaf. Leaflets 11-15, lobed to shallowly divided. Pink flower, petals 10-15 mm.	Mechanical removal by hand-pulling ensuring that the root system is removed.
<p><i>Eucalyptus camaldulensis</i></p> <p>a. Category 1b within- (i) riparian areas; (ii) a Protected Area declared in terms of the Protected Areas Act; or, (iii) within a Listed Ecosystem or an ecosystem identified for conservation in terms of a Bioregional Plan or Biodiversity Management Plans published under the Act.</p> <p>b. Not listed within Nama-Karoo, Succulent Karoo and Desert biomes, excluding within any area mentioned in (a) above.</p> <p>c. Category 1b in Fynbos, Grassland, Savanna, Albany</p>		Tall tree. The bark is smooth white, grey, yellow-green, grey-green, or pinkish grey, shedding in strips or irregular flakes. Juvenile leaves are petiolate, ovate to broadly lanceolate, up to 260 mm long and 80 mm broad, green, grey-green, or blue-green, slightly discoloured. Adult leaves are lanceolate to narrowly lanceolate, acuminate, lamina 80-300 mm long, 0.07-20 mm wide, green or grey-green, concolorous. Inflorescence axillary, 7-11 (sometimes up to 13)-flowered, flowers white.	Seedlings can be mechanically removed. Large specimens can be ring-barked, and for the sake of safety the dead trees should preferably be felled before they fall over. If felled, the stump must be treated with herbicide to prevent regrowth. Imazapyr is the active ingredient that can be used for cut stump treatment. 10% mix in water + dye + wetter can be used at a rate of 5 L/ha.

Thicket, Forest and Indian Ocean Coastal Belt biomes,

but-

(i) Category 2 for plantations, woodlots, bee-forage areas, wind-rows and the lining of avenues.

(ii) Not listed within cultivated land that is at least 50 metres away from untransformed land, but excluding within any area in (a) above.

(iii) Not listed within 50 metres of the main house on a farm, but excluding in (a) above.

(iv) Not listed in urban areas for trees with a diameter of more than 400 mm at 1000 mm height at the time of publishing of this Notice, but excluding in (a) above.

Malva parviflora



Stem is prostrate, decumbent, ascending, or erect. Leaf is 20--80 mm wide, round to reniform, 5--7-angled to -lobed. Flowers pink to white.

Physical removal by hand-pulling ensuring that the root system is removed. Herbicides are effective and can be controlled with contact herbicides while the plant is still young. Larger plants will require a systemic herbicide for effective control.

4.3 Areas of Potential Invasion

IAP Clearing Plans typically require a map showing the age or size and density of the dominant alien species in the area. However, considering that the construction phase of the WFs has not been undertaken and the surrounding landscape is largely natural, this was not possible. Nevertheless, areas of potential invasion were identified during the survey. Essentially, these areas of potential invasion are construction footprint where there is disturbance and includes the roads, laydown areas, site office, substations and wind turbine locations.

These potential areas have a high likelihood of possessing any invasive species especially during the summer growing season and during the operational phase, these areas are likely to be invaded by the aforementioned species. Therefore, routine monitoring of these areas is essential in order to effectively control the spread of IAPs. Clearing undertaken within each area should be documented. Mapping and dating cleared areas are useful in identifying 'hotspots' and where follow-up is essential. The species and an estimate of the cover should be recorded to ascertain the effectiveness of control. In addition, time taken, method and quantity of each herbicide used per site or effort should be recorded. It is vital that this data be stored on a spreadsheet. Photographs can be taken at quarterly intervals.

During the operational phase these disturbed areas and the drainage lines that cross the roads must be monitored every three (3) months within the first two years of operation in order to ensure that there is no cover of IAPs. Subsequently, i.e. after the first two years, these areas can be monitored every (6) months.

4.4 Prevention of Future Invasion

To put measures in place to prevent the introduction of new NEM:BA listed IAS onto the property, and from spreading from the property to neighbouring properties.

Preventative actions

- No listed invasive and alien plant species must be planted;
- Areas bordering onto neighbouring land must be prioritized for control to prevent existing invasive plants from spreading beyond the boundaries of the property; and
- No listed invader animal species must be introduced on the property.

Early Detection and Rapid Response and Eradication actions

- Regularly survey the property to detect any new or emerging listed invasive plant species;
- Report Category 1a species immediately to the Department of Environmental Affairs/Provincial Conservation Agency/Local Municipality/South African National Biodiversity Institute (SANBI) EDRR programme and ask for assistance with the control of the species;
- Do not allow emerging or new species to produce seeds, or start growing vegetative, act immediately by removing them;
- Update the species list by including these species and indicate where on the property they were located; and

- Increase surveillance in the areas after the species were controlled to quickly remove re-sprouting plants or seedlings.

Monitoring

The following monitoring framework should be adapted to ensure that IAS are continually monitored, and progress is recorded Table 4-4. The monitoring of the area throughout the process is crucial in order to prevent IAS growing and spreading out of control.

Table 4-4 Proposed monitoring framework

What	Frequency	How	Response
Effectivity of the control methods	4-6 months after every operation	Survey the cleared areas and evaluate regrowth. Before and after pictures are very effective. Determine if any non-target effects of herbicide are present.	If the survey reveals that the control methods are effective, e.g. low levels of re-sprouting, continue following the herbicide mixtures and control methods. If non-target plants are dying off where herbicides were applied, ensure appropriate training for herbicide applicators, demonstrate the off-target effects to herbicide applicators to ensure they are using the correct methods and herbicides. (If the results show that the control methods are not effective, adapt by e.g. cutting lower above ground or changing herbicides or timing of herbicide application.
Review the decrease in the level of infestation	Annually	Survey the cleared areas and record species, densities and size. Before and after pictures are very effective.	If the infestation levels are not decreasing, reconsider clearing intervals and look at clearing methods. If infestation levels are decreasing - continue clearing, you are doing well!
Compile and update the list of AIS present	Annually	A list of the alien invasive species present must be updated annually. Their distribution must be mapped to allow for forward planning on areas to prioritise	The management of the species must be reviewed and adapted should the number of species increase. An expert must be consulted.
Herbicide usage	During operation every	Keep track of cost and ensure no wastage. Record herbicide usage	Track usage over time, it will reveal a certain trend in quantities for different infestation levels. Less herbicides should be used when the infestation levels are lower. Record herbicide cost.
Recovery of bare patches with indigenous vegetation	Annually	Survey the cleared areas and determine the indigenous species abundance and density. Before and after pictures must be taken from the same geotagged location.	If recovery is taking place, the programme is effective. Should the area not be recovering the clearing methods and clearing intervals must be reassessed. Should this continue, an expert must be consulted.
Document & record alien control measures implemented	Every 6 months	Records of clearing activities must be compiled.	The record keeping allows an expert to come in and review what has been done and what can be changed should the plan not be effective.

5 Conclusion

A total of one (1) NEMBA Category 1b species were listed according to the list of IASs published in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (Government Gazette No 78 of 2014).

IAP and the appropriate clearing strategy was assigned to all identified IAS within the project area. It is recommended that a registered pest control operator be present on site during the use of any herbicides. Management and control of IAS is not a single occurrence, but an ongoing process mostly because of the seedbank containing a large amount of different IAS seeds which will emerge when the conditions are suitable.

6 References

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APPENDIX

F

PLANT RESCUE AND
PROTECTION PLAN FOR THE
ESIZAYO WEF



Esiyazo Wind Farm – Plant Rescue Plan

Matjiesfontein, Western Cape Province

September 2021

CLIENT



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Report Name	Esiyazo Wind Farm – Plant Rescue Plan
Reference	Esiyazo Wind Farm
Submitted to	
Report Writer	<p>Lindi Steyn </p> <p>Dr Lindi Steyn has completed her PhD in Biodiversity and Conservation from the University of Johannesburg. Lindi is a terrestrial ecologist with a special interest in ornithology. She has completed numerous studies ranging from Basic Assessments to Environmental Impact Assessments following IFC standards.</p>
Reviewer	<p>Andrew Husted </p> <p>Andrew Husted is Pr Sci Nat registered (400213/11) in the following fields of practice: Ecological Science, Environmental Science and Aquatic Science. Andrew is an Aquatic, Wetland and Biodiversity Specialist with more than 12 years' experience in the environmental consulting field. Andrew has completed numerous wetland training courses, and is an accredited wetland practitioner, recognised by the DWS, and also the Mondi Wetlands programme as a competent wetland consultant.</p>
Declaration	<p>The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2017. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.</p>

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1 Introduction

1.1 Background

Biotherm Energy (Pty) Ltd holds an Environmental Authorisation (EA) (DEA Reference: 14/12/16/3/3/2/967), dated 14/07/2017 to develop the Esiyazo Wind Farm near Matjiesfontein, Western Cape Province. The authorised Esiyazo Wind Energy Facility (WEF) falls between Matjiesfontein and Sutherland in the Laingsburg Local Municipality, Western Cape. The energy facility comprises of the following:

- A total of 56 wind turbines initially, now 28 turbines;
- An on-site 132 kV substation;
- A powerline linking to the existing Eskom transmission infrastructure;
- Underground cables linking the turbines to the substations;
- Crane platforms;
- Operations and maintenance compound area, car park, storage area; and
- Internal access roads (4-6 m wide) to each turbine.

The Biodiversity Company was commissioned to development of a Plant Rescue Plan (PRP) to meet the requirement of the issued EA as per the Regulations (No. R. 982-985, Department of Environmental Affairs, 4 December 2014) emanating from the National Environmental Management Act (Act No. 107 of 1998) with specific reference to the Esiyazo Wind Energy facility.

The requirement of the EA is the development of a PRP, along with the requirement to obtain relevant permits for the removal or destruction of Threatened or Protected Species (TOPs).

1.2 Aim of the Plant Rescue Plan

The aim of the PRP is to provide guidance on the search and rescue of plant species, including TOPS, within the planned development areas in order to prevent the further loss of these species. Plant species are generally declining either due to overexploitation or habitat loss from anthropogenic activities. Therefore, the aim of plant rescue actions is always to maintain as many individuals of a plant population in close proximity to the original area and habitat as possible in order to minimise fragmentation of populations which may lead to genetic erosion due to the restricted movement of pollen.

