



## ***Eskom Holdings SOC Ltd***

**ERMELO-RICHARDS BAY COAL LINE UPGRADE PROJECT: PROPOSED DEVELOPMENT OF THE MADLANZINI MAIN TRANSMISSION STATION AND ASSOCIATED 88KV AND 400KV TURN IN POWER LINES NEAR PIET RETIEF, MPUMALANGA PROVINCE.**

## **Draft Basic Assessment Report**

**DEA REF:** 14/12/16/3/3/2/634

**Issue Date:** 23 March 2015

**Revision No.:** 1

**Project No.:** 12133

## BASIC ASSESSMENT REPORT

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Contact:

**Kelly Tucker / Veronique Evans**  
**SiVEST Environmental Consultants**

51 Wessels Road


Rivonia

2128

Tel: 011 798 0600

Fax: 011 803 7272

Email: [kellyt@sivest.co.za](mailto:kellyt@sivest.co.za) / [veronique@sivest.co.za](mailto:veronique@sivest.co.za)

<b>Date:</b>	23 March 2015
<b>Document title:</b>	<b>DRAFT BAR: PROPOSED DEVELOPMENT OF THE MADLANZINI MAIN TRANSMISSION STATION AND ASSOCIATED 88KV AND 400KV TURN IN POWER LINES NEAR PIET RETIEF, MPUMALANGA PROVINCE</b>
<b>Author:</b>	Lynsey Rimbault
<b>Revision No.:</b>	1
<b>Checked by:</b>	Kelly Tucker
<b>Approved:</b>	Jenny Barnard
<b>Signature:</b>	
<b>For:</b>	<b>SiVEST Environmental Division</b>
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## EXECUTIVE SUMMARY OF THE CONTENT OF THE BASIC ASSESSMENT REPORT

### **INTRODUCTION AND PROJECT DESCRIPTION**

The Applicant, Eskom Holdings (SOC) Ltd. is making an Application for Environmental Authorisation for the development of a 400/88 kV, 160MVA electrical substation and associated 88kV and 400kV turn-in power lines near Piet Retief, Mpumalanga, in terms of the National Environmental Management Act, Act No. 107 of 1998 (as amended). This Application for Environmental Authorisation is being made to the Competent Authority, namely, the National Department of Environmental Affairs (DEA). The proposed development requires compliance with the Environmental Impact Assessment (EIA) Regulations of 2010 (as amended), promulgated in terms of the National Environmental Management Act (No. 107 of 1998) (NEMA).

SiVEST Environmental has been appointed by Trans-Africa Projects Pty Ltd, on behalf of Eskom Holdings (SOC) Ltd (herein after referred to as the Applicant) to undertake a Basic Assessment Process for the above-mentioned project.

#### **Project Background:**

The proposed Madlanzini transmission substation and associated power lines are part of a suite of projects collectively known as the Ermelo-Richards Bay Coal Line Upgrade.

Transnet is South Africa's sole provider of rail transport infrastructure for coal transportation. One of South Africa's largest foreign exchange earners is the export of high quality coal products to China. The Transnet rail link between the coal fields in Mpumalanga Province and the export node, the Richards' Bay Coal Terminal, is one of the busiest railway links in South Africa.

The increase in demand for South Africa's high quality coal necessitates an increase in production, which in turn increases demand on the railway network infrastructure. In response to the increased demand for South Africa's coal in the global market place, Transnet intends to increase the volume of coal that is being transported between the Mpumalanga coal fields and the Richards' Bay Coal Terminal. This increase will be facilitated through capital expenditure on two fronts, the supporting infrastructure, i.e. the electrical network supplying the locomotives and the locomotives themselves.

Accordingly, Transnet intends to upgrade the power supply to various traction substations between Ermelo and Richards Bay to facilitate the introduction of the new, larger locomotives that will be added to increase the volume of coal being transported and exported. Eskom Holdings (SOC) Ltd being the main supplier of electrical energy in South Africa has been tasked by Transnet to supply the additional energy requirements to these traction substations.

#### **Project Description:**

The proposed development entails the establishment of a 400/88 kV, 160MVA electrical substation and associated 400 kV turn-in power lines along the existing Camden – Normandie 400 kV line, with the associated development of two turn-in power lines tying into the existing 88kV power line. This connection will provide an extra injection point to the 88kV Transnet Coal Link backbone.

The proposed new Madlanzini Main Transmission Substation study area site is located north-west of Piet Retief. The proposed development entails the construction of one of two proposed substation alternatives, as well as an associated power line corridor that is recommended as preferred through this Basic Assessment Process.

The "South-East" substation alternative (Alternative 1) of the proposed development entails the construction of the afore-mentioned substation, a small section of a 400kV turn-in power line, and one

of the three 88kV power line alternatives (approximately 13 km to 14 km). Each of these corridor alternatives consists of a section of new power line and a shorter section of power line which entails the refurbishment of an existing 88kV power line.

The “North-West” substation alternative (Alternative 3) of the proposed development entails the construction of the substation Alternative 3, and power line Alternative 3; including short new 88kV and 400kV power lines and the longer refurbishment of an existing 88kV power line (approximately 17.5km).

Alternative 2 was an alternative with the substation situated close to Alternative 3. The substation site Alternative 2 was ruled out by the project proponent and was not assessed as a part of the Basic Assessment Process.

All the above mentioned power line alternatives terminate at the existing Iswepe Substation.

It is proposed that the 88kV power lines will be constructed with steel monopole type towers. All 88kV power lines will be constructed with 132kV capacity but operated at 88kV at inception, in order to cater for future capacity increases.

The following construction strategies are proposed for the power line refurbishment:

1. **Servitude Swap.** This will include:
  - Negotiating a new servitude within 250m of either side of the existing servitude with land owner/s (where possible);
  - Registering the new servitude;
  - Building a new line in the new negotiated servitude;
  - Energising the new line;
  - Dismantling the old line and rehabilitate the associated servitude; and
  - Handing over of the old servitude to land owner/s.
2. **Line Bypass.** This will include:
  - Building a line bypass within 25m of the existing servitude;
  - The bypass line should then span the entire length of the line that will be upgraded;
  - Dismantling of the old line;
  - Building a new line;
  - Energising the new line;
  - Dismantling the bypass line; and
  - Rehabilitating the temporary servitude (if needed).
3. **Line Section Bypass.** This will include:
  - Building a line section/s bypass within 25m of the existing servitude;
  - Bypassing line section/s will be limited to strain section/s of the line that will be upgraded; Dismantling of the old line section/s;
  - Building the new line section/s;
  - Energising the new line section/s;
  - Dismantling the bypass line section/s;
  - Rehabilitating the temporary servitude (if needed); and
  - Proceeding to the next line section/s that needs to be upgraded.
4. **Servitude Widening.** This will include:
  - Widening the servitude by 25m

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It is envisaged that any line rebuild may warrant a combination of all four construction strategies. It is therefore important to note that the environmental authorisation should not limit any of the above options. It is noted that all four options should not violate any environmental considerations / constraints within the 500m corridor. Such constraints can be managed via the detailed environmental management plan and policed by an environmental control office. These construction strategies will be informed by the public participation process and the land owner negotiations.

Where applicable the procedure for the recycling and rehabilitation of the dismantled line will be in line with the Eskom process.

The dismantled towers and line hardware will be stored at a local Eskom depot. All steel material and conductors will be removed by an accredited Eskom supplier and recycled. All non-ferrous material will be returned to the Eskom stores and disposed of from there by an accredited scrap dealer.

The footprint for the 400/88 kV 160 MVA substation site is approximately 48 000m<sup>2</sup>, or 48ha. The minimum size (footprint) of the proposed Madlanzini transmission substation site is 600 m x 800 m, which needs to accommodate:

- One (1) 400 kV Transmission power lines exiting and entering the proposed substation ;
- Two (2) 88 kV Distribution power lines entering and exiting the proposed substation; and
- One (1) 400/88kV transformer bay.
- One (1) transformer bays, which will be reserved for the future;
- Stormwater drainage systems;
- Earth mat underlying the proposed substation at approximately 1m depth to ensure earthing/grounding of the substation; and
- Associated control room building housing support services infrastructure.
- All 88kV infrastructure will be constructed at 132kV.

Access to the site is to comprise a single lane access road that will be constructed off the Main Road. , and the exact position and type of road will be determined once the power line positions have been confirmed through the negotiation process.

At the location of proposed substation sites, earth mats (grounds mats) will be installed underground to provide a uniform potential gradient over the substation sites.

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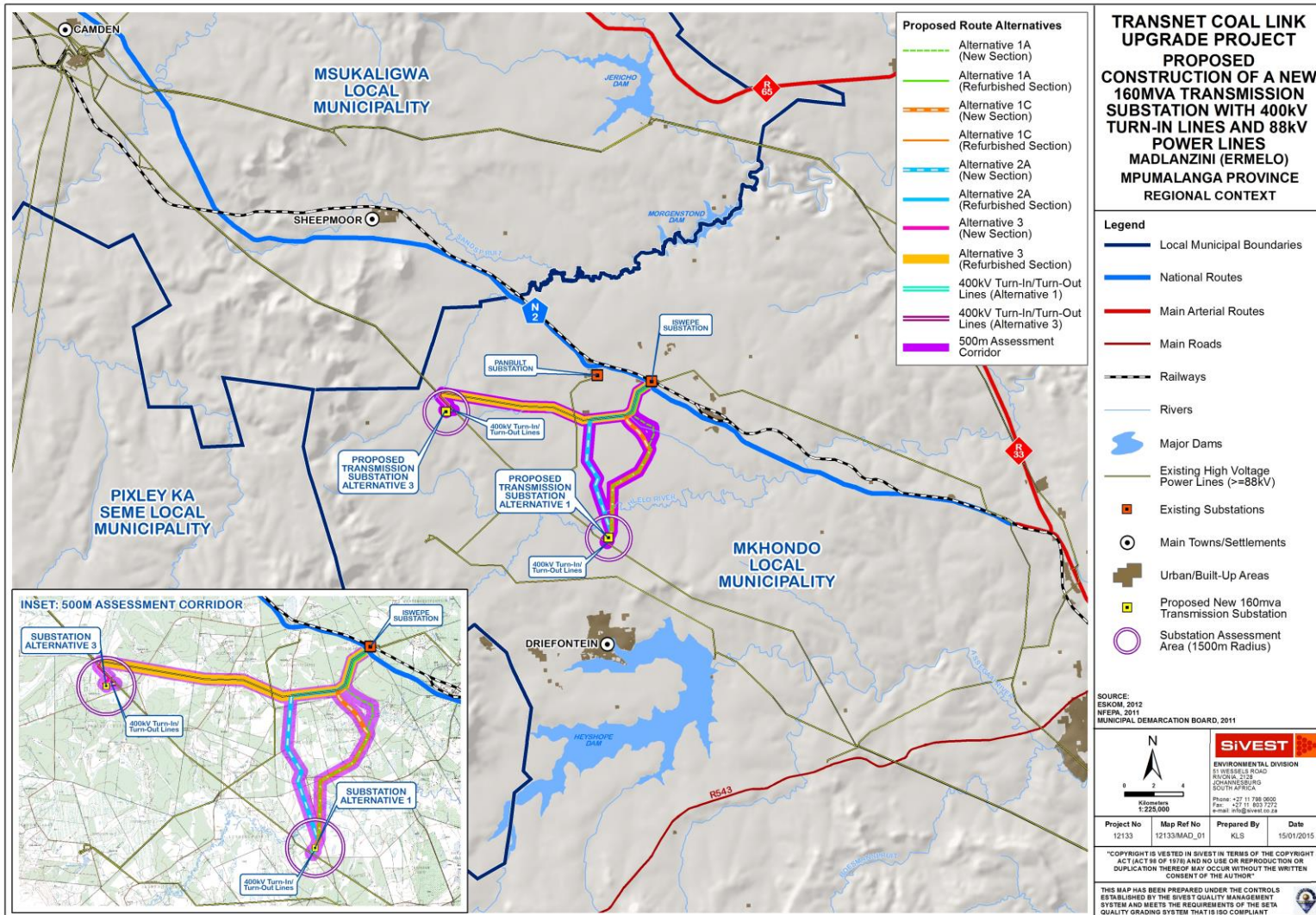


Figure 1: Site Locality Map

### **APPLICABILITY OF NEMA EIA REGULATIONS (2010):**

The proposed development requires compliance with the Environmental Impact Assessment (EIA) Regulations of 2010 (as amended), promulgated in terms of the National Environmental Management Act, Act 107 of 1998, as amended.

The proposed project is an existing EIA application (DEA Ref. NO. 12/12/20/1263) with a long history, including a 54 month inactive period up until 15 November 2013. SiVEST and the clients (Eskom and TAP) met with DEA representatives on 12 November 2013 to discuss the way forward. SiVEST proposed to downgrade the EIA applications to BA applications, in order to streamline the process, and start "afresh" to avoid confusion amongst stakeholders and to reduce the risk of appeals. The project components triggering a Listing Notice 2 Activity are considered less significant than the new 88kV power line corridors proposed, which trigger Listing Notices 1 and 3. The proposed downgrade from and EIA to a BA for the proposed Madlanzini power line and Substation was granted by DEA on 24 March 2014. (Appendix J2)

The proposed activity now requires a Basic Assessment as listed under **Government Notice No R. 544 Activities 10(i) and 11(xi), Government Notice No R. 545 Activity 8** as well as **Government Notice No R. 546 Activities 12 (b), 13 (a), 14(a)(i) and 16 (iv)(a)(ii)(ff)** of the EIA 2010 Regulations (as amended) are triggered.

Although Listing Notice 2 (GN No. R545) stipulates that a full EIA is required for the proposed development, a motivation was drafted and subsequently accepted by the DEA for a basic Assessment process to be undertaken instead of a full EIA (Appendix J2).

### **RECEIVING ENVIRONMENT:**

The proposed development is situated approximately 40km north-west of the town of Piet Retief, Mpumalanga Province, along the Transnet railway line. The site is in the Mkhondo Local Municipality, and the Gert Sibande District Municipality. The study area's climate is classified as a Highveld Type Climate with a summer rainfall. Most of the study area can be classified as having a climate which moderately restricts crop choice due to heat, cold and / or moisture stress. The proposed development is situated in low-value agricultural land and fragmented natural vegetation. Unimproved grazing land is interspersed with water bodies, wetland areas, commercial forestry blocks, scrub forests and limited dry land cultivation. There is little in the way of high value agricultural infrastructure, along the proposed corridors, which could be compromised by the proposed development. The surrounding areas are comprised of existing power lines, farmsteads, plantations, natural vegetation in good to degraded condition, and associated agricultural activities such as livestock grazing. The project site is directly north of the Heyshope Dam.

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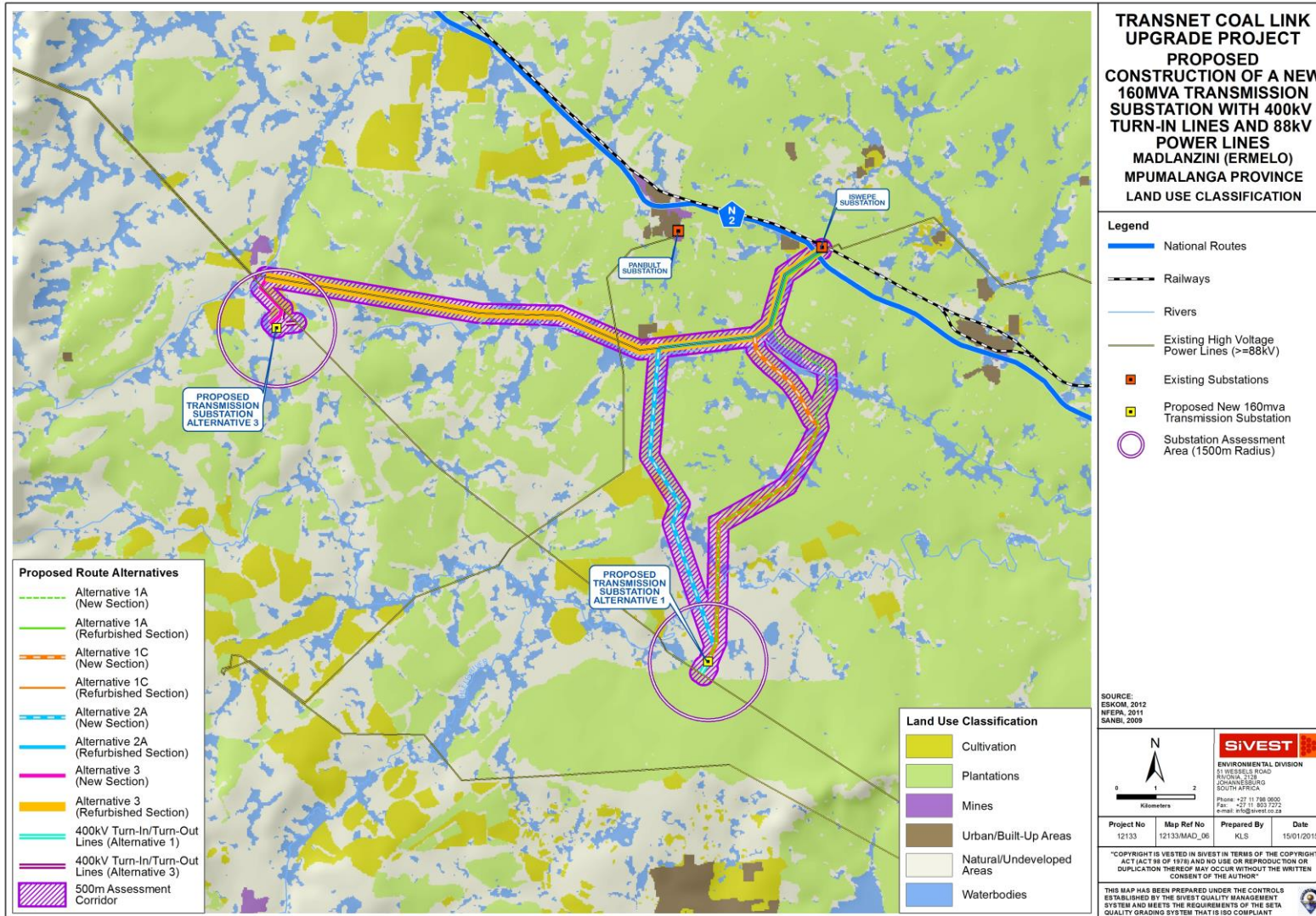


Figure 2: Land Use Map



### **ALTERNATIVES:**

Alternatives are defined in the NEMA EIA Regulations (2010) as “different means of meeting the general purpose and requirements of the activity, which may include alternatives to: (a) the property on which or location where it is proposed to undertake the activity; (b) the type of activity to be undertaken; (c) the design or layout of the activity; (d) the technology to be used in the activity; and (e) the operational aspects of the activity and (f) the option of not implementing the activity”.

For the purpose of this Application, the following Alternatives were investigated:

#### **Site Alternatives and Associated Route Alternatives:**

The “South-East” substation alternative (Alternative 1) of the proposed development entails the construction of the afore-mentioned substation, a small section of 400kV turn-in power line, and three 88kV corridor alternatives. These are Alternatives 1A, 1C and 2A. The length of the power line corridor alternatives range from 13 km to 14 km. Each of the corridor alternatives consists of a section of new power line and a shorter section of power line which entails the refurbishment of an existing 88kV power line.

The “North-West” substation alternative (Alternative 3) of the proposed development entails the construction of both the substation, and of corridor Alternative 3; including the shorter new 88kV and 400kV power lines and the longer refurbishment of an existing power line to accommodate 88kV. The length of this power line corridor is 17.5 km.

Both power line alternatives terminate at the existing Iswepe Substation. The power lines are proposed to be constructed with steel monopole type or steel lattice towers.

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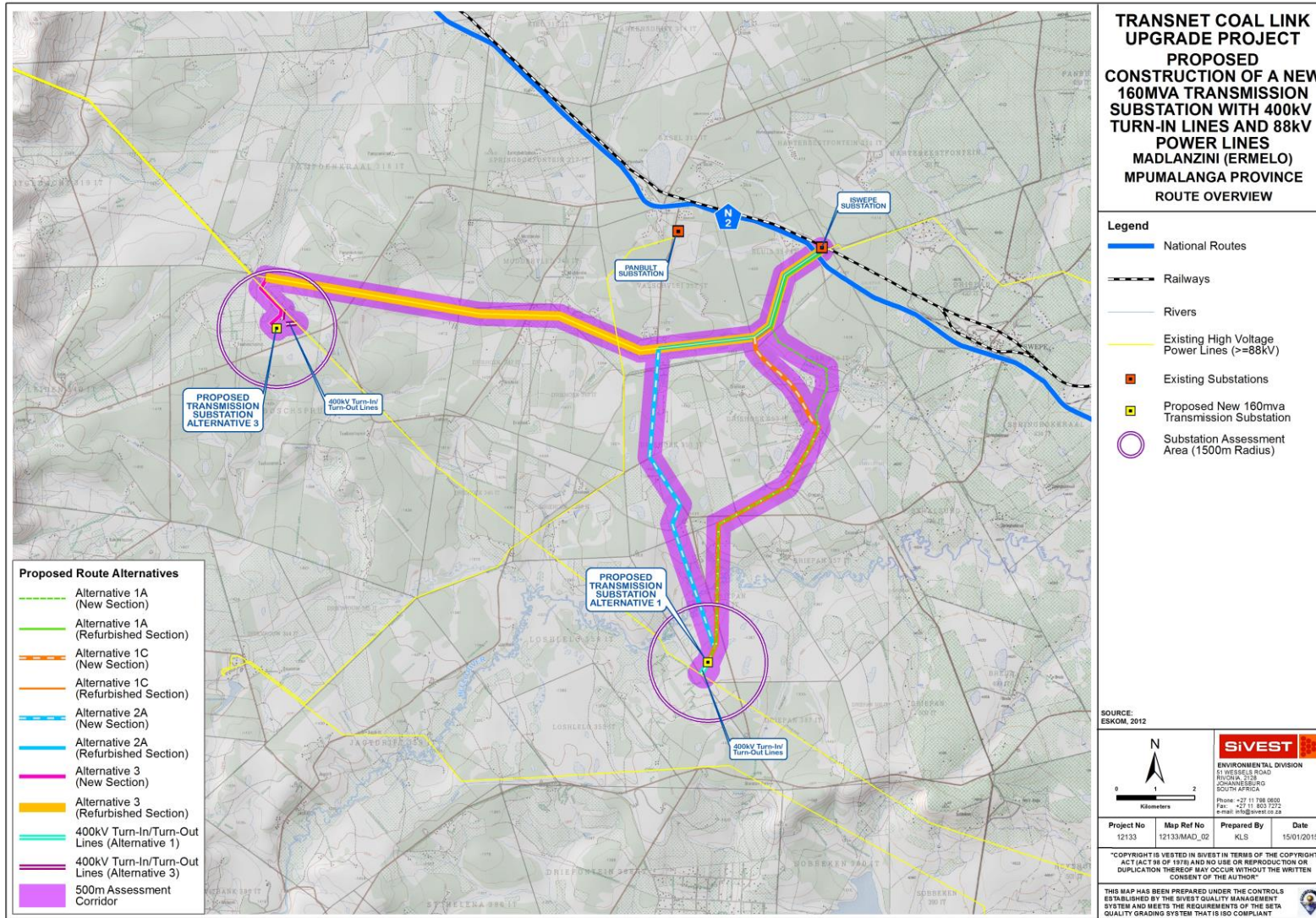


Figure 3: Route Overview Map

### **No-Go Alternative:**

The No-Go Alternative refers to the option of not implementing the proposed infrastructure development and ultimately the continuation of the current *status quo*. However, should Eskom and Transnet not proceed with the development of the proposed Madlanzini Main transmission substation and associated power lines, the necessary electrical input into the Transnet railway system will not be present. This will prevent Transnet from increasing the locomotive traffic between Richards Bay (KwaZulu-Natal) and Ermelo (Mpumalanga) and subsequently prevent increased coal transport to the Richards Bay harbour for export. The proposed project is part of a Strategic Infrastructure Plan, aimed at increasing the coal mining industry and economic profile of South Africa, with a total CAPEX value of over 1 billion Rand and an employment opportunity value of over 48 million Rand, 80% of which is to be allocated to previously disadvantaged individuals. The Coal Link Upgrade project is therefore a major economic undertaking from which South African citizens can benefit economically and financially.

**Substation Alternative 3** and the associated **Power Line Alternative 3** is the preferred alternative as this route avoids the sensitive wetland, it contains a smaller total area of new power line and a larger percentage of refurbished power line, and it is associated with fewer negative environmental impacts.

### **PUBLIC PARTICIPATION**

A public participation process is being undertaken in accordance with the NEMA EIA 2010 Regulations (as amended):

#### Initial and Draft BAR Notification

The following parties were notified of the Basic Assessment Process and the availability of the Background Information Document (BID), Draft Basic Assessment Report (DBAR) and Environmental Management Programme (EMPr) for review and comment:

- Department of Environmental Affairs
- Department of Water and Sanitation
- Department of Agriculture, Forestry and Fisheries
- Gert Sibande District Municipality
- Mkhondo Local Municipality
- NGO and Ratepayers Association of the Area
- Affected landowners
- Ward Councillor of the area

In addition to this, newspaper advertisements will be published between the 23rd March 2015 – 3rd April 2015 in the Sowetan Newspaper, Ermelo Tribune, Zululand Observer and the Paulpietersburg Advertiser. Due to the high likelihood of overlapping stakeholders, all 8 Ermelo-Richards Bay Coal Link Upgrade projects are being advertised together.

Additionally, site notices will be placed on the site (along route alternatives and at the substation sites); and the BID, Draft BAR and Draft EMPr were delivered to:

- Piet Retief Library (10 Piet Retief St, Piet Retief, Mkhondo, 2380, Tel: 017 826 8153)

The documents were also made available on SiVEST's website ([www.sivest.co.za](http://www.sivest.co.za)) for review and comment. Stakeholders have been given the opportunity to review and comment on the Draft BAR for a period of **40 days (26<sup>th</sup> March 2015 – 8<sup>th</sup> May 2015)**. All comments received or responses sent during

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the public comment period for the Draft BAR will be recorded in a Comments and Response Report (to be included in Appendix E3 of the Final BAR)

### **ENVIRONMENTAL IMPACT STATEMENT**

The construction and operational phase impacts for the two alternative substation sites and the four alternative power lines are listed below. Due to the homogenous nature of the area traversed by the various alternatives, both substations and all power line alternatives were assessed together. The impact statements for the Alternative route and Substation site can be found in Appendix F (Impact Assessment Report) of this report along with a comparative assessment of the preferred and Alternative routes and Substation sites.

#### **The impacts rated for the CONSTRUCTION PHASE:**

**The impact rating summary for all the power line and substation alternatives during the construction phase.**

Type of Impact	Description	Status	Significance Rating Pre-Mitigation	Status after mitigation
<b>Botanical</b>	Impact on habitat for floral species	Negative	Medium	Low
	Impact on floral diversity	Negative	Medium	Low
	Impact on important species	Negative	Medium	Low
<b>Fauna</b>	Vegetation clearing, disturbance and the use of heavy machinery and human presence along the power line route and at substation location	Negative	Medium	Low
<b>Avifauna</b>	Disturbance of birds in the area during construction of the proposed project	Negative	Low	Low
			Medium-(in areas close to wetlands)	
	Destruction and alteration of habitat available to birds in the area during construction of the proposed project	Negative	Medium	Low
<b>Surface Water</b>	Pre-Construction Lay-down area potential impacts: wetland habitat degradation	Negative	Medium	Low
	Tower and Substation in Wetlands: