



BASIC ASSESSMENT PROCESS FOR THE PROPOSED DEVELOPMENT OF THE 132kV CHIKADEE POWER LINE BETWEEN THE EXISTING HENDRINA/ARBEDEEN 132kV POWER LINE AND THE PROPOSED BOSCHMANSKOP TRACTION STATION WITHIN THE STEVE TSHWETE LOCAL MUNICIPALITY, MPUMALANGA PROVINCE.

DRAFT BASIC ASSESSMENT REPORT

JANUARY 2018

FOR PUBLIC REVIEW

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EXECUTIVE SUMMARY

I. INTRODUCTION

EnviroLution Consulting (Pty) Ltd was appointed by Eskom Holdings SOC Limited (Eskom) to conduct the Basic Assessment (BA) Process for the proposed development of the 132 kV Chikadee power line between the existing Hendrina/Arbedeen 132 kV power line and the proposed Boschmanskop Traction Station within the Steve Tshwete Local Municipality, Mpumalanga Province.

In terms of the NEMA EIA Regulations (2014), published in Government Notice R. 982 in Government Gazette No. 38282 of 4 December 2014, under Section 24(5) of the National Environmental Management Act, 1998 (Act No.107 of 1998), a Basic Assessment is required for the proposed due to the following listed activities (NEMA EIA Regulations 982, 983, 985):

- The development 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. **GR 983 Listing Notice 1, Activity 11 (i).**
- The development infrastructure or structures with a physical footprint of 100 square metres or more within a watercourse. **GR 983 Listing Notice 1, Activity 12 (ii)(a).**
- The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse: **GR 983 Listing Notice 1, Activity 19.**
- The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for the undertaking of a linear activity: **GR 983 Listing Notice 1, Activity 27.**
- The clearance of an area of 300 square metres or more of indigenous vegetation within critical biodiversity areas identified in bioregional plans in Mpumalanga: **GR 985 Listing Notice 3, Activity 12(f)(ii).**
- The development of infrastructure or structures with a physical footprint of 10 square metres or more, where such development occurs within a watercourse or if no development setback has been adopted within 32 metres of a watercourse, measured from the edge of a watercourse, outside urban areas in Mpumalanga in Critical Biodiversity Areas or in Bioregional Plans,: **GR 985 Listing Notice 3, Activity 14(f)(i)(c)(ff).**

The National Department Environment Affairs (DEA) will be the relevant decision-making authority as Eskom is a parastatal. The environmental authorisation will need to be granted by DEA for setting of conditions prior to commencement of any construction activities.

The proposed development also triggers activities that require a Water Use License the pylons will interact with a watercourse. Therefore, before construction activities take place, the activity will require a Water Use License as per requirement in the National Water Act (Act No.36 of 1998) (NWA) under Section 21(c) and (i) Water Uses. In terms of the NWA, this development requires a Water Use License as per the following regulations:

- Section 21(c) impeding or diverting the flow of water in a watercourse and;

- Section 21 (i) altering the bed, banks, course or characteristics of a watercourse.

II. DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER AND EXPERTISE TO CONDUCT THE BASIC ASSESSMENT

Envirolution Consulting (Pty) Ltd was contracted by Eskom SOC Ltd (Eskom) as the independent environmental consultants to undertake the Environmental Basic Assessment Process for the proposed project. Envirolution is not a subsidiary or affiliated with Eskom. Furthermore, Envirolution Consulting does not have any interests in secondary developments that may arise out of the authorisation of the proposed project. Envirolution Consulting is a specialist environmental consulting company providing holistic environmental management services, including environmental impact assessments and planning to ensure compliance with environmental legislation and evaluate the risk of development; and the development and implementation of environmental management tools. Envirolution Consulting benefits from the pooled resources, diverse skills and experience in environmental field held by its team. We offer solutions to environmental issues that are key during our clients' planning and decision-making processes. The Envirolution Consulting team have considerable experience in environmental impact assessments and environmental management, and have been actively involved in undertaking environmental studies, for a wide variety of projects in South Africa, including those associated with linear developments.

The EAPs from Envirolution Consulting who are responsible for this project are (refer to **Appendix H** for CV's):

Thabang Sekele forms part of the project team and acts as the Project Manager and Environmental Assessment Practitioner for all phases of the project. Thabang holds a Bachelor's degree in Environmental Management from the University of South Africa. Thabang's key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which include integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; environmental auditing and compliance reporting; the identification of environmental management solution and mitigation/risk minimising measures; environmental auditing, monitoring and reporting compliance. Thabang is currently an Environmental Consultant at Envirolution Consulting (Pty) Ltd. He is currently involved in several Environmental Impact Assessments for energy projects across the country.

Gesan Govender – The principle environmental assessment practitioner (EAP) for this project is a registered Professional Natural Scientist and holds an Honours Degree in Botany. He has over 15 years of experience within the field of environmental management. His key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management solutions and mitigation/risk minimising measures; and strategy and guideline development. He is currently responsible for the project management of EIAs for several diverse projects across the country.

III. NEED FOR THE PROJECT

Eskom Holdings is the biggest producer of electricity in South Africa and is a vertically integrated company licensed to generate, transmit and distribute electricity. A distribution operation constructs and maintains

equipment that transforms the power supply to the type that meets the customer's needs. Reliable network performance targets necessitate that Eskom Distribution improves present distribution network performance levels.

The need and desirability for this specific development is to assist Transnet (SOC) Ltd (Transnet) in increasing its export coal capacity to 81MTPA and to upgrade the Direct Current (DC) sections on the Transnet traction site as well as on the corresponding Eskom sides.

Local benefits of the proposed development include benefits to the local economy through possible job creation and local supplier procurement during the construction phase as well as during the operational phase of the development.

The project qualifies as a Strategic Infrastructure Project (SIP 10), namely "Electricity transmission and distribution for all". The project serves to "expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development. Align the 10-year transmission plan, the services backlog, the national broadband roll-out and the freight rail line development to leverage off regulatory approvals, supply chain and project development capacity".

IV. PUBLIC PARTICIPATION PROCESS

Interested and Affected Parties, including surrounding and affected landowners, Provincial, National and Local Governments Departments were involved during the Public Participation Process (PPP). The Public Participation is attached to the DBAR as **Appendix E**. The summary of the PPP that commenced in 03 November 2017, and continued up to 04 December 2017 is summarised as follows:

- A2 site notices were placed at conspicuous places around the proposed power line alternatives.
- A Newspaper advertisement was placed in The Middleburg Observer Herald (Mpumalanga) on 03 November 2017 to notify the public of the proposed development.
- Knock and drop notification letters were intended to be distributed to adjacent land owners and members of the public, however due to the deserted and scarcely populated nature of the study area, none were able to be distributed.
- Notification letters were sent to predetermined I&APs inviting I&APs to participate and comment on the draft Basic Assessment Report.
- Any comments received from I&APs up to date have been included in the Comments and Responses Report.
- A pre-assumed institutional I &APs database was developed. The database was expanded through networking and fieldwork throughout the process.
- Background Information Document (BID) and registration form was compiled and forwarded to predetermined I&APs registered on the database.
- Municipal councillors of the wards in which project alternatives are situated were informed of the project.
- Organs of state and other parties that were notified include Mpumalanga Agriculture, Rural Development; Steve Tshwete Local Municipality; Department of Water Affairs and Sanitation.
- Comments/ issues during the registration period were captured into a Comment and Response Report (CRR).

V. ALTERNATIVES/DEVIATIONS CONSIDERED

A Preferred Alternative 1 (Orange route) has been proposed for the 132 kV Chikadee power line between the existing Hendrina/Arbedeen 132 kV power line and the proposed Boschmanskop substation, which will span for approximately 2.3 km. Two other alignments (Alternative 2 and Alternative 3) were proposed as alternatives and will span for approximately 3.4 km and 2.9 km, respectively. All three alternatives alignments are proposed to have 31 m servitude. It must be noted that a corridor of 100 m (50 m either side) will be assessed for all three alternatives for the purpose of this basic assessment. (Please refer to **Figure 1**).

Important Note: An environmental authorisation from Department of Environmental Affairs (DEA) has been granted to Transnet (SOC) Ltd (hereinafter referred to as Transnet) for the proposed Boschmanskop substation (DEA Ref: 14/12/16/3/3/1/1434) (see **Appendix J1**). The proposed Boschmanskop substation's footprint servitude belongs to Transnet however, Eskom will install feeder equipment on a section of this servitude footprint of the substation in order to accommodate the proposed 132 kV Chikadee line will connect from the Boschmanskop substation to the existing Hendrin/Arbedeen 132 power line. At the time of compilation of this BAR, construction works of the substation had commenced. The proposed Boschmanskop substation will be located directly adjacent to the existing Transnet traction station. As mentioned above, the objective for this specific development is to assist Transnet in increasing its export coal capacity to 81MTPA and to upgrade the DC sections on the Transnet traction site as well as on the corresponding Eskom sides.

Alternative 1 (preferred):

The length of power line Alternative 1 is approximately 2.3 km in total and it will originate from the proposed Boschmanskop substation. The power line will start at the proposed Boschmanskop substation and span in a north westerly direction for approximately 1830 m and will turn slightly to a more westerly direction for approximately 260 m before joining the existing Hendrina/Aberdeen 132 kV power line. This power line servitude is 31 m and traverses **Farm Boschmanskop 154 IS Portion 3, 7** and **Farm Roodepoort 151 IS, Portion 13**.

Alternative 2:

The length of power line Alternative 2 is approximately 3.4 km in total and it will originate from the proposed Boschmanskop substation. The power line will start at the proposed Boschmanskop substation and span in a western direction for approximately 1300 m and will turn to a more north westerly direction for approximately 1400 m before turning to a northern direction to span for a further 660 m to join the existing Hendrina/Aberdeen 132 kV power line. This power line servitude is 31 m and traverses **Farm Boschmanskop 154 IS Portion 3** and **Farm Roodepoort 151 IS, Portion 14**.

Alternative 3:

The length of power line Alternative 3 is approximately 2.9 km in total and it will originate from the proposed Boschmanskop substation. The power line will start at the proposed Boschmanskop substation and span in a north westerly direction for approximately 260 m and will turn to a more northern direction for approximately 1600 m before turning to a north western direction to span for a further 100 m before joining the existing Hendrina/Aberdeen 132 kV power line. This power line servitude is 31 m and traverses **Farm Boschmanskop 154 IS Portion 3, Portion 7** and **Farm Roodepoort 151 IS, Portion 1**.

No Go Alternative:

The No-go option implies that the Project does not proceed, and will thus comprise of Eskom not going ahead with the construction of the proposed power line and substation expansion. Ideally, this would be the

preferred alternative as the status quo of the environment remains unchanged, however due to the growing demand for energy and activities that will require electricity in the area, this alternative is not preferred. This option is assessed as the “No go” alternative in this basic assessment report.

VI. LOCATION OF THE PROPOSED DEVELOPMENT

The proposed Chikadee 132 kV power line is located on **Portion 3 of Farm Boschmanskop 154 IS**, within the Steve Tshwete Local Municipality in the Nkangala District Municipality, Mpumalanga Province.

Table 1: Property details of proposed development

Alternative 1 (preferred)

Province	Mpumalanga Province
District Municipality	Nkangala District Municipality
Local Municipality	Steve Tshwete Local Municipality
Ward Number(s)	Ward 5
Farm name and number	<ul style="list-style-type: none"> • Farm Boschmanskop 154 IS Portion 3 • Farm Boschmanskop 154 IS Portion 7 • Farm Roodepoort 151 IS, Portion 13
Portion number	See above
SG Code	<ul style="list-style-type: none"> • T0IS00000000015400003 • T0IS00000000015400007 • T0IS00000000015100013

Alternative 2

Province	Mpumalanga Province
District Municipality	Nkangala District Municipality
Local Municipality	Steve Tshwete Local Municipality
Ward Number(s)	Ward 5
Farm name and number	<ul style="list-style-type: none"> • Farm Boschmanskop 154 IS, Portion 3 • Farm Roodepoort 151 IS, Portion 14
Portion number	See above
SG Code	<ul style="list-style-type: none"> • T0IS00000000015400003 • T0IS00000000015100014

Alternative 3

Province	Mpumalanga Province
District Municipality	Nkangala District Municipality

Local Municipality	Steve Tshwete Local Municipality
Ward Number(s)	Ward 5
Farm name and number	<ul style="list-style-type: none"> • Farm Boschmanskop 154 IS, Portion 3 • Farm Boschmanskop 154 IS, Portion 7 • Farm Roodepoort 151 IS, Portion 1
Portion number	See above
SG Code	<ul style="list-style-type: none"> • T0IS00000000015400003 • T0IS00000000015400007 • T0IS00000000015100001

The coordinates of the proposed power line are as follows:

Alternative:

Latitude (S):

Longitude (E):

Alternative 1 (preferred)

	Latitude (S)	Longitude (E)
• Starting point of the activity	26° 03'48.50"S	29°35'7.60"E
• Middle/Additional point of the activity	26° 03'23.78"S	29°34'51.32"E
• End point of the activity	26°02'52.44"S	29°34'25.39"E

Alternative 2

• Starting point of the activity	26° 03'48.50"S	29°35'07.60"E
• Middle/Additional point of the activity	26° 03'55.71"S	29°34'14.76"E
• End point of the activity	26° 03'17.05"S	29°33'39.20"E

Alternative 3

• Starting point of the activity	26° 03'48.50"S	29°35'07.60"E
• Middle/Additional point of the activity	26° 03'03.15"S	29°35'07.63"E
• End point of the activity	26° 02'26.55"S	29°34'43.24"E

VII. IDENTIFICATION OF KEY POTENTIAL IMPACTS

Potential risks and key issues identified during the basic assessment were based on consultation with Interested and Affected Parties (I&AP's), experience with similar developments, desktop studies, site walk

abouts, site and current state of the environment of the site. The main issues identified through this study associated with the proposed power line are summarised in **Table 1** below.

Table 2: Summary of significance of the potential impacts associated with the proposed development without mitigation and with mitigation.

Impact	Significance	
	Without Mitigation	With Mitigation
CONSTRUCTION PHASE		
Impacts on natural vegetation.	Medium	Low
Impacts on changes in sediment entering and exiting the watercourse	High (Alt 2 & 3) Medium (Alt1)	Medium (Alt 2 &3) Low (Alt1)
Impacts on changes in the hydrology of wetlands also impacts downstream areas	Medium	Low
Introduction and spread of alien vegetation.	High	Medium
Exposure of the soil to erosion	Medium	Low
Impact on Heritage resources	Low	Low
Visual impacts	Low	Low
Socio-economic impacts	Low	Low
Pollution caused by Inappropriate Management and Handling of Waste	Medium	Low
Soil and Groundwater Pollution	Medium	Low
Impact on Air Quality	Medium	Low
OPERATION PHASE		
Impacts on natural vegetation.	Low	Low
Impacts on changes in sediment entering and exiting the watercourse	Low	Low
Impacts on changes in the hydrology of wetlands also impacts downstream areas	Medium	Low
Introduction and spread of alien vegetation.	Medium	Low
Exposure of the soil to erosion	Low	Low
Impact on Heritage resources	Low	Low
Visual impacts	Low	Low
Socio-economic impacts	Low+	Low+
Pollution caused by Inappropriate Management and Handling of Waste	Low	Low
Soil and Groundwater Pollution	Low	Low
Impact on Air Quality	Low	Low

VIII. SUMMARY OF FINDINGS

The specialist findings on the proposed development are summarised as follows:

Vegetation Assessment:

The excavation of soil for the base of pylons would remove vegetation that can be replanted as sods after the construction and its re-establishment monitored to ensure that the soil and vegetation rehabilitate over time. The greatest threat to the rehabilitation of the land disturbed by construction is the potential of invasive plant species rapidly establishing on the disturbed soil and spreading into adjacent natural areas. The category 1b invasive *Verbena bonariensis* and *Cirsium vulgare* were recorded in moist grasslands, as well as the category 2 *Acacia mearnsii* (wattle). If remedial measures and monitoring are properly implemented, the vegetation that will be disturbed during construction could rehabilitate well over time, and long term impacts on vegetation could thus be minimal. Once in use, the powerlines have relatively contained impacts on the vegetation and can successfully be mitigated to limit or even negate the negative impacts.