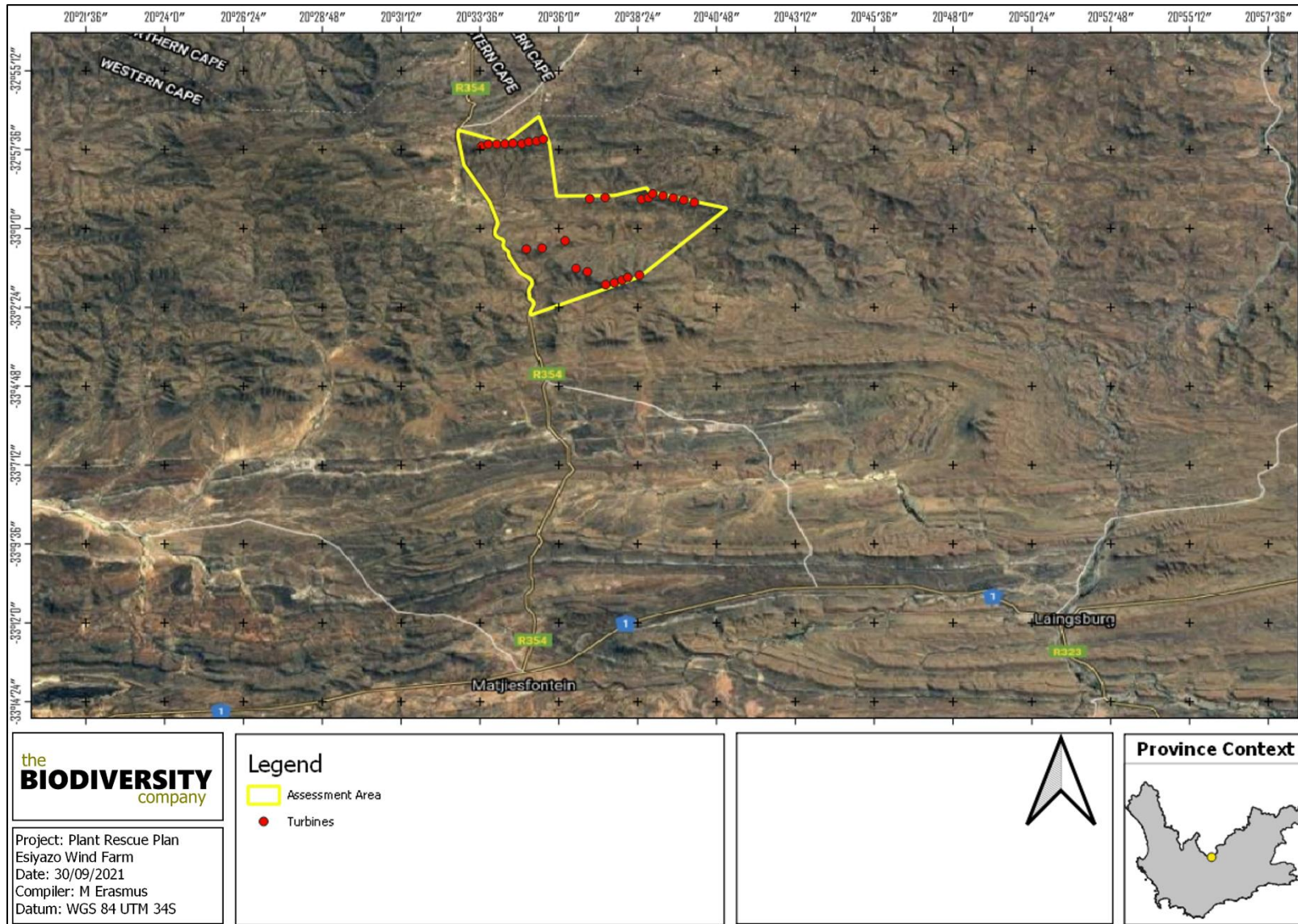


Figure 1-1 Map illustrating the location of the Esiyazo Wind Farm

1.3 Key Legislative Requirements

The legislation, policies and guidelines listed below in Table 1-1 are applicable to the current project in terms of biodiversity and ecological support systems. The list below, although extensive, may not be complete and other legislation, policies and guidelines may apply in addition to those listed below.

Of particular relevance to plant species protection are the following legislation items:

- List of Protected Tree Species under Section 15 (1) of the National Forest Act, 1998 (Act No. 84 of 1998) (NFA), wherein no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a licence or exemption granted by the National Department of Agriculture, Forestry and Fisheries (DAFF).
- Nature Conservation Ordinance 19 of 1974, section 62. Within this legislative context no person may:
 - a) Be in possession of Endangered Flora without a permit; and
 - b) Convey, export or sell a protected indigenous plant, except under the authority of a permit issued by the Conservation Service and in accordance with any special protective measures under section 16 of Ord. 26 of 1986 and amended by s. 1 of Act No. 3 of 2000.
- No person may gather or transport an indigenous plant growing in the wild except with the prior written permission of:
 - (a) The owner of the land on which it was gathered or from which it was transported; or
 - (b) The relevant tribal authority.
- The person must produce the written permission when called upon to do so by an officer, a member of the South African Police Services or a peace officer.

Table 1-1 *A list of key legislative requirements relevant to biodiversity and conservation in Western Cape within the context of the Plant Rescue Plan*

Region	Legislation
International	The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 1973)
	The National Environmental Management Act (NEMA) (Act No. 107 of 1998)
	The National Environmental Management Biodiversity Act (Act No. 10 of 2004)
	The National Environmental Management Act (NEMA) (Act No. 107 of 1998) Section 24 , No 42946 (January 2020)
	The National Environmental Management Act (NEMA) (Act No. 107 of 1998) Section 24 , No 43110 (March 2020)
	The Environment Conservation Act (Act No. 73 of 1989) and associated EIA Regulations
	National Protected Areas Expansion Strategy (NPAES)
	Natural Scientific Professions Act (Act No. 27 of 2003)

	National Forest Act (Act No. 84 of 1998)
	National Veld and Forest Fire Act (101 of 1998)
	Alien and Invasive Species Regulations, 2014
	South Africa's National Biodiversity Strategy and Action Plan (NBSAP)
Provincial	Nature Conservation Ordinance 19 of 1974
	Draft Western Cape Biodiversity Bill, 2019

1.4 Listing of Red and Orange List Plant Species

South Africa has adopted the IUCN Red List Categories and Criteria to provide an objective, rigorous, scientifically founded system to identify Red List species. A published list of the Red List species of South African plants (Raimondo *et al.* 2009) contains a list of all species that are considered to be at risk of extinction. This list is updated regularly to take new information into account. Updated assessments are provided on the SANBI website (<http://redlist.sanbi.org/>). The conservation status of plants indicated on the Red List of South African Plants Online represents the status of the species within South Africa's borders. The global conservation status, which is a result of the assessment of the entire global range of a species, can be found on the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species: <http://www.iucnredlist.org>. The South African assessment is generally used for projects within the South African territory.

2 Recommended Actions

It is understood that *in situ* conservation is typically regarded as the only option for conserving species of conservation concern and *ex situ* conservation, often termed 'search and rescue' is generally regarded as an unacceptable conservation measure (SANBI, 2021). This is because "translocated individuals may harm other species within the receiving environment, the translocated individuals may transmit pathogens and/or parasites, and translocation may result in rapid changes in the species itself" (SANBI, 2021). Nevertheless, the species or individuals rescued for the purposes of this project will be relocated to natural areas within the property or offset areas and not in formally protected areas.

Table 2-1 Summary of recommended actions pertaining to the plant rescue plan for the Esiyazo Wind Farm

Aspect	Actions
Nursery	An on-site nursery facility must be erected prior to removal for the holding of rescued plant material. Nursery facilities should be established where additional natural habitat will not be affected and where there is access to water. The nursery must be fenced off, demarcated and inaccessible to livestock and natural herbivores to avoid loss of species
	Soil and other propagation media must be organic and weed free.
	The area where rescued plants are maintained must be kept free of weedy species.
	Plants must be protected from excessive sun and wind.
Plant Material Collection	Plants should be monitored for pests, but no hazardous pesticides are to be used but organic or physical methods can be used for control.
	An Environmental Control Officer (ECO) or botanist must be present during plant collection to guide the collection process and to ensure that the correct species are collected and that species requiring collection are not missed.
	Plants with underground storage organs (bulbs, corms, tubers etc.) must be removed carefully from the ground without causing excessive damage to the roots. For lifting, loosen the soil or wedge apart rocks working from a circle of about 20 cm away from the base of the plant, working inwards but not closer than about 5 cm of the plant with a sharp narrow object. Once the soil is loosened the organ can be removed carefully by hand. The soil around the organ can be removed gently and the organs can be placed in paper bags for storage.

	<p>For plants with storage organs, the depth of the organ in the soil must be recorded. This will be important for replanting as the plant must be replanted to the same approximate depth.</p> <p>Seed can be collected from specimens and used for cultivation. This will be vital for species that do not relocate well. Seeds must be stored in a suitable manner until required for cultivation or seeding. Seeds could possibly be provided to a local nursery for germination purposes.</p> <p>Succulent species may not respond positively to being transplanted as a whole specimen. Cuttings can be taken from these species and these transplanted. It is important that a straight edged knife be used for cuttings and that the 'wet' portion of the cutting is given time to dry prior to being planted.</p> <p>All plant material collected must be labelled with the species name or at least genus, habitat collected, location (GPS coordinates) and date.</p> <p>Each plant removed must be handled packed and stored under conditions suitable for that species. Removed plants must be protected from windburn and physical damage during transport. Plants must not be subjected to excessive sun exposure or water logging.</p>
Planting	<p>Planting must occur during the growing which in the case of this area, will be during September. Plants should be watered immediately after planting to help bind soil particles to the roots.</p> <p>Plants must be planted in a space with fine-scale habitat features that are similar to the area where they were collected.</p> <p>The size of the planting hole must be large enough to ensure that the entire root system is covered except in species where part of the underground storage organ is exposed.</p> <p>Firm down soil around the base of the plant once it is in a new position. Allow the plant to resprout naturally after sufficient rains and do not water after the initial watering</p>
Establishment	<p>The growth and establishment of replanted species must be monitored to ensure their survival.</p> <p>Some species or specimens may lose their leaves after relocation or only the storage organ may be present during the planting. Therefore, the location of the planted specimens must be clearly demarcated to ensure that they can be monitored. It is recommended that the plants be monitored once a week until establishment to ascertain the efficacy of the relocation process. The species and the number of surviving individuals must be recorded.</p> <p>The emergence/growth of IAPs can be monitored in conjunction and must be removed in the appropriate manner.</p>

2.1 Nursery Facilities

The nursery facilities will need to facilitate the effective maintenance of recovered material for the duration of the contract. Standard horticultural practice would include among others, fertilization, irrigation and pest control. In terms of actual layout and size, the nurseries would each need to be an approximate area of 3 000 m², fenced securely with shade cloth fencing, with one water point supplied per site and on a site with an even slope for drainage purposes.

In the event that nursery set ups were not possible, then an existing nursery or horticultural facility in close proximity to the study area could be utilised for space rental, plant maintenance and the temporary storage of the plant material, until such a time as the plant material is required to be taken back to the source area (project area) for re-planting.

2.2 Search and Rescue Mitigations

The following principles apply in terms of plant rescue and protection:

- A permit is required from Cape Nature (<https://www.capenature.co.za/permits/protected-and-endangered-plants>) to translocate or destroy any listed and protected species identified by the ecological assessment undertaken, even if they do not leave the property. This permit should be obtained prior to any search and rescue operations being undertaken;
- The search and rescue operation of these species should be undertaken within the development footprint prior to the commencement of construction by a qualified ECO or Botanist;
- Timing of search and rescue activities should be planned with the onset of the growing season;

- All individuals that are translocated must be assigned a number for record keeping and monitoring purposes. Each individual plant must be photographed before removal, tagged with a unique number or code and a latitude-longitude position recorded using a hand - held GPS device;
- After the plant has been temporarily housed in the nursery it must be re-planted back in the wild, this should be as close as possible to where they were originally removed. Re-planting into the wild must cause as little disturbance as possible to existing natural ecosystems;
- The position of the rescued individual/s must be recorded to aid in future monitoring of the plant;
- The site where the plants are relocated to may not be one that is likely to be developed in future;
- ECO to give permission to clear vegetation only once all search and rescue operations are completed;
- The collecting of plants or their parts should be strictly forbidden (as per the mitigations included in the Environmental Management Programme report (EMPr). Staff should be informed of the legal and conservation aspects of harvesting plants from the wild as part of the environmental induction training as per the mitigations including the EMPr); and
- Sensitive habitats and areas outside project development should be clearly demarcated as no go areas during the construction and operational phase to avoid accidental impacts.

3 Flora Species


The flora species summarised in this section are those that must be relocated to natural areas within the property (Table 3-1). These are species that are listed by the Red List of South Africa (2021) and that were recorded in the Simon Todd (2016) fauna and flora study, also included are protected (listed under the Nature-Conservation-Ordinance-19-of-1974) species recorded during the ecological walkdown. The exact location of these species was not provided in the report by Simon Todd (2016), it would thus form part of the search and rescue exercise to look for the plants and relocate them.

Collection of seed from those specimens that are fruiting during the rescue period should be undertaken in conjunction. The species included as part of the seed collection action can also include those that are not necessarily of conservation concern but will be useful for any rehabilitation efforts or reducing the loss of species diversity.

The areas where these species are located or likely to occur according to the Simon Todd (2016) report overlaps with the areas of high sensitivity. Figure 3-1 is a combination of sensitivities of the biodiversity, avifauna and bat studies and as such might not be a true representation of the areas of likely occurrence. However, it will still provide a starting point for the search and rescue exercise.

Geophytes are expected to be particularly abundant within the lowland areas. It is important to note that these growth forms, and some succulents, are protected under the Western Cape Legislation (WC Nature-Conservation-Ordinance-19-of-1974) and include. All species of Amaryllidaceae; All Iridaceae; All species of Mesembryanthemaceae and All *Orchids* (Orchidaceae). Species of Mesembryanthemaceae (Aizoaceae) occurred in large numbers throughout the project area.

Table 3-1 Summary of target flora species for the Plant Rescue Plan pertaining to the Esiyazo Wind Farm

Family	Species Name	Red List Status	Description	Photograph
POACEAE	<i>Ehrharta eburnea</i> Gibbs Russ.	NT	Tufted grass with longitudinal ridges on the spikelets.	 <p>Photos by Seth Musker (https://inaturalist.nz/photos/29789684)</p>

GERANIACEAE

*Pelargonium
denticulatum* Jacq.

Rare

“Plant with sticky finely divided leaves. The leaf margins are irregular and finely dentate with sharply pointed teeth. The leaves are characteristically hard and rigid and are densely covered with glandular hairs. The inflorescence consists of three to seven pink to purple flowers. The two posterior petals have dark red to purple markings and the anterior three have narrow claws. A claw is a narrow proximal part of a spatulate petal.” (SANBI, 2010)



<http://pza.sanbi.org/pelargonium-denticulatum>





<p>CRASSULACEAE</p>	<p><i>Adromischus mammillaris</i></p>	<p>EN</p>	<p>Branchlets simple, stout, elongate, erect or decumbent, 7-12 mm across up to 35 cm long, rarely with stilt adventitious roots. Leaves: 2-8 cm long, 5-15 mm broad, oblanceolate, elliptic to oblong, or linear-elliptic and almost terete (cylindrical), often spindle-shaped, narrowed on both sides, often distinctly flattened above grey-green to greyish brown, with or without dark spots.</p>	 <p>Photo by Brian du Preez (https://www.inaturalist.org/photos/15303159)</p>
<p>ASTERACEAE</p>	<p><i>Eriocephalus grandiflorus</i> M.A.N.Müll.</p>	<p>Rare</p>	<p>Robust, rigid, spinescent, much-branched shrubs, 200-450 mm tall. Leaves decussate, rarely alternate on some flowering shoots or clustered on brachy blasts, sessile on cushion-like thickenings, 4.5-9.0 x 1.2-2.2 mm. Ray florets 2-4, 4-6 mm long; lamina broadly cuneate, 3- or 4-dentate or -lobed, 3.5 x 3.5-4.2 mm, white or pale to dark purple. Flowering time: June to September (https://plants.istor.org/stable/10.5555/al.ap.flora.flosa003350315700055).</p>	 <p>Photo from https://www.inaturalist.org/search?q=Eriocephalus%20grandiflorus</p>



Photo from <http://redlist.sanbi.org/species.php?species=3157-55>

<p>ASPHODELACEAE</p>	<p><i>Bulbine torta</i> N.E.Br.</p>	<p>Rare</p>	<p>It grows from a flat based tuber and has twisted or coiled thread-like leaves and yellow to light orange flowers with fluffy yellow stamens. In the wild it blooms July to September. https://www.pacificbulbsociety.org/pbswiki/index.php/bulbine</p>	
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Photo Peter Thompson (<https://www.inaturalist.org/photos/50811355>)

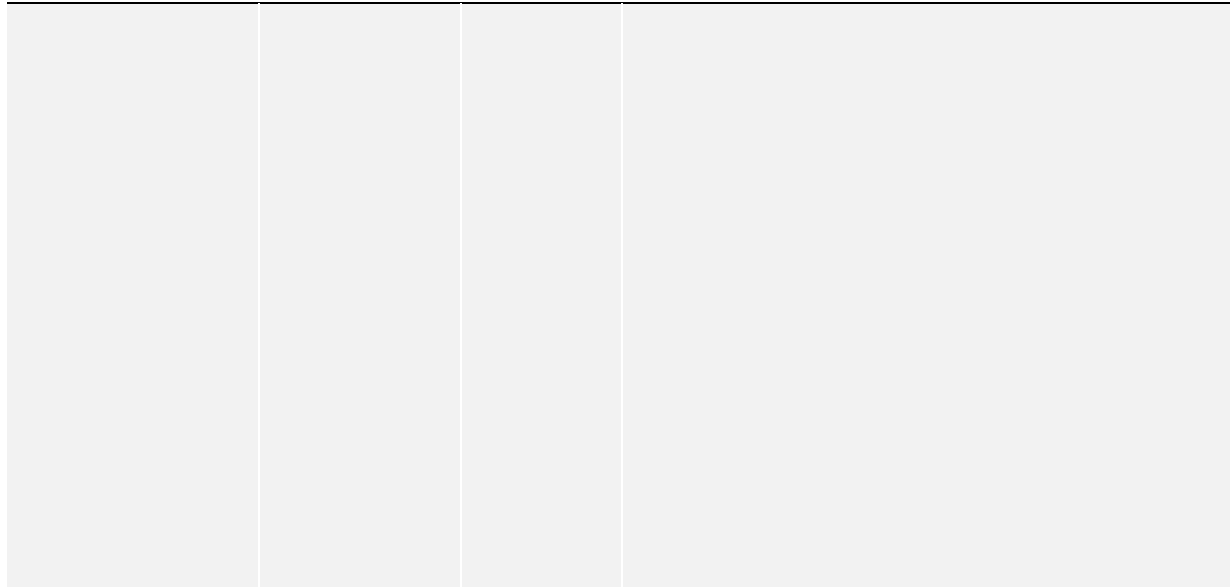


Photo by Richard Adcock
(<https://www.inaturalist.org/photos/15666426>)

APOCYNACEAE

Duvalia parviflora
N.E.Br.

VU

Stems about 1 in. long and 1/2 in. thick, oblong, very obtusely and somewhat obscurely 5 angled, light green, mottled with dull purple, faintly glaucous; flowers 4–5 together, successively developed near the apex of the stems; pedicels 1/6– 1/3 in. long; sepals 3/4–1 lin. long, ovate-lanceolate, acuminate; corolla about 5–7 lin. in diam., “cream-colour, with the apical half of the lobes pale purple” (Pillans); lobes 2–2 1/2 lin. long, very spreading, closely replicate to the base into vertical plates 3/4 lin. deep, glabrous, ciliate with a few very minute simple cream-coloured hairs at the base only; annulus 1 1/2–2 lin. in diam., raised about 1/4 lin. above the level of the lobes, obtusely pentagonal, glabrous, the top quite covered (without leaving a margin) by the equally large outer corona; “outer and inner coronas straw-coloured, anthers purple”
(<https://plants.jstor.org/stable/10.5555/al.ap.flora.floc010061>)






Photo by Audissou (<https://www.inaturalist.org/photos/16007836>)



Photo by Audissou (<https://www.inaturalist.org/photos/16007841>)

<p>AMARYLLIDACEAE</p>	<p><i>Brunsvigia josephinae</i> (Redouté) Ker Gawl.</p>	<p>VU</p>	<p>The plants including the inflorescence grow to about 0.65 m in height. The bulbs are usually exposed, 200 mm in diameter and covered with dry, papery tunics. The 8-20 leaves are blueish-grey, strap-like, and about 600 x 200 mm.</p> <p>The 30-40 flowers are carried on open, widely spreading umbels, are dark red, and orange-yellow toward the base. The individual flowers are tubular, measuring 15mm long and produce nectar, which is enjoyed by sugarbirds. The fruiting body is a capsule 30-50 mm long, more or less cylindrical. The seeds are ovoid, reddish-green, fleshy, 5-10 mm in diameter and are dispersed when the capsule ruptures as they are blown by the wind. From seed, plants may take up to 14 years to mature (http://pza.sanbi.org/brunsvigia-josephinae)</p>	
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Photo from <http://pza.sanbi.org/brunsvigia-josephinae>

<p>Iridaceae</p>	<p><i>Babiana cuneata</i></p>	<p>LC; WC Schedule 4 protected plant</p>	<p>A perennial plant with striking purple flowers. The leaves are abruptly truncate. Grows on rocky sandstone or dolerite slopes and flat, and blooms late August -September. (https://www.pacificbulbsociety.org/pbswiki/index.php/BabianaTwo)</p>	
<p>Crassulaceae</p>	<p><i>Crassula pyramidalis</i></p>	<p>LC; WC Schedule 4 protected plant</p>	<p>A sparingly branched succulent with erect to decumbent stems that is hidden by green to brown leaves. Grows up to 15cm with leaves packed in 4 ranks usually, triangular-ovate. Flowers are white to cream pink. (https://worldofsucculents.com/crassula-pyramidalis-pagoda-mini-jade/)</p>	
<p>Crassulaceae</p>	<p><i>Crassula columnaris</i></p>	<p>LC; WC Schedule 4 protected plant</p>	<p>Grows in columns of tightly packed leaves approximately 1cm wide and 5cm tall. Grows to about 8-10cm tall. Produces white flowers on the top of the columns in the springtime. (https://worldofsucculents.com/crassula-columnaris-upright-crassula/)</p>	

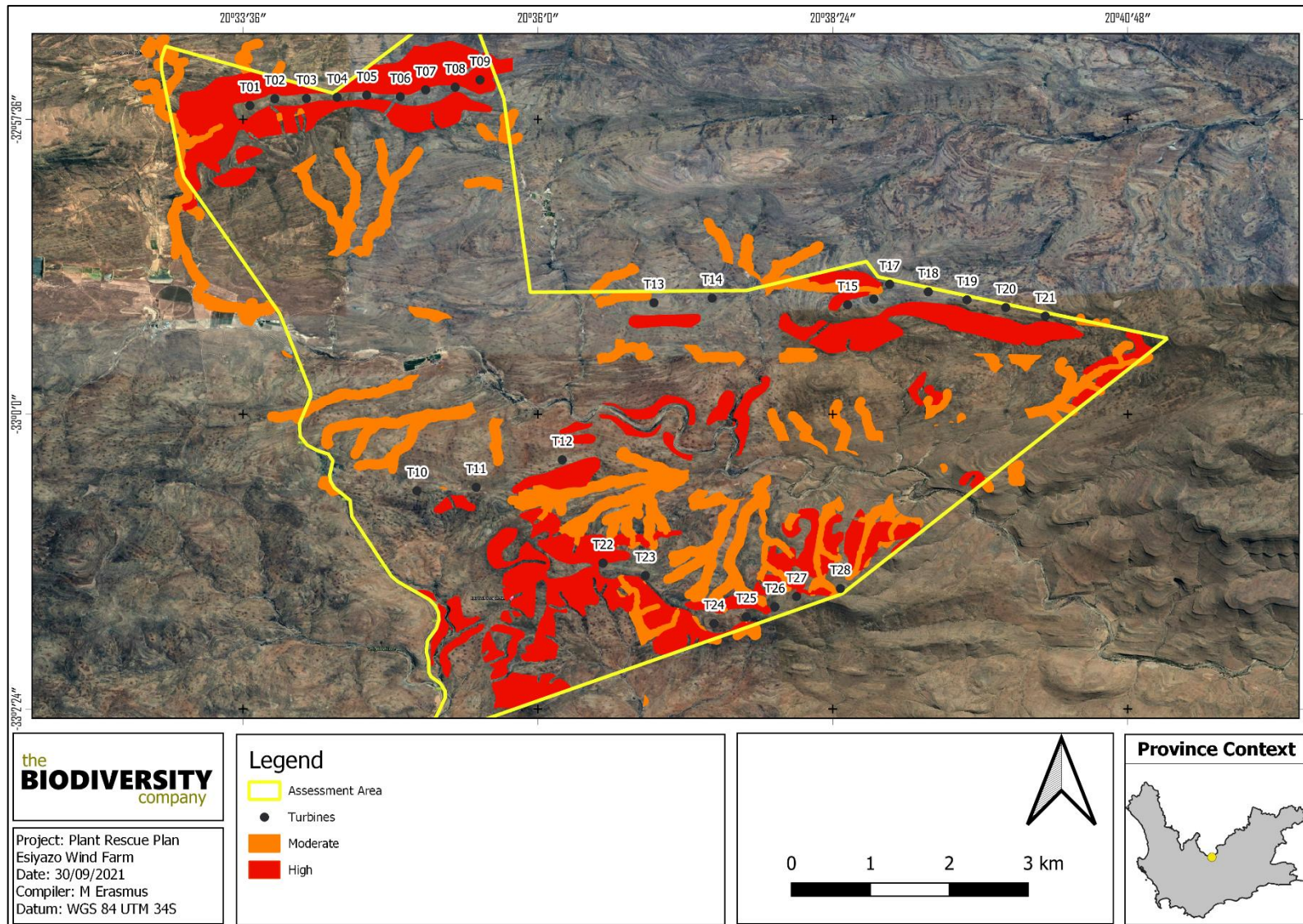


Figure 3-1 Map illustrating the priority areas for the Plant Rescue Plan pertaining to the Esiyazo Wind Farm

4 Monitoring

Monitoring is crucial to ensure the relocation was a success. The following processes must be followed:

- It is recommended that the plants be monitored once a week until establishment to ascertain the efficacy of the relocation process. The species and the number of surviving individuals must be recorded; and
- Photos must be included in a progress report for each specimen to show the before (original location), during (in nursery) and after (replanted in the natural area).

5 Concluding Remarks

This Plant Rescue Plan was developed for the Esiyazo Wind Farm as a requirement of the environmental authorization. It is important to consider that not all of the relocated individuals may survive but by implementing the recommended actions as provided in this report, it is possible to reduce the level of loss. Therefore, all recommendations within this report must be adhered to to ensure an effective plant rescue effort.

6 References

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SANBI, 2021. Guidelines for Environmental Impact Assessments (EIAs). <http://redlist.sanbi.org/eiaguidelines.php>. Accessed: August 2021

7 Appendix Items

7.1 Specialists Declaration of Independence

I, Lindi Steyn, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Lindi Steyn

Biodiversity and Aquatic Specialist

The Biodiversity Company

September 2021

APPENDIX

G

RE-VEGETATION AND
HABITAT REHABILITATION
PLAN FOR THE ESIZAYO WEF



Rehabilitation Plan: Esiyazo Wind Farm

Metjiesfontein, Western Cape

September 2021

CLIENT



Prepared by:

The Biodiversity Company




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Report Name	Esiyazo Wind Farm – Rehabilitation Plan
Reference	Esiyazo Wind Farm
Submitted to	
Report Writer	Lindi Steyn 
	Dr Lindi Steyn has completed her PhD in Biodiversity and Conservation from the University of Johannesburg. Lindi is a terrestrial ecologist with a special interest in ornithology. She has completed numerous studies ranging from Basic Assessments to Environmental Impact Assessments following IFC standards.
Reviewer	Andrew Husted 
	Andrew Husted is Pr Sci Nat registered (400213/11) in the following fields of practice: Ecological Science, Environmental Science and Aquatic Science. Andrew is an Aquatic, Wetland and Biodiversity Specialist with more than 12 years' experience in the environmental consulting field. Andrew has completed numerous wetland training courses, and is an accredited wetland practitioner, recognised by the DWS, and also the Mondi Wetlands programme as a competent wetland consultant.
Declaration	The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2017. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.

DECLARATION

I, Lindi Steyn declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Lindi Steyn

The Biodiversity Company

September 2021

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1 Introduction

Biotherm Energy (Pty) Ltd holds an Environmental Authorisation (EA) (DEA Reference: 14/12/16/3/3/2/967), dated 14/07/2017 to develop the Esiyazo Wind Farm near Matjiesfontein, Western Cape Province. The authorised Esiyazo Wind Energy Facility (WEF) falls between Matjiesfontein and Sutherland in the Laingsburg Local Municipality, Western Cape. The energy facility comprises of the following:

- A total of 56 wind turbines initially, now 28 turbines;
- An on-site 132 kV substation;
- A powerline linking to the existing Eskom transmission infrastructure;
- Underground cables linking the turbines to the substations;
- Crane platforms;
- Operations and maintenance compound area, car park, storage area; and
- Internal access roads (4-6 m wide) to each turbine.

The Biodiversity Company was commissioned to compile a rehabilitation management plan to meet the requirement of the issued EA as per the Regulations (No. R. 982-985, Department of Environmental Affairs, 4 December 2014) emanating from the National Environmental Management Act (Act No. 107 of 1998) with specific reference to the Esiyazo Wind Energy facility.

Rehabilitation refers to the measures that are undertaken to “as far as it is reasonably practicable, to rehabilitate the environment affected by the development to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development”. Where the intention is to return to its natural state, the objective may read ‘to establish a self-sustaining, indigenous ecosystem’. This principle has been adopted for this project.

1.1 Rehabilitation Approach

Rehabilitation measures are costly and there needs to be a financial assurance that these costs are met. Regardless, it is vital that natural areas are rehabilitated to ensure ecosystem functioning.

The revegetation process that forms part of the rehabilitation process not only attempts to restore the ecosystem processes of the affected area, but also impedes the encroachment of Invasive Alien Plants (IAPs). The following guidelines are recommended with regards to this process:

- The affected area must be re-shaped to a suitable topography and covered with a suitable soil material;
- Plants that are well-adapted to prevailing climatic conditions must be used. This essentially dictates that only local indigenous species are to be used;

- Perennial species must form the main component of the revegetation programme. Annual species do have some role but only in providing rapid temporary cover in the initial stage of revegetation or as a component of mixtures containing perennials;
- Good quality planting material and preferably seed must be readily available with an assured source of supply;
- A combined approach to revegetation, i.e., sowing and planting, is the best strategy to achieve the intended results of a suitable plant density and diversity; and
- Fauna tend to be overlooked in rehabilitation programmes but play critical roles in ecosystems and the addition of fauna may be useful in certain cases.

1.2 Terms of Reference

The following is applicable:

- Review of existing information related to the development;
- Compilation of a report detailing the results of the site visit; and
- Compilation of a rehabilitation plan, including a monitoring plan.

2 Limitations

The following limitation should be noted for the study:

- The assessment area was based on the spatial file provided by the client and any alterations to the development area subsequent to the site visit may affect the results; and
- The biodiversity assessments associated with the approved EIA did not list any focus areas for rehabilitation, neither did it provide a map of the different vegetate classes for that a fine scale revegetation of the area could be provided.

3 Project Area

The Esiyazo WEF is located approximately 19 km North of Matjiesfontein and 60 km South of Sutherland in the Western Cape Province. The development is located South of the Great Escarpment and the Klein Roggeveldberge traverses in an approximately North-South trajectory. The climate is arid to semi-arid, and precipitation occurs throughout the year with a peak in Autumn/Winter within the lowland areas and early Autumn (March) at higher altitudes.

The WEF is located within the Cape Floristic Region (CFR) Biodiversity Hotspot. The CFR is an exceptionally important region for plant biodiversity globally. Approximately 69% of the estimated 9 000 plant species in the CFR are restricted (endemic). Diversity and endemism are also high at the genus and family, as the CFR possesses five families that are endemic to South Africa. The CFR comprises of several vegetation types, and the two overlapping the development area comprise of Renosterveld and Succulent Karoo. In congruency with other Biodiversity Hotspots on a global scale, the wellbeing of the CFR has been negatively affected by climate change, landcover change and invasions by alien species (Bellard *et al*, 2014). Moreover, the CFR has been identified as being particularly vulnerable to all three global

changes. Accordingly, the management of the remaining natural vegetation within CFR must be taken into consideration for development projects (Figure 3-1).

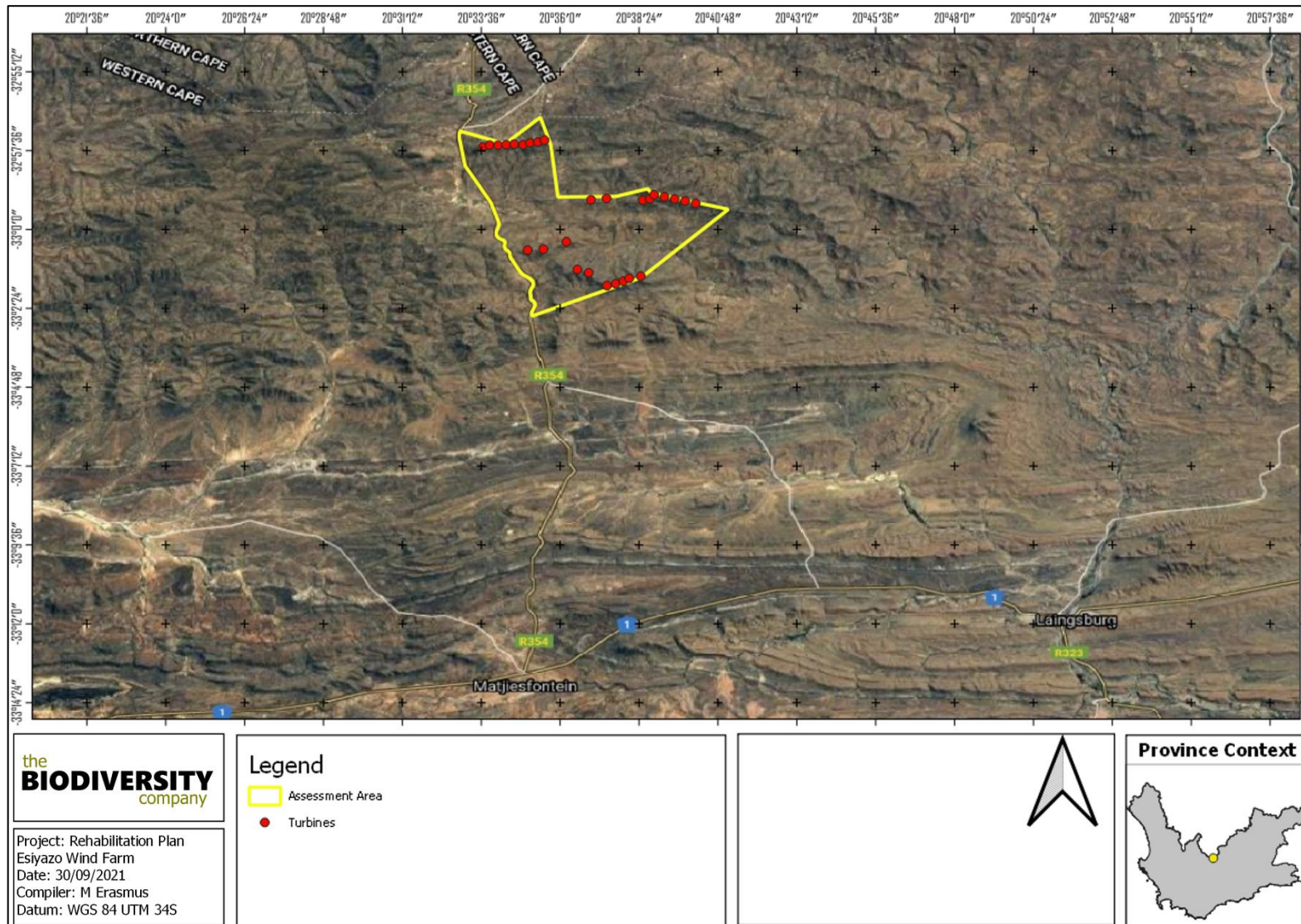


Figure 3-1 The location of the Esiyazo Wind Farm project area

4 Methodology

4.1 Desktop Assessment

The following dataset and source was reviewed for the study:

- The Vegetation of South Africa, Lesotho & Swaziland (SANBI, 2018).

The Simon Todd Consulting (2016), Environmental impact assessment for the proposed Esizayo wind energy facility: fauna & flora specialist study for EIA was used for guidance on the state of the habitat and baseline species present in the area.

5 Results & Discussion

5.1 Desktop Assessment

5.1.1 Vegetation Assessment

The project area is situated in the Fynbos and Succulent Karoo biome. The fynbos biome comprises of three naturally fragmented vegetation types, they are; fynbos, renosterveld and sandveld (Mucina & Rutherford, 2006). This evergreen, fire-prone shrubland is characterised by the presence of restios, high cover of ericoid shrubs and the common occurrence of proteoid shrubs (Mucina & Rutherford, 2006).

The fynbos occurs mainly on nutrient poor sandy soils and less frequently on limestone, leached clay soils derived from shale and granite, and gravelly soils derived from duricrust outcrops and alluvial sediments (Mucina & Rutherford, 2006).

The Succulent Karoo biome covers a flat to gently undulating plain, with some hilly and "broken" veld, mostly situated to the west and south of the escarpment, and north of the Cape Fold Belt. The altitude is mostly below 800 m, but in the east, it may reach 1 500 m (SANBI, 2019).

The Succulent Karoo Biome is primarily determined by the presence of low winter rainfall and extreme summer aridity. Rainfall varies between 20 and 290 mm per year. Because the rains are cyclonic, and not due to thunderstorms, the erosive power is far less than of the summer rainfall biomes. During summer, temperatures in excess of 40°C are common, while fog is common nearer to the coast (SANBI, 2019).

The vegetation is dominated by dwarf, succulent shrubs, of which the Vygies (Mesembryanthemaceae) and Stonecrops (Crassulaceae) are particularly prominent. Mass flowering displays of annuals (mainly Daisies Asteraceae) occur in spring, often on degraded or fallow lands. Grasses are rare, except in some sandy areas, and are of the C3 type. The number of plant species mostly succulents - is very high and unparalleled elsewhere in the world for an arid area of this size (SANBI, 2019).

On a finer scale, the project area overlaps with the Central Mountain Shale Renosterveld and the Koedoesberge Moordenaars Karoo (Figure 5-1).

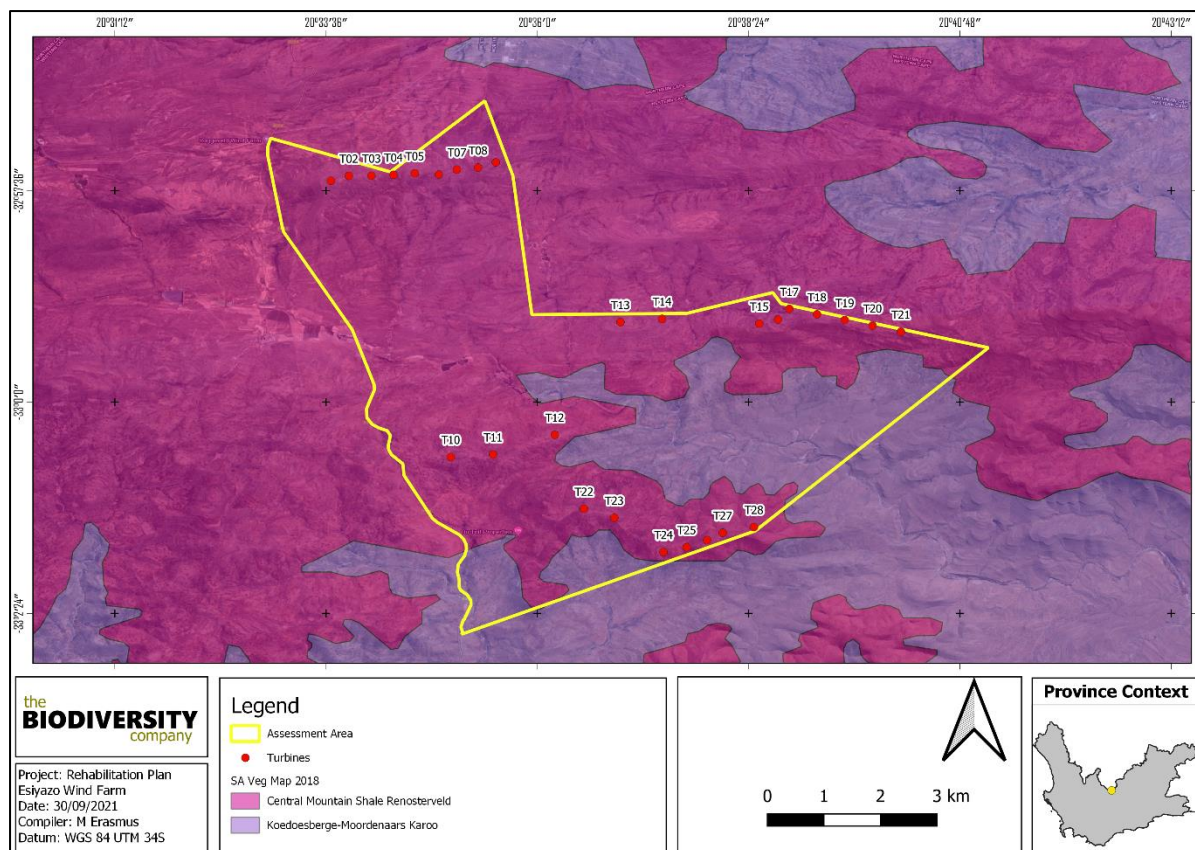


Figure 5-1 Project area showing the vegetation type based on the Vegetation Map of South Africa, Lesotho & Swaziland (SANBI, 2019)

5.1.1.1 Central Mountain Shale Renosterveld

The central Mountain Shale Renosterveld is made up of slopes and broad ridges of low mountains and escarpments, with tall shrubland dominated by renosterbos and large suites of mainly nonsucculent karoo shrubs and with a rich geophytic flora in the undergrowth or in more open, wetter or rocky habitats (Mucina & Rutherford, 2006). The soil forms found in this vegetation type are clayey soils overlying Adelaide Subgroup mudstones and subordinate sandstones. Glenrosa and Mispah forms are prominent. The soil type is an important consideration in the rehabilitation of the area especially should new soil be brought in, if the topsoil layer were not stored appropriately.

Important Taxa found in this vegetation type includes: Low Shrubs: *Elytropappus rhinocerotis*, *Amphiglossa tomentosa*, *Asparagus capensis* var. *capensis*, *Chrysocoma ciliata*, *C. oblongifolia*, *Diospyros austro-africana*, *Eriocephalus africanus* var. *africanus*, *E. ericoides* subsp. *ericoides*, *E. eximius*, *E. grandiflorus*, *E. microphyllus* var. *pubescens*, *E. pauperrimus*, *E. purpureus*, *Euryops imbricatus*, *Exomis microphylla*, *Felicia filifolia* subsp. *filifolia*, *F. muricata* subsp. *muricata*, *F. ovata*, *Galenia africana*, *Helichrysum dregeanum*, *H. lucilioides*, *Hermannia multiflora*, *Lessertia fruticosa*, *Lycium cinereum*, *Nenax microphylla*, *Pelargonium abrotanifolium*, *Pentzia incana*, *Pteronia ambrariifolia*, *P. glauca*, *P. glomerata*, *P. incana*, *P. sordida*, *Rosenia glandulosa*, *R. humilis*, *R. oppositifolia*, *Selago albida*, *Tripteris sinuata*, *Zygophyllum spinosum*. Succulent Shrubs: *Delosperma subincanum*, *Drosanthemum lique*, *Euphorbia stolonifera*, *Trichodiadema barbatum*, *Tylecodon reticulatus* subsp. *reticulatus*, *T. wallichii* subsp. *wallichii*. Woody Climber: *Asparagus aethiopicus*. Herbs: *Dianthus*

caespitosus subsp. *caespitosus*, *Heliophila pendula*, *Lepidium desertorum*, *Osteospermum acanthospermum*, *Senecio hastatus*. Geophytic Herbs: *Bulbine asphodeloides*, *Drimia intricata*, *Othonna auriculifolia*, *Oxalis obtusa*. Succulent Herbs: *Crassula deceptor*, *C. muscosa*, *C. tomentosa* var. *glabrifolia*, *Senecio radicans*. Graminoids: *Ehrharta calycina*, *Karoochloa purpurea*, *Merxmuellera stricta*.

5.1.1.2 Koedoesberge Moordenaars Karoo

The Koedoesberge Moordenaars Karoo consists of slightly undulating to hilly landscape covered by low succulent scrub and dotted by scattered tall shrubs, patches of 'white' grass visible on plains, the most conspicuous dominants being dwarf shrubs of *Pteronia*, *Drosanthemum* and *Galenia*. The soil type consists of mudstone (mainly), shale and sandstone of the Adelaide Subgroup, accompanied by sandstone, shale and mudstone of the Permian Waterford Formation (Ecca Group) and sandstone and shale of other Ecca Group Formations as well as Dwyka Group diamictites (all of the Karoo Supergroup). This geology gives rise to shallow, skeletal soils.

Important Taxa Succulent Shrubs: *Hereroa odorata*, *Antimima fergusoniae*, *A. maxwellii*, *A. wittebergensis*, *Aridaria noctiflora* subsp. *straminea*, *Crassula nudicaulis*, *C. rupestris* subsp. *commutata*, *Cylindrophyllum comptonii*, *Drosanthemum framesii*, *D. karroense*, *D. lique*, *Euphorbia decussata*, *E. eustacei*, *E. mauritanica*, *Hoodia gordonii*, *H. grandis*, *Lycium oxycarpum*, *Manochlamys albicans*, *Peersia macradenia*, *Pelargonium crithmifolium*, *Ruschia grisea*, *R. intricata*, *Salsola aphylla*, *Sarcocaulon crassicaule*, *Sceletium rigidum*, *Tetragonia robusta* var. *psiloptera*, *Trichodiadema barbatum*, *Tylecodon reticulatus*, *T. wallichii* subsp. *wallichii*, *Zygophyllum flexuosum*. Tall Shrub: *Diospyros pallens*. Low Shrubs: *Pteronia incana* (d), *Amphiglossa tomentosa*, *Aptosimum indivisum*, *A. spinescens*, *Asparagus burchellii*, *A. capensis* var. *capensis*, *Athanasia minuta* subsp. *inermis*, *Barleria stimulans*, *Berkheya spinosa*, *Chrysocoma ciliata*, *Eriocephalus africanus*, *E. ericoides*, *E. pauperrimus*, *E. spinescens*, *Euryops lateriflorus*, *Felicia filifolia*, *F. macrorrhiza*, *F. muricata*, *F. scabrida*, *Galenia africana*, *G. fruticosa*, *Garuleum bipinnatum*, *Helichrysum lucilioides*, *Hermannia grandiflora*, *H. multiflora*, *Lessertia fruticosa*, *Limeum aethiopicum*, *Melolobium candicans*, *Menodora juncea*, *Microloma armatum*, *Monechma spartioides*, *Muraltia scoparia*, *Pelargonium hirtum*, *Pentzia incana*, *Polygala seminuda*, *Pteronia adenocarpa*, *P. ambrariifolia*, *P. empetrifolia*, *P. glauca*, *P. glomerata*, *P. pallens*, *P. scariosa*, *P. sordida*, *Rhigozum obovatum*, *Senecio haworthii*, *Tripteris sinuata*, *Zygophyllum microphyllum*, *Z. retrofractum*, *Z. spinosum*. Semiparasitic Shrub: *Thesium lineatum*. Woody Climbers: *Asparagus fasciculatus*, *A. racemosus*, *A. retrofractus*, *Microloma sagittatum*. Herbaceous Climber: *Fockea sinuata*. Semiparasitic Epiphytic Shrub: *Viscum capense*. Herbs: *Atriplex suberecta*, *Felicia bergeriana*, *Gazania jurineifolia* subsp. *scabra*, *Hermannia althaeifolia*, *H. pulverata*, *Lepidium africanum*, *L. desertorum*, *Leysera tenella*, *Pelargonium minimum*, *P. nervifolium*, *Syncarpha dregeana*, *Ursinia nana*, *Zaluzianskya inflata*, *Z. peduncularis*. Geophytic Herbs: *Drimia intricata*, *Geissorhiza karooica*, *Ixia marginifolia*, *I. rapunculoides*, *Ornithogalum adseptentrionesvergentulum*, *Oxalis obtusa*, *Romulea austinii*, *R. tortuosa* subsp. *tortuosa*, *Strumaria karooica*, *S. pubescens*, *Trachyandra thyrsoidea*. Succulent Herbs: *Astroloba foliolosa*, *A. spiralis*, *Brownanthus vaginatus*, *Crassula deceptor*, *C. muscosa*, *C. tomentosa*, *Deilanthus thudichumii*, *Haworthia marumiana* var. *archeri*, *Mesembryanthemum stenandrum*, *Pectinaria articulata*, *Piarranthus parvulus*, *Psilocaulon coriarium*, *P. junceum*, *Quaqua arenicola* subsp. *arenicola*, *Q. arida*, *Q. ramosa*, *Stapelia pillansii*, *S. rufa*,

Stapeliopsis exasperata, *Tetragonia microptera*, *Tripteris aghillana* var. *integrifolia*. Parasitic Herb: *Hyobanche glabrata*. Graminoids: *Aristida adscensionis*, *A. diffusa*, *Ehrharta calycina*, *E. delicatula*, *Enneapogon scaber*, *Fingerhuthia africana*, *Karoochloa tenella*, *Pentaschistis airoides*, *Stipagrostis ciliata*, *S. obtusa*.

Biogeographically Important Taxa (^{GKB}Great Karoo basin endemic, ^{RH}Roggeveld-Hantam endemic, ^SSouthern distribution limit, ^WWestern distribution limit) Succulent Shrubs: *Deilanthus peersii* ^W, *Hereroa crassa* ^{GKB}, *Pleiospilos nelii* ^{GKB}, *Rhinephyllum graniforme* ^{GKB}, *Ruschia crassa* ^{GKB}, *R. perfoliata*. Low Shrubs: *Felicia lasiocarpa* ^{GKB}, *Sericocoma pungens* ^S. Herbs: *Helichrysum cerastioides* var. *aurosicum* ^W, *Ifloga molluginoides* ^S. Geophytic Herbs: *Brunsvigia comptonii* ^S, *Drimia karooica* ^W. Succulent Herbs: *Aloe longistyla* ^W, *Crassula hemisphaerica* ^W, *Pectinaria longipes* subsp. *longipes* ^{RH}, *Piarranthus comptus* ^{GKB}, *Quaqua parviflora* subsp. *gracilis* ^{RH}, *Tridentea parvipuncta* subsp. *parvipuncta* ^{GKB}.

Endemic Taxa Succulent Shrubs: *Antimima karroidea*, *A. loganii*, *Calamophyllum teretiusculum*, *Cerochlamys gemina*, *Drosanthemum comptonii*, *Ruschia karooica*, *Tanquana archeri*, *Trichodiadema hallii*, *Tylecodon faucium*. Low Shrub: *Pelargonium stipulaceum* subsp. *ovato-stipulatum*. Semiparasitic Shrub: *Thesium marlothii*. Geophytic Herbs: *Lachenalia comptonii*, *Strumaria undulata*. Succulent Herbs: *Haworthia nortieri* var. *pehlemanniae* (Mucina & Rutherford, 2006).

5.2 Field Summary

According to Simon Todd Consulting (2016), the project area can broadly be divided into three main areas, the high-lying ground in the north and west of the project area, the low-lying areas in the central and southern parts of the project area and then the river valley of the Roggeveld River which is the dominant feature of the project area.

The ridge on the high lying part of the project area consist of species such as *Pteronia glomerata*, *Pteronia ciliata*, *Oedera genistifolia*, *Ruschia intricata*, *Chrysocoma ciliata*, *Rosenia spinescens* and *Euryops lateriflorus*. The main vegetation associated with the Roggeveld River is said to be *Pseudoschoenus inanis*, *Athanasia minuta* subsp. *inermis*, *Felicia filifolia*, *Lycium cinereum*, *Euryops imbricatus*, *Dicerotheramnus rhinocerotis*, *Phragmites australis*, *Conyza scabrada*, *Mentha longifolia* subsp. *capensis*, *Artemisia afra*, *Searsia lancea*, *Salix mucronata* and *Vachellia karoo*. The low-lying parts is dominated by *Tetragonia fruticosa*, *Hermannia cueneifolia*, *Tripteris sinuata*, *Pentzia incana*, *Galenia africana* and *Pterononia paniculata*.

A full list of the species recorded by Simon Todd Consulting (2016) is shown in **Table 5-1**. This does not mean it is a comprehensive species list found in the area but it is rather assumed to be highlighting the dominant species. The purpose of providing this list in this report is to assist with the compilation of the required species needed for the revegetation of the rehabilitated area. More information on the species to use can be found in Section 5.1.1.

Table 5-1 Plant species recorded in the indigenous vegetation community (Simon Todd Consulting, 2016)

Family	Taxon	IUCN	Ecology
Crassulaceae	<i>Adromischus triflorus</i>	EN	Indigenous; Endemic

Asteraceae	<i>Amphiglossa tomentosa</i>	LC	Indigenous
Asparagaceae	<i>Asparagus capensis</i> var. <i>capensis</i>	LC	Indigenous
Asteraceae	<i>Athanasia minuta</i> subsp. <i>inermis</i>	LC	Indigenous; Endemic
Amaryllidaceae	<i>Brunsvigia josephinae</i>	VU	Indigenous; Endemic
Asphodelaceae	<i>Bulbine torta</i>	LC	Indigenous; Endemic
Asteraceae	<i>Chrysocoma ciliata</i>	LC	Indigenous
Asteraceae	<i>Conyza scabrida</i>		Indigenous
Crassulaceae	<i>Crassula tetragona</i> subsp. <i>connivens</i>	LC	Indigenous; Endemic
Asteraceae	<i>Dicrothamnus rhinocerotis</i>		Indigenous; Endemic
Hyacinthaceae	<i>Drimia altissima</i>	LC	Indigenous
Apocynaceae	<i>Duvalia parviflora</i>	VU	Indigenous; Endemic
Poaceae	<i>Ehrharta calycina</i>	LC	Indigenous
Poaceae	<i>Ehrharta eburnea</i>	NT	Indigenous; Endemic
Asteraceae	<i>Eriocephalus grandiflorus</i>	LC	Indigenous; Endemic
Asteraceae	<i>Eriocephalus microphyllus</i> var. <i>microphyllus</i>	LC	Indigenous; Endemic
Asteraceae	<i>Euryops imbricatus</i>	LC	Indigenous; Endemic
Asteraceae	<i>Euryops lateriflorus</i>	LC	Indigenous
Asteraceae	<i>Felicia filifolia</i>		Indigenous
Aizoaceae	<i>Galenia africana</i>	LC	Indigenous
Malvaceae	<i>Hermannia cueneifolia</i>	LC	Indigenous
Asteraceae	<i>Hirpicium alienatum</i>	LC	Indigenous
Solanaceae	<i>Lycium cinereum</i>	LC	Indigenous
Lamiaceae	<i>Mentha longifolia</i> subsp. <i>capensis</i>	LC	Indigenous
Asteraceae	<i>Oedera genistifolia</i>	LC	Indigenous; Endemic
Asteraceae	<i>Oedera genistifolia</i>	LC	Indigenous; Endemic
Asteraceae	<i>Osteospermum sinuatum</i> var. <i>lineare</i>	LC	Indigenous; Endemic
Geraniaceae	<i>Pelargonium denticulatum</i>	LC	Indigenous; Endemic
Asteraceae	<i>Pentzia incana</i>	LC	Indigenous
Poaceae	<i>Phragmites australis</i>	LC	Not Indigenous
Asteraceae	<i>Pteronia ciliata</i>	LC	Indigenous
Asteraceae	<i>Pteronia glauca</i>	LC	Indigenous
Asteraceae	<i>Pteronia glomerata</i>	LC	Indigenous; Endemic
Asteraceae	<i>Pteronia paniculata</i>	LC	Indigenous
Asteraceae	<i>Pteronia sordida</i>	LC	Indigenous
Asteraceae	<i>Rosenia spinescens</i>	LC	Indigenous; Endemic
Aizoaceae	<i>Ruschia intricata</i>	LC	Indigenous; Endemic
Poaceae	<i>Tenaxia stricta</i>	LC	Indigenous
Aizoaceae	<i>Tetragonia fruticosa</i>	LC	Indigenous
Crassulaceae	<i>Tylecodon wallichii</i> subsp. <i>wallichii</i>	LC	Indigenous; Endemic

Figure 5-2 shows the areas that must ideally be avoided during construction as per the Environmental Management Programme (EMPr). This map however provides a guide for areas where the rehabilitation and revegetation must be prioritised as the portions adjacent to the high and moderate sensitivity areas would be fauna support areas.

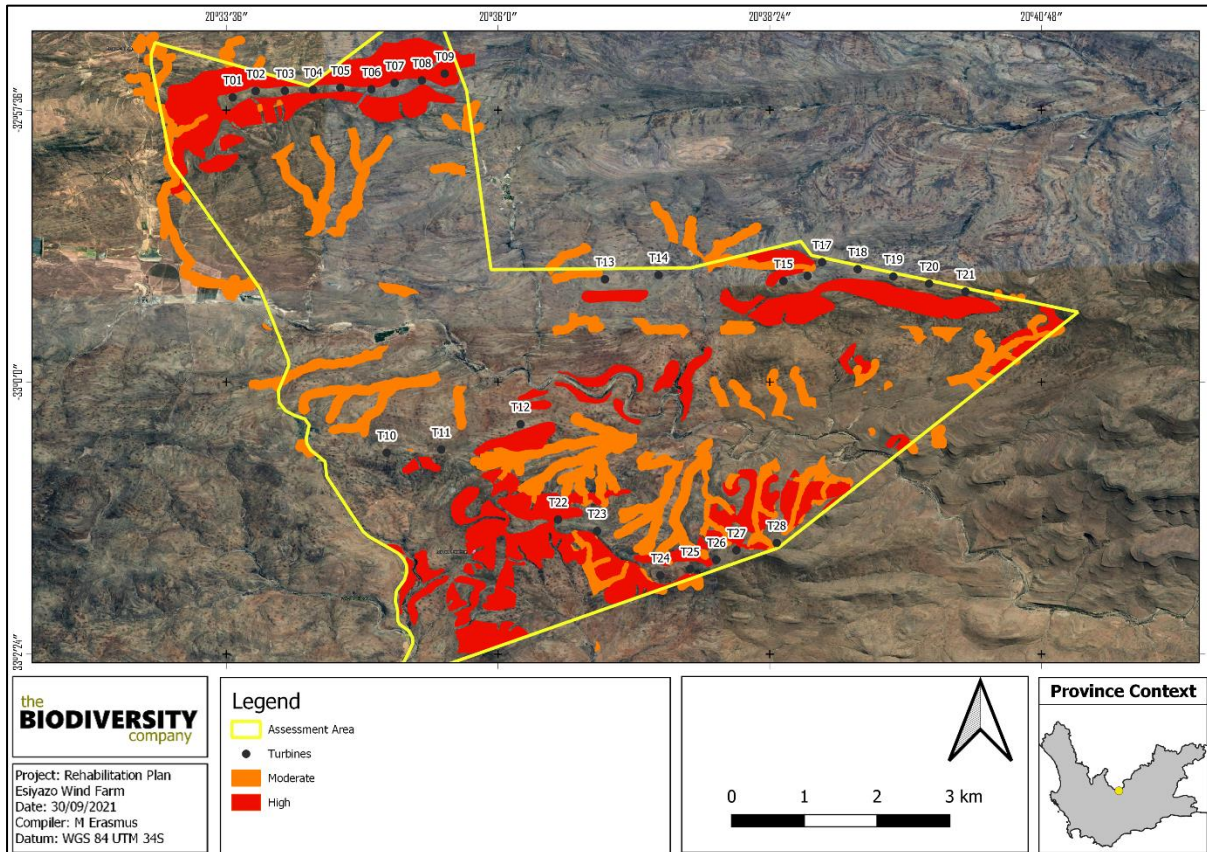


Figure 5-2 The sensitive areas identified in the Esiyazo Wind Farm project area based on the Biodiversity.

6 Rehabilitation Plan

6.1 Purpose of the rehabilitation plan

The purpose of this document was to establish sound environmental principles and guidelines to ensure the revegetation of cleared areas in the project area in order to achieve the following:

1. Restore the natural topography and shape of the area;
2. Reduce the risk of soil erosion in order to achieve long-term stability of the landscape;
3. Re-establish the vegetation cover with suitable indigenous plant species; and
4. Restore some ecosystem functions to the rehabilitated area.

Time is one of the main factors that have an influence on the restoration process of an area, and it may take years for an area to restore itself to its original state. This Revegetation and Rehabilitation Plan should be closely aligned with other site-specific plans, including the

Erosion Management Plan, Soil Management Plan, Alien Plant Management Plan, and Plant Rescue and Protection Plan.

6.1.1 Shaping of the natural topography

The natural slope or topography of the area that has been affected by the clearing (as a result of the large earth moving machinery) needs to be restored in order to ensure that the flow of water and the growth of vegetation can occur naturally. The re-adjustment of the topography will also improve the general aesthetics of the area.

No existing or emerging vegetation should be destroyed or damaged during this process and where plants are emerging sloping should be done in a controlled manner such as using a shovel. In instances where heavy machinery will be used, the areas where plants exist and are emerging should be avoided as far as possible. To avoid the re-emerging of the vegetation the rehabilitation must be performed progressively as the construction continues.

The following are methods that can be used to reshape the slope of the area:

6.1.1.1 Sand Bags

Only biodegradable bags are to be used, this includes Geojute sacks or similar. No plastic bags may be utilised. The bags must be filled with a sand or rock mixture under no circumstances may any contaminants be put into the bags (i.e. cementitious material, soil with chemical spill or fuel etc.). This must be checked by the Environmental Control Officer (ECO).

6.1.1.2 Terracing and Soil Stabilisation

For this process rows of straw, hay or bundles of cut vegetation may be used. The hay, straw or vegetation is dug into the soil in contours, in order to help slow surface wash and capture eroded soil. The spacing between rows would be dependent on slope and the specific area (refer to Figure 6-1 for the slope found in the area).

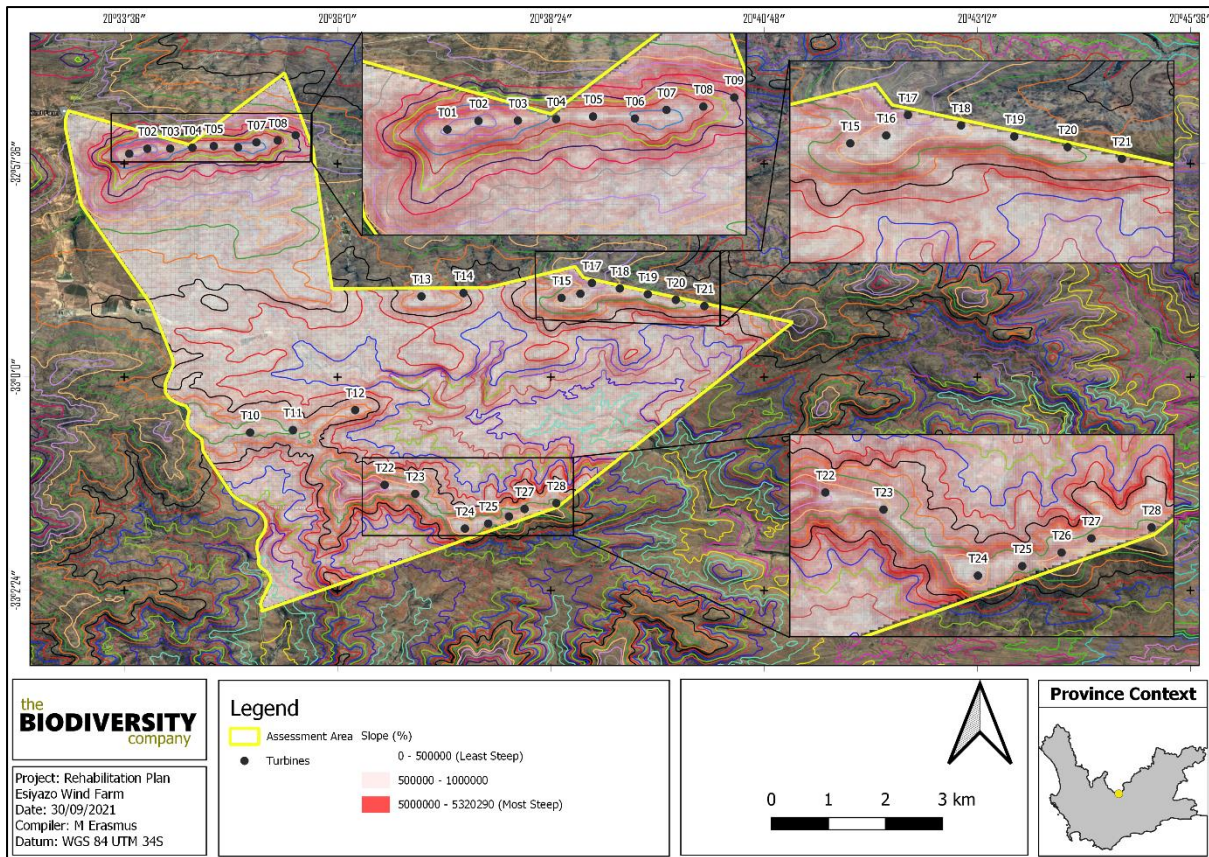


Figure 6-1 The contour lines slope steepness of the project area illustrating the slope in the various parts.

6.1.1.3 Fascine Work

During the site clearing process logs and/or branches must be kept being utilised in the rehabilitation process. They will form the vertical peg supports of the fascine which are driven into the ground, leaving approximately one-third of the total length exposed. This is then horizontally enforced by placing horizontal pieces of wood behind the vertical ones or using the net rolls as described below. The spacing of rows of fascine is site specific and their layout might differ in the various part of the project area based on the slope of the area. It is important that water channelling be prevented by using alternatively placed pegs so that water channels do not form. An example of this system is shown in Figure 6-2.

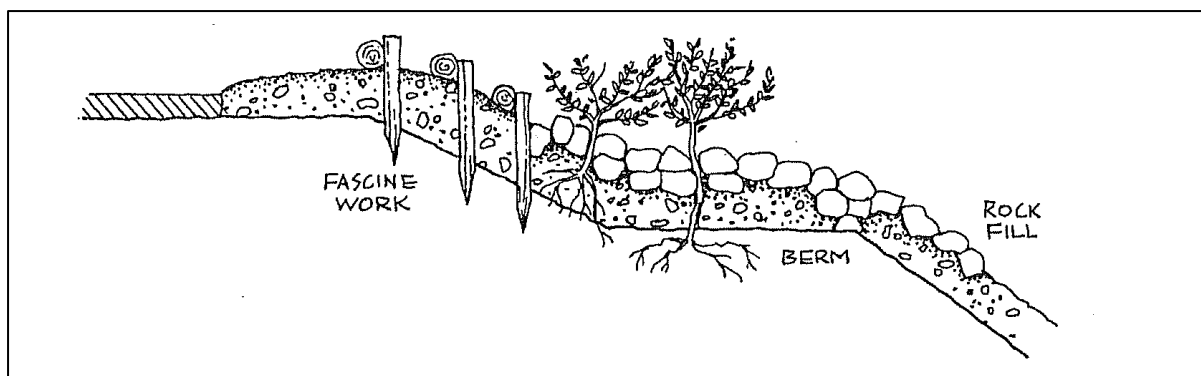


Figure 6-2 Slope stabilization (eThekweni Municipality Generic EMP for Construction Activities, 2002)

6.1.1.4 Geojute Netting

Netting or matting (biodegradable) can also be utilised on slopes to protect the soil from wind and water erosion. This assists with soil retention, weed control and vegetation establishment. Plants can be installed by making small incisions for planting. This would be an effective method in this area due to the high level of wind present. It is however important that this cannot be placed over existing vegetation growth and can only be used right after sloping have been performed.

6.1.1.5 Geojute Rolls

Cylindrical rolls of Geojute fabric filled with sand (as described in the sandbag section) are effective on slopes and large cleared areas. This method is very effective in assisting with erosion control. Geojute rolls are kept in place with the use of pegs (alien invasive plant material can be utilised for this).

6.1.1.6 Gabion Baskets and Reno Mattresses

These represent engineered solutions to steep slopes and banks; in this instance, it would be relevant to the edges of the cliffs or the river (This would be in extreme cases as this is an area that should be seen as a no-go area). These methods are to be utilised in areas where drainage and flooding is a concern. Gabion baskets are 1m x 1m x 1m wire baskets that are filled with uniform sizes rocks. Reno mattresses are generally used to cover a larger area and are made of flat baskets. These two features are often used to enhance one another.

6.1.2 Soil Management

Following soil management guidelines are important, this involves the correct storage of the topsoil layer to ensure the rehabilitation process can be done successfully. The topsoil must be retained so that the seedbank and nutrients can be conserved for the rehabilitation process. The management of the topsoil must follow the mitigations stipulated in the EMP, the following is just to serve as general guidelines:

- The correct depth of topsoil needs to be stored. It is generally recommended that the top 25 cm be stored. Except if otherwise advised by a specialist;
- Topsoil may not be mixed with other soil layers as this will dilute the nutrient level and reduce the number of seeds per square meter. It could also hinder germination;

- Topsoil must only be handled twice, once to strip and stockpile and once for rehabilitation;
- Topsoil must be stored separately away from overburden and must be reapplied progressively and demarcated as no go areas. Ideally must be stored for no more than 3 months;
- The topsoil heaps should not exceed 1 m in height to ensure micro-organisms are not lost;
- Topsoil should not be stripped when wet as compaction will occur;
- Stored away from drainage lines or flood plains;
- Sediment fencing to be placed down slope and upslope of the stockpile, to prevent the runoff of sediment of the stockpile and runoff of the upslope natural area onto the stockpile;
- Stockpile must be protected from wind erosion, especially in this highly wind prone area. If the topsoil is replaced wind nests must be erected to avoid the erosion of the area.

6.1.3 Re-vegetation of the area

The area to be revegetation should follow an indigenous landscaping approach. Locally occurring indigenous vegetation is usually sourced from nurseries and not from the natural landscape, this is with the exception of seeds that should have been collected prior to the removal of vegetation. Post construction the plants that were in the temporary nursery for safe keeping must be replanted. Before the revegetation can take place, the soil consistency must be improved and matched to adjacent areas.

- Before seeding any topsoil and mulched vegetation should be spread across the bare soil areas to a depth of 50 mm and should not be thicker than 100 mm;
- Presently within the site, there are certain indigenous pioneer species that can be left to create an initial plant cover, ensure short-term soil stability and create fine-scale conditions for the future planting and sowing of indigenous plants. These comprised of *Arctotheca calendula*, *Gazania rigida*, *Oxalis obtusa* and *Senecio arenarius*;
- Indigenous grass species should be used for revegetation purposes. Ideally, these should include species that are local to the area *Merxmuellera stricta*, *Ehrharta calycina* and *Pentastichistis eriostoma*;
- Re-grassing should be undertaken (as far as possible) during the summer months, as germination and establishment is best at this time of year;
- Re-grassing can be done by hand broadcasting and/or hydro-seeding, the best approach must be decided by the ECO once the local conditions are examined;
- Grass species must be used in conjunction with perennial species as well as those plants that were rescued during the plant relocation programme. *Drimia altissima* was ubiquitous within the landscape and appeared to be tolerant of disturbance.

Consequently, those individuals that have been displaced during the current activity can be used for revegetation;

- Shrubs indigenous to the area should also be used for rehabilitation purposes. These should include that dominant species in the area such as *Dicerotheramnus rhinocerotis*, *Euryops lateriflorus*, *Oedera genistifolia*, *Montinia caryophyllacea*, *Pteronia paniculata*, *P. aspalatha* and *Eriocephalus africanus var. paniculatus*. However, it is unlikely that these plants are available commercially and a permit should be obtained from the Department of Environment & Nature Conservation to collect seed material to propagate these species for rehabilitation;
- Should plants be acquired from nurseries they must adhere to a specific set of specifications: plant sizes, heights and overall health. This must be decided by the ECO or a specialist. It is important that the plants sourced do not carry pests or diseases that could spread to the local flora. The planting of these species must be according to standard horticultural best practices. If the ECO is unfamiliar with this a specialist must be consulted;
- The entire area will have to be irrigated on a regular basis if possible, in order to increase the yield of the vegetation. Irrigation should be regular enough to ensure that the soil layer is saturated without causing erosion or surface run;
- General maintenance must be performed this will involve alien and weed control as well as thinning of encroachment. Continuous weed control is critical to the success of revegetation and should be a high priority. Weeding around plants may be necessary to avoid competition and stress. This should be carried out as required; and
- The project area is to be left undisturbed and all access prohibited, except when maintenance is being undertaken; livestock and domestic animals should be kept out of the area as far as possible. In order to allow the movement of natural fauna the use of fences must be restricted, and brush cut must rather be used.

6.1.4 Alien Invasive Vegetation

The process of rehabilitation and revegetation along with the original disturbance would lead to a reoccurrence of alien invasive species. It is thus very important to continue implementing the alien invasive management plan and monitoring the areas.

6.1.5 Monitoring

Regular monitoring and maintenance (such as removing alien species and encroachment) are required for successful revegetation/rehabilitation projects. Monitoring includes photo points (at same GPS Location in the same direction) and documentation of observations. The monitoring of the rehabilitation must be conducted by an independent party that specialises in botany or ecology along with the ECO. An example of a monitoring report can be found in Appendix A. The following are principles and features that needs to be monitored/followed:

- Rehabilitated areas must be monitored continuously for IAP growth;

- It is recommended that monitoring must occur every three (3) months for the first two (2) years and subsequently every six (6) for a further 3 years. This is due to the very high sensitivity of the ecosystems within the landscape;
- The moisture level must be monitored to ensure that drought is not the cause for failed revegetation attempts;
- The disturbance level in the area must be monitored;
- The decrease in bare soil must be recorded by photographs and reported;
- The stability and nature of the soil must be assessed;
- Composition and density of replanted vegetation, distinguishing between species introduced for initial revegetation only and species that are part of the pre-determined desirable end state;
- Any areas showing erosion, should be re-contoured and seeded with indigenous grasses or other locally occurring species which grow quickly;
- Re-vegetated areas showing inadequate surface coverage (less than 20% within 12 months after revegetation) should be prepared and re-vegetated;
- Monitoring of rehabilitation success and follow-up adaptive management, together with clearing of emerging alien plant species should continue until acceptable plant cover has been reached. This must be confirmed by a specialist.

6.1.6 Rehabilitation Plan Instructions

- The step by step instructions of the rehabilitation plan can be seen below and will ultimately assist in clarifying the process:
 1. Shaping of the natural slope
 - a) Remove all building rubble and general litter;
 - b) Stabilise the slope with the best method for the area e.g., sand bags, create fascine work or Geojute netting/rolls;
 - c) Level top soil over the chosen slope correction. Ensure the soil is in a good state and organic.
 2. Re-vegetation
 - d) Mulch and manure the topsoil;
 - e) Irrigate the area;
 - f) Seed the area, replant perennial species and relocated species;
 - g) Brush pack over the area;

- h) Irrigate the area (and continue to do so); and
- i) Demarcate the rehabilitation area and prevent access.

3. Monitor

- j) Take before and after photos;
- k) Compile a report of the species used and their revegetation success;
- l) Monitor the alien invasive species and encroachment; and
- m) Re-adjust the revegetation programme if the area does not reach adequate coverage.

7 Conclusion

The rehabilitation and revegetation plan must be implemented with care in this sensitive environment. Impacts such as erosion, soil movement, habitat loss in this area is highly likely due to the strong wind conditions found in the area. The goals of the rehabilitation plan set out to be:

1. Restore the natural topography and shape of the area;
2. Reduce the risk of soil erosion in order to achieve long-term stability of the landscape;
3. Re-establish the vegetation cover with suitable indigenous plant species; and
4. Restore some ecosystem functions to the rehabilitated area.

If the above features are achieved the plan would have been successfully implemented. Considering the natural state of the vegetation within the landscape and available fauna, it is not necessary to incorporate fauna introduction into the rehabilitation strategy.

8 References

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Appendix A: Monitoring Guideline: After field survey

DATE	PERSON PERFORMING THE MONITORING	ASPECT	ACTION	PROGRESS	EXPECTED DEADLINE	PHOTO
		E.g., Topography	E.g., The natural slope or topography of the area has been restored: <ol style="list-style-type: none"> 1. Removal of all the building material and rocks and gravel lying around 2. Backfilling and sloping of the area. 	Partially completed		
		E.g., Vegetation and soil cover	E.g., The soil layer must be stabilised, and the vegetation community restored: <ol style="list-style-type: none"> 1. The bare soil areas need to be re-seeded, and brush piled 2. Monitoring of the woody plant species emerging. Density and relation to grass species. 3. Soil wetness 	To be initiated		