

**MAINTENANCE MANAGEMENT PLAN FOR THE 132kV D/C
BOSKLOOF-LAINSBURG LINE WITHIN BREEDE VALLEY LOCAL
MUNICIPALITY OF CAPEWINELEADS DISTRICT AND
LAINGSBURG LOCAL MUNICIPALITY OF CENTRAL KAROO
DISTRICT, WESTERN CAPE PROVINCE**



Applicant:



Eskom: Distribution, Cape Coastal Cluster
Eskom Road, Protea Heights,
Brackenfell,
7561

Environmental Assessment Practitioner:



Ufefe Development Consultants (Pty) Ltd
16 Shaw Avenue, The Reeds,
Centurion,
0157

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VERIFICATION PAGE			
TITTLE	DRAFT MAINTENANCE MANAGEMENT PLAN FOR 132kV D/C BOSKLOOF-LAINSBURG LINE, WITHIN BREEDE VALLEY LOCAL MUNICIPALITY OF CAPEWINELADS DISTRICT AND LAINGSBURG LOCAL MUNICIPALITY OF CENTRAL KAROO DISTRICT, WESTERN CAPE PROVINCE		
DATE	August 2025	REPORT STATUS	Draft
CARRIED OUT BY	Ufefe Development Consultants (Pty) Ltd 16 Shaw Avenue, Reeds Centurion Pretoria 0157 Tel: 082 269 4524		
Author	Mr Mukwevho M.C		

EAP DECLARATION:

I CAIPHUS MUKWEVHO; herewith undertake that:

- I act as an independent specialist consultant in the field of Environmental Sciences;
- Do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014;
- Have and will not have any vested interest in the proposed activity proceeding;
- Have no, and will not engage in, conflicting interests in the undertaking of the activity;
- Undertake to disclose, to the competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report; and
- Will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not.



Signature of EAP:

August 2025

Date:

ACRONYM DESCRIPTION

BAR	Basic Assessment Report
BAT	Best Available Technology
BPEO	Best Practicable Environmental Option
BPM	Best Practicable Means
BVM	Breede Valley Municipality
CBA	Critical Biodiversity Area
CK	Central Karoo District Municipality
DEFF	Department of Environmental, Forestry & Fisheries
EIA	Environmental Impact Assessment
GA	General Authorisation
LLM	Laingsburg Local Municipality
MMP	Maintenance Management Plan
NEM: AQA	National Environmental Management: Air Quality Act
NEMA	National Environmental Management Act
NFEPA	National Freshwater Priority Areas
NHRA	National Heritage Resources Act
NWA	National Water Act
SDF	Spatial Development Framework
WC	Western Cape

Glossary of Terms

Activity: An activity or operation carried out as part of the construction or operation of the powerline

Basic Assessment: A process of evaluating the environmental and socio-economic consequences of a proposed course of action or project

Community: Those people who may be impacted upon by the construction and operation of the project. This includes neighbouring landowners, local communities and other occasional users of the area.

Contractor: Any company appointed by the Proponent to undertake construction or related activities on site, and will include the main Contractor, as well as any Sub-Contractors.

Contaminated water: Water contaminated by activities on site, e.g. concrete water and run-off from plant / personnel wash areas.

Environment: The external circumstances, conditions and influences that surround and affect the existence and development of an individual, organism or group. These circumstances include biophysical, social, economic, historical and cultural aspects.

Environmental Authorisation: The authorisation by a competent authority of a listed activity or specified activity in terms of NEMA.

Environmental Management Measures: Requirements or specifications for environmental management, as presented in the MMP, some of which are based on the mitigation measures identified in the BA Report.

Hazardous substance: A substance (including materials and waste) that can have a deleterious (harmful) effect on the environment and those substances declared hazardous substances in terms of the Hazardous Substances Act 15 of 1973.

Impact: A change to the existing environment, either adverse or beneficial, that is directly or indirectly due to the development of the project and its associated activities.

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

Method Statement: A mandatory written submission by the Contractor to the Environmental Control Officer outlining setting out the plant, materials, labour and method the Contractor proposes using to carry out an activity.

Mitigation Measures: Actions identified in the BAR to manage (avoid, minimise or optimise) potential environmental impacts which may result from the development.

Operational Phase: The stage of the works (including maintenance) following the Construction Phase, during which the development will function or be used as anticipated in the Environmental Authorisation.

Proponent: The person or organisation implementing the project.

Resources: The personnel, financial, equipment and technical requirements necessary for the successful completion of mitigation measures and for monitoring activities.

Schedule: The schedule or deadline for completion of each mitigation measure, which are recorded to ensure that mitigation measures are implemented in good time and in the correct sequence.

Solid waste: All solid waste including construction debris, chemical waste, broken / redundant equipment, oil filters, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).

Sub-Contractors: A Sub-Contractor is any individual or Contractor appointed by the main Contractor, to undertake a specific task on site.

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1. INTRODUCTION

Eskom: Distribution Cape Coastal Cluster has appointed Ufefe Development Consultant (Pty) Ltd to compile a Maintenance Management Plan (MMP) for the 132 Kilovolt (kV) overhead line and associated tower structures between Boksloof and Laingsurg sub stations.

The proposed maintenance project will enable Eskom to undertake necessary maintenance activities along the 143 km distribution line, thereby ensuring optimal functionality and reducing the risk of outages or failures that could disrupt the power supply.

Authorisation to adopt the MMP will be required from the Department of Forestry, Fisheries and the Environment (DFFE). Given the proximity of the proposed maintenance activities to an overhead line that traverses numerous inland aquatic ecosystems, the project constitutes Section 21 (c) and (i) 'water uses' under Section 39 of the National Water Act, No. 36 of 1998 (NWA), thus requiring Water Use Authorisation (WUA) - either by the form of a Water Use Licence (WUL) or a General Authorisation (GA) - from the Department of Water and Sanitation (DWS).

The identification of the listed activities in accordance with the proposed works indicates that an MMP will be necessary for the interventions along the power line between the Boskloof and Laingsburg substations. This will facilitate future repair work without the need to apply for approval again from the relevant authority. As part of the application process, a terrestrial biodiversity study, Palaeontological study and an aquatic biodiversity study were conducted to better inform the method statements and required mitigation measures.

1.1 Objectives of the Maintenance Management Plan (MMP)

The objective of this MMP is to provide environmental management guidance through measures designed to manage the impacts that may result from maintenance activities associated with the 132 KV Boskloof to Laingsburg Distribution Line and the associated Tower structures, which connect the Boskloof Sub Station, Quarry Traction Substation, Pietermeinties Traction Substation and Laingsburg Substation.



This report (MMP) is a binding document to all contractors, subcontractors, and other individuals working on the site to adhere to its terms and conditions throughout any maintenance activities related to the project.

1.2 Terms of Reference

The following Terms of Reference (ToR) have been set for the compilation of the MMP:

- Consideration of existing and historic approvals
- Ensure compliance with relevant NEMA legislation, policies and guidelines;
- Detail potential impacts to ensure that the MMP covers future maintenance activities of the repairs;
- Address potential current and future impacts associated with future maintenance activities through appropriate management measures;
- Identify areas within the project envelope that may require future maintenance and detail the type of remedial work that may be required;
- Detail the responsibilities of the various parties who will do the monitoring; and
- Detail any reporting and monitoring that needs to be done.

1.3 Project Application Process

A pre-application meeting was held on 14 August 2025 between the EAP's teams, and officials from the DFFE. The purpose of the meeting was to discuss and confirm the necessary regulatory processes to follow when maintenance of the power line and associated Tower structures is required, as well as the process to authorise the replacement of Tower structures planned to be erected in order to reinforce support, particularly in areas where structures have collapsed. During the meeting, the DFFE officials confirmed the plan by the EAP and confirmed the appointed specialist are necessary, the meeting also confirmed the public participation plan can be run concurrently with the EIA application for the Basic Assessment Process.

2. DETAILS OF PROJECT TEAM

2.1 Details of Proponent

The Applicant for this project is Eskom Distribution, Cape Coastal Cluster, Eskom has been powering our nation since 1923 when the Electricity Supply Commission was established. The Details of the applicant are provided in the table below:

Table 1: Details of Proponent

Details of Applicant	
Applicant	Eskom: Distribution, Cape Coastal Cluster, Miss Namhla Dondi
Contact Person	Mr Aseza Mpokopi
Physical Address	Eskom Road, Protea Heights, Brackenfell, 7561
Postal Address	PO Box 222, Brackenfell, 7561
Tel No	021 915 2801
e-mail address	mpokop@eskom.co.za

2.2 Details of EAP and Expertise

Ufefe Development Consultants (Pty) Ltd has been appointed by Eskom, Distribution, Cape Coastal Cluster as the independent EAP for the proposed project and meets the general requirements as stipulated in regulations 13(3) of the NEMA EIA 2014 Regulations as amended.

Ufefe does not have any interests in secondary developments that may arise out of the authorisation of this project. Neither the EAP nor any specialist are subsidiaries or are affiliated to the proponent. Table 2 below provide details and expertise of the EAP in carrying out the MMP adoption process.

The Lead Environmental Assessment Practitioner for this project is Mr Caiphus Mukwevho:

Mr. Caiphus Mukwevho is a Senior Environmental Assessment Practitioner and he holds a Bachelor of Environmental Sciences and an Honours of Environmental Sciences in the field of Ecology both at the University of Venda, his honours

dissertation was aimed at “assessing the environmental compliance of a landfill site” the study was conducted at Makhado Vondeling landfill site.

Mr Mukwevho has attended various training courses to enhance his knowledge and understanding in the Environmental Field, the courses includes; Geographic Information System (GIS), Environmental Management Systems (ISO 14001:2004), Environmental Law & Compliance. He is a registered Environmental Assessment Practitioner under the Environmental Assessment Practitioners Association of South Africa (EAPASA), and he has applied as Professional Natural Scientist under the South African Council of Natural Science Professions (SACNASP), he is a member of the International Association of Impact Assessment South Africa (IAIASA).

Below are the details of the EAP, For the expertise of the EAP.

Details of EAP	
Name of Company	Ufefe Development Consultants (Pty) Ltd
Lead EAP	Mr Caiphus Mukwevho
Contact Number	0822694524
E-mail Address	caiphusm@ufefe.co.za
Office Address	16 Shaw Avenue, The Reeds, Centurion, 0157
Qualifications	<ul style="list-style-type: none"> - B. Environmental Sciences - B. Honours Ecology and Resources Management
Professional Registration and Registration number	EAPASA (Registered EAP- 2019/618) SACNASP (124149) IAIASA (7146)
Years of Experience	8 Years

3. LEGALISLATIVE FRAMEWORK APPLICABLE

This section provides a general overview of the policy and legal framework governing the proposed repairs of 132kv D/C between Boskloof to Laingsburg. It outlines the environmental laws and regulations relevant to this activity that must be considered during the assessment process. These laws and regulations may also influence or affect the proposed project.

3.1 The Constitution of South Africa (Act No. 108 of 1996)

Section 24 of the Constitution of South Africa No. 108 of 1996 states that “...everyone has the right (a) to an environment that is not harmful to their health or well-being; and (b) to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that (c) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.” This protection encompasses preventing pollution and promoting conservation and environmentally sustainable development.

3.2 National Environmental Management Act (Act 107 of 1998)

The National Environmental Management Act, 1998 (No. 107 of 1998) (NEMA), as amended, and its Chapter 5 allow for the control of specific listed activities, which are regulated by the EIA Regulations 2014 (as amended). Until written authorization is received from the appropriate authority—in this case, the national DEFF—such activities are not allowed to begin.

With that said the present document encompasses all legal provisions and the legal context for the proposed development. It also includes a review of laws, rules, policies, and guidelines that are pertinent to or have an impact on the proposed project. When drafting the report for the proposed development, the following national, provincial, and local government laws were taken into consideration:

- Constitution of the Republic of South Africa, 1996 (Act No 108 of 1996);
- National Environmental Management Act, 1998 (Act 107 of 1998);
- NEMA EIA Regulations 2014 (as amended);
- National Environmental Management Waste Act, 2008 (Act 59 of 2008);
- National Environmental Management Biodiversity Act, 2004 (Act 10 of 2004);
- National Heritage Resources Act, 1999 (Act 25 of 1999);
- National Environmental Management Protected Areas Act, 2003 (Act 57 of 2003);
- The South African National Roads Agency Limited and National Roads Act, 1998 (Act 7 of 1998);
- Central Karoo District Spatial Development Framework;
- Western Cape Environmental Management Act, 2003 (Act No. 7 Of 2003)

- The Western Cape Biodiversity Spatial Plan (WCBSA)

3.3 Listed and specified activities for the proposed 132 KV D/C Boskloof Laingsburg project

In terms of section 24(2) of NEMA, the Minister and or any MEC in concurrence with the Minister may identify activities that require authorisation as these activities may negatively affect the environment. Environmental Impact Assessment (EIA) Regulations were promulgated in December 2014 (as amended) in terms of Section 24(5) and Section 44 of the National Environmental Management Act (NEMA), Act 107 of 1998. In terms of the 2014, EIA Regulations the triggered listed activities fall under Listing Notices 1, 2 and 3 which are further discussed as follows:

- *Listing Notice 1 (Regulation 983) define activities which will trigger the need for a **Basic Assessment process**;*
- *Listing Notice 2 (Regulation 984) define activities which trigger a **Scoping and Environmental Impact Assessment (EIA) process**.*
- *Listing Notice 3 (Regulations 985) refers to certain listed activities located in specifically defined geographical areas for which a **Basic Assessment process** would be required.*

The Eskom: Distribution is applying for an Adoption of the MMP as confirmed in the pre-application meeting held with DFFE. Due to the nature and location of the proposed works, the EIA Regulations of 2014 pursuant to the NEMA, were consulted. The table below provides an extract of the Listing Notices and Listed Activities that were considered in the context of the periodic repair and maintenance work along the overhead line between the Boskloof and Laingsburg substations, as well as associated infrastructure.

Table 2: Triggered activity listed under GNR.327

Government Notice No:	Activity No (s) (relevant notice): e.g. Listing notices 1, 2 or 3	Describe each listed activity as per the wording in the listing notices:	Describe the portion of the proposed project to which the applicable listed activity relates. Ensure to include thresholds/area/footprint applicable.
GNR 327	LN1; Activity 11	The development of facilities or infrastructure for the transmission and distribution of electricity— (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or (ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more; excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is – (a) temporarily required to allow for maintenance of existing infrastructure; (b) 2 kilometers or shorter in length; (c) within an existing transmission line servitude; and (d) will be removed within 18 months of the commencement of development.	Eskom Distribution proposes to repair 132kv line between Boskloof and Laingsburg. The power line was constructed approximately 60 years ago prior to the promulgation of the National Environmental Management Act: Act No. 107 of 1998 and the associated regulations. According to our understanding Listing Notice 1, Activity 11 would have been triggered if this was a construction of a new power line and or development. For the purpose of the proposed repairs the project will trigger activity 11 of LN 1 (GN R327)
GNR 327	LN 1; Activity 12	The development of— (i)dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (a) within a watercourse;	The proposed powerline repairs will involve excavations for the foundation of the towers that are situated within the watercourse, the total footprint of the towers that are within the watercourse is above 100m ² in extent.

		<p>(b) in front of a development setback; or</p> <p>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; – excluding–</p> <p>(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;</p> <p>(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;</p> <p>(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;</p> <p>(dd) where such development occurs within an urban area; [or]</p> <p>(ee) where such development occurs within existing roads, [or] road reserves or railway line reserves; or</p> <p>(ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.</p>	
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3.4 Environmental Management Principle

It is crucial for effective environmental management that the Applicant understands and incorporates the fundamental principles of sound environmental practices in all aspects of the maintenance of the overhead powerline (Boskloof to Laingsburg 132kv line). NEMA provides a general framework for environmental law, including national environmental management principles that must be considered when making decisions with potentially significant environmental impacts. A brief overview of these principles is provided in the following sections.

3.5 Holistic principle

The holistic principle in environmental management emphasizes the interconnectedness of all environmental components, recognizing that actions impacting one part of the environment can have wide-reaching effects on others. This principle advocates for a comprehensive approach that considers the entire ecosystem, including the interrelationships between air, water, land, flora, fauna, and human activities. By adopting a holistic perspective, environmental management seeks to maintain ecological balance, promote sustainability, and ensure that all environmental, social, and economic factors are integrated into decision-making processes.

The Holistic principle, as defined by NEMA (Section 2(4)(b)) requires that environmental management must be integrated, acknowledging that all elements of the environment are linked and inter-related and it must take into account the effect of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option (defined below). Holistic evaluation does not mean that a project must be looked at as a whole. It rather means that it must be accepted that there is a whole into which a project is introduced. If the indications are that the project could have major adverse effects, the project must be reconsidered and where appropriate replanned or relocated to avoid an adverse impact or to ensure a beneficial impact.

3.5.1 Best practicable environmental option

When undertaking any action with environmental impacts, it is essential to identify and define the different options available for consideration. The Best Practicable Environmental Option (BPEO) is described in NEMA as "the option that offers the most benefit or causes the least harm to the environment overall, at a cost that is acceptable to society in both the long term and short term." Additionally, other guidelines commonly used for environmental management under various legislation include BPM, which stands for Best Practicable Means, and BAT, which refers to Best Available Technology.

3.5.2 Preventative principles

The precautionary principle is crucial to sustainable development, requiring that disruptions to ecosystems, as well as pollution, environmental degradation, and other negative impacts, be avoided. If complete avoidance is not possible, these impacts should be minimized and addressed.

3.5.3 The precautionary principles

The precautionary principle dictates that when there is uncertainty about whether an impact could be harmful to the environment, it is assumed to be harmful as a precaution until proven otherwise. This principle requires that decisions made by the private sector, governments, institutions, and individuals take into account and recognize conditions of uncertainty, especially regarding potential environmental consequences. In South Africa, the Department of Water and Sanitation (DWA, previously DWAF, now DWS) adopted the Best Practicable Environmental Option (BPEO) guideline for water quality management in 1991 and included it in the 1994 Minimum Requirements document for waste management.

According to the 1994 DWAF Minimum Requirements for the Handling and Disposal of Hazardous Waste, the precautionary principle is defined as "assuming the worst-case scenario when a risk is unknown and making provisions for such a situation." In this context, the precautionary principle presumes that a waste or an identified contaminant is "highly hazardous and toxic until proven otherwise."

Within the EIA process in South Africa, the precautionary principle entails the need to supply sound, scientifically based information that enables the decision-making authority to reasonably understand the potential environmental impacts, their scope, and how they might be mitigated. If the information provided is insufficient for this purpose, the authority cannot be satisfactorily informed and should then require the collection and submission of additional information.

3.5.4 Duty of care and cradle to grave principle

According to Section 28 of NEMA, "Any person who causes, has caused, or may cause significant pollution or environmental degradation must take reasonable steps to prevent such pollution or degradation from occurring, continuing, or recurring. If such harm to the environment is legally authorized or cannot be reasonably avoided or stopped, they must minimize and rectify the pollution or degradation."

According to the 1994 DWAF Minimum Requirements for the Handling and Disposal of Hazardous Waste, "any person who generates, transports, treats, or disposes of waste must ensure that no unauthorized transfer or escape of waste occurs under their control. Such a person must retain documentation describing the waste and any related transactions." This places the responsibility for waste on the generator, following the "Cradle to Grave" principle, where a "manifest" must accompany each load of hazardous waste until it is legally and responsibly disposed of. This manifest is passed from one transporter to the next, if multiple transporters are involved, and once the waste is properly disposed of at a suitable, permitted facility, a copy of the manifest must be returned to the point of origin. The "duty of care" provides a strategy for implementing sustainable development.

3.5.5 Polluter pays principle

The "polluter pays principle" asserts that the individual or organization responsible for causing pollution is accountable for the costs of cleaning it up or rehabilitating the environment. However, the polluter is not always necessarily the waste generator, as the responsibility for the safe handling, treatment, or disposal of waste can be transferred from one competent party to another. Therefore, the polluter could be a disposal site operator or a transporter. Nevertheless, under the "duty of

care" principle, the generator remains one of the parties held accountable for any pollution caused by the waste. As such, the generator must be able to demonstrate that the transfer of waste management was done responsibly. According to NEMA, the polluter pays principle dictates that "the cost of remedying pollution, environmental degradation, and any resulting adverse effects, as well as the cost of preventing, controlling, or minimizing further pollution, environmental damage, or adverse health effects, must be borne by those responsible for harming the environment."

3.5.6 Sustainable Development

The principle of Sustainable Development is enshrined in the Constitution of the Republic of South Africa (Act No. 108 of 1996) and is implemented through NEMA. According to Section 1(29) of NEMA, sustainable development involves integrating social, economic, and environmental factors into the planning, implementation, and decision-making processes to ensure that development benefits both present and future generations. Therefore, Sustainable Development requires that:

- Pollution and environmental degradation should be prevented, or if not entirely avoidable, minimized and addressed.
- Disruption to landscapes and sites of cultural heritage should be avoided, or if unavoidable, minimized and addressed.
- Waste generation should be avoided, or if not entirely avoidable, minimized, reused, or recycled where possible, and otherwise disposed of responsibly.
- Disturbance to ecosystems and loss of biological diversity should be avoided, or if not entirely avoidable, minimized and addressed.

3.5.7 Climate Change Consideration

The proposed project will incorporate energy-efficient technologies and adhere to international best practices in construction methods and resource management. Given the uncertainties and extreme weather conditions associated with climate change, ensuring the provision of essential human needs, such as a reliable fresh water supply, is considered crucial.

4. PROJECT LOCATION AND DESCRIPTION

4.1 Project Location

The table 3 below provides the details of the location on which the proposed maintenance project traverse. Refer to figure 1 for the locality map showing the 132kv Line and substations.

Table 3: Details of properties

Farm Name	Portion No	SG 21 Code
Oude Wagendrift 362	0	C08500000000036200000
	6	C08500000000036200000
Bernheim 899	RE	C08500000000089900000
	2	C08500000000089900002
De nonna 341	1	C08500000000034100001
	4	C08500000000034100004
	6	C08500000000034100006
Patrys Kloof 330	0	C08500000000033000000
Keeroms 1	RE	C05000000000000100000
	1	C05000000000000100001
Witwaters Kloof 3	0	C05000000000000300000
Witvlakte 175	RE	C08500000000017500000
Farm 761	RE	C0850000000001740000
	2	C0850000000001740002
Stinkfontein 172	RE	C08500000000017200000
Stinkfonteins Berg 140	RE	C08500000000014700000
Helpmekaar 148	9	C08500000000014800009
Ratelbosch 149	1	C08500000000014900001
Skulpiesklip 151	RE	C08500000000015100000
Nouwgat 157	2	C08500000000015700002
Farm 740	0	C08500000000074000000
Vredefort 34	RE	C08500000000003400000
Zeekoe Gat 32	RE	C08500000000003200000

Slang Rivier 21	1	C0850000000002100001
Farm 262	0	C08500030000026200000
Farm 771	0	C08500000000077100000
Quaree Kloof 12	RE	C0850000000001200000
Quarrie Kloof 155	0	C04300000000015500000
Farm 156	0	C04300000000015600000
Farm 157	0	C04300000000015700000
Tweeside 151	RE	C04300000000015100000
Besten Weg 150	RE	C04300000000015000000
	1	C04300000000015000001
Matjesfontein 148	8	C04300000000014800008
Grootwater 270	RE	C04300000000027000000
Farm 282	RE	C04300000000028200000
Paarde fontein 44	3	C04300000000014400003
Baviaans Krants 104	6	C04300000000029000006
Farm 1115	0	C04300010000111500000

The table 4 providing the coordinates of location of the substation from the start point (Boskloof to end point Laingsburg Substation).

Table 4: details of the substations

Substation	Central Coordinates	
	Longitude	Latitude
Boskloof Substation	19° 33'7.21"E	33° 37'49.53"S
Quarry Traction Substation	20° 11'19.37"E	33° 15'58.67"S
Pietermeinties Traction Substation	20° 25'19.24"E	33° 15'2.87"S
Laingsburg Substation	20° 52'14.78"E	33° 11'35.66"S

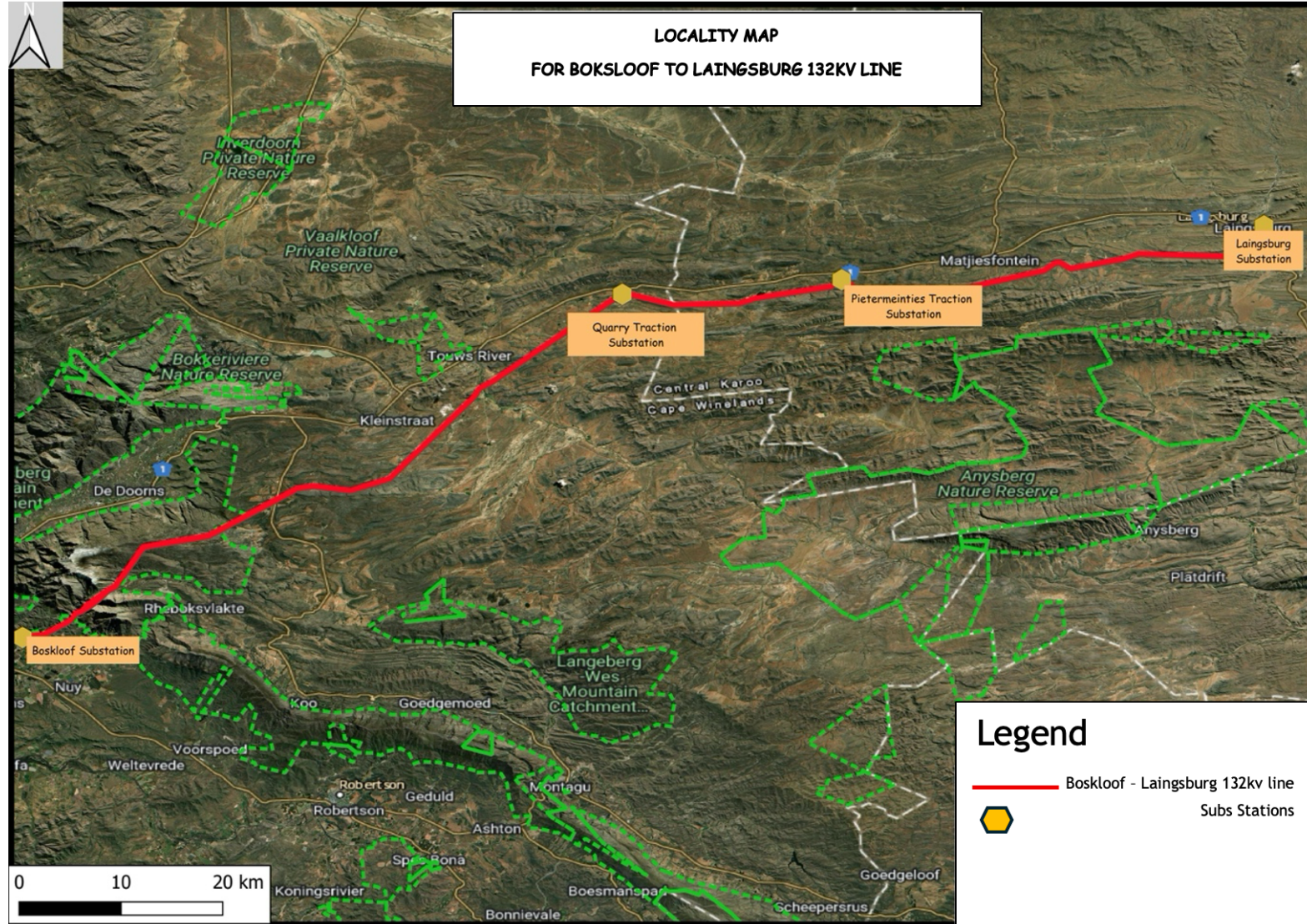


Figure 1: Locality Map

4.2 Maintenance Activities

Preventative maintenance for overhead lines shall be classified into (1) Routine maintenance primarily for inspections, (2) Minor Maintenance that might be intrusive and (3) Major Maintenance which is the most comprehensive.

- Servitude - Eskom has the right to manage its servitude and the encroachment of building, vegetation, structures etc. shall be reported immediately.
- Foundations - The steel foundations on overhead lines shall be checked for erosion, corrosion and to ensure that the foundation's capping is clear. Soil around the tower footings shall be cleared where required and structures' footings repaired where necessary.
- Structures - All anti-climbs devices shall be inspected and repaired. Loose nuts and bolts to be tightened.
- Hardware - Split pins, armouring, ferrules, spacers and dampers must be checked and repaired or replaced where required in line with Eskom's conditions and standards.
- Insulators - Shall be inspected and maintained or replaced when necessary.
- Bird nests - All structures with nests shall be identified, reported and possibly removed provided it can be done in a safe manner.

4.2.1 Required tools and equipment.

The following tools and equipment might be required when repairs are being undertaken:

- Cranes, drilling rigs, digger loaders, tip trucks, trucks, bakkies, motor vehicles etc.
- Hammers, shovels, spanners screw drivers etc. (toolbox equipment or material)
- Concrete mixers, concrete pumps, trailers, rollers etc.
- Rebar, steel casing, shutter boxes etc.
- Overalls, safety boots, hard hats, gloves, masks, protective eye wear, FAS, vests etc.

Note that additional tools and equipment might be required which are not mentioned above depending on the resultant findings and repairs required.

4.2.2 Foundation repairs

The appointed party (contractor) and or Eskom will be responsible for all designs required for the repairs and all designs must be submitted to the competent design engineer for review and approval.

4.2.3 Concrete and Grouts

Concrete and grout mix shall be apportioned to obtain a strength of 25MPa (target of 35MPa) and 35MPa respectively. Cement shall have a minimum cement to water ratio of 1.8:1 and grout shall obtain its strength at 28 days. All mixes shall comply to SANS 10100- 2 and SANS 50197-1 with acceptance by the civil engineer / design engineer.

4.2.4 Fine and Coarse Aggregates

All sources of aggregates shall comply with SANS 1083 and SANS 2001 CC1 and be accepted by the civil / design engineer. Fine aggregates shall be clean natural sand derived from local sources, free from any harmful pollutants or particles. Coarse aggregates shall be crushed stone or gravel of 26.5/28mm nominal size and the content of fine material in coarse aggregates less than 10%. Aggregate material shall not contain any reactive material, and the bulk void content shall not exceed 48%.

4.2.5 Workability of concrete

The design mix shall be in line with the guidelines set out by Eskom standard 240-47172520 and signoff acceptance by the civil / design engineer.

4.2.6 Steel reinforcing

As per Eskom standard 240-47172520, all main reinforcing steel shall conform to SANS 920 Type C, Class 2, and Grade II hot rolled deformed bars with a minimum yield stress of 450MPa. The minimum bar size utilised shall be 10 mm. All water used during construction shall comply with SANS 51008.

4.2.7 Excavation and backfilling

The first installation of a new foundation type or foundation system (first structure) shall be witnessed by the civil / design engineer. Excavation, construction and backfilling the excavation shall be undertaken as approved engineering designs. Excavation shall entail the removal of rock and soil to the appropriate level for the purpose of constructing the appropriate foundation.

All excavations shall be covered and barricaded. Upon completion of construction of the foundation's, the excavation shall be backfilled with the appropriate material. As per Eskom standard 240-47172520: "The material to be utilised for backfilling shall be moistened to optimum moisture content (OMC) $\pm 10\%$, and deposited in horizontal layers, having a thickness of not more than 300 mm before being compacted. In backfilling, the pad of the foundation shall be covered, first with a 200 mm layer of well-graded material containing no pieces larger than 20 mm, before any coarse material is deposited."

The backfill shall contain no stones bigger than 150mm diameter, be consistent, have optimum moisture content, compacted to at least 90% and ensure an elevated foundation to reduce moisture buildup.

4.2.8 Concrete foundations

The appointed party (contractor) shall be responsible for the supply and delivery of all materials required during the construction of foundations. Additionally, the following considerations should be noted:

- Acceptance and placement prior to concrete mix - The appointed party shall obtain test reports or samples as required by the civil engineer / designer.
- Concrete tolerances - the appointed party shall maintain excavations, shuttering and steelwork within specified limits / tolerances as set out in Eskom standard 240- 47172520.
- Formwork - Formwork to be of suitable material and designed to withstand pressure of concrete to ensure finished product.

- Concrete and grout mix - The mix shall consist of Portland cement, fine and coarse aggregate as well as water. The mix design should be acceptable to the civil / design engineer.
- Mixing of the concrete - Mixing of concrete shall be done sufficiently to ensure uniformity.
- Reinforced steel - All steel shall be bent and placed as per SANS 282 and shall be cleaned of mill scale and coatings before positioning.
- Concrete placement - No concrete shall be placed / poured until inspected by a civil / design engineer.
- Embedded items - All embedded items shall be installed prior to placement / pouring.
- Construction joints - All joints during construction should be avoided but should this be unavoidable the civil / design engineer should be consulted, and the necessary approval(s) obtained.
- Concrete curing / finishing - The top surface shall be contoured to shed water and be free from defects. All means of maintaining concrete in a moist condition for at least 7 days shall be adhered to.
- Crack repair - Repairs can be conducted on cracks less than 2mm wide and 30mm deep via approved Eskom products.
- Steelwork - Embedded steel to be galvanized and encased in concrete. Eskom approved bituminous paint to be applied at steel / concrete interface.

4.2.9 Tower Steel

The steelwork for all tower members shall conform to SANS 50025 Grade S355JR, and shall be hot dip galvanized. Certificates should be made available on request by the mechanical engineer / design engineer. All manufacturing and bending of steel shall be done according to SANS 2001CS1 and in consultation with the mechanical / design engineer.

4.2.10 Nuts, bolts and washers

As per Eskom standard 240-47172520 manufacturing of bolts and nuts shall be at least grade 6.8 in accordance with DIN EN ISO 898-1 and bolts should be treaded according to SANS 1556-1: ISO metric screw threads.

4.2.11 Anti-climbing devices

These devices shall be installed approximately 3.5m above ground for each tower and swaged bolts should be used. Anti-climb devices shall be of the palisade type with razor / barbed wire.

4.2.12 Welding

Permission for welding shall be obtained from the mechanical / design engineer should the need arise. Should permission be granted the appropriate party (contractor) shall provide the method or procedure to be applied.

4.2.13 Stringing

The following shall be considered:

- Material - Quantities and delivery shall be as agreed between Eskom and the appropriate party (contractor).
- Phase and earth conductor installation - Where changes between horizontal, vertical or delta configurations are required the appropriate party (contractor) shall consult the design engineer.
- Crossing notices and permits - At least 45 days notification shall be provided where there are crossing of power lines, communication lines and road crossings or major railways. A method statement should be submitted to the design engineer for approval / review.
- Handling and stringing of conductor - All stringing of conductor shall be done as per applicable standards and best practices to the appropriate tensions to prevent damage, kinks, twists etc. Conductor repairs and deformities, depending on the damage, shall be repaired in accordance with Eskom standards and procures. Additionally, the appropriate design engineer should be consulted.

4.2.14 Labels

As per Eskom standard 240-47172520, all tower labels are to be installed and manufactured as per “240-67561924 - Design, manufacturing and installation of transmission line labels”.

5. ROLES AND RESPONSIBILITIES

The roles and responsibilities stipulated below details the requirements of each party. The overall responsibility for implementation and compliance remains with Eskom, although the delegated representatives must take responsibility for the actions under their management/supervision. Specific responsibilities are defined in table below.

Table 5: Roles and responsibilities for MMP implementation

Key Responsibility/Role	Responsible Person
<p>Eskom’s operations manager has the following responsibility:</p> <ul style="list-style-type: none"> • Enforcing the compliance of the maintenance activities to the MMP and legal requirements. • Ensuring that the correct level of authority is assigned to project team members to enable compliance. • To assign resources to facilitate compliance. • Ensure that this MMP is shared with all contractors awarded maintenance activities associated with the powerline and related infrastructure within the distribution line. 	<p>Eskom Distribution (Client Operations Manager)</p>
<p>The Eskom Environmental Coordinator is responsible for:</p> <ul style="list-style-type: none"> • Oversight of the implementation of the MMP. • Assigning resources to the project team to meet compliance requirements. • Regular monitoring of the activities to observe compliance to the MMP and Eskom’s related authorisations and permits. 	<p>Eskom Distribution (Environmental Coordinator)</p>
<p>The Client Project Manager is responsible for managing the contractors on site on behalf of Eskom:</p> <ul style="list-style-type: none"> • Ensure that Eskom and the Contractor are aware of the contents of the MMP and the management measures which need to be implemented. • Be fully conversant with the MMP 	<p>Eskom Distribution (Project Manager)</p>

Key Responsibility/Role	Responsible Person
<p>The Construction Manager will be part of the Contractor’s team and will report to the Project Manager:</p> <ul style="list-style-type: none"> • Be fully conversant with the MMP and the management measures of the MMP. • Approve method statements. • Have overall responsibility for the implementation of the MMP. • Liaise with the Project Manager 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 maintenance activities to the demarcated areas. 	<p>Contractor’s Construction Manager / Site Agent</p>
<p>Should a Contractor be appointed to undertake maintenance activities. The Contractor must appoint a qualified person to act as ECO onsite. Alternatively, an internal Eskom Environmental Officer can be used for monitoring construction activities in the event that an Eskom Major Engineering Works Department is assigned to undertake required maintenance activities. The ECO will be part of the project team and will report to the Contractor Construction Manager. The ECO will be responsible for the following:</p> <ul style="list-style-type: none"> • Conveying the contents of the conditions of the MMP to the Project Manager and Construction Manager at the beginning of construction. • Conducting daily checks during maintenance activities to ensure the contractor is compliant with the conditions of the MMP. 	<p>Environmental Control Officer (ECO)</p>

Key Responsibility/Role	Responsible Person
<ul style="list-style-type: none">• Compiling compliance audit reports.	

6. SITE SPECIFIC METHOD STATEMENT

The following serves as a general guide required to minimise the spatial impact of the maintenance activity:

- Repairs and maintenance should be conducted during the drier months, particularly in areas where powerlines cross watercourses and where pylon structures are located within the banks of the watercourse. This approach aims to minimize the impact of maintenance works on the watercourses, except in cases of emergency maintenance.
- Where at all possible, existing access routes shall be used. In cases where none exist, a most degraded area shall be used in order to avoid sensitive/indigenous vegetation areas.
- Responsible management of pollutants through ensuring handling and storage of any pollutants shall be located away from the watercourse. When machinery is involved, ensure effective operation with no leaking parts and refuel outside of the riparian area, at a safe distance from the watercourse to manage any accidental spillages and pose no threat of pollution. Spill kits must be made available to immediately deal with spills.
- At no time should the flow of the watercourse be blocked (temporary diversions may be allowed; however, this should be done in consultation with DWS) nor should the movement of aquatic and riparian biota (noting breeding periods) be prevented during maintenance actions.
- No new berms can be created.
- In circumstances which require the removal of any topsoil, this must be sufficiently restored through sustainable measures and practices.
- A concerted effort must be made to actively rehabilitate repaired or reshaped banks, as well as areas cleared of vegetation, with indigenous local vegetation. Soil must be tilled / scarified, especially if it was compacted by groundworks. Mulch should be applied. Seed should be collected from plants present at the site and should be used immediately or stored appropriately and used at the start of the following wet season. Plants such as perennial grasses, shrubs, succulents and geophytes can be removed before groundworks and replaced once work is completed.

- No deepening of the watercourse beyond the original, pre-damage determined thalweg, unless such deepening is directly related to the natural improved functioning and condition of such a watercourse.
- Where at all possible, limit the disturbance to the zone of the thalweg. This is due to the ecological importance of the low flow channel and respective habitat being allowed to re-establish improving the ecological condition.
- The build-up of debris/sediment removed from a maintenance site may:
 - be utilised for the purpose of in-filling or other related maintenance actions related to managing erosion, which form part of an adopted MMP;
 - not be used to enlarge the height, width or any extent of existing berms;
 - not be deposited anywhere within the watercourse or anywhere along the banks of a river where such action is not part of the proposed maintenance activity (ies). Material that cannot be used for maintenance purposes must be removed out of the riparian area to a suitable stockpile location or disposal site. Further action and consideration may be required where the possibility of contaminated material may occur, such as in urban watercourses.
- The use of foreign material, such as concrete, rubble, woody debris and/or dry land based soil, is strictly prohibited from being used in maintenance actions unless for the specific purpose of repairs to existing infrastructure, coupled with appropriate mitigation measures.
- On completion of the maintenance action, the condition of the site in terms of relative topography should be similar to the pre-damaged state (i.e. the shape of the riverbank should be similar or in a state which is improved to manage future damage). This ultimately dictates that the channel, banks and bed cannot be made narrower, higher or deepened respectively. Exceptions are considered for systems involved with the management of stormwater and improvements for water quality within the urban context.
- Construction and maintenance vehicles should stay on the existing service roads as far as possible. Peripheral impacts around the maintenance footprint, on the surrounding vegetation of the area, should be avoided.
- Invasive plant species should be controlled through the eradication of both existing plants and any emerging seedlings. Weeds and invasive plants must

be managed in accordance with the guidelines set forth by the CARA, or in line with the Working for Water guidelines.

6.1 Site conditions

The pictures below present the observed conditions of the distribution line;



Figure 2: Picture of the Sub stations



Figure 3: Picture showing the slope along the distribution line



Figure 4: Picture showing the vegetation along distribution line



Figure 5: Tower foundation



Figure 6: Wooden Towers to be replaced by Monopole Towers

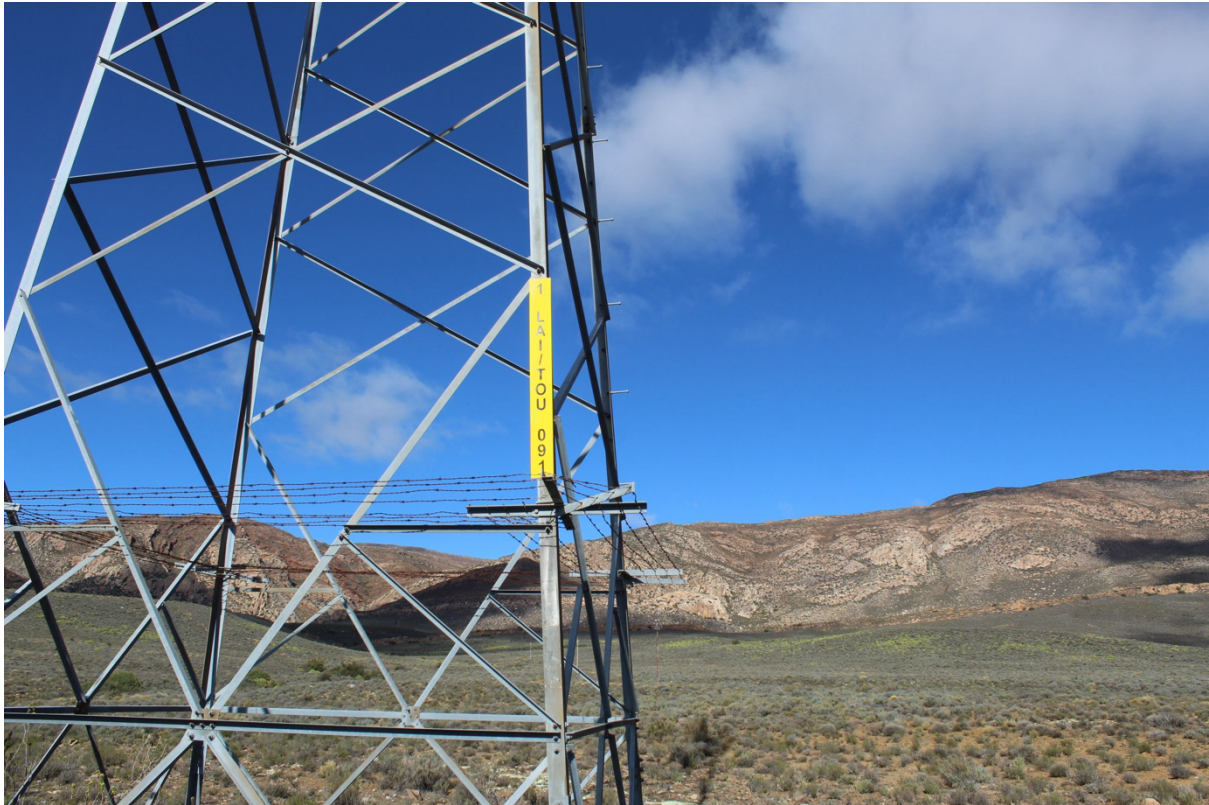


Figure 7: Tower Labelling

6.2 Environmental Management Measures

The management measures listed in table below are either:

- **Essential:** measures which must be implemented and are non-negotiable; or
- **Best Practice:** recommended to comply with best practice, with adoption dependent on the proponent's risk profile and commitment to adhere to best practice, and which must be shown to have been considered and sound reasons provided by the proponent if not implemented.

These measures have been italicised for ease of reference. The environmental management and mitigation measures that must be implemented during maintenance, as well as responsibilities and timelines for the implementation of these measures.

Table 6: Potential risks associated with the maintenance activities and proposed mitigation measures

Activity	Potential Impact/Risk	Mitigation/Management Measures	Responsible Person
Biodiversity	Loss floral Species	Proposed mitigation would mainly be to avoid disturbance to the patches of natural vegetation wherever possible.	Contractor's Construction Manager and ECO
	Potential loss of species of concern	Protected species permits are required from the DFFE for disturbance (cutting or removal) of any protected trees. Species to be removed prior to clearing.	Project Manager, Contractor's
		If avoidance is not possible, impacted protected tree species to be replaced (like-for-like where possible), in a suitable nearby location.	Construction Manager and ECO
	Potential loss of species of concern	Erosion control structures must be put into place where soil may be prone to erosion.	Contractor's Construction Manager
		Topsoil and subsoil should be stockpiled separately.	Contractor's
		Topsoil and subsoil stockpile storage should not exceed a height of 2 meters.	Construction

	Potential sedimentation and erosion due to maintenance activities.	During rehabilitation, prompt and progressive reinstatement of bare areas is required. The topsoil layer is to be replaced on top during reinstatement.	Manager and ECO
		Checks must be carried out at regular intervals to identify areas where erosion is occurring.	
		Remedial action, including the rehabilitation of eroded areas and, where necessary, the relocation of the paths causing erosion, is to be undertaken.	
		Sediment loads should be prevented from entering watercourses.	
	Infestation of alien invasive species within areas where maintenance activities have occurred.	Natural open spaces outside the existing Eskom servitude footprint should be left in their undeveloped state.	
		Upon commencement of maintenance, a photographic record of IAPs present in the maintenance site, as well as in nearby areas, must be made.	
		After revegetation has been completed, the Contractor must remove weeds and alien plant species at the maintenance sites and adjacent areas on a monthly basis, until the end of the defects liability period of the contract.	
	Special care must be taken when removing alien invasive plants from site, so as to not leave any part of the plant behind. When removing alien invasive plants, soil disturbance must be minimised		

		<p>to prevent as little germination as possible as alien invasive plants can spread their seeds when disturbed.</p> <p>All felled or cut alien invasive plants must be removed from site and appropriately disposed of.</p> <p>Care must be taken to avoid the introduction of alien invasive plant species to the site. Particular attention must be paid to imported materials such as construction material, fill material or dirty earth moving equipment. Stockpiles should be checked regularly and any weeds emerging from material stockpiles must be removed.</p> <p>A monitoring program should be put into place to remove alien vegetation and maintain areas free from alien invasions during construction.</p>	
		Rehabilitation should be undertaken on a progressive basis in these areas.	
Social-Economic Environment	Job opportunities	As part of the contractor’s contract, contractors will be required to meet a certain target of employing labourers from the local community.	Project Manager, Contractor's Construction Manager
	Influx of people to the area seeking employment	As part of the contractor’s contract, contractors will be required to meet a certain target of employing labourers from the local community.	

		Should labour be required during the maintenance activities, consideration must be given to sourcing the labour from the local communities where possible. This requirement must be specified within the contract signed by the contractor. This will contribute to the local gross domestic product of the area.	
Air Quality	Increased nuisance dust fall rates associated with maintenance activities.	Dust suppression must be undertaken using water or other dust suppressants sprayed onto open areas / topsoil stockpiles.	Construction Manager
		Reductions of vehicle exhaust emissions by ensuring equipment is in good working order. The use of non-portable water for dust suppression is encouraged.	Contractor's Construction Manager
Agriculture and Land Capability	Clearance of vegetation along the 132 kV powerline which may lead to soil erosion.	Remove usable topsoil and subsoil from demarcated areas to be disturbed and stockpile in the designated area.	Contractor's Construction Manager and ECO
		Limit vegetation removal to physical footprint.	
		Topsoil and subsoil stockpile to be used as part of maintenance activities must be maintained when stockpiled for its duration. Erosion of stockpiles must be prevented and remediated, should it occur.	
		The topsoil stockpiles must be vegetated and maintained to preserve the nutrient content.	

	<p>Erosion control measures (for wind and water erosion) must be implemented and maintained in areas disturbed by maintenance activities such as revegetation of areas with natural vegetation.</p> <p>To reduce dust, topsoil stockpiles must be watered regularly until the topsoil stockpiles have been revegetated.</p> <p>To reduce dust, water or an appropriate dust suppressant must be sprayed onto exposed surfaces.</p> <p>Rehabilitation of disturbed areas must be done by loosening/ripping soil and rehabilitated by using indigenous grasses/vegetation.</p>	
	<p>Soil stockpiles must not be deposited / stored within riparian areas (watercourses and their banks).</p>	Construction Manager
	<p>Topsoil must be monitored to ensure recovery and maintain its biological function.</p>	Environmental Coordinator
Soil compaction due to heavy machinery during construction.	<p>Maintenance vehicles must be restricted to the demarcated access roads.</p> <p>Rehabilitation of disturbed areas must be done by loosening/ripping soil and using indigenous grasses/vegetation.</p>	Construction Manager
Increased runoff to surrounding system due to vegetation disturbance and new infrastructure.	<p>The maintenance infrastructure to be installed shall be included into the stormwater management plan.</p>	Environmental Coordinator and

			Operations Manager
		This MMP and applicable environmental controls and specifications and conditions must be included in all maintenance contracts and sub-contracts, thereby making contractors accountable for preventing accidental spillages.	Project Manager, Construction Manager and Environmental Coordinator
	Soil pollution due to hazardous substances spills.	All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability. No repairs may be undertaken on site unless they are conducted on impervious surfaces.	Contractor's Construction Manager and ECO
		All earth moving vehicles and equipment when stationary, must have drip trays underneath the engine and fuel tank to prevent soil contamination from leaks and spills.	ECO
		All hazardous substances must be stored on an impervious surface in a designated bunded area, able to contain 110% of the total volume of materials stored at any given time. Storage areas must be well marked with appropriate signage.	Contractor's Construction Manager and ECO

		<p>If a spillage of a hazardous substance occurs, the resultant hazardous waste must be cleaned up using spill kits on site and treated or disposed of appropriately.</p>	
		<p>Any incidents must be reported to the CA as soon as possible. Measures must be put in place to prevent similar incidents from occurring. If necessary, remediation of any contamination must be carried out.</p>	
		<p>All hazardous waste must be re-used, recycled, treated or disposed of at licensed facilities and stored in designated, lined, and bunded areas (for no longer than 90 days).</p>	
	<p>Loss of topsoil due to incorrect stockpiling (including re-vegetation).</p>	<p>Remove all topsoil from maintenance sites and stockpile.</p>	<p>Construction Manager and ECO</p>
		<p>Limit vegetation removal to areas not impacted by the project areas.</p>	<p>ECO</p>
		<p>During maintenance activities, special attention must be given to the maintenance of the topsoil and soil stockpiles.</p>	
		<p>Re-vegetate any topsoil stockpiles to prevent erosion and loss of nutrients.</p>	

		To reduce dust, water or an appropriate dust suppressant must be sprayed onto topsoil stockpiles until the topsoil stockpiles have been revegetated.	Contractor's Construction Manager and ECO
		Topsoil stockpiles to be monitored and inspected weekly for re-vegetation and erosion.	ECO
	Incorrect disposal of waste aggregate. Waste material is not stockpiled and stored correctly.	All waste aggregate to be removed from site and re-used, recycled, treated or disposed of at a licensed waste management facility unless material is reused during maintenance activities.	Contractor's Construction Manager and ECO
		If waste aggregate is stockpiled on site, this must be within the allocated demarcated area.	Contractor's Construction Manager
Landscape	Litter and bad housekeeping from maintenance staff.	All maintenance staff will be made aware of the waste management procedure.	Contractor's Construction Manager
		Bins to be made available by the contractor for the disposal of general and hazardous waste during maintenance activities.	
	Clearing of vegetation along the powerline route.	Remove the absolute minimum vegetation and topsoil along the powerline.	ECO
		Ensure that all existing natural vegetation is retained wherever possible and incorporated into the site design.	Engineering Team

	Inadequate rehabilitation of the maintenance footprint.	The Contractor will be instructed to rehabilitate areas as soon as maintenance activities within those areas have ceased.	ECO
		Rehabilitation specification must be incorporated into the maintenance contractors' requirements.	Project Manager
Paleontology	Paleontological chance finding during the excavation of foundations.	All contractors to implement "Chance Find Procedure".	Project Manager and Contractor's Construction Manager
		Should any paleontological artefacts be exposed during construction, the activities near the findings must be stopped immediately. Under no circumstances shall any artefact be destroyed. Such a paleontological site must be marked and fenced off, and the SAHRA must be contacted immediately.	Contractor's Construction Manager
Archaeological and Cultural Heritage	Archaeological and cultural heritage chance finds during the excavation within the affected areas.	All contractors to implement "Chance Find Procedure".	
		Should any archaeological artefacts be exposed during maintenance, the activities near the findings must be stopped immediately.	
		Under no circumstances shall any artefacts be destroyed. Such an archaeological site must be marked and fenced off, and the South African Heritage Agency (SAHRA) must be contacted immediately.	

		If these appear to be human remains, the South African Police Service must also be contacted.	
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7. MONITORING AND REPORTING

It is important to note that any activities undertaken outside the scope of the adopted MMP, in terms of the action outlined within the given method statement, the responsible person(s) will be subject to Section 24(F) of NEMA and that appropriate enforcement and compliance requirements will follow.

The implementation of this MMP should be monitored by a suitably qualified ECO. The ECO should monitor the following:

- Repair work is completed according to original specifications.
- No new erosion or sedimentation has occurred.
- The bed and banks of watercourses and wetlands impacted by tree felling and the removal of invasive alien grasses are in good condition, without signs of erosion or bare areas.
- IAPs have been removed from prioritised areas (i.e., within a 25 m radius of each maintenance activity).
- Vegetation management has not led to a deterioration in the condition of watercourses and wetlands (i.e., the PES has remained unchanged, with the desired outcome being the maintenance of existing conditions).
- Areas within the streams, wetlands, and their ecological buffers that have been impacted by maintenance activities have been rehabilitated.

Any issues such as failed re-vegetation, or erosion should be addressed immediately upon detection during the monitoring process. Corrective actions may include re-initiating rehabilitation in severe cases or directly addressing the identified problems. If issues arise from constructed infrastructure that were not anticipated in this plan, an engineer and wetland specialist should be consulted as soon as possible.

8. APPLICATION OF DUTY OF CARE

The plan must be used to remedy any form of land degradation that has resulted from activities on site and prevent any future degradation from reoccurring. Therefore, any activities that pose a threat to the environment, regardless of their location on the property or footprint, must be remedied. This is in alignment with

Section 28 duty of care under NEMA which requires every person who causes, has caused or may cause significant degradation of the environment to take reasonable measures to prevent such degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution and degradation of the environment.

"Reasonable measures" include measures to investigate, assess and evaluate the impact on the environment; cease, modify or control any act causing degradation and remedying the effects of degradation. The compilation of this independent report is one of the reasonable measures being implemented to prevent further degradation. It will provide an account of the impacts and detail measures to remedy the impacts. Further reasonable measures include the implementation of the recommendations and monitoring the success of maintenance and rehabilitation actions.

9. EMERGENCY RESPONSE PROCEDURES

The potential environmental risks that may arise as a result of maintenance activities must be identified, and appropriate emergency response procedures must be compiled for each emergency scenario. Potential environmental emergencies that require an emergency response include, but are not limited to, unplanned fires, spills of hazardous chemicals etc.

- The maintenance contractor is responsible for identifying potential significant environmental risks that may arise as a result of pre-maintenance, maintenance and rehabilitation activities, and the contractor must formulate emergency response procedures for these potential incidents.
- The ECO, the contractor and the Holder are responsible for ensuring that all maintenance workers are aware of the emergency procedures and are properly trained on how to identify and respond to an emergency incident during maintenance.
- An emergency procedure must clearly indicate who will take charge during an emergency, and the roles and responsibilities of workers and authorities during an emergency.

- The maintenance contractor is responsible for ensuring that the requirements of the Occupational Health & Safety Act (OHSA) are adhered to during the maintenance phase. The Holder is responsible for ensuring compliance with the OHSA during the undertaking of maintenance activities.

9.1 Emergency Preparedness

The following measures must be implemented, as appropriate, to ensure effective responses to emergencies:

- All workers on site during the maintenance phase must be properly educated about possible emergency incidents that may arise, how to avoid such incidents and how to respond in the event of an incident. “Refresher” training sessions on emergency procedures must be held if needed.
- All workers must ideally be given basic fire-awareness training, as well as be advised on basic firefighting and safety techniques. Fire-fighting equipment must be available on-site during maintenance and maintenance activities.
- All workers must be trained on how to respond in the event of a spill of a hazardous substance (fuel, chemicals etc.), if hazardous substances are to be used on site.
- A spill kit for containing and/or neutralising spills of hazardous substances (e.g., hydrocarbons) must be available on site at all times, when hazardous substances are present.
- Any incidents of pollution or spillage of hazardous materials during maintenance must be reported to the ECO as soon as possible. The ECO must then (depending on the nature of the spill) notify the relevant authorities, if needed.
- A first aid kit must be available on site at all times.
- Emergency contact numbers (including the fire department, police and ambulance) must be prominently displayed on site at all times and regularly updated.
- All emergency incidents must be recorded on a site incident log. The cause of the incident, the measures taken in response to the incident and the effectiveness of those measures must also be recorded. This information must

be used to inform future emergency preparedness planning, avoid and or prevent similar incidents from arising again.

10. ENVIRONMENTAL AWARENESS PLAN

Environmental Awareness Training must be conducted prior to the commencement of maintenance activities. It is the holder's responsibility to familiarise himself/herself with the content and requirements of this MMP. The holder is also responsible to ensure that the contractor and all labourers working on site during the maintenance phase are familiar with the content of this MMP. The following actions must be taken to ensure that all relevant parties are aware of their environmental roles and responsibilities:

- This MMP must be kept on site at all times.
- The provisions of this MMP and the conditions of any relevant permits/licenses/authorizations must be explained in detail to all staff during Awareness Training.
- Training material must be handed out to all employees and must be explained to them.
- The ECO shall conduct frequent site visits where applicable.
- Monitoring reports must be compiled by the ECO (when applicable) after each site visit during the maintenance period. These reports must be circulated to all parties involved (including the holder, contractor and the competent authority).

The Maintenance Contractor must make allowance for all maintenance site staff, including all subcontractors that will be working at the site, to attend environmental awareness training sessions (undertaken by the ECO) prior to commencement of any maintenance work on site. During this training, the ECO will explain the contents of the MMP, and the conditions contained therein. Attention will be given to the maintenance process and how the MMP fits into this process. Other items relating to sound environmental management which must be discussed and explained during the environmental awareness training sessions include:

- The demarcated "No-Go" areas (only where necessary);

- General do's and don'ts of the site;
- Making of fires;
- Waste management, use of waste receptacles and littering;
- Use of the toilets provided;
- Use and control of maintenance materials and equipment etc.;
- Control, maintenance and refuelling of vehicles;
- Methods for cleaning up any spillage;
- Access and road safety;
- Emergency procedures (e.g., in case of fire, spillage etc.)
- General “best practice” principles, with regards to the protection of environmental resources.

Environmental awareness training and education must be ongoing throughout the maintenance of the powerline and must be undertaken regularly if deemed necessary (especially if it becomes apparent that there are repeat contraventions of the conditions of the MMP), or as new workers come to site. Translators must be utilised where required.

11. INVASIVE ALIEN PLANT SPECIES MANAGEMENT PLAN

Alien plant invasions cause a decline in species diversity, local extinction of indigenous species and ecological imbalance. Thus, preventing the onset of an alien invasion, management of further spreading is required as problem plants outcompete indigenous plant species and quickly establish themselves in an area. In light of this, a national strategy was compiled identifying four primary programs to address the management of alien invasive plant species as listed below:

1. Prevention: Keep the invasive species out;
2. Early detection and rapid response: Detect and eradicate invasive species to stop them from spreading;
3. Control and management: Eliminate or control the problem of invasive species; and
4. Rehabilitation and restoration: Heal, minimize, or reverse the harmful effects from invasive species.

The occurrence of alien invasive plants does not only affect the growth and distribution of natural endemic plants, they also use more water than indigenous plants, some have toxic fruits or leaves which when consumed could lead to fatalities. Therefore, alien invasive plant species need to be controlled or removed, and the following section contains different methods that can be used.

The ultimate aim of an alien invasive management plan is to completely eradicate problem species from site. This is often very difficult as many of the species have seeds that remain viable for a very long time and even after physical removal of plants, the seeds germinate to form new infestations. An alien invasive management plan must therefore be an ongoing practice over many years and should follow the following phases:

1. The initial bulk eradication of alien invasive species by chemical or mechanical means, and in some instances biological control agents. This may also require rehabilitation if large stands of alien invasive species are removed. Local, indigenous species should be planted in the disturbed areas;
2. There should also be immediate follow up and all seedlings should be pulled out and removed. This should be done regularly, although the timeframes will vary from species to species depending on their growth forms and rates; and
3. Finally, monitoring of areas that appear to be under controlled must continue on at least an annual basis. Rehabilitated areas should also be monitored and action taken immediately if regeneration of problem plants occur.

Various options are available for the control of alien invasive species, including mechanical, chemical and biological control. In most instances, mechanical means are utilised and include physical removal of plants. Research on use of herbicides has been conducted on many species and can be applied in conjunction with mechanical methods. For some species, herbicides have not yet been fully researched and/or herbicides have not been registered and these need to be mechanically controlled. The Department of Water and Sanitation's Working for Water section provides guidelines to the preferred clearing methods for most problem plants. This information can be obtained from their website:

<http://www.dwaf.gov.za/wfw/Control/>. The selection of appropriate methods of control shall be based on the species to be controlled, the size of the plants, the density of the stand, the accessibility of terrain and environmental safety.

Biological control of alien invasive species is an ongoing process with some biological control agents having been released on various alien invasive species showing varying degrees of success. Biological control options need to be carried out with specialist advice from academic or research institutes involved in research of alien invasive species.

Control options must take into account the species being controlled, as well as the ecosystem in which the control options are being applied. For instance, some of the herbicides registered for control of alien invasive species may not be used in riparian areas, while some should preferably be used in areas where natural grass cover occurs. Some herbicides should only be utilised after consultation with a Working for Water technical advisor.

The control options are discussed below as individual actions, but in many cases integrated measures (more than one (1) control measure) are taken for more effective control of alien invasive species.

The Department of Water and Sanitation proposes that the following methods of control for age or size target plants:

❖ **Seedlings**

Hand pulling or hoeing:

- Hand pulling/hoeing should be carried out in sparse stands.
- Seedlings should be severed below the soil surface or removed from the soil. Soil disturbance should be minimized to reduce re-germination.

❖ **Herbicides:**

- Herbicides can be used on dense stands.

❖ **Saplings**

Hand pulling or hoeing:

- Where appropriate saplings can be removed manually as described above.

Herbicides:

- Foliar sprays can be carried out depending on the density of the stand. Fan nozzles should be fitted for overall spraying and solid cone nozzles for individual plant treatment. Spraying should be restricted to plants waist high or lower. Ensure there is sufficient foliage to carry the herbicide to the root system.
- Basal stem treatments of suitable herbicides in diesel can be carried out to the bottom 250 mm of the stem. Applications should be by means of a low pressure, coarse droplet spray from a narrow angle solid cone nozzle.
- Cut stump treatments can be used where stems are cut as low as practical. Herbicides are applied in diesel or water as recommended for the herbicide. Applications in diesel should be to the whole stump and exposed roots and in water to the cut area as recommended on the label.
- The application of herbicides should only be sprayed/used on site by a registered pest control officer.
- ❖ Mature Trees (trees above shoulder height or robust bushes 12 - 1 months or older) Ring Barking:
 - Bark must be removed from the bottom of the stem to a height of 0.75 - 1.0 m. All bark must be removed to below ground level for good results.
 - Where clean de-barking is not possible due to crevices in the stem or where exposed roots are present, a combination of bark removal and basal stem treatment should be carried out.

Frilling or partial frilling:

- Cuts should be made through the bark into the sapwood by means of a light axe and a suitable herbicide must be applied into the cuts.

Basal stem treatments:

- Suitable herbicides should be applied in diesel to the base of the stem and to any exposed roots. Stems with a diameter up to 50 mm should be treated to

a height of 250 mm and stems above 50 m diameter to a height of 500 mm.
This method is only suitable for stems up to 100 mm in diameter.

Cut stump treatment:

- Stumps should be cut as low as practical and the herbicide applied. Applications in diesel should be to the whole stump and exposed roots and in water to the cut area as recommended on the label.

12. FOSSIL CHANCE FIND PROTOCOL

Monitoring Programme for Palaeontology - to commence once the excavations / drilling activities begin.

1. The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence.
2. When excavations begin the rocks, and discard must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (invertebrates, traces, plants, insects or bone) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
3. Photographs of similar fossils must be provided to the contractor to assist in recognizing the fossil plants, vertebrates, invertebrates or trace fossils in the shales and mudstones. This information shall also be provided on the the EMP's training and awareness plan and procedures.
4. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
5. If there is any possible fossil material found by the contractor/environmental officer then the qualified palaeontologist should be contacted and or appointed for such maintenance work. Ultimately, the qualified palaeontologist must visit the site to inspect the selected material and check the dumps where feasible.
6. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a

suitable institution where they can be made available for further study. Before the fossils are removed from the site a HWC permit must be obtained. Annual reports must be submitted to HWC as required by the relevant permits.

7. If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to HWC once the project has been completed and only if there are fossils.

8. If no fossils are found and the excavations have been completed then no further monitoring is required.

13. CONCLUSION

The MMP must guide the activities associated with maintenance of the 132 kV overhead line from Boskloof substation to Laingsburg substation. This includes the activities required to address the damage to towers that has already occurred. Recommendations for further steps are as follow:

- Incorporation of the MMP into the Eskom environmental management system.
- Auditing of the activities.
- Regular review of the MMP against maintenance activities where it may apply.

The involvement of an ECO during the planning and construction phases of maintenance activities is crucial for ensuring that the mitigation measures outlined in this MMP are strictly applied.