This assessment found that all three (3) alternatives include modified areas of a low sensitivity to the proposed powerline construction and the impacts in such areas are envisaged to be minimal. However, the moist grasslands along Alternative 2 and at the substation locality pose a significant constraint to the powerlines. Only one pan area that was historically disturbed/cultivated will be directly traversed by Alternative 1 and 3. All three alternatives will impact on the moist grassland around the substation locality.

The most significant impact of the powerline construction is expected to occur during the construction phase and within or close to moist grasslands.

- Alternative 1 has a lower probability of causing direct impacts on intact moist grassland vegetation as most the route comprises secondary vegetation or are modified. This route is thus preferred from a vegetation perspective.
- However, should Alternative 1 for any reason highlighted by other specialist be unsuitable, this vegetation opinion has no objection if Alternative 3 is implemented, provided that mitigation measures are applied to limit the impact on the vegetation to a minimum.
- Alternative 2 could be considered only if the moist grassland area can be spanned. The area spanned should include the wetland boundary and recommended buffer as per the wetland delineation report undertaken concurrently to this report, and no construction related activities be allowed to impact on the moist grassland directly or indirectly.

The excavation of soil for the base of pylons would remove vegetation that can be replanted as sods after the construction and its re-establishment monitored to ensure that the soil and vegetation rehabilitate over time. The greatest threat to the rehabilitation of the land disturbed by construction is the potential of invasive plant species rapidly establishing on the disturbed soil and spreading into adjacent natural areas. The category 1b invasive *Verbena bonariensis* and *Cirsium vulgare* were recorded in moist grasslands, as well as the category 2 *Acacia mearnsii* (wattle). If remedial measures and monitoring are properly implemented, the vegetation that will be disturbed during construction could rehabilitate well over time, and long term impacts on vegetation could thus be minimal. Once in use, the powerlines have relatively contained impacts on the vegetation and can successfully be mitigated to limit or even negate the negative impacts.

Wetland Assessment:

Three wetland areas were recorded directly in line with the powerline alternatives or within 500 m of the powerlines. The wetlands recorded are classified as an unchannelled valley bottom wetland (crossed by Alternative 2), a seepage wetland (associated with the existing substation and with Alternatives 1 and 2) and a depressional pan wetland (crossed by Alternative 3) The seepage wetland links up with an unchannelled valley bottom wetland south east from the study site. The seepage wetland has a drain located within it

adjacent and parallel to the railway. The drain also extends over the railway in a western direction where it links up with the unchannelled valley bottom wetland. The unchannelled valley bottom drains northwards into the Woes-Alleenspruit River which drains into the Klein-Olifants River.

From the fieldwork conducted and the aerial imagery it can be seen that the seepage wetland and the unchannelled valley bottom wetland have been the most impacted followed by the depression pan wetland. The seepage wetland has been impacted by the construction of a slime dam, a substation and various infrastructures within the wetland. The unchannelled valley bottom has been impacted by prolonged farming practices as well as the construction of various infrastructures within the wetland. Furthermore, the unchannelled valley bottom wetland has been dammed up in three areas just within the study area. The pan has been left relatively intact over the years although the catchment has been greatly altered.

Faunal and Avifaunal Assessment:

From a mammal habitat perspective, small patches of terrestrial habitat remained; most has been transformed. The wetland habitat is modest and has not been altered, and is crossed only by Alternative 2. The terrestrial habitat type has largely been transformed by agriculture and only a narrow band of grassland persists along the edge of the wetland and along the railway line.

Avian habitats along the three proposed power line routes consist predominantly of highly transformed agricultural fields and disturbed grasslands. There are several dams in the area, with Alternative 1 running parallel to two small dams. The presence of water bodies at the site means that large-bodied waterfowl are likely to be present, a factor that has a bearing on the risk of collision with the proposed lines. From an avifaunal standpoint, Alternative 1 is the preferred route, as it is the shortest of the three. Although it is the closest to the two small dams, the installation of bird flight diverters will mitigate this impact, and the likelihood of collisions will not differ between the three routes.

The natural grasslands of both Alternative 1 and 2 have been severely altered by maize fields. Both Alternatives have been also disturbed by exotic plants, gravel roads, and a railway line. No moribund termitaria were recorded. These structures are generally good indicators of the occurrence of small herpetofauna. Accordingly, it is estimated that the reptile and amphibian population density for the study site is lower. At the time of the site visit the basal cover was only at the fringes of the maize fields and would not provide adequate cover for small terrestrial herpetofauna.

It is concluded that the impact of the proposed development on the environment will be minimal where the lines will cross the railway line and the maize fields, and similarly minimal where the new substation is being built or where the lines are to traverse transformed grasslands. The choice of which route to follow is incumbent on factors other than environmental concerns, or the comparative costs of the respective routes, although alternative 1 is preferred from an avifaunal standpoint. Considering on the nature of the development and the fact that it is not necessary to implement conservation measures, it is most likely that none of the terrestrial vertebrates with their habitat(s) will be displaced. The mitigation measures in the Fauna Assessment Report are required to reduce the likelihood of impacts on birds through collisions and electrocutions.

Heritage Assessment:

The cultural landscape qualities of the region essentially consist of two components. The first is made up of a pre-colonial (Stone Age and Iron Age) occupation. The second component is a rural settlement largely based on farming, but also in which coal mining activities in recent years contributed to a densification of settlement and concurrent business development.

No sites, features or objects of cultural heritage significance were found in the development area. As no sites, features or objects of cultural heritage significance were found in the development area, there would be no impact as a result of the proposed development. Alternative 1 is recommended as it is the shortest possible route.

Visual Assessment:

With respect to the potential visual impacts, the landscape character sensitivity in the study area is considered to be medium. It is predominantly a rural landscape with extensive farming activity occurring in large blocks. During the summer season it is visually pleasing and the small farm dams and pans raise the visual quality of the landscape. This is however very common in the region and not regarded as unique. The even terrain causes a high degree of inter-visibility between parts of the study area with panoramic views of the surroundings. Despite the presence of the Hendrina Power Station in the north, the study area is surprisingly free of electrical infrastructure with only one power line traversing the study area.

The only observers in the study area are residents from the dispersed farming community. Only one farmstead was identified in the Zone of Maximum Visual Exposure (ZMVE) which is located at Portion 7 of the farm Boschmanskop 154. Residents living here will be directly affected by Alternative 1 and 3 as it passes in close proximity to the farmstead. They are classified as visual receptors of high sensitivity owing to their sustained visual exposure to the proposed development as well as their attentive interest towards their living environment.

Alternative 2 is the most preferred option. This alignment is the furthest away from any sensitive observers and will therefore have the least impact on them. It is the longest route and will cause a slightly higher magnitude of disturbance on the landscape due to more pylons, but the low severity of the impact on the observers carries more weight in this regard.

Alternative 1 is marginally less preferred than Alternative 2. It is closer to the farmstead on Portion 7 of the farm Boschmanskop 154 which places it within the ZMVE. Its impact on the landscape character is similar to Alternative 2, but will be marginally less due to the shorter distance. If realignment is considered as proposed, Alternative 1 will be the most preferred option.

Alternative 3 is the least preferred option as it affects directly on the residents on Portion 7 of the farm Boschmanskop 154. It will pass directly overhead of the farmstead. The impact on the residents is the highest of the 3 options.

IX. CONCLUSION (IMPACT STATEMENT)

The need and desirability for this specific development is to assist Transnet (SOC) Ltd (Transnet) in increasing its export coal capacity to 81MTPA and to upgrade the Direct Current (DC) sections on the Transnet traction site as well as on the corresponding Eskom sides.

The project is intended to strengthen the network and assist Transnet in increasing its export coal capacity. With a No-Go option, this will not be possible. Not to construct the powerline will not be in line with the country's Strategic Infrastructure Project (SIP). This is the main negative impact of a No Go Alternative. A No-Go alternative will have no change to the status quo of the environment and will therefore not cause any negative impacts. However, benefits outweigh the costs as establishing this power line ultimately will result in producing a reliable electricity supply for the country's electricity supply grid.

From the Basic Assessment findings it was found that Alternative 1 is the preferred choice as it crosses no wetland areas. It does however run parallel to the valley bottom wetland and this should be factored in to potential impacts that should be mitigated and monitored. From a vegetation perspective, Alternative 1 has a lower probability of causing direct impacts on intact moist grassland vegetation as most the route comprises of secondary vegetation or are modified. However from a visual perspective Alternative 1 is marginally less preferred than Alternative 2. It is closer to the farmstead on Portion 7 of the farm Boschmanskop 154 which places it within the ZMVE. Its impact on the landscape character is similar to Alternative 2, but will be marginally less due to the shorter distance. If realignment is considered as proposed, Alternative 1 will be the most preferred option.

Considering on the nature of the development and the fact that it is not necessary to implement conservation measures, it is most likely that none of the terrestrial vertebrates with their habitat(s) will be displaced. Some mitigation measures in the Fauna Assessment Report are required to reduce the likelihood of impacts on birds through collisions and electrocutions.

From a heritage perspective, no sites, features or objects of cultural heritage significance were found in the development area. As no sites, features or objects of cultural heritage significance were found in the development area, there would be no impact as a result of the proposed development. Alternative 1 is recommended as it is the shortest possible route.

X. RECOMMENDATIONS

This Basic Assessment conducted a comprehensive assessment of the potential environmental impacts associated with the 132 kV Chikadee power line. The construction of the proposed power line (Alternative 1) should be implemented according to the Environmental Management Programme (EMPr) to adequately mitigate and manage potential impacts associated with construction activities. The construction activities and relevant rehabilitation of disturbed areas should be monitored against the approved EMPr, the Environmental Authorisation and all other relevant environmental legislation. Relevant conditions to be adhered to include:

- Eskom must adhere to the authorised alignment servitude.
- Compliance with the mitigation measures outlined in this BA report and EMPr.
- Continued consultation and engagement with all relevant stakeholders – especially the land owner, local communities and respective municipalities during labour recruitment and procurement for services and supplies during construction phase.
- The appointment of an independent ECO to conduct monthly monitoring and evaluation of the construction sites for environmental compliance.
- Eskom shall ensure that adequate protection measures are taken to minimize the potential risk of theft during the construction and operational phase.

- Applicant should provide contractual agreement with the water service provider to the Local Municipality administering the area.
- Compliance with all legal requirements in relation to environmental management and conditions of the authorisation once issued by DEA

Based on the findings of the site assessment and specialist studies undertaken, in terms of environmental constraints identified through the Environmental Basic Assessment process, no environmental fatal flaws are envisaged from the granting of an environmental authorisation for the proposed construction of the 132 kV Chikadee power line (Alternative 1) within Steve Tshwete Local Municipality, Mpumalanga Province. The development of the proposed project is therefore considered to be sustainable from an environmental perspective.

Therefore it is a recommendation of this Basic Assessment that the development of the 132 kV (Alternative 1) route Chikadee power line be authorised with application of effective mitigation measures.

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ABBREVIATIONS AND ACRONYMS

DEA	Department of Environmental Affairs
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMBA	National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004)
NEMWA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
SAHRA	South African Heritage Resources Agency
SOC	State Owned Company
VIA	Visual Impact Assessment
WULA	Water Use License Application

1 INTRODUCTION

1.1 Project Background and description

Envirovolution Consulting (Pty) Ltd was appointed by Eskom Holdings SOC Limited (Eskom) to conduct the Basic Assessment (BA) Process for the proposed development of the 132 kV Chikadee power line between the existing Hendrina/Arbedeen 132 kV power line and the proposed Boschmanskop Traction Station within the Steve Tshwete Local Municipality, Mpumalanga Province.

Eskom Holdings is the biggest producer of electricity in South Africa and is a vertically integrated company licensed to generate, transmit and distribute electricity. A distribution operation constructs and maintains equipment that transforms the power supply to the type that meets the customer's needs. Reliable network performance targets necessitate that Eskom Distribution improves present distribution network performance levels.

The need and desirability for this specific development is to assist Transnet in increasing its export coal capacity to 81MTPA and to upgrade the Direct Current (DC) sections on the Transnet traction site as well as on the corresponding Eskom sides.

Local benefits of the proposed development include benefits to the local economy through possible job creation and local supplier procurement during the construction phase as well as during the operational phase of the development.

The project qualifies as a Strategic Infrastructure Project (SIP 10), namely "Electricity transmission and distribution for all". The project serves to "expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development. Align the 10-year transmission plan, the services backlog, the national broadband roll-out and the freight rail line development to leverage off regulatory approvals, supply chain and project development capacity".

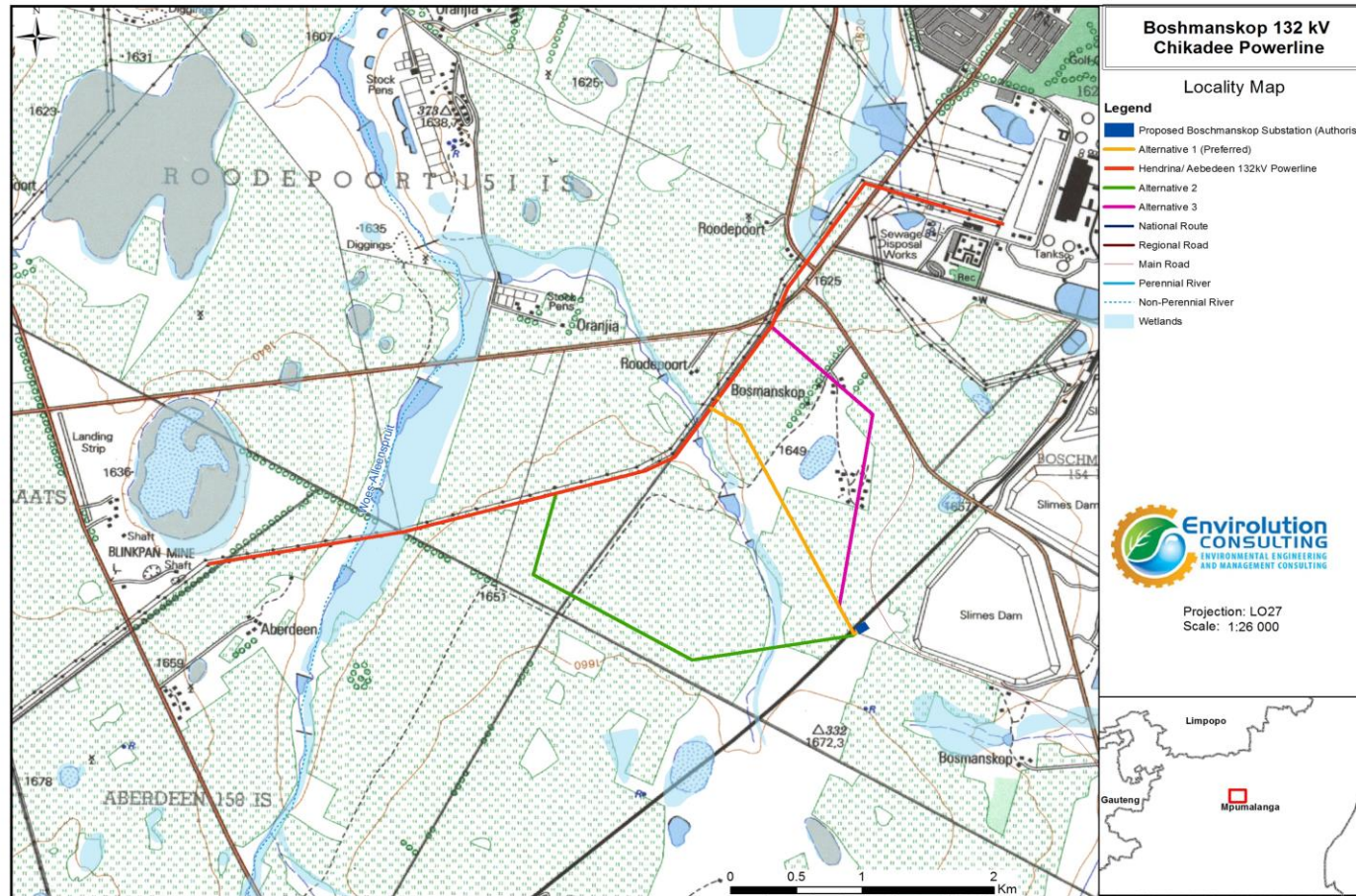


Figure 1: Locality map of study area (Please refer to A3 size maps in Appendix A of the report)

1.2 Requirement for a Basic Assessment Process

The proposed project development is subject to the requirements of the Environmental Impact Assessment Regulations (2014 EIA Regulations), as amended, in terms of the National Environmental Management Act (NEMA, Act 107 of 1998, as amended). NEMA is national legislation that provides for the authorisation of certain controlled activities known as "listed activities". In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed, and reported on to the competent authority (the decision-maker) charged by NEMA with granting of the relevant environmental authorisation.

1.3 Objectives of the Basic Assessment process

The Basic Assessment process aimed to address those identified potential environmental impacts and benefits (direct, indirect and cumulative impacts) associated with the project including design, construction, operation, and decommissioning, and recommend appropriate mitigation measures for potentially significant environmental impacts. The purpose of this BAR is to consider the impacts associated with the proposed power line. This BAR aims to provide the environmental authorities with sufficient information to make an informed decision regarding the proposed development.

The release of a draft BAR for a 30 day period will provide stakeholders with an opportunity to verify that issues that they raised during the notification phase have been captured and adequately considered. The final BAR for submission to the DEA will incorporate all issues and responses raised during the public review period of the draft BAR.

1.4 Project Team

Project Applicant:

Name: **Eskom Holdings SOC Ltd**
Contact Person: Tebogo Chauke
(Officer Environmental Management: Land Development)
Physical Address: Mpumalanga Operating Unit, Emalahleni
Postal Address: P. O. Box 223, 1035
Telephone Number: 013 693 2714
Fax Number:
Email: ChaukeTA@eskom.co.za

Environmental Assessment Practitioner:

Company Name: Envirolution Consulting (Pty) Ltd
Name: Thabang Sekele
Physical Address: Vista Place, Suite 1a & 2, No 52, Cnr Vorster Avenue & Glen Avenue, Glenanda
Postal Address: PO Box 1898, Sunninghill, 2157
Telephone Number: (0861) 44 44 99
Fax Number: (0861) 62 62 22
E-mail: thabang@envirolution.co.za

Expertise of the EAP to carry out the Basic Assessment procedures:

Mr. Thabang Sekele forms part of the project team and acts as the Project Manager for all phases of the project. Thabang holds a Bachelor's degree in Environmental Management from the University of South Africa. Thabang's key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which include integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; environmental auditing and compliance reporting; the identification of environmental management solution and mitigation/risk minimising measures; environmental auditing, monitoring and reporting compliance. Thabang is currently an Environmental Consultant at Envirolution Consulting (Pty) Ltd. He is currently involved in several Environmental Impact Assessments for energy projects across the country.

Gesan Govender, the project manager and Environmental Assessment Practitioner (EAP) responsible for this project, is a registered Professional Natural Scientist and holds an Honours degree in Botany. He has over 15 years of experience within the field of environmental management. His key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management solutions and mitigation/risk minimising measures; and strategy and guideline development. He is currently responsible for the project management of EIA's for several diverse projects across the country.

Specialists:

In order to adequately identify and assess potential environmental impacts associated with the proposed project, Envirolution Consulting has appointed the following specialist consultants (**Table 4**) to conduct specialist impact assessments:

Table 2: Project Specialists

Discipline	Organisation	Contact Person & Details
Vegetation Assessment	Dimela ECO Consulting	Antoinette Eyssell-Knox Tel: 083 642 6295 anotINETTE@dimela-eco.co.za
Heritage Assessment	Johan Van Schalkwyk	Dr Johan Van Schalkwyk Tel: 076 790 6777 jvschalkwyk@mweb.co.za
Visual Impact	Skets Architects, Planning & Environmental Consulting cc.	Mr. Mader van den Berg Cell: 076 169 1435 mader@skets.co.za
Wetlands Delineation	Limosella Consulting Pty Ltd	Antoinette Bootsma Tel: 27 83 4545 454 antoinette@limosella.co.za
Fauna Impact	I.L. Rautenbach Ph.D., Pr.Sci.Nat. , J.C.P. Van Wyk MSc., Pr.Sci.Nat. A.E. McKechnie Ph.D., Pr.Sci.Nat.	I.L. Rautenbach Tel: 27 83 4545 454

2 PROJECT DESCRIPTION

2.1 Project Motivation

Envirovolution Consulting (Pty) Ltd was appointed by Eskom Holdings SOC Limited (Eskom) to conduct the Basic Assessment (BA) Process for the proposed development of the 132 kV Chikadee power line between the existing Hendrina/Arbedeen 132 kV power line and the proposed Boschmanskop Traction Station (under construction) within the Steve Tshwete Local Municipality, Mpumalanga Province.

Eskom Holdings is the biggest producer of electricity in South Africa and is a vertically integrated company licensed to generate, transmit and distribute electricity. A distribution operation constructs and maintains equipment that transforms the power supply to the type that meets the customer's needs. Reliable network performance targets necessitate that Eskom Distribution improves present distribution network performance levels.

The need and desirability for this specific development is to assist Transnet (SOC) Ltd (Transnet) in increasing its export coal capacity to 81MTPA and to upgrade the Direct Current (DC) sections on the Transnet traction site as well as on the corresponding Eskom sides.

Local benefits of the proposed development include benefits to the local economy through possible job creation and local supplier procurement during the construction phase as well as during the operational phase of the development.

The project qualifies as a Strategic Infrastructure Project (SIP 10), namely "Electricity transmission and distribution for all". The project serves to "expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development. Align the 10-year transmission plan, the services backlog, the national broadband roll-out and the freight rail line development to leverage off regulatory approvals, supply chain and project development capacity".

The alternatives considered are as follows:

Alternative 1 (preferred):

The length of power line Alternative 1 is approximately 2.3 km in total and it will originate from the proposed Boschmanskop substation. The power line will start at the proposed Boschmanskop substation and span in a north westerly direction for approximately 1830 m and will turn slightly to a more westerly direction for approximately 260 m before joining the existing Hendrina Aberdeen 132 kV power line. This power line servitude is 31 m and is located on **Portion 3 of Farm Boschmanskop 154 IS**.

Alternative 2:

The length of power line Alternative 2 is approximately 3.4 km in total and it will originate from the proposed Boschmanskop substation. The power line will start at the proposed Boschmanskop substation and span in a western direction for approximately 1300 m and will turn to a more north westerly direction for approximately 1400 m before turning to a northern direction to span for a further 660 m to join the existing Hendrina Aberdeen 132 kV power line. This power line servitude is 31 m and is located on **Portion 3 of Farm Boschmanskop 154 IS**.

Alternative 3:

The length of power line Alternative 3 is approximately 2.9 km in total and it will originate from the proposed Boschmanskop substation. The power line will start at the proposed Boschmanskop substation and span in a north westerly direction for approximately 260 m and will turn to a more northern direction for approximately 1600

m before turning to a north western direction to span for a further 100 m before joining the existing Hendrina Aberdeen 132 kV power line. This power line servitude is 31 m and is located on **Portion 3 of Farm Boschmanskop 154 IS**

No Go Alternative:

The No-go option implies that the Project does not proceed, and will thus comprise of Eskom not going ahead with the construction of the proposed power line and substation expansion. Ideally, this would be the preferred alternative as the status quo of the environment remains unchanged, however due to the growing demand for energy and activities that will require electricity in the area, this alternative is not preferred. This option is assessed as the “No go” alternative in this basic assessment report.

The proposed Chikadee 132 kV power line is located on **Portion 3 of Farm Boschmanskop 154 IS**, within the Steve Tshwete Local Municipality in the Nkangala District Municipality, Mpumalanga Province.

Table 3: Property details of proposed development:

Alternative 1 (preferred)

Province	Mpumalanga Province
District Municipality	Nkangala District Municipality
Local Municipality	Steve Tshwete Local Municipality
Ward Number(s)	Ward 5
Farm name and number	<ul style="list-style-type: none"> • Farm Boschmanskop 154 IS Portion 3 • Farm Boschmanskop 154 IS Portion 7 • Farm Roodepoort 151 IS, Portion 13
Portion number	See above
SG Code	<ul style="list-style-type: none"> • T0IS00000000015400003 • T0IS00000000015400007 • T0IS00000000015100013

Alternative 2

Province	Mpumalanga Province
District Municipality	Nkangala District Municipality
Local Municipality	Steve Tshwete Local Municipality
Ward Number(s)	Ward 5
Farm name and number	<ul style="list-style-type: none"> • Farm Boschmanskop 154 IS, Portion 3 • Farm Roodepoort 151 IS, Portion 14
Portion number	See above
SG Code	<ul style="list-style-type: none"> • T0IS00000000015400003

	<ul style="list-style-type: none"> TOIS00000000015100014
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Alternative 3

Province	Mpumalanga Province
District Municipality	Nkangala District Municipality
Local Municipality	Steve Tshwete Local Municipality
Ward Number(s)	Ward 5
Farm name and number	<ul style="list-style-type: none"> Farm Boschmanskop 154 IS, Portion 3 Farm Boschmanskop 154 IS, Portion 7 Farm Roodepoort 151 IS, Portion 1
Portion number	See above
SG Code	<ul style="list-style-type: none"> TOIS00000000015400003 TOIS00000000015400007 TOIS00000000015100001

The coordinates of the proposed power line are as follows:

Alternative:

Latitude (S):

Longitude (E):

Alternative 1 (preferred)

<ul style="list-style-type: none"> Starting point of the activity 	26° 03'48.50"S	29°35'7.60"E
<ul style="list-style-type: none"> Middle/Additional point of the activity 	26° 03'23.78"S	29°34'51.32"E
<ul style="list-style-type: none"> End point of the activity 	26°02'52.44"S	29°34'25.39"E

Alternative 2

<ul style="list-style-type: none"> Starting point of the activity 	26° 03'48.50"S	29°35'07.60"E
<ul style="list-style-type: none"> Middle/Additional point of the activity 	26° 03'55.71"S	29°34'14.76"E
<ul style="list-style-type: none"> End point of the activity 	26° 03'17.05"S	29°33'39.20"E

Alternative 3

<ul style="list-style-type: none"> Starting point of the activity 	26° 03'48.50"S	29°35'07.60"E
<ul style="list-style-type: none"> Middle/Additional point of the activity 	26° 03'03.15"S	29°35'07.63"E
<ul style="list-style-type: none"> End point of the activity 	26° 02'26.55"S	29°34'43.24"E

Motivation for the preferred alternative

The preferred alternative power line is motivated due to being the shortest line amongst all the other alternatives and also it has only one (1) less pronounced bend of which is more preferred by Eskom from an electrical and technical perspective as compared to the other two alternatives. Also, the preferred alternative does not cross over any watercourse as compared to Alternative 2. Furthermore, this alternative is located in one property and will not cross over existing farmsteads unlike Alternative 3. This factor will assist Eskom achieve its safety mandate by reducing the risk and will save money in relation to servitude negotiations with land owners because only one land owner will be negotiated with.

Alternative 1 has a lower probability of causing direct impacts on intact moist grassland vegetation as most the route comprises secondary vegetation or are modified. This route is thus preferred from a vegetation perspective. Alternative 1 is the preferred choice as it crosses no wetland areas. It does however run parallel to the valley bottom wetland and this should be factored in to potential impacts that should be mitigated and monitored.

2.2 The selection process of the proposed preferred alternative

The extent of the study area and the selection of the preferred alternative alignment gave consideration to aspects such as ecological impacts, social impacts, visual impacts, technical feasibility and cost.

The following selection process criteria were considered by Eskom in the identification of the technically feasible corridor for the establishment of power line Alternative 1:

- A number of technically viable and cost effective corridors were identified of which a technically feasible, cost effective and environmental less intrusive corridor was selected as the preferred alignment.
- As far as possible, the number and magnitude of angles along the line should be minimised in order to allow the use of less expensive and visually less-intrusive pylon types.
- Crossing over of existing major power lines should be avoided as far as possible as this increases the potential for technical incidents during operation.
- Crossing over of watercourses should be avoided as far as possible to limit environmental impact.
- The preferred alignment should cater for known topographical/terrain constraints of the pylon types to be used, and soil conditions for the foundations in terms of geotechnical suitability and costs
- The preferred alignment should provide for the need of appropriate access roads to the servitude and tower positions for both construction and maintenance/operation phases
- Care should be taken to avoid the following as far as tower positioning and access road construction are concerned:
 - extensive rock outcrops;
 - rugged terrain, hills and mountains;
 - active clay soil, vleis and floodplains;
 - potential unstable side-slope terrain; and
 - eroded and unstable areas.
- Other issues which technically affect the selection of the location of a power line include:
 - agricultural lands, in particular those under irrigation
 - large water bodies
 - open-cast mining
 - crossing points with roads, rail and telecommunication lines at off-set angles less than 60°.
- The following obvious and observable environmental issues were taken into account:
 - human settlements and communities;

- land use (where possible)
- passing between water bodies (bird flight paths usually extend between water bodies)
- ecologically sensitive areas
- scenic areas with high visual/aesthetic quality and
- untransformed indigenous vegetation.

2.3 Infrastructural description of the proposed activities

2.3.1 Infrastructural description

The project infrastructure will include two 132 kV single tern distribution power lines approximately 2.3 km long, on a double-circuit structure, typically steel monopole structures, to span the lines.

Based on similar projects, it is anticipated that the following types of towers may be used on this project:

- Steel monopole structures
- Double-circuit structure
- Guyed strain structures.

Illustrative examples of 132 kV distribution pylons are shown in **Appendix C**.

2.3.2 Servitude Requirements

A servitude of 31 m is required for a single 132 kV power line. Power line servitudes are occasionally secured along existing servitudes such as roads and pipelines. The land beneath the overhead lines can be continued to be used, as normal, by the landowners. Eskom, however, require that no dwellings or vegetation/crops higher than 4 m be established within the servitude.

2.3.3 Clearance Requirements (foundations and access)

It is anticipated that existing dirt tracks will be used to facilitate access and construction, except where tower erection and stringing requires more space. Eskom have their internal guidelines and standards for Bush Clearance and maintenance within Overhead Power line Servitudes. This document provides minimum clearances for overhead conductors that will need to be taken into account in the formulation of any power line development.

2.4 Required services

2.4.1 Access Routes & Storm Water

Most areas along the proposed routes are reasonably accessible and can be reached via the existing public and farm roads. Temporary access routes will be required to construct the lines in areas where the pylons will be placed on private properties, such as farms and reserves. The details and permissions will be negotiated after the project has been approved.

Storm water will be managed according to the Eskom Guidelines for Erosion Control and Vegetation Management as well as the Environmental Management Programme (EMPr), attached as **Appendix G**.

2.4.2 Construction Site camps

Due to the length of the line it is possible that more than one site camp will be required, but the construction contractor would need to set up at least one site camp. This does not necessarily need to be near the power line route, as the contractor may prefer to use a fully serviced site at another location. The contractor will be encouraged to utilise already disturbed areas for construction camp purposes, in order to minimise cumulative impacts. It is likely that a number of construction camps would need to be established for the construction period.

2.4.3 Sewage

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

2.4.4 Solid Waste Disposal

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

2.4.5 Electricity

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

2.4.6 Land and Rights Acquisition

Once a positive uncontested Environmental Authorisation has been granted, the process of securing the servitude or title of the said portions of land will commence. To achieve this, the following activities have to be completed:

- The legal boundaries are identified for each property affected by the project;
- The legal ownership of each property is identified;
- An independent property evaluator is appointed to determine the market value of the affected properties; and
- Negotiations are conducted by Transmission negotiators with each legal landowner to acquire the rights to construct power lines over their properties. Rights are also acquired from affected statutory bodies and mineral right holders.

All land and rights acquired for the purpose of building power lines are registered at the Deeds Office as either title deeds for land or servitudes for rights.

2.4.7 Survey and line design

Topographical surveys are conducted subsequent to identifying and securing servitudes. The survey information is used by the design engineers to design the tower foundations, structures, buildings, and the exact placement of structures.

The EMPr will be finalised when all the profiles and local site plans are available. The EMPr will outline all activities that have to be undertaken, where they will take place, the responsible person, all possible environmental or social impacts, the mitigation measures, the rehabilitation plans, the monitoring methods, the frequency of monitoring and the performance indicators. The EMPr is a legally binding document which is used to ensure that Eskom adheres to all conditions of the Environmental Authorisation and EIR.

2.4.8 Construction

A procurement process is followed to identify a suitable construction contractor. During this process all potential contractors are invited to bid for the implementation of the project. Various factors are considered when appointing these contractors, among others capacity, legal status, adherence to all Eskom standards (i.e. safety, quality, and environment) and other legislated regulations, policies and procedures.

2.4.9 Rehabilitation & Maintenance

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

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

3 LEGISLATION AND GUIDELINES CONSIDERED

3.1 Requirement for a Basic Assessment

The overarching environmental legislation for the management of the environment in South Africa is the National Environmental Management Act, 1998 (Act 107 of 1998) (“NEMA”). Its preamble states that sustainable development requires the integration of social, economic and environmental factors in the planning, implementation and evaluation of environmental decisions to ensure that development serves present and future generations. Important sections of NEMA include:

- Section 2: The NEMA principles
- Section 28 Duty Of Care
- Section 30 The Prevention of incidents and reporting should an incident occur

Chapter 5 of NEMA makes provisions for regulations to be formulated and published. In December 2014, new EIA Regulations were published, that are relevant to the EIA to this project:

- Regulation Gazette No. 10328 Vol. 594 Pretoria, 4 December 2014, as amended
 - GNR. 982: Environmental Impact Assessment Regulations (EIA Regulations)
 - GNR. 983.: EIA Regulations Listing notice 1
 - GNR. 985.: EIA Regulations Listing notice 3

The proposed development triggers activities in terms of the National Environmental Management Act, Government Notices R982, R983, and R985 as shown in **Table 5**. In terms of the 2014 NEMA EIA Regulations, a Basic Assessment is required for the proposed development due to the following listed activities:

Table 4: EIA Listed Activities Applicable applied for:

Detailed description of listed activities associated with the project	
Listed activity as described in GN R 983, 984 and 985	Description of project activity that triggers listed activity
GR 983 Listing Notice 1 – Activity 11 (i) The development 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 proposed development will be constructed outside the urban area and will transmit electricity of up to 132 kilovolts.

<p>GR 983 Listing Notice 1 - Activity 12 (ii) (a).</p> <p>The development infrastructure or structures with a physical footprint of 100 square metres or more within a watercourse.</p>	<p>The pylon structures and servitude will cover more than 100 square metres will be located within 32 metres of a watercourse.</p>
<p>GR 983 Listing Notice 1, Activity 19.</p> <p>The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse</p>	<p>The proposed development will involve the infilling or depositing of material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse for the pylon foundations.</p>
<p>GR 985 Listing Notice 3 - Activity 12(f) (ii).</p> <p>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</p> <p>(f) In Mpumalanga, (ii) Within critical biodiversity areas identified in bioregional plans;</p>	<p>The proposed development will entail the clearance of 300 square metres or more of indigenous vegetation, in Mpumalanga, within critical biodiversity areas identified in bioregional plans.</p>
<p>GR 985 Listing Notice 3, Activity 14(f) (i) (c) (ff).</p> <p>The development of infrastructure or structures with a physical footprint of 10 square metres or more, outside urban areas in Mpumalanga in Critical Biodiversity Areas or in Bioregional Plans, where such development occurs within a watercourse or if no development setback has been adopted within 32 metres of a watercourse, measured from the edge of a watercourse</p>	<p>The proposed development will entail development of infrastructure or structures with a physical footprint of 10 square metres or more, outside urban areas in Mpumalanga in Critical Biodiversity Areas or in Bioregional Plans, where such development occurs within a watercourse or if no development setback has been adopted within 32 metres of a watercourse, measured from the edge of a watercourse.</p>

3.2 Legislation and Guidelines that have informed the preparation of this BAR.

Appendix 1 of the 2014 Environmental Impact Assessment Regulations states that one of the purposes of the basic assessment report is to, through a consultative process –

- (a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;

- (b) identify the alternatives considered, including the activity, location, and technology alternatives;
- (c) describe the need and desirability of the proposed alternatives;
- (d) through the undertaking of an impact and risk assessment process, inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine—
 - (e) (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
 - (f) (ii) the degree to which these impacts—
 - (g) (aa) can be reversed;
 - (h) (bb) may cause irreplaceable loss of resources; and
 - (i) (cc) can be avoided, managed or mitigated; and
- (e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
 - (i) identify and motivate a preferred site, activity and technology alternative;
 - (ii) identify suitable measures to avoid, manage or mitigate identified impacts; and
 - (iii) identify residual risks that need to be managed and monitored.

Table 5: Relevant legislative and permitting requirements applicable to the proposed development

Legislation	Applicable Requirements	Relevant Authority
Constitution of the Republic of South Africa, 1996	<p>The Constitution of the Republic of South Africa, 1996 has major implications for environmental management. The main effects are the protection of environmental and property rights, the drastic change brought about by the sections dealing with administrative law such as access to information, just administrative action and broadening of the <i>locus standi</i> of litigants. These aspects provide general and overarching support and are of major significance in the effective implementation of the environmental management principles and structures of the Environment Conservation Act and NEMA. Section 24 in the Bill of Rights of the Constitution specifically states:</p> <p>"Everyone has the right –</p> <ul style="list-style-type: none"> • To an environment that is not harmful to their health or well-being; and • To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that - <ul style="list-style-type: none"> ○ Prevent pollution and ecological degradation; ○ Promote conservation; and ○ Secure ecologically sustainable development and use of 	

Legislation	Applicable Requirements	Relevant Authority
	<p>natural resources while promoting justifiable economic and social development."</p> <p><i>Section 24 of the Constitution therefore places a duty on all spheres of government to take reasonable steps, including making laws, preventing pollution, promoting conservation and ensuring sustainable development. Eskom is committed to abide by this requirement.</i></p>	
<p>National Environmental Management Act (Act No 107 of 1998)</p>	<p>The EIA Regulations have been promulgated in terms of Chapter 5 of the Act. Listed activities which may not commence without an environmental authorisation are identified within these Regulations.</p> <p>In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation.</p> <p>In terms of GN R982, R983, and R985 of December 2014, a Basic Assessment Process is required to be undertaken for the proposed project</p> <p><i>The final BA report is to be submitted to the DEA for authorisation.</i></p>	<p>Department of Environmental Affairs (DEA)</p>
<p>National Environmental Management Act (Act No 107 of 1998)</p>	<p>In terms of the Duty of Care Provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with this project is avoided, stopped or minimised.</p> <p>In terms of NEMA, it has become the legal duty of a project proponent to consider a project holistically, and to consider the cumulative effect of a variety of impacts.</p> <p><i>While no permitting or licensing requirements arise directly by virtue of the proposed project, this section will find application during the Basic Assessment and will continue to apply throughout the life cycle of the project.</i></p>	<p>DEA</p>
<p>National Water Act (Act No 36 of 1998)</p>	<p>The development also triggers activities that require a Water Use License (WUL) because it crosses several water courses. Therefore, before construction activities may take place, the activity will require a Water Use License as per requirement in the National Water Act (Act No.36 of 1998) (NWA) under Section 21 Water Uses. In terms of the NWA, this development requires a Water Use License for the following water uses:</p> <ul style="list-style-type: none"> • Section 21(c) impeding or diverting the flow of water in 	<p>Department of Water and Sanitation (DWS)</p>

Legislation	Applicable Requirements	Relevant Authority
	<p>a watercourse and;</p> <ul style="list-style-type: none"> • Section 21 (i) altering the bed, banks, course or characteristics of a watercourse. <p>The purpose of the EIA Regulations is “to regulate the procedures and criteria as contemplated in Chapter 5 of the National Environmental Management Act relating to the submission, processing and consideration of, and decision on applications for environmental authorisation for the commencement of activities in order to avoid detrimental impacts on the environment, or where it cannot be avoided, ensure mitigation and management of impacts to acceptable levels, and to optimise positive environmental impacts, and for matters pertaining thereto”.</p> <p><i>A water use license (WUL) is required in terms of Section 21(c) and 21 (i) of the National Water Act. If wetlands or drainage lines are impacted on, or the regulated area of a watercourse (being the riparian zone or the 1:100yr floodline whichever is greatest).</i></p>	
<p>National Environmental Management: Air Quality Act (Act No 39 of 2004)</p>	<p>S18, S19, and S20 of the Act allow certain areas to be declared and managed as “priority areas.”</p> <p>Declaration of controlled emitters (Part 3 of Act) and controlled fuels (Part 4 of Act) with relevant emission standards.</p> <p>GN R 827 – National Dust Control Regulations prescribes general measures for the control of dust in all areas</p>	<p>DEA, Affected District and Local Municipalities</p>
<p>National Heritage Resources Act (Act No 25 of 1999)</p>	<ul style="list-style-type: none"> » S38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including <ul style="list-style-type: none"> » The construction of a road, power line, pipeline, canal or other similar linear development or barrier exceeding 300 m in length; » Any development or other activity which will change the character of a site exceeding 5 000 m² in extent » The relevant Heritage Authority must be notified of developments such as linear developments (i.e. roads and power lines), bridges exceeding 50 m, or any development or other activity which will change the character of a site exceeding 5 000 m²; or the re-zoning of a site exceeding 10 000 m² in extent. This notification must be provided in the early stages of initiating that development, and details regarding the location, nature and extent of the proposed development must be provided. <p><i>No heritage features were identified. Should there be heritage</i></p>	<p>South African Heritage Resources Agency (SAHRA)</p> <p>Provincial Heritage Resources Authority</p>

Legislation	Applicable Requirements	Relevant Authority
	<i>features identified during construction, then a permit should be sought as per the Heritage Act.</i>	
<p>National Environmental Management: Biodiversity Act (Act No 10 of 2004)</p>	<p>In terms of S57, the Minister of Environmental Affairs has published a list of critically endangered, endangered, vulnerable, and protected species in GNR 151 in Government Gazette 29657 of 23 February 2007 and the regulations associated therewith in GNR 152 in GG29657 of 23 February 2007, which came into effect on 1 June 2007.</p> <p>In terms of GNR 152 of 23 February 2007: Regulations relating to listed threatened and protected species, the relevant specialists must be employed during the EIA Phase of the project to incorporate the legal provisions as well as the regulations associated with listed threatened and protected species (GNR 152) into specialist reports in order to identify permitting requirements at an early stage of the EIA Phase.</p> <p>The Act provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (National Environmental Management: Biodiversity Act: National list of ecosystems that are threatened and in need of protection, (GG 34809, GN 1002), 9 December 2011).</p> <p>GNR 598: The Alien and Invasive Species (AIS) Regulations provides for the declaration of weeds and invader plants.</p> <p><i>Under this Act, a permit would be required for any activity which is of a nature that may negatively impact on the survival of a listed protected species.</i></p> <p><i>An ecological study has been undertaken as part of the Basic Assessment. As such the potential occurrence of critically endangered, endangered, vulnerable, and protected species and the potential for them to be affected has been considered. This report is contained in Appendix D of the Basic Assessment Report.</i></p>	DEA
National Forests Act (Act No. 84 of 1998)	In terms of S5(1) no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a license granted by the Minister to an (applicant and subject to such period and conditions as may be stipulated”.	Department of Agriculture, Forestry and Fisheries

Legislation	Applicable Requirements	Relevant Authority
	<p>Protected trees: According to this act, the Minister may declare a tree, group of trees, woodland or a species of trees as protected. The prohibitions provide that ' no person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister'.</p> <p>Forests: Prohibits the destruction of indigenous trees in any natural forest without a licence.</p> <p>Permits must be obtained from DAFF (Department of Agriculture, Forestry and Fisheries) to remove any identified protected species.</p>	
National Veld and Forest Fire Act (Act 101 of 1998)	<p>In terms of S13 the landowner would be required to burn firebreaks to ensure that should a veldfire occur on the property, that it does not spread to adjoining land.</p> <p>In terms of S13 the landowner must ensure that the firebreak is wide and long enough to have a reasonable chance of preventing the fire from spreading, not causing erosion, and is reasonably free of inflammable material.</p> <p>In terms of S17, the applicant must have such equipment, protective clothing, and trained personnel for extinguishing fires.</p>	Department of Agriculture, Forestry and Fisheries
Minerals and Petroleum Resources Development Act (Act No 28 of 2002)	<p>According to S27 of the act, any person who wishes to apply to the Minister for a mining permit must simultaneously apply for an environmental authorisation and must lodge the application (repealed by section 23 (b) of Act 49 of 2008).</p> <p>Requirements for Environmental Management Programmes and Environmental Management Plans are set out in S39 of the Act (repealed by section 33 of Act 49 of 2008)</p> <p>S53 Department of Mineral Resources: Approval from the Department of Mineral Resources (DMR) may be required to use land surface contrary to the objects of the Act in terms of section 53 of the Mineral and Petroleum Resources Development Act, (Act No 28 of 2002). Section 42 of Act 49 of 2008 (Repealed of section of S53) states that the Minister may cause an investigation to be conducted if it is alleged that a person intends to use the surface of any land in any way that could result in the mining of mineral resources being detrimentally affected.”</p> <p><i>As no borrow pits are expected to be required for the construction of</i></p>	DMR

Legislation	Applicable Requirements	Relevant Authority
	<i>the facility, no mining permit or environmental authorisation is to be obtained.</i>	
Hazardous Substances Act (Act No 15 of 1973)	<p>This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitising or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products.</p> <ul style="list-style-type: none"> » Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc, nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared as Group I or Group II substance » Group IV: any electronic product; and » Group V: any radioactive material. <p>The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force.</p>	Department of Health
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	<p>The Minister may by notice in the <i>Gazette</i> publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment.</p> <p>The Minister may amend the list by –</p> <ul style="list-style-type: none"> » Adding other waste management activities to the list. » Removing waste management activities from the list. » Making other changes to the particulars on the list. <p>In terms of the Regulations published in terms of this Act (GN 921), A Basic Assessment or Environmental Impact Assessment is required to be undertaken for identified listed activities (Category A and B) while Category C Activities (such as storage of waste) must be undertaken in accordance with the necessary norms and standards.</p> <p>Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that:</p> <ul style="list-style-type: none"> » The containers in which any waste is stored, are intact and not corroded or in » any other way rendered unfit for the safe storage of waste. » Adequate measures are taken to prevent accidental spillage or 	Hazardous Waste –DEA General Waste – Provincial Authorities

Legislation	Applicable Requirements	Relevant Authority
	<p>leaking.</p> <ul style="list-style-type: none"> » The waste cannot be blown away. » Nuisances such as odour, visual impacts and breeding of vectors do not arise; and » Pollution of the environment and harm to health are prevented. 	
<p>National Road Traffic Act (Act No 93 of 1996)</p>	<ul style="list-style-type: none"> » The technical recommendations for highways (TRH 11): “Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads” outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed. » Legal axle load limits and the restrictions imposed on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges, and culverts. » The general conditions, limitations, and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power/mass ratio, mass distribution, and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the National Road Traffic Act and the relevant Regulations. <p><i>An abnormal load/vehicle permit may be required to transport the various components to site for construction. These include: Route clearances and permits will be required for vehicles carrying abnormally heavy or abnormally dimensioned loads. Transport vehicles exceeding the dimensional limitations (length) of 22m. Depending on the trailer configuration and height when loaded, some of the power station components may not meet specified dimensional limitations (height and width).</i></p>	<p>South African National Roads Agency Limited (SANRAL) (national roads)</p> <p>Provincial Department of Transport</p>
<p>Conservation of Agricultural Resources Act (Act No 43 of 1983)</p>	<p>Regulation 15 of GNR1048 provides for the declaration of weeds and invader plants, and these are set out in Table 3 of GNR1048. Declared Weeds and Invaders in South Africa are categorised according to one of the following categories:</p> <p>Category 1 plants: are prohibited and must be controlled.</p> <p>Category 2 plants: (commercially used plants) may be grown in demarcated areas providing that there is a permit and that steps are taken to prevent their spread.</p> <p>Category 3 plants: (ornamentally used plants) may no longer be planted; existing plants may remain, as long as all reasonable steps are taken to prevent the spreading thereof, except within the floodline of watercourses and wetlands.</p> <p>These regulations provide that Category 1, 2 and 3 plants must not</p>	<p>DAFF</p>

Legislation	Applicable Requirements	Relevant Authority
	<p>occur on land and that such plants must be controlled by the methods set out in Regulation 15E.</p> <p><i>While no permitting or licensing requirements arise from this legislation, this Act will find application during the EIA phase and will continue to apply throughout the life cycle of the project. In this regard, soil erosion prevention and soil conservation strategies must be developed and implemented. In addition, a weed control and management plan must be implemented.</i></p> <p><i>The permission of agricultural authorities will be required if the Project requires the draining of vleis, marshes or water sponges on land outside urban areas. However, none of these activities are expected to be undertaken on site.</i></p>	
<p>Subdivision of Agricultural Land Act (Act No 70 of 1970)</p>	<p>Details the subdivision of agricultural land and provisions under which the act is triggered. It also provides for the approval of such division by the Minister of Agriculture. Applies for subdivision of all agricultural land and long-term leasing of portions of agricultural land.</p> <p><i>Long-term leases on portions or subdivision of the site properties will require an approval of the Minister of Agriculture. An application to DAFF will need to be submitted detailing the areas to be subdivided or leased for the purposes of the proposed development. An application in terms of SALA will need to be undertaken and submitted following the issuing of an environmental authorisation for the proposed project.</i></p>	<p>(DAFF) Provincial Departments of Agriculture and Environment - commenting authority. Local Municipality – competent authority</p>

3.3 Policy Guidelines

The following Guideline documents have been considered in the preparation of this report:

- Department of Environmental Affairs (DEA) Integrated Environmental Management Guideline Series 7, Public Participation in the EIA Process as published in Government Gazette No. 33308, 18 June 2010;
- Implementation Guidelines (published for comment) in Government Notice 603 of 2010
- Integrated Environmental Management Information Series (Booklets 0 to 23) (DEAT, 2002 – 2005);
- Guidelines for Involving Specialists in the EIA Processes Series (DEA&DP; CSIR and Tony Barbour, 2005 – 2007)
- DEAT (2004) Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7.

4 APPROACH TO UNDERTAKING THE BASIC ASSESSMENT

A Basic Assessment (BA) process refers to a process (in line with the EIA Regulations) which involves the identification of and assessment of direct, indirect, and cumulative environmental impacts associated with a proposed project/ activity. The BA process culminates in the submission of a Basic Assessment Report (including an Environmental Management Programme (EMPr)) to the competent authority for decision-making.

The Public Participation Process (PPP) was conducted in accordance with **Chapter 6 of the Environmental Impact Assessment (EIA) Regulations, Published in Government Notice (G.N.) Number R 982 (2014)**. In addition the PPP was guided by the Integrated Environment Management Guidelines Series 7, Public Participation in the EIA process, published in Government Gazette no. 33308, 18 June 2010.

4.1 Purpose of Public Participation

The engagement of Interested and Affected Parties (I&AP's) and the Stakeholder Engagement Process continue is an important part of any basic assessment process. The main objectives of the Stakeholder Engagement / Public Participation Process includes amongst others:

- Informing the adjacent landowners, tenants, residents' associations, ward councillors, the local municipality and other organs of state of the proposed project;
- Establishing lines of communication between the stakeholders, I&AP's and the project team;
- Providing all parties with an opportunity to exchange information and to express their views and concerns regarding the proposed project;
- Obtaining comments/input from stakeholders and I&AP's, and ensuring that all views, issues, concerns and queries raised are fully documented; and
- Identifying all the significant issues associated with the proposed project

4.2 Public Participation undertaken

The following has been undertaken as part of the **basic assessment process**:

- Notification and Consultation with Organs of State may have jurisdiction over the project, including:
 - Provincial departments
 - Parastatals and Non-Governmental Organisations
 - Local Municipality and District Municipality
- Telephonic consultation sessions (consultation with various parties from the EIA project team, including the specialist consultants).
- Written, faxed or e-mail correspondence.

A record of the above consultation in the BA process is included within **Appendix E**.

In terms of the requirement of Chapter 6 of the EIA Regulations of December 2014, the following key public participation tasks are required to be undertaken:

- Fixing a notice board at a place conspicuous to the public at the boundary or on the fence of—
 - (i) the site where the activity to which the application relates is or is to be undertaken; and
 - (ii) any alternative site mentioned in the application;
- Giving written notice to:
 - (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;

- (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
 - (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
 - (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
 - (v) the municipality which has jurisdiction in the area;
 - (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
 - (vii) any other party as required by the competent authority.
- Placing an advertisement in:
 - (i) one local newspaper; and
 - (ii) in at least one provincial newspaper.
 - Open and maintain a register/ database of interested and affected parties and organs of state.
 - » Release of a Draft EIA Report for Public Review
 - » Preparation of a Comments and Responses Report which documents all of the comments received and responses from the project team.

In compliance with the requirements of Chapter 6 of the EIA Regulations, 2014, the following summarises the key public participation activities conducted to date.

4.2.1 Placement of Site Notices

Site notices were displayed within the boundaries of the study area from 03 November 2017.

4.2.2 Steps taken to notify I&AP's

See details in **Appendix E** - Public Participation Report.

i. Stakeholder and land owner Identification

Stakeholder and land owner identification will provide a basic understanding of the social context in which the public participation process will be undertaken in the project. The following methods have been used for Stakeholder and land owner identification:

- WinDeed searches to identify landowners;
- Consultation with Provincial, District and Local Authorities

ii. Project Announcement

Project announcement, which included the placement of site notices and distribution of Background Information Documents (BID's) in the affected area took place on 03 November 2017. The public participation process (PPP) part in the BA process was announced on 03 November 2017.

4.2.3 Newspaper advertisement

Newspaper advertisement was placed in The Middleburg Observer (Mpumalanga) on 03 November 2017, requesting Interested and Affected Parties (I&APs) to register, and submit their comments.

4.2.4 I&AP Register

An I&AP's register (See **Appendix E** for Public Participation Report) was opened and maintained in terms of Regulation 55 and contains the names, contact details and addresses of:

- All persons who, as a consequence of the public participation process have submitted written comments or attended meetings with the applicant or EAP; and
- All organs of state which have jurisdiction in respect of the activity to which the application relates.

4.2.5 **Comments and Responses Report**

At the end of the notification phase, all comments/input from stakeholders and I&AP's, were captured in the Issues and Response Report (IRR) and formed part of the DBAR. This is included in **Appendix E**.

4.3 **Summary of Issues Raised by I&AP's**

Issues and concerns raised by I&AP's to date have been integrated into the Comments and Responses Report of this DBAR (see Appendix E). The issues and concerns were raised by means of:

- written submissions in response to advertisements
- Telephonic communications with I&AP's;
- Comments raised through written correspondence received from I&AP's (fax, email and mail).

5 DESCRIPTION OF THE AFFECTED ENVIRONMENT

This section provides a description of the environment that may be affected by the proposed Chikadee powerline project. It is intended to provide an overview of the affected environment and is not a detailed environmental study. Detailed environmental specialist studies, which focus on significant environmental issues of the project, will be provided during the impact assessment phase.

5.1 Climate

The study area receives summer rainfall and winters are typically very dry with frequent frost. The Mean Annual Precipitation ranges from 600-720mm. Summer temperatures can reach an average of 30°C, while average lows in winter can reach 0°C (Mucina & Rutherford, 2006).

5.2 Soils, Geology

The geology of the study site is Arenite (ENPAT, date unknown). The soil type is Bb4 (AGIS, Date unknown) and the soil class is S3 (ENPAT, date unknown) (Figure 4). S3 soils class is characterised by red or yellow structureless soils with a plinthic horizon and is known to have favourable water-holding properties. The soil type Bb4 is characterised by a Plinthic catena: dystrophic and/or mesotrophic; red soils not widespread, upland duplex and marginal soils rare as well as Shale, sandstone, clay and conglomerate of the Ecca Group, Karoo Sequence; dolerite; occasional felsitic lava of the Rooiberg Group, Transvaal Sequence (Fey, 2005). The Geology of the area is characterised by the Madzaringwe Formation, Karoo Supergroup.

5.3 Vegetation

The study site is located on a vegetation type known as Eastern Highveld Grassland. Eastern Highveld Grassland comprises short dense grassland and small, scattered rocky outcrops are characterised by wiry, sour grasses and some woody species. This vegetation unit is poorly conserved with much of its area transformed by cultivation, grazing, and mining. Where disturbances occurred, the invasive exotic tree *Acacia mearnsii* (Black Wattle) can become dominant and displace the natural vegetation. Due to the extensive usage of the areas once covered by Eastern Highveld Grassland vegetation types, the remaining portions are of high conservation value and sensitivity and are thus classified as endangered vegetation types (Mucina & Rutherford, 2006).

Other than the cultivated fields, the vegetation traversed by the proposed alternatives includes moist grassland and small pockets of secondary grassland. Secondary grassland was noted along Alternative 1 where cultivation or prior disturbances due to the existing powerline and edge effects from cultivation resulted in a change from the species composition. The secondary grasslands are small with lower species diversity than what would be expected from Eastern Highveld Grassland.

All three proposed routes traverse moist grasslands in various stages of disturbance. Alternative 3 aligns north-east of a pan area, traversing a small portion of moist grassland, while another pan depression along alternative 1 & 3 was historically ploughed and not assessed at the time of the site visit. The forb diversity at the pans was limited. The moist grassland along Alternative 1 was intact, diverse and has a likelihood of supporting plant species of conservation concern.

Mpumalanga Critical Biodiversity Areas

Critical Biodiversity Areas (CBA's) are terrestrial and aquatic features in the landscape that are critical for retaining biodiversity and supporting continued ecosystem functioning and services (SANBI 2010). These form the key output of a systematic conservation assessment and are the biodiversity sectors inputs into multi-sectoral planning and decision making. CBA's are therefore areas of the landscape that need to be maintained in a natural

or near-natural state in order to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. In other words, if these areas are not maintained in a natural or near-natural state then biodiversity conservation targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity-compatible land uses and resource uses (Desmet et al, 2009).

In addition, the assessment also made provision for Ecological Support Areas (ESA's), which are areas that are not essential for meeting biodiversity representation targets/thresholds but which nevertheless play an important role in supporting the ecological functioning of critical biodiversity areas and/or in delivering ecosystem services that support socio-economic development, such as water provision, flood mitigation or carbon sequestration. The degree of restriction on land use and resource use in these areas may be lower than that recommended for critical biodiversity areas (Desmet et al, 2009).

5.4 Fauna

During the assessment the site was surveyed and assessed for the potential occurrence of Red Data and/or wetland-associated species such as Juliana's golden mole (*Neamblosomus juliana*), Highveld golden mole (*Amblysomus septentrionalis*), Rough-haired golden mole (*Chrysospalax villosus*), African marsh rat (*Dasymys incomtus*), Angoni vlei rat (*Otomys angoniensis*), Vlei rat (*Otomys irroratus*), White-tailed rat (*Mystromys albicaudatus*), a number of shrews such as the Forest shrew (*Myosorex varius*), Southern African hedgehog (*Atelerix frontalis*), a number of bats such as the Short-eared trident bat (*Cloeotis percivali*), African clawless otter (*Aonyx capensis*), Spotted-necked otter (*Lutra maculicollis*), Marsh mongoose (*Atilax paludinosus*), Brown hyena (*Parahyaena brunnea*), etc.

A desktop study was undertaken in which bird species that potentially occur at the site and in the surrounding areas were identified using data from the first and second South African Bird Atlas Projects (SABAP 1 and 2). SABAP 2 data are based on records for pentads (i.e., 5' X 5'), where SABAP 1 data were based on quarter-degree grid cells (i.e., 15' X 15'). A list of species potentially occurring at the site was developed for the SABAP 2 pentad within which the site falls (2600_2930), as well as adjacent pentads covering the entire area of the study site. This species list is thus based on an area much larger than the actual development site. This precautionary approach is adopted to ensure that all species potentially occurring at the site, whether resident, nomadic, or migratory, are identified, and that the cumulative impacts of all four power lines are considered in terms of avifaunal impacts.

As the majority of mammals, reptiles and frogs are secretive, nocturnal, hibernators, migrators and/or seasonal, distributional ranges and the presence of suitable habitats were used to deduce the presence or absence of these species based on authoritative tomes, scientific literature, field guides, atlases and databases. This can be done irrespective of season. During the field work phase of the project, these derived lists of occurrences are audited.

The probability of occurrences of vertebrates was based on their respective geographical distributional ranges and the suitability of on-site habitats. In other words, high probability would be applicable to a species with a distributional range overlying the study site as well as the presence of prime habitat occurring on the study site. Another consideration for inclusion in this category is the inclination of a species to be common, i.e. normally occurring at high population densities.

Medium probability pertains to a mammal species with its distributional range peripherally overlapping the study site, or required habitat on the site being sub-optimal. The size of the site as it relates to its likelihood to sustain a viable breeding population, as well as its geographical isolation is also taken into consideration. Species categorised as medium normally do not occur at high population numbers, but cannot be deemed as rare.

A low probability of occurrence will mean that the species' distributional range is peripheral to the study site and habitat is sub-optimal. Furthermore, some mammals categorised as low are generally deemed rare.

During the fieldwork mammals, birds, reptiles and frogs were identified by visual sightings through random transect walks and patrolling with a vehicle. Habitats were qualitatively and quantitatively defined and also used to deduce species presences. In addition, vertebrates were also identified by means of spoor, droppings, burrows, roosting sites or nests.

5.5 Watercourses

Quaternary Catchments and Water Management Area (WMA)

As per Macfarlane et al, (2009) one of the most important aspects of climate affecting a wetland's vulnerability to altered water inputs is the ratio of Mean Annual Precipitation (MAP) to Potential Evapotranspiration (PET) (i.e. the average rainfall compared to the water lost due to the evapotranspiration that would potentially take place if sufficient water was available). The site is situated in the Quaternary Catchment B12B. In this catchment, the precipitation rate is lower than the evaporation rate with a Mean Annual Precipitation (MAP) to Potential Evapotranspiration (PET) of 0.35. Consequently, wetlands in this area are sensitive to changes in regional hydrology, particularly where their catchment becomes transformed and the water available to sustain them becomes redirected.

Nine water management areas were established by, and their boundaries defined in Government Notice No. 40279 on 16 September 2016. Quaternary Catchment B12B falls within the second WMA, the Olifants WMA. The major rivers in this WMA include the Elands, Wilge, Steelpoort and Olifants and Letaba Rivers. The wetland recorded on the study site drains into the Woes-Alleenspruit River which drains into the Klein-Olifants River.

5.6 Visual

Topography

The regional topography consists predominantly of undulating plains that slopes evenly towards streams and pans. Numerous small pans and farm dams are noticeable on aerial imagery. The project site is located on an evenly sloped plain that allows open panoramic views in all directions. The ash dump to the east of the site, hinders panoramic views towards the east, and is considered a large topographic alteration to the even landscape.

Land use/cover

The predominant land uses in the study area are agriculture and mining. The study area falls within the Eastern Highveld Grassland Vegetation type (Mucina & Rutherford, 2006). The natural vegetation can broadly be described as mostly grassland with scattered small and medium trees in the valleys or ridges. The natural vegetation cover is greatly transformed by agriculture and large cultivated field parcels dominate the even landscape. Invader tree species such as Wattles and Blue Gums, form isolated clusters between the open fields or around farmsteads.

Mining and the operations of the Hendrina Power Station, have also transformed the natural landscape in the region. The Hendrina Power Station and a large ash dump are present to the north and the east of the project site. Large scale coal mining occurs behind the power station but is out of sight from the study area. A small town, called Pullens Hope, is situated north west of the power station and 3 km north of the project site.

The site is located near the existing Boschmanskop Substation which is in the process of being upgraded. A railway line also passes the existing substation. Cultivated fields surround the site with a sparse dirt road network connecting farmsteads.

A sparse farming community is present with only a few farmsteads located inside a 2 km radius from the project sites. One farmstead is located in the northern part of the study area and will be directly affected by the proposed project. The small town of Pullens Hope is situated 3 km north of the study area and are considered outside the ZMVE.

Existing electricity network

A number of power lines converge at the Hendrina Power Station, but only one crosses the project site. This is the Hendrina/Aberdeen 132kV power line that traverses across the farmlands. The existing Boschmanskop Substation is a fenced, brick building which is currently being upgraded. It is situated next to the railway line that comes from Hendrina Power Station, going towards the south west. More power lines are visible to the north of the site, near the power station

5.7 Socio-Economic Profile

Level of unemployment:

The official unemployment rate within the Steve Tshwete Local Municipality is 19, 7%. About 12.34 of the households with the Steve Tshwete Local Municipality have no income at all, 8.61 % earn less than R 9601 and about 63.8 % of the households in the Municipality earn more than R 9601 as per census 2011. The formal employment opportunities are catered for by Governmental Services (34.3%), followed by Trade (17.3%) and Manufacturing (16.0%).

Economic profile of local municipality:

Manufacturing, mining and finance are the main drivers of the municipal economy in Steve Tshwete. The Municipality's economy and contribution towards the provincial GDP continues to grow significantly. According to the Steve's Tshwete's economy contributes about 14.7% towards the Mpumalanga Economy with an estimated growth of about 4% from 2011-2016.

Level of education:

The level of education within the Steve Tshwete Local Municipality is relatively low as depicted below:

- No Schooling – 7,4% □
- Higher Education – 14,4%
- Matric – 35%

6 DESCRIPTION OF ISSUES AND POTENTIAL IMPACTS

6.1 Identification of Potential Impacts

This section of the report aims to predict the potential impacts likely to occur from the undertaking of the proposed activities. The activities that are associated with the construction, maintenance and operation of the proposed power line, which could potentially have an impact on the environment, are highlighted in this section.

In addition, the Department of Environmental Affairs guide on assessing cumulative effects describes that it is not practical to analyse the cumulative effects of an action on every environmental receptor. Therefore, for cumulative effects analysis to help the decision-maker and inform interested and affected parties, it must be limited to effects that can be evaluated meaningfully. This chapter will highlight potential impacts and issues that can be evaluated.

6.2 Impacts on flora and vegetation

The excavation of soil for the base of pylons would remove vegetation that can be replanted as sods after the construction and its re-establishment monitored to ensure that the soil and vegetation rehabilitate over time. The greatest threat to the rehabilitation of the land disturbed by construction is the potential of invasive plant species rapidly establishing on the disturbed soil and spreading into adjacent natural areas. The category 1b invasive *Verbena bonariensis* and *Cirsium vulgare* were recorded in moist grasslands, as well as the category 2 *Acacia mearnsii* (wattle). If remedial measures and monitoring are properly implemented, the vegetation that will be disturbed during construction could rehabilitate well over time, and long term impacts on vegetation could thus be minimal. Once in use, the powerlines have relatively contained impacts on the vegetation and can successfully be mitigated to limit or even negate the negative impacts.

This assessment found that all three (3) alternatives include modified areas of a low sensitivity to the proposed powerline construction and the impacts in such areas are envisaged to be minimal. However, the moist grasslands along Alternative 2 and at the substation locality pose a significant constraint to the powerlines. Only one pan area that was historically disturbed/cultivated will be directly traversed by Alternative 1 and 3. All three alternatives will impact on the moist grassland around the substation locality.

The most significant impact of the powerline construction is expected to occur during the construction phase and within or close to moist grasslands.

- Alternative 1 has a lower probability of causing direct impacts on intact moist grassland vegetation as most the route comprises secondary vegetation or are modified. This route is thus preferred from a vegetation perspective.
- However, should Alternative 1 for any reason highlighted by other specialist be unsuitable, this vegetation opinion has no objection if Alternative 3 is implemented, provided that mitigation measures are applied to limit the impact on the vegetation to a minimum.
- Alternative 2 could be considered only if the moist grassland area can be spanned. The area spanned should include the wetland boundary and recommended buffer as per the wetland delineation report undertaken concurrently to this report (Limosella Consulting, 2017), and no construction related activities be allowed to impact on the moist grassland directly or indirectly.

The excavation of soil for the base of pylons would remove vegetation that can be replanted as sods after the construction and its re-establishment monitored to ensure that the soil and vegetation rehabilitate over time. The greatest threat to the rehabilitation of the land disturbed by construction is the potential of invasive plant species rapidly establishing on the disturbed soil and spreading into adjacent natural areas. The category 1b invasive

Verbena bonariensis and *Cirsium vulgare* were recorded in moist grasslands, as well as the category 2 *Acacia mearsnii* (wattle). If remedial measures and monitoring are properly implemented, the vegetation that will be disturbed during construction could rehabilitate well over time, and long term impacts on vegetation could thus be minimal. Once in use, the powerlines have relatively contained impacts on the vegetation and can successfully be mitigated to limit or even negate the negative impacts.

6.3 Possible impacts on Watercourses

The specialist study that was conducted by Limosella Consulting (Appendix D) found that physical alteration to wetlands can have an impact on the functioning of those wetlands. The following potential impacts were identified:

Changes in sediment entering and exiting the system

Activities such as earthworks and soil disturbance as well as the removal of natural vegetation. This could result in the loss of topsoil, sedimentation of the wetland and increase the turbidity of the water. Possible sources of the impacts include:

- Earthwork activities during structure construction and upgrade
- Disturbance of soil surface including soil compaction
- Disturbance of slopes through creation of access roads and tracks adjacent to the wetland

Changes in water /hydrology

Activities that change the catchment of a wetland will affect the way in which water enters into the wetlands. This has an effect on water flow volumes as well as energy. Possible sources of the impacts include:

- Soil compaction through movement of heavy vehicles
- Disturbance of slopes through creation of roads and tracks adjacent to the wetland
- Disturbance of vegetation cover through trampling
- Creation of additional access roads, particularly parallel to wetlands

Introduction and spread of alien vegetation impact ratings

Any activities that damage the natural vegetation cover will result in opportunistic invasions after disturbance and the introduction of seed in construction materials and on vehicles. Invasions of alien plants can impact on hydrology, by outcompeting natural vegetation and decreasing the natural biodiversity. The cumulative impacts are expected to be High to Moderate.

6.4 Impact on fauna and habitat

From a mammal habitat perspective, small patches of terrestrial habitat remained; most has been transformed. The wetland habitat is modest and has not been altered, and is crossed only by Alternative 2. The terrestrial habitat type has largely been transformed by agriculture and only a narrow band of grassland persists along the edge of the wetland and along the railway line.

Avian habitats along the three proposed power line routes consist predominantly of highly transformed agricultural fields and disturbed grasslands. There are several dams in the area, with Alternative 1 running parallel to two small dams. The presence of water bodies at the site means that large-bodied waterfowl are likely to be present, a factor that has a bearing on the risk of collision with the proposed lines.

The natural grasslands of both Alternative 1 and 2 have been severely altered by maize fields. Both Alternatives have been also disturbed by exotic plants, gravel roads, and a railway line. No moribund termitaria were

recorded. These structures are generally good indicators of the occurrence of small herpetofauna. Accordingly, it is estimated that the reptile and amphibian population density for the study site is lower. At the time of the site visit the basal cover was only at the fringes of the maize fields and would not provide adequate cover for small terrestrial herpetofauna.

It is concluded that the impact of the proposed development on the environment will be minimal where the lines will cross the railway line and the maize fields, and similarly minimal where the new substation is being built or where the lines are to traverse transformed grasslands. The choice of which route to follow is incumbent on factors other than environmental concerns, or the comparative costs of the respective routes, although alternative 1 is preferred from an avifaunal standpoint. Considering on the nature of the development and the fact that it is not necessary to implement conservation measures, it is most likely that none of the terrestrial vertebrates with their habitat(s) will be displaced. The mitigation measures in the Fauna Assessment Report are required to reduce the likelihood of impacts on birds through collisions and electrocutions.

6.5 Impact heritage and cultural resources

The cultural landscape qualities of the region essentially consist of two components. The first is made up of a pre-colonial (Stone Age and Iron Age) occupation. The second component is a rural settlement largely based on farming, but also in which coal mining activities in recent years contributed to a densification of settlement and concurrent business development.

Vegetation removal for site preparation, the installation of required infrastructure, e.g. access roads and water pipelines and construction machinery movement is coupled with the risk of damage or changes to resources that are generally protected in terms of Sections 27, 28, 31, 32, 34, 35, 36 and 37 of the NHRA that may occur in the proposed project area.

No sites, features or objects of cultural heritage significance were found in the development area. As no sites, features or objects of cultural heritage significance were found in the development area, there would be no impact as a result of the proposed development. Alternative 1 is recommended as it is the shortest possible route.

6.6 Impact on visual receptors

With respect the potential visual impacts, the landscape character sensitivity in the study area is considered to be medium. It is predominantly a rural landscape with extensive farming activity occurring in large blocks. During the summer season it is visually pleasing and the small farm dams and pans raise the visual quality of the landscape. This is however very common in the region and not regarded as unique. The even terrain causes a high degree of inter-visibility between parts of the study area with panoramic views of the surroundings. Despite the presence of the Hendrina Power Station in the north, the study area is surprisingly free of electrical infrastructure with only one power line traversing the study area.

The only observers in the study area are residents from the dispersed farming community. Only one farmstead was identified in the Zone of Maximum Visual Exposure (ZMVE) which is located at Portion 7 of the farm Boschmanskop 154. Residents living here will be directly affected by Alternative 1 and 3 as it passes in close proximity to the farm stead. They are classified as visual receptors of high sensitivity owing to their sustained visual exposure to the proposed development as well as their attentive interest towards their living environment.

Alternative 2 is the most preferred option. This alignment is the furthest away from any sensitive observers and will therefore have the least impact on them. It is the longest route and will cause a slightly higher magnitude of

disturbance on the landscape due to more pylons, but the low severity of the impact on the observers carries more weight in this regard.

Alternative 1 is marginally less preferred than Alternative 2. It is closer to the farmstead on Portion 7 of the farm Boschmanskop 154 which places it within the ZMVE. Its impact on the landscape character is similar to Alternative 2, but will be marginally less due to the shorter distance. If realignment is considered as proposed, Alternative 1 will be the most preferred option.

Alternative 3 is the least preferred option as it affects directly on the residents on Portion 7 of the farm Boschmanskop 154. It will pass directly overhead of the farmstead. The impact on the residents is the highest of the 3 options.

6.7 Possible Noise Impacts

Short term noise impacts are anticipated during the construction phase of the project for the proposed power line. It is however, anticipated that the noise will be localised and contained within the construction site and its immediate surroundings. No noise will be generated during the operational phase of the development.

6.8 Possible Socioeconomic Impacts

The project can deliver many benefits in the long term for communities in the Steve Tshwete Local Municipality. Potential negative impacts are also anticipated in the short, which can be reduced or avoided with management measures. It is anticipated that the project has the potential to realise the following positive social impacts:

- Improved quality of life, through
 - Creation of jobs ;
 - Increased procurement opportunities;
 - Increased reliability of energy services; and
 - Improved community health from the introduction and maintenance of safer sources of energy

The project can possibly also introduce negative social impacts, including:

- Loss of assets and disruption in people's lives because of physical displacement, which can arise if residences are located in the same path as the power infrastructure.
- Loss of livelihood from economic displacement, which can arise when:
 - Agricultural or other commercial activities are disrupted in the short or long term;
 - Tourist or holiday facilities become less appealing because of visual intrusion from the power infrastructure;
 - Loss of economic value of properties such as private residential estates because of visual intrusion.
- Increased community health risks from possible increased exposure to HIV/AIDS; and
- Increased community safety risks from increased direct exposure to electrical hazards, if there is tampering with power infrastructure.
- There is also a perception that the electromagnetic fields from power lines will have a negative impact on health of children. The potential of this impact will also be discussed.

7 IMPACT ASSESSMENT

7.1 Route Alternatives Evaluation

The purpose of impact assessment is to assign relative significance to predicted impacts associated with the project, and to determine the manner in which impacts are to be avoided, mitigated or managed. The potentially significant environmental impacts were identified based on the nature of the receiving environment, a review of the proposed activities, and the issues raised in the public participation process.

The potential impacts of the proposed development were identified through a site visit, the Environmental Assessment Practitioners experience and expertise in the field and specialist study reports. In the Basic Assessment Report, the potential impacts are broadly identified and outlined. An assessment of the potential impacts is provided, identifying the impacts that are potentially significant and recommending management and mitigation measures to reduce the impacts.

In general, it is recognized that every development has the potential to pose various risks to the environment as well as to the residents or businesses in the surrounding area. Therefore, it is important that these possible risks are taken into account during the planning phase of the development. Risks and key issues were identified and addressed through an internal process based on similar developments, and an environmental evaluation.

7.2 Impact Evaluation methodology

In accordance with the requirements from the EIA Regulations 2014 GN 982, Regulation 19 (3) and as set out in Appendix 1, the following impacts of the issues identified through the basic assessment phase were assessed in terms of the following methodology. All impacts are assessed according to the following criteria.

- The **nature**, a description of what causes the effect, what will be affected, and how it will be affected.
- The **extent**, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international. A score of between 1 and 5 is assigned as appropriate (with a score of 1 being low and a score of 5 being high).
- The **duration**, wherein it is indicated whether:
 - * The lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
 - * The lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
 - * Medium-term (5–15 years) – assigned a score of 3;
 - * Long term (> 15 years) - assigned a score of 4; or;
 - * Permanent - assigned a score of 5.
- The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
 - * 0 is small and will have no effect on the environment;
 - * 2 is minor and will not result in an impact on processes;
 - * 4 is low and will cause a slight impact on processes;
 - * 6 is moderate and will result in processes continuing but in a modified way;
 - * 8 is high (processes are altered to the extent that they temporarily cease); and
 - * 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **probability** of occurrence, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned:
 - * Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
 - * Assigned a score of 2 is improbable (some possibility, but low likelihood);
 - * Assigned a score of 3 is probable (distinct possibility);
 - * Assigned a score of 4 is highly probable (most likely); and
 - * Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).

- The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.
- The **status**, which is described as positive, negative or neutral.
- The degree to which the impact can be reversed.
- The degree to which the impact may cause irreplaceable loss of resources.
- The degree to which the impact can be mitigated.

The **significance** is determined by combining the criteria in the following formula:

$S = (E+D+M) P$; where

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance** weightings for each potential impact are as follows:

- **< 30 points:** Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- **30-60 points:** Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- **60 points:** High (i.e. where the impact must have an influence on the decision process to develop in the area).

7.3 Assessment tables

It is important to note that this section aims to highlight areas of concern. The details of the mitigation measures that are finally put in place should ideally be based on these issues, but must necessarily take into consideration the physical and economical feasibility of mitigation. It is important that any mitigation be implemented in the context of an Environmental Management Plan to in order to ensure accountability and ultimately the success of the mitigation.

6.3.1. **Vegetation and Flora Impacts Assessment**

This assessment found that all three (3) alternatives include modified areas of a low sensitivity to the proposed powerline construction and the impacts in such areas are envisaged to be minimal. However, the moist

grasslands along Alternative 2 and at the substation locality pose a significant constraint to the powerlines. Only one pan area that was historically disturbed/cultivated will be directly traversed by Alternative 1 and 3. All three alternatives will impact on the moist grassland around the substation locality.

Destruction & Fragmentation of vegetation

Nature: Clearing of pylon sites as well as the strip of vegetation in powerline corridor.

This impact will involve the clearing of vegetation and digging of pylon foundations. The impact footprint will be at the site and directly around it is unlikely that significant amount of natural habitat will be lost. The consequences of this impact are:

- habitat loss for plants and animal species;
- loss of plant species of conservation importance;
- Total destruction or reduction in biodiversity at the pylon site and under the conductors (depending on the extent of the clearance of
- increased potential for fragmentation (depending on the clearing of the vegetation along the power line route);
- disturbance to processes maintaining biodiversity and ecosystem goods and services; and
- local loss of ecosystem goods and services.

While the significance of this impact is Moderate before mitigation, mitigation measures will still be necessary in order to mitigate the impacts to all indigenous vegetation to be restored once the earthworks have been completed, the pylon has been erected and the conductors have been strunged.

CONSTRUCTION PHASE		
Rating of Impacts	Without mitigation	With mitigation
Probability	Highly Probable (4)	Probable (3)
Duration	Medium-term (3)	Short Duration (2)
Extent	Site (1)	Site (1)
Magnitude	Low (4)	Low (3)
Significance	32 (moderate)	18 (Low)
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Highly Probable (4)	Probable (3)
Duration	Medium-term (3)	Short Duration (2)
Extent	Site (1)	Site (1)
Magnitude	Low (4)	Low (4)
Significance	32 (moderate)	21 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Low	High
Irreplaceable loss of resources?	Moderate	Low
Can impacts be mitigated?	Yes	
NO GO Option		

<p>Mitigation:</p> <ul style="list-style-type: none"> • There should be a preconstruction walk-through of the development footprint/project site in order to assess the pylon footprint areas for Red Data / protected species. • A search and rescue operation should be done to remove plants which can be successfully transplanted • Bush clearing can be avoided or stopped to allow vegetation to restore itself • The footprint of the impact area around a pylon can be minimised • Disturbed areas must be revegetated
<p>Cumulative impacts:</p> <p>Residual Risks: Bush clearing and the disturbances of the soil at the pylon sites will destroy the natural vegetation. It will take many years (40+) to restore the vegetation in a natural way, even then the restoration woools still not be exactly as before the disturbance.</p>

<p>Nature: Introduction and spread of alien vegetation.</p>		
<p>Activity: Any activities that damage the natural vegetation cover will result in opportunistic invasions after disturbance and the introduction of seed in construction materials and on vehicles. Invasions of alien plants can impact on hydrology, by outcompeting natural vegetation and decreasing the natural biodiversity.</p>		
	Without mitigation	With mitigation
CONSTRUCTION PHASE		
Probability	Definite (5)	Highly probable (4)
Duration	Long-term (4)	Medium-term (3)
Extent	Limited to Local Area (2)	Limited to Local Area (2)
Magnitude	High (8)	Low (4)
Significance	70 (high)	36 (moderate)
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Probable (3)	Improbable (1)
Duration	Permanent (5)	Permanent (5)
Extent	Limited to Local Area (2)	Limited to the Site (1)
Magnitude	High (8)	Low (4)
Significance	45 (moderate)	10 (low)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Moderate
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	Yes	
<p>Mitigation:</p> <ul style="list-style-type: none"> • Weed control • Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area and returning it where possible afterwards. • Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish. • Rehabilitate or revegetate disturbed areas 		
<p>Cumulative impacts: Expected to be high to moderate. Regular monitoring should be implemented during construction, rehabilitation including for a period after rehabilitation is completed. Refer to the accompanying General Rehabilitation and Monitoring Report</p>		
<p>Residual Risks: Expected to be moderate provided that the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.</p>		

6.3.2. Impact on Watercourses Impact Assessment

The development changes habitats, the ecological environment, infiltration rates, amount of runoff and runoff intensity of stormwater, and therefore the hydrological regime of the area. A range of management measures are available to address threats posed to water resources. In the context of the proposed powerlines, the mitigation measures proposed below are intended to prevent further degradation to the wetland areas as a result of the powerline upgrade.

Nature: Changes in sediment entering and exiting the system. This impact is equally relevant to each alternative		
Activity: Changing the amount of sediment entering the wetland. Construction and operational activities will result in earthworks and soil disturbance as well as the removal of natural vegetation. This could result in the loss of topsoil, sedimentation of the wetland and increase the turbidity of the water. Possible sources of the impacts include:		
<ul style="list-style-type: none"> • Earthwork activities during structure construction and upgrade • Disturbance of soil surface including soil compaction • Disturbance of slopes through creation of access roads and tracks adjacent to the wetland 		
	Without mitigation	With mitigation
CONSTRUCTION PHASE		
Probability	Highly probable (4)	Probable (3)
Duration	Long-term (4)	Medium-term (3)
Extent	Regional (3)	Limited to Local Area (2)
Magnitude	High (8)	Moderate (6)
Significance	60 (high)	33 (moderate)
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Probable (3)	Possible (2)
Duration	Short-term (2)	Short-term (2)
Extent	Regional (3)	Limited to Local Area (2)
Magnitude	Low (3)	Low (3)
Significance	24 (low)	14 (low)
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	Low	Low

Can impacts be mitigated?	Yes
<p>Mitigation:</p> <ul style="list-style-type: none"> • In the case of Alternative 1 where the proposed line runs parallel to the valley bottom wetland, particular care should be taken during the construction phase to prevent sediment ingress into the wetland by installing temporary sediment barriers and effective monitoring • Pylons/towers should not be located in the wetlands or their buffer zone • Prevent access of heavy vehicles and machinery in the wetlands • Work in wet conditions should be avoided • Rehabilitation plans must be submitted and approved for rehabilitation of damage during construction activities and that plan must be implemented immediately upon completion of construction. • Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access. • Implementation of best management practices 	
<p>Cumulative impacts: May be high unless effective mitigation measures are applied. Refer to the accompanying General Monitoring and Rehabilitation report.</p>	
<p>Residual Risks: Expected to high unless the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.</p>	

<p>Nature: Changes in the hydrology of wetlands also impacts downstream areas.</p>		
<p>Activity: Any activities that change the catchment of a wetland will affect the way in which water enters into the wetlands. This has an effect on water flow volumes as well as energy. Possible sources of the impacts include:</p> <ul style="list-style-type: none"> • Soil compaction through movement of heavy vehicles • Disturbance of slopes through creation of roads and tracks adjacent to the wetland • Disturbance of vegetation cover through trampling • Creation of additional access roads, particularly parallel to wetlands 		
	Without mitigation	With mitigation
CONSTRUCTION PHASE		
Probability	Probable (3)	Possible (2)
Duration	Medium-term (3)	Short-term (2)
Extent	Regional (3)	Limited to Local Area (2)
Magnitude	High (8)	Moderate (6)
Significance	42 (medium)	20 (low)

Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Possible (2)	Possible (2)
Duration	Long-term (4)	Short-term (2)
Extent	Regional (3)	Limited to Local Area (2)
Magnitude	High (8)	Moderate (6)
Significance	30 (medium)	20 (low)
Status (positive or negative)	Negative	Negative
Reversibility		
	Moderate	High
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Prevent access of heavy vehicles and machinery in the wetlands • Rehabilitation plans must be submitted and approved for rehabilitation of damage during upgrade activities and that plan must be implemented immediately upon completion of construction. • Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access. • Implementation of best management practices • Source-directed controls 		
Cumulative impacts: May be high unless effective mitigation measures are applied. Refer to the accompanying General Monitoring and Rehabilitation report.		
Residual Risks: Expected to high unless the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.		

6.3.3. Impact on Fauna (including Avifauna) Impact Assessment

Considering on the nature of the development and the fact that it is not necessary to implement conservation measures, it is most likely that none of the terrestrial vertebrates with their habitat(s) will be displaced. The mitigation measures in the Fauna Assessment Report are required to reduce the likelihood of impacts on birds through collisions and electrocutions.

Impact assessment – avifaunal habitat loss

Nature: Avian habitats will be lost in the areas cleared for the substation and servitude involved in this project. In the case of the Boschmanskop power line, this impact will be of low severity on account of the small area involved and disturbed nature of the habitats. Additional habitat loss may occur during the construction phase.

	Without mitigation		With mitigation	
CONSTRUCTION PHASE				
Probability	Highly probable	4	Probable	3
Duration	Short term	2	Short term	2
Extent	Limited to Site	1	Limited to Site	1
Magnitude	Low	2	Low	1
Significance	Low	20	Low	12
Status (positive or negative)	Negative		Negative	
OPERATIONAL PHASE				
Probability	Probable	3	Improbable	2
Duration	Long-term	4	Long-term	4
Extent	Limited to Route	1	Limited to Route	1
Magnitude	Low	1	Low	1
Significance	Low	18	Low	12
Status (positive or negative)	Negative		Negative	
Reversibility	Low		Low	
Irreplaceable loss of resources?	Low		Low	
Can impacts be mitigated?	Yes			
Mitigation:				
<ul style="list-style-type: none"> Minimise areas cleared for towers, construction activities and access roads, and as far as possible use existing roads Restrict construction activities to area directly below power line 				
Cumulative impacts: Will result in additional loss of habitat in an area that is already highly transformed.				
Residual Risks: None anticipated provided that the mitigation measures are implemented correctly.				

Impact assessment – avifaunal disturbance

Nature: The presence of vehicles and personnel during construction will create disturbance for birds along the route of the proposed line. This disturbance will be most likely manifested through increased stress levels modulated by the stress hormone corticosterone, with consequences for breeding success, immune function and foraging. Further disturbance will occur during the operational phase as a consequence of routine maintenance, but the magnitude of this impact will be lower than during the construction phase.

	Without mitigation	With mitigation
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CONSTRUCTION PHASE				
Probability	Highly probable	4	Probable	3
Duration	Short term	2	Short term	2
Extent	Limited to Site	1	Limited to Site	1
Magnitude	Low	2	Low	2
Significance	Low	20	Low	15
Status (positive or negative)	Negative		Negative	
OPERATIONAL PHASE				
Probability	Improbable	2	Very improbable	1
Duration	Permanent	5	Permanent	5
Extent	Limited to Route	1	Limited to Route	1
Magnitude	Low	1	Low	1
Significance	Low	14	Low	7
Status (positive or negative)	Negative		Negative	
Reversibility	Moderate		Moderate	
Irreplaceable loss of resources?	Low		Low	
Can impacts be mitigated?	Yes			
Mitigation:				
<ul style="list-style-type: none"> Construction of the proposed power line should take place during winter, outside the breeding season of most birds and when migrants are absent. Construction workers must be instructed to minimise disturbance of birds at all times. Illegal hunting of birds must be strictly prevented All construction and maintenance should take place as per Eskom Transmission's environmental best practice standards. 				
Cumulative impacts: Construction activities, and to a lesser extent maintenance activities thereafter, will increase overall levels of human disturbance along the power line route.				
Residual Risks: None anticipated provided that the mitigation measures are implemented correctly.				

Impact assessment – avian collisions				
Nature: Avian mortalities and injuries as a result of birds colliding with power lines while in flight.				
	Without mitigation		With mitigation	
CONSTRUCTION PHASE				
Probability	Probable	3	Very improbable	2

Duration	Short term	2	Short term	2
Extent	Limited to Route	1	Limited to Route	1
Magnitude	Low	2	Low	1
Significance	Low	15	Low	8
Status (positive or negative)	Negative		Negative	
OPERATIONAL PHASE				
Probability	Probable	3	Improbable	2
Duration	Permanent	5	Permanent	5
Extent	Limited to Site	1	Limited to Site	1
Magnitude	Moderate	5	Moderate	3
Significance	Moderate	33	Low	18
Status (positive or negative)	Negative		Negative	
Reversibility	Low		Low	
Irreplaceable loss of resources?	Low		Low	
Can impacts be mitigated?	Yes			
Mitigation:				
<ul style="list-style-type: none"> The possibility that several large-bodied threatened species (e.g., Secretary bird, Blue Crane, Southern Bald Ibis) move through the area from time to time means that the risk of collision needs to be taken seriously. Bird flight diverters should be fitted to the line. Specifically, "Bird flappers" or double-loop flight diverters developed by the Eskom / Endangered Wildlife Trust (EWT) Strategic Partnership should be fitted to the line during initial construction. These devices must be attached to the centre 60% of the line between each pair of pylons, with the flappers 5 m apart in a staggered configuration. 				
Cumulative impacts: Collisions caused by power lines have had devastating impacts on the populations of a number of threatened bird species, but the risk posed by the proposed Boschmanskop powerline is unlikely to be significant if mitigation measures are employed as described above.				
Residual Risks: None.				

Impact assessment - electrocutions				
Nature: Avian mortalities and injuries as a result of birds creating short circuits between live wires, or between live wire and tower. Risk generally significant for 132 kV lines.				
	Without mitigation		With mitigation	
CONSTRUCTION PHASE				
Probability	Improbable	2	Improbable	1

Duration	Short term	2	Short term	2
Extent	Limited to Route	1	Limited to Route	2
Magnitude	Low	4	Low	4
Significance	Low	14	Low	8
Status (positive or negative)	Negative		Negative	
OPERATIONAL PHASE				
Probability	Probable	3	Improbable	1
Duration	Permanent	5	Permanent	5
Extent	Limited to Route	1	Limited to Route	1
Magnitude	Moderate	4	Low	3
Significance	Moderate	30	Low	9
Status (positive or negative)	Negative		Negative	
Reversibility				
	Low		Low	
Irreplaceable loss of resources?	Low		Low	
Can impacts be mitigated?	Yes			
Mitigation:				
<ul style="list-style-type: none"> Electrocutions are likely on 132 kV towers. In the interests of preventing short circuits caused by excreta, it is recommended that standard Eskom Bird Guards be fitted to all towers in the proposed line. 				
Cumulative impacts: Electrocutions are likely to be a cause of avian mortality unless adequately mitigated, and have contributed significantly to the declines of some threatened species.				
Residual Risks: None.				

6.3.4. Visual Impacts

With respect to the potential visual impacts, the landscape character sensitivity in the study area is considered to be medium. It is predominantly a rural landscape with extensive farming activity occurring in large blocks. During the summer season it is visually pleasing and the small farm dams and pans raise the visual quality of the landscape. This is however very common in the region and not regarded as unique. The even terrain causes a high degree of inter-visibility between parts of the study area with panoramic views of the surroundings. Despite the presence of the Hendrina Power Station in the north, the study area is surprisingly free of electrical infrastructure with only one power line traversing the study area.

The only observers in the study area are residents from the dispersed farming community. Only one farmstead was identified in the Zone of Maximum Visual Exposure (ZMVE) which is located at Portion 7 of the farm Boschmanskop 154. Residents living here will be directly affected by Alternative 1 and 3 as it passes in close proximity to the farmstead. They are classified as visual receptors of high sensitivity owing to their sustained visual exposure to the proposed development as well as their attentive interest towards their living environment.

Impact assessment – Visual Impact Severity		
Nature: Severity of impacts on observers (OB) and landscape character(LC)		
CONSTRUCTION PHASE		
Rating of Impacts	Without mitigation	With mitigation
Probability	Probable (3)	improbable (3)
Duration	Very short duration(1)	Very short duration(1)
Extent	Limited to Local Area (2)	Limited to Local Area (1)
Magnitude	Minor (2)	Minor (2)
Significance	15 (Low)	8 (Low)
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Probable (3)	Improbable (2)
Duration	Long term (4)	Long term (4)
Extent	Limited to Local Area (2)	Limited to Local Area (2)
Magnitude	Minor (2)	Small (0)
Significance	24 (Low)	12 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Avoidance: Complete avoidance of the impacts is a function of either not proceeding with the proposed project or relocating the project to an alternative site. This is often the most effective mitigation strategies but within the constraints of economics and available land it is not necessarily possible or feasible. • Reduction: Where negative impacts cannot be avoided it should be considered how to reduce the impact as much as possible. Different projects require different solutions but scaling down or limiting disturbances are some of the options. • Remediation: Remediation mitigation relies on add-on or cosmetic measures to “soften” the impact to a degree. This is often associated with screening or camouflage treatment to avoid or limit intrusive views. • Compensation: Where a negative impact cannot be mitigated adequately, other compensatory measures may offset the residual effects. This requires a thorough understanding and assessment of the environment in order to provide equivalent compensation. This may require extensive public consultation, especially if the impacts lean towards sentimental issues or personal values and perceptions. • Enhancement: Enhancement aims to manage certain changes and impacts by enhancing the quality of the environment for local people. This requires the exploring of opportunities in the proposed project to contribute positively to the landscape and its experience. Enhancement may take many forms but could include preservation of ecosystems, proper land management, and restoration of habitats or historic landscapes. • Keep dust levels down by regularly wetting dirt roads and exposed soil areas 		

- Remove rubble and other waste that is generated by the construction process as soon as possible and dispose at an appropriate dump site.
- Implement rehabilitation of disturbed areas as soon as possible to limit the duration of exposed soil surfaces. Monitor the rehabilitated areas for at least 6 months to ensure a sufficient vegetation cover is established that will prevent erosion from occurring.
- Keep the construction camp neat and tidy at all times. Remove any waste from the site or contain it in an enclosed area out of sight from sensitive viewpoints.
- Enhance screening of the construction camps by erecting a temporary fence with a 3m high shade cloth to limit the intrusive nature of such a site.

Cumulative impacts: A medium risk of cumulative impacts can be expected due to the presence of the existing power line, railway line and power station in the study area. The proposed route is considered a noticeable addition to the baseline environment and will increasing the visual dominance of electrical infrastructure in the study area.

Residual Risks: Residual risks will occur as the visibility of the power line cannot be effectively reduced and therefore visual intrusion will remain an impact for the lifetime of the project, unless underground cabling is considered.

6.3.5. Heritage and Cultural Impacts

The cultural landscape qualities of the region essentially consist of two components. The first is made up of a pre-colonial (Stone Age and Iron Age) occupation. The second component is a rural settlement largely based on farming, but also in which coal mining activities in recent years contributed to a densification of settlement and concurrent business development.

No sites, features or objects of cultural heritage significance were found in the development area. As no sites, features or objects of cultural heritage significance were found in the development area, there would be no impact as a result of the proposed development. Alternative 1 is recommended as it is the shortest possible route.

Impact assessment – Heritage and Cultural Impacts		
Nature: Loss and disturbance of heritage sites due to the development.		
CONSTRUCTION PHASE		
Rating of Impacts	Without mitigation	With mitigation
Probability	Probable (3)	Probable (3)
Duration	Permanent(5)	Permanent(5)
Extent	Limited to Local Area (1)	Limited to Local Area (1)
Magnitude	Minor (1)	Minor (1)
Significance	21 (Low)	21 (Low)
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Probable (3)	Probable (3)
Duration	Permanent(5)	Permanent(5)

Extent	Limited to Local Area (1)	Limited to Local Area (1)
Magnitude	Minor (1)	Minor (1)
Significance	21 (Low)	21 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	High	High
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • The contractors and workers should be notified that archaeological sites might be exposed during the construction activities. • Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible; • All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken; • Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and • Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1). • Known sites should be located and isolated, e.g. by fencing them off. All construction workers should be informed that these are no-go areas, unless accompanied by the individual or persons representing the Environmental Control Officer as identified above 		
Cumulative impacts:		
Residual Risks: The identified risk is damage or changes to resources that are generally protected in terms of Sections 27, 28, 31, 32, 34, 35, 36 and 37 of the NHRA that may occur in the proposed project area.		

6.3.6. Social Impacts

The development areas of the two alternative powerline do not differ in any significant way as far as the social impacts are concerned. Therefore, there is no significant difference in the potential impacts associated with the alternatives, and the impacts for the two alternatives are not comparatively assessed in the assessment tables below.

Improved quality of life, through creation of jobs		
Nature:		
It is expected that contractors will bring their own workers and will be required by Eskom to employ local people. Jobs therefore will be created for locals and at a national level. Jobs are a source of livelihoods and can therefore improve the quality of life for those who work. Increased procurement during construction will largely sustain jobs. There may also be some jobs created during this time if the levels of procurement justify them. Procurement is expected to benefit companies on a national scale, and to a lesser extent, companies locally.		
Rating of Impacts	Without mitigation	With mitigation
CONSTRUCTION PHASE		

Rating of Impacts	Without mitigation	With mitigation
Probability	Probable (3)	Definite (5)
Duration	Short-term (2)	Short-term (2)
Extent	Local (2)	Regional (3)
Magnitude	Low (4)	High (8)
Significance	24 (low)	65 (High)
Status (positive or negative)	Positive	Positive
OPERATIONAL PHASE		
It is expected that there will be limited opportunities for job creation during the operations phase, including for maintenance activities, at local and national/regional scales. This impact is therefore not assessed for the operations phase.		
Reversibility	Not applicable for this impact	Not applicable for this impact
Irreplaceable loss of resources?	Not applicable for this impact	Not applicable for this impact
Can impacts be mitigated?	This is a positive impact and should be promoted. From a developmental point of view, as far as possible local communities should benefit from the impact. Management measures are directed at increasing the likelihood that more eligible locals are employed.	
Mitigation/Enhancements:		
<ul style="list-style-type: none"> Eskom contract conditions should provide for at least unskilled labour to be sourced from the local municipal area affected. Contractors can be required to assess local applicants to identify those with potential to join the skilled and semi-skilled workforce. These workers can be put onto a regional database for contractors to draw their semi-skilled and skilled labour from, in the future. Where Eskom training schemes make provisions, locals with potential can be offered training opportunities. Eskom can identify as much procurement opportunity as possible at the local level to support businesses and job creation locally. 		
Cumulative impacts: there is a possibility that cumulative impact will be achieved at regional/national scale without management measures.		
Residual Risks: None, as project work will be on a contract basis.		

Improved quality of life from increased reliability of energy services (during operations)		
Nature: Currently, South Africa is not meeting its electricity demand to support economic growth rates it would like to see. Security of energy supply will therefore positively contribute towards stabilizing and perhaps also stimulating economic activities in the region. This can improve livelihoods through sustaining and possibly increasing the number of jobs available.		
CONSTRUCTION PHASE		
Rating of Impacts	Without mitigation	With mitigation
This impact is expected to be delivered after the construction phase.		
OPERATIONAL PHASE		
Probability	Probable (3)	Highly Probable (4)
Duration	Long-term (4)	Very Long-term (5)
Extent	Regional (3)	Regional (3)
Magnitude	High (8)	High (8)

Significance	45 (Medium)	72 (High)
Status (positive or negative)	Positive	Positive
Reversibility	Not applicable for this impact	Not applicable for this impact
Irreplaceable loss of resources?	Not applicable for this impact	Not applicable for this impact
Can impacts be mitigated?	This is a positive impact and should be promoted. If the development benefits many households, businesses and other development units within the municipal areas the infrastructure passes through, this may ease the negative impacts experienced. Management measures are therefore directed at increasing the likelihood that more people benefit from energy provision in these municipalities.	
Mitigation:		
<ul style="list-style-type: none"> • Infrastructure will have to be maintained on an ongoing basis, to provide a permanent benefit for development. Where infrastructure has to be changed in the long term, for example, if there is a switch to environmentally friendly energy technology, this should be affected with little disruption. • A large proportion of households in the area are unable to pay for services. For example, 12% of households in George do not have any income. While it is favourable that households move towards improving their income status so that they are able to pay for services in the long term, this outcome is very much out of the influence of Eskom. It is therefore recommended that Eskom also consider renewable energy sources especially for no and low income households. This can allow energy access at no cost for poor households and support their social and economic development activities. It can also reduce the burden on Eskom and government in the long term to maintain conventional infrastructure and provide free electricity for households unable to pay for services. 		
Cumulative impacts: improving security of supply will be cumulative to having access to electricity. For those who are receiving electricity for the first time and have been beneficiaries of other development measures such as the provision of water, the provision of secure electricity will be cumulative by improving their quality of life further.		
Residual Risks: access to secure sources of electricity can lead to many “downstream” development benefits.		

6.4. Comparison Assessment of Alternatives

Environmental considerations:

In terms of the specialist studies undertaken, Table 6 summarises that were made regarding the two alternative powerline routes along with the EAPs comment

Table 6: A comparative summary of the impact findings for each of the respective alternatives with (✓) depicting preferred suitability of the site for the proposed electrical infrastructure development and (X) depicting least preferred suitability.

Specialists	Alternative 1	Alternative 2	Alternative 3	Preference of Alternatives		EAP comment
				Preferred	Least preferred	
Vegetation	✓	X	✓	Alternative 1 Alternative 2	Alternative 3	<p>Alternative 1 has a lower probability of causing direct impacts on intact moist grassland vegetation as most the route comprises secondary vegetation or are modified. This route is thus preferred from a vegetation perspective.</p> <p>The vegetation assessment has no objection if Alternative 3 is implemented, provided that mitigation measures are applied to limit the impact on the vegetation to a minimum.</p> <p>Alternative 2 could be considered only if the moist grassland area can be spanned. The area spanned should include the wetland boundary and recommended buffer as per the wetland delineation report undertaken concurrently to this report, and no construction related activities be allowed to impact on the moist grassland directly or indirectly.</p>
Wetland / Watercourses	✓	X	X	Alternative 1	Alternative 2 Alternative 3	Alternative 2 crosses and unchannelled valley bottom watercourse (Perennial river) of which is undesired from a watercourse impact

						<p>perspective. Alternative 2 also crosses a seepage wetland.</p> <p>Alternative 3 would impact on the depressional wetland recorded on site as it crosses it directly.</p> <p>Alternative 1 does not directly cross any watercourse and is ideally preferred as it is the shortest route and has the least impact on the watercourses recorded on site.</p>
Fauna, Avifauna and habit at	✓	X	X	Alternative 1	Alternative 2 Alternative 3	<p>The wetland habitat is modest and has not been altered, and is crossed only by Alternative 2.</p> <p>The natural grasslands of both Alternative 1 and 2 have been severely altered by maize fields. Both Alternatives have been also disturbed by exotic plants, gravel roads, and a railway line.</p> <p>The presence of water bodies at the site means that large-bodied waterfowl are likely to be present, a factor that has a bearing on the risk of collision with the proposed lines. From an avifaunal standpoint, Alternative 1 is the preferred route, as it is the shortest of the three. Although it is the closest to the two small dams, the installation of bird flight diverters will mitigate this impact, and the likelihood of collisions will not differ between the three routes.</p> <p>Alternative 1 is preferred from an avifaunal standpoint as it does not directly cross a watercourse which is known to be a habitat for avifaunal species, aquatic and amphibian species.</p>
Heritage	✓	✓	✓	Equally suitable		<p>No sites, features or objects of cultural heritage significance were found in the development area. As no sites, features or objects of cultural heritage significance were found in the development area, there would be no impact as a result of the proposed</p>

						development. Alternative 1 is recommended as it is the shortest possible route.
Visual	✓	✓	X	Alternative 2 Alternative 1	Alternative 3	<p>Alternative 1 is marginally less preferred than Alternative 2. It is closer to the farmstead on Portion 7 of the farm Boschmanskop 154 which places it within the ZMVE. Its impact on the landscape character is similar to Alternative 2, but will be marginally less due to the shorter distance.</p> <p>Alternative 3 is the least preferred option as it affects directly on the residents on Portion 7 of the farm Boschmanskop 154. It will pass directly overhead of the farmstead. The impact on the residents is the highest of the 3 options.</p> <p>Alternative 2 is the most preferred option. This alignment is the furthest away from any sensitive observers and will therefore have the least impact on them.</p>

8 CONCLUSION (IMPACT STATEMENT)

This Basic Assessment Report has provided a comprehensive assessment of the potential environmental impacts associated with the proposed 132 kV Chikadee power line, Steve Tshwete Local Municipality, Gauteng Province. This was done through a consultative process through the undertaking of an impact assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity. The construction of the proposed power line should be implemented according to the associated EMPr and Environmental Authorisation conditions to adequately mitigate and manage potential impacts associated with construction activities. The construction activities and relevant rehabilitation of disturbed areas should be monitored against the approved EMPr, the Environmental Authorisation and all other relevant environmental legislation.

The need and desirability for this specific development is to assist Transnet (SOC) Ltd (Transnet) in increasing its export coal capacity to 81MTPA and to upgrade the Direct Current (DC) sections on the Transnet traction site as well as on the corresponding Eskom sides.

The project is intended to strengthen the network and assist Transnet in increasing its export coal capacity. With a No GO option, this will not be possible. Not to construct the powerline will not be in line with the country's Strategic Infrastructure Project (SIP). This is the main negative impact of a No Go Alternative. A No-Go alternative will have no change to the status quo of the environment and will therefore not cause any negative impacts. However, benefits outweigh the costs as establishing this power line ultimately will result in producing a reliable electricity supply for the country's electricity supply grid.

From the Basic Assessment findings it was found that Alternative 1 is the preferred choice as it crosses no wetland areas. It does however run parallel to the valley bottom wetland and this should be factored in to potential impacts that should be mitigated and monitored. From a vegetation perspective, Alternative 1 has a lower probability of causing direct impacts on intact moist grassland vegetation as most the route comprises secondary vegetation or are modified. However from a visual perspective Alternative 1 is marginally less preferred than Alternative 2. It is closer to the farmstead on Portion 7 of the farm Boschmanskop 154 which places it within the ZMVE. Its impact on the landscape character is similar to Alternative 2, but will be marginally less due to the shorter distance. If realignment is considered as proposed, Alternative 1 will be the most preferred option.

Considering fauna, the nature of the development and the fact that it is not necessary to implement conservation measures, it is most likely that none of the terrestrial vertebrates with their habitat(s) will be displaced. Some mitigation measures in the Fauna Assessment Report are required to reduce the likelihood of impacts on birds through collisions and electrocutions.

From an avifaunal standpoint, Alternative 1 is the preferred route, as it is the shortest of the three. Although it is the closest to the two small dams, the installation of bird flight diverters will mitigate this impact, and the likelihood of collisions will not differ between the three routes.

The cultural landscape qualities of the region essentially consist of two components. The first is made up of a pre-colonial (Stone Age and Iron Age) occupation. The second component is a rural settlement largely based on farming, but also in which coal mining activities in recent years contributed to a densification of settlement and concurrent business development.

No sites, features or objects of cultural heritage significance were found in the development area. As no sites, features or objects of cultural heritage significance were found in the development area, there would be no impact

as a result of the proposed development. Alternative 1 is recommended as it is the shortest possible route. **Therefore this basic assessment recommends that powerline Alternative 1 be authorised for development as it presents no fatally flawed environmental issues.**

Thabang Sekele

NAME OF EAP

12 January 2017

SIGNATURE OF EAP

DATE