

DRAFT

BASIC ASSESSMENT REPORT

PROPOSED ESKOM WARDEN RURAL-VREDE MUNIC 88kV POWER LINE

PHUMELELA LOCAL MUNICIPALITY,

FREE STATE PROVINCE

MARCH 2014

DEA REF: 14/12/16/3/3/1/1056

WES REF: 13/30/07/09

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 FREE STATE PROVINCE

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PROJECT INFORMATION

REPORT TITLE: Basic Assessment Report
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PROJECT TITLE: ESKOM Warden Rural –Vrede Munic 88kV Power Line,
CLIENT: ESKOM Distribution

ENVIRONMENTAL CONSULTANTS: Wandima Environmental Services

DEA REFERENCE NUMBER: 14/12/16/3/3/1/1056
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EXECUTIVE SUMMARY

1. PROPOSED ACTIVITY

1.1 Background to Proposed Project

Wandima Environmental Services have been appointed by *Eskom Distribution* (the Applicant) to lodge an application for Environmental Authorisation with the Department of Environmental Affairs (DEA) in terms of National Environmental Management Act, 1998 (Act 107 of 1998) as amended and the Environmental Impact Assessment Regulations, 2010 for this project.

The proposed activity is about the construction of a ± 60 km 88kV power line from Warden Rural substation to Vrede Municipal substation. The trigger for this project is that it takes long for the Standerton line (which supplies Vrede Munic.) to be fixed, repaired, or attended to and leaves customers at Vrede and surrounding consumers without electricity for extended times with its negative consequences in the event of breakdowns.

The proposed line will therefore, only be used in emergency situations, i.e. if Vrede loses supply from the Standerton line then the new line will kick in while the main source is been attended to and therefore, will not be connected to the grid permanently. The project will be constructed with monopole power structures.

The total servitude width of an 88kV line without any other line around it will be 22m (i.e. 11m on each side from the centre line) and the average span length between poles will be 250m at the most. When an 88kV runs parallel to an existing 22kV power line the distance between the 2 power lines must be 15m calculated from the centre line of each power line. The average span length between poles is 150m.

1.2 Proposed Activities

The proposed project includes:

- The construction of ± 60 km 88kv Chikadee powerline from Warden Rural Substation to Vrede Municipal Substation, from the proposed new 88kV feeder bay at Warden.

1.3 Activity Listing

The **construction of facilities or infrastructure for the transmission and distribution of electricity** is a listed activity according to the Environmental Impact Assessment (EIA) Regulations R543, 2010 and it must be adhered to in terms of Sections 24(2)(a) and 24(d) of the National Environmental Management Act (NEMA), Act no 107 of 1998. The proposed activity triggers

Listing Notice 1, R544 of June, 2010:

- **Activity No 10(i):** The construction of facilities or infrastructure for the transmission and distribution of electricity outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts;

The construction of a ± 60 km 88kV power line from Warden Rural substation to Vrede Municipal substation

Activity No 11(xi): Construction of Infrastructure or structures covering 50 square meters or more in size, where such construction occurs within a watercourse or within 32metres of a watercourse, measured from the edge of the watercourse, excluding where such construction will occur behind the development set back line.

The construction of a power line within 32 meters of various water-bodies. Four rivers are crossing the study area through which the proposed power line is to be constructed. The rivers are Holspruit, Cornelius, Venterspruit and Grootspruit.

This listing requires the **Applicant** to carry out a Basic Assessment Process.

1.4 Alternatives

Two (2) alternatives were identified and are being evaluated. Paragraph A & B below outlines the directions of the routes followed by the two Alternatives, as well as the No Go Alternative which is covered in paragraph C. A route map clearly indicating the two Alternatives is herewith submitted for clarity. (**Appendix A**)

Alternative 1

Warden-Vrede proposed power line: Alternative 1 will exit from the Warden substation towards the N3 Durban road. The line will cross over the National road along with the other existing lines and take a bend $\pm 850\text{m}$ to follow the N3 road over the R714 and towards Warden town along the western side. It then proceeds alongside the N3 and proceed towards the Warden Cemetery. The line bypasses along the cemetery area which is located $\pm 2\text{km}$ from the bend to the Warden substation over the N3. The route then leaves the N3 and follows the R103 in a northerly direction, and cross over the road (R103) to the eastern side. It runs through a number of properties until it reaches the property Eerstegeluk 1797 where it bends and crosses over the R103 into the property Newmarket 260. It then bends to the Northern direction again along the R103 to a point where Alternative 2 in this project divert with the existing Eskom HV Lines into the property Bitterwater just after passing Spitskop 1226. The bend cuts through the property Palmiet 585 to cross over the R34 into property Brakleegte 294 and proceed to the East along the R34 till property Krynaauwslust No. 275 where it again meets Alternative 2. Alternative 1 proceeds along the property Frederiksdal 927 along the R34 towards Vrede town. It then leaves R34 and runs along the R546 till the roads intersection where it crosses over to the existing Vrede Munic 88/22/11kV substation which is located along the outskirts of Vrede town and connects. N.B. All affected properties/farms are listed and submitted as APPENDIX E 5 under the alternative in review.

Alternative 2

Warden-Vrede: Alternative 2 runs from the Warden substation over the N3. The route then leaves the N3 and follows the R103 in a northerly direction, and cross over the road (R103) to the eastern side diverting from the other existing lines to go along with Alternative 1. It runs through a number of properties until it reaches the property Eerstegeluk 1797 where it bends and crosses over the R103 to into the property Newmarket 260. It then bends to the Northern direction again along the R103 to a point where it (Alternative 2) divert into the property Bitterwater just after passing Spitskop 1226, leaving Alternative 1 to the north-eastern direction along the gravel road with the existing Eskom HV Lines. It goes along the property Graskop 145 and proceed through various properties along the gravel road till it reaches Vlakplaats 206 and bends a little bit towards Hugenot 1351 to the Y-junction and bends towards Aurora 1213 and Morgenson 953 and the latter is a game farm. The line passes Morgenson 953 (Morgenson Ranch) but along the property Aurora 1218 and along the road towards Vrede town. It passes by Edenvale 617 till it reaches Krynaauwslust 275. At this point it bends towards the R546, crossing over the road to meet Alternative 1. Both lines run with the existing Eskom HV Lines into the Vrede Munic 88/22/11kV substation and connect. N.B. All affected properties/farms are listed and submitted as APPENDIX E 5 under the alternative in review.

No Go Alternative

The no go alternative means that the proposed power lines and substation will not be constructed. The result will be:

- Problems of low capacity power within the Vrede area will not be resolved.
- Employment opportunities for local community will be lost.
- ESKOM will not be able to fulfill its bigger mandate of supplying power to all South Africans

2. PROPERTY DESCRIPTION

2.1 Location and Particulars of Property

The proposed project is to be located in Phumelela Local Municipality in the Free State Province. The project will start at Warden Rural Substation and end at Vrede Municipal Substation, traversing several farm portions. Vrede gets its supply of electricity from Standerton substation via an 88kV line. This line supplies both Vrede and Ascent substation. These two substations have feeders supplying different areas around Vrede via 22kV lines. Warden is fed by an 88kV line from Ras substation. A number of farm portions, as indicated in Appendix E of the report, will be affected.

2.2 Current Land Use & State

The properties on which the line is proposed are used for various purposes ranging from agriculture activities such as grazing and cultivation of crops, natural vegetation, existing power lines and formal and informal settlements. For the substation the current land use is grazing and cultivation of crop.

2.3 Description of the Environment

The topography of the study area is predominately flat to slightly undulating. Undulating terrain with streams and rivers drain the foothills of the Drakensberg Mountains and greater escarpment. Along certain areas of the proposed power line corridors the terrain and topography is steeper and numerous ridges are present, as one starts to descend lower and the outer edges of the escarpment are encountered.

This is a Summer-rainfall region, with a mean annual precipitation (MAP) of around 630 – 700 mm. Much of the precipitation falls between November and March, in the form of thunderstorms and heavy but short downpours. There are vast differences between the average winter and summer temperatures, as well as frequent occurrences of frost in winter. The region is one of the coldest regions of the Highveld.

The general geology of the region and study area is that of mudstones, sandstones and shale of the Beaufort Group (Tarkastad Formation in the south and Adelaide Formation in the north). Dolerite dykes and sills as well as sandstone outcrops, resistant to weathering, form isolated hills and ridges that create a broken landscape in parts of the study area and region. This is especially prevalent along Alternative Route 2 and the northern area of Alternative 1 where the corridors drop down a bit off the Highveld plateau.

Sepane, Arcadia, Estcut and Rensburg soil forms dominate the mist bottomlands, while the Glenrosa, Bonheim, Avalon, Clovelly and Mayo soil forms dominate the outcrops and slightly elevated areas. The main land types are Bb, Bd, Ca and Ea. A description of the land types are summarized below:

- Bb – Plinthic catena: Upland duplex and marginalitic soils rare. Dystrophic and/or mesotrophic. Red soils not widespread.
- Bd - Plinthic catena: Upland duplex and marginalitic soils rare. Eutrophic; red soils not widespread.
- Ca - Plinthic catena: Upland duplex and/or marginalitic soils are common. The soils are generally the same as in Broad Soil Pattern Ba-Bd. However, > 10% of the landscape consists of a variety of structured clay soils. Shallow, rocky soils commonly also occur in places.
- Ea – One or more of : Vertic, melanic, red structured diagnostic horizons. Undifferentiated.

3. PUBLIC PARTICIPATION PROCESS

3.1 Approach

A public participation process was followed in accordance with Section 54 of the EIA regulations, R543, (2010). This process was executed as elaborated in the following section.

Availability of the Draft Basic Assessment Report

All identified Interested & Affected Parties (I&AP's) will be notified of the availability of the Draft Basic Assessment Report. They will be invited to comment on the report. Notifications will be made through the following means:

- Advertisement in the local Vrede Nuus newspaper
- Site notifications and
- Through the desk of the Farmers Union secretary and
- E-mails;

3.2 Further Participation

After the issuing of the Environmental Authorization (EA), the decision will be communicated to all registered I&AP's and they will be afforded the opportunity to appeal against any decision.

4. IMPACT ASSESSMENT

This phase identified and analyzed the potential impacts of the activities of the proposal on the biophysical and socio-economic components of the environment. Activities throughout the project; i.e. Design/Pre-construction, construction, operational phases were considered during the assessment. Both negative and positive impacts were assessed, negative for mitigation and positive for enhancement. The assessment also covered various areas of specialization such as ecological assessment, avi-fauna, wetland assessment, visual impact assessment and cultural heritage.

The Specialist studies for the proposed construction and operation of the proposed 88kV power line from Warden Rural Substation to Vrede Substation was undertaken to determine the possible impacts likely to arise during the construction and operational phase. The findings of the specialists are summarized as follows:

4.1. Terrestrial Biodiversity

Due to the requirement of vegetation removal for ESKOM power lines it has a negative impact on vegetation communities with tall trees. Servitude (corridors) of 22m wide is required for the 88kV distribution lines. The general vegetation types (or veldtypes) of the region within which the study area falls are:

- Eastern Free State Clay Grassland,
- Eastern Free State Sandy Grassland and
- Frankfort Highveld Grassland.

Pockets of Northern Free State Shrub land and Eastern Temperate Freshwater Wetlands are found scattered throughout the region.

No floral or faunal species of preservation concern were encountered during the field surveys. No floral species of conservation concern are known to occur in the study area. The study area does fall within areas of fish and reptile species of conservation concern.

Conservation status of veldtypes in the study area

Veld Type	Status	% Transformed	Conservation Status
Eastern Free State Clay Grassland	Endangered (EN)	>50%	Only statutorily in the Willem Pretorius N.R.
Eastern Free State Sandy Grassland	Endangered (EN)	>50%	Qwaqwa and Golden Gate Highlands Nat. Parks; Sterkfontein Dam N.R.
Frankfort Highveld Grassland	Vulnerable (VU)	>33%	No state protection

Ecological sensitivity of the ecological communities in the study area

Ecological Community	Floristic Sensitivity	Faunal Sensitivity	Ecological Sensitivity	Development Go-Ahead
Grassland	Medium/Low	Medium/Low	Medium/Low	Go
Watercourses	Medium	Medium/High	Medium/High	Go-But
Rocky ridges	Medium/High	Medium/High	Medium/High	Go-But
Grazing lands	Low	Low	Low	Go
Cultivated lands	Low	Low	Low	Go

The Ecologically recommended power line route alternative for the proposed project is: **Alternative Route 1**

4.1.2 Avi-fauna Assessment

There are many negative interactions between wildlife and electricity structures in Southern Africa, but the two most common problems are the electrocution of birds and birds colliding with power lines as well as electrical faults caused by bird excreta when roosting or breeding on electrical infrastructure. Disturbance and habitat destruction during the construction and maintenance activities associated with electrical infrastructure can also interfere with bird activities.

The construction of the proposed new Warden- Vrede 88kV power line poses a limited threat to the birds occurring in the vicinity of the infrastructure.

4.1.2.1 Collisions

Red Data species that are expected to be most at risk of collisions in grassland are Secretary bird and Blue Crane and to the lesser extent Blue Korhaan and Southern Bald Ibis. Greater Flamingo and Black Stork might be at risk where the line skirts water bodies, although both species occur at low densities. Agricultural lands pose less of a risk as most of the collision sensitive species select natural grassland, although both Southern bald Ibis and Blue Crane do on occasion utilize agricultural lands.

4.1.2.2 Displacement through habitat destruction

The fragmentation of grassland in the study area has happened already through the establishment of roads, power lines, towns and agriculture; ideally such existing infrastructure corridors (roads and power lines) should be utilized to prevent further fragmentation. The best option from an avifaunal perspective would be to follow the existing roads or power line, thereby reducing the need for new access roads during construction and reducing the cumulative impact of further fragmentation. Species most likely to be negatively impacted by habitat destruction and fragmentation are Blue Crane, Blue Korhaan, Secretary bird, Black Harrier, Lesser Kestrel and Southern Bald Ibis.

4.1.2.3 Displacement through disturbance

The potential for disturbance of Red Data List species is the largest in unfragmented grassland areas. Alignment alternative 2 is recommended from a bird impact perspective for the total length of the power line recommended by the bird specialist, Mr. C Van Rooyen (see attached **Appendix D** for the **Bird Impact Assessment Study**)

4.1.3 Heritage Impact Assessment

The two proposed power line options were surveyed by Archaetnos CC and found that the area is largely disturbed by past human activities such as housing and agriculture. The heritage assessment also noted that there is a grave yard (Warden Municipal Graveyard) with a number of graves along **Alternative 1**. Most of these graves might be younger than 60 years. This grave yard is located at GPS co-ordinates: 27°51.882'S, 28°57.368'E respectively. There are more graves along the study area but will not be affected by the activity. There are 4 dilapidated houses along **Alternative 2** at the Vrede Substation which might age between the late 19th and early 20th century. These houses are built of sandstone and are most likely older than 60 years. They are located at GPS co-ordinates: 27°26.163S, 29°08.984'E. Basically, six sites of cultural significance were found of which one (1) is located along Alternative 1 and five (5) are along Alternative 2. As they are of high cultural significance, they are worth mentioned in this report but will not be affected by the activity especially along Alternative 1. **Alignment alternative 1 is recommended for the total length of the power line by Dr. A van Vollenhoven** (see attached **Appendix D** for the **Heritage Assessment**).

4.1.4 Wetland Assessment

There are four medium to large perennial rivers along the study area. These are the Cornelius (Along the N3 for Alternative 1), Holspruit (Along the R103- Alternative 1), Grootspuit (Along Alternative 1) and Venterspruit (Along Alternative 1). In addition, smaller semi perennial streams and drainage lines occur. A few farm dams are also present within the proposed power line corridors. The rivers and streams found do not have large or significant floodplains and riparian zones. There are no formal wetlands occurring in the area. The 'wetland' areas that occur are more in terms of floodplains associated with the rivers and streams and even these are not visible throughout the study area.

(Present Ecological Status) PES of the watercourses in the study area

Criteria	Main Rivers in the Study Area			
	Cornelius	Holspruit	Grootspuit	Venterspruit
Category	D	C	C	D
Description	Largely modified	Moderately modified	Moderately modified	Largely modified
Integrity (PES)	Low	Medium	Medium	Low

The PES of most of the small streams and drainage line in the area are moderately (Category C) to Largely D.

4.3 Summary of Impact Assessment

ALTERNATIVE S1 (PREFERRED ALTERNATIVE)							
Phase	Nature of Impact	Extent	Duration	Intensity/ Severity	Probability/ Certainty	Significance	
						Before	After mitigation
Planning	Topography & Geology	Site	Long term	Low	Definite	Low	Low
	Fauna & Flora	Local	Long term	Low	Probable	Low	Low
	Land use	Site	Long term	Low	Definite	Low	Low
	Locality	Site	Long term	Low	Definite	Low	Low
Construction	Topography & Geology	Local	Short term	Low	Probable	Low	Low
	Surface & groundwater quality	Site	Short term	Medium	Definite	Medium	Low
	Waste management	Site	Short term	Low	Definite	Medium	Low
	Loss of Fauna & Flora	Site	Long term	Medium	Unsure	Low	Low
	Air quality	Site	Short term	Low	Probable	Low	Low
	Heritage	Site	Long term	Low	Definite	High	Low
	Noise	Site	Short term	Low	Unsure	Low	Low
	Visual impacts	Local	Short term	Medium	Unsure	Low	Low
Social Impact	Local	Short term	Medium	Definite	High-Medium	Low	
Operational	Topography & Geology	Site	Short term	Low	Unsure	Low	Low
	Surface & groundwater quality	Local	Long term	Low	Unsure	Low	Low
	Waste management	Local	Long term	Low	Unsure	Low	Low
	Fauna: Birds	Local	Long term	Medium	Probable	Medium	Low
		Local	Long term	Medium	Unsure	High	Low
	Visual impacts	Local	Long term	High	Definite	Medium	Low
	Social impact: Work force	Site	Short term	Medium	Definite	Medium	Low
	Social Impacts: available electricity	Local	Long term	High	Definite	High	No mitigations

4.4 Proposed Mitigation Measures

The following preventative and mitigation measures must be incorporated in the planning, construction and operational phases of the power line.

I. Planning Phase

- The **ESKOM Holdings** must be committed to a conservation approach during the planning phase;
- Sensitive habitats must be avoided or least sensitive crossings must be used as mitigation;
- Potential impacts on biodiversity can be mitigated by planning the power line alongside existing power lines and roads; and by considering easy and existing access.
- Riparian vegetation at river crossings and indigenous forests must be avoided altogether where possible by passing or by suspending the lines across from high ground to higher ground. If this is not achievable such habitats must only be disturbed where absolutely necessary and prominent trees must be avoided. It is recommended that only a minimal opening, large enough for the lines to cross without interference is created in such areas;
- A specialist must assist the surveyor to ensure that the above recommendations are followed.
- The spans that cross drainage lines should be marked with “Bird Flight Diverters”.
- Poles for the power line should be fitted with bird perches on top of the poles.

II. Construction Phase

- **Eskom Holdings** must be committed to a conservation approach of practice and the actual footprint of construction/disturbance must be kept to a minimum;
- As much of the natural environment as possible must be conserved (minimal construction of access roads and bush clearing);
- Relocation of important species, identification and demarcation of specimens and sub-habitats not to be disturbed will have to be done beforehand by a specialist;
- Important species (fauna as well as flora) that will be threatened by the development must be relocated to safer habitats by suitable specialists;
- Preventative erosion control measures to be put in place.

III. Operational Phase

- Maintenance crews must be educated with regards to the importance of biodiversity;
- Maintenance of the lines and servitudes must be done in such a manner to conserve vegetation and create the least disturbance as possible, especially at river crossings and in pristine natural areas and habitats;
- The operational phase must be monitored by **ESKOM** environmental officials to ensure that adequate mitigation measures are in place and to take reactive measures in places where impacts pose problems.

5. CONCLUSION AND RECOMMENDATIONS

For an option or project to be sustainable, it needs to demonstrate economic viability, social equity and soundness, and ecological integrity within a framework of good governance. All three of these dimensions of sustainability need to be taken into account when assessing a proposed option or project, taking due cognizance that the three dimensions are seldom in perfect balance, often dictated by local circumstances. Thus the preferred route chosen at the end of the analysis is one that has minimal impacts both ecologically, socially and in terms of heritage.

From the analysis given in the specialist reports and other site impact assessments, proposed **Alternative 1** was suggested by 4 specialists as the route that will have the minimal impacts and thus is the recommended route. Although both proposed routes/alternatives for the new Warden –Vrede 88kV power line were suggested, **Alternative 1 is recommended**. It is however recommended that the mitigation measures presented in the Environmental Management Program (EMPr) be fully implemented. If there is vagueness in the wording and actions to be undertaken, clarifications must be sought from the environmental consultant and specialists involved in the compilation of the report. The contact details are presented within the main report.

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Appendix A: Maps

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports (including terms of reference)

Appendix E: Public Participation

Appendix F: Impact Assessment

Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and expertise

Appendix I: Specialist’s declaration of interest

Appendix J: Additional Information

Definition of Terms

"Activity" means an activity identified in Government Notice No. R. 544 and No. R. 545 of 2010 as a listed activity

"Alternatives", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to property, activity, design or technology.

"Associated Infrastructure" means any building or infrastructure that is necessary for the functioning of a facility or activity or that is used for an ancillary service or use from the facility.

"Cumulative impact", in relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

"Environmental impact assessment", means the process of collecting, organizing, analyzing, interpreting and communicating information that is relevant to the consideration of that application.

"Environmental management programme" means a detailed plan of action prepared to ensure that recommendations for enhancing positive environmental impacts and/or limiting or preventing negative environmental impacts are implemented during the life-cycle of a project.

"Interested and Affected Party" means any person, group of persons or organization interested in or affected by an activity; and any organ of state that may have jurisdiction over any aspect of the activity;

"Public Participation Process" means a process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to, specific matters;

"Significant impact" means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment;

"The Act" means the National Environmental Management Act, 1998 (Act No.107 of 1998).

Abbreviations

BA	Basic Assessment
BID	Background Information Document
DEDTEA	Department of Economic Development Tourism and Environmental Affairs,
DAFF	Department of Agriculture, Forestry and Fishery
DWA	Department of Water Affairs
DWA&E	Department of Water Affairs and Environment
EA	Environmental Authorization
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Program
I&APs	Interested and Affected Parties
MAP	Mean Annual Precipitation
NEMA	National Environmental Management Act, Act No 107 of 1998
NEM:WA	National Environmental Management: Waste Act, Act No 59 of 2008.
SABS	South African Bureau of Standards
EA	Environmental Authorisation
WES	Wandima Environmental Services
kV	Kilovolts
S/S	Substation

ASSUMPTIONS & LIMITATIONS

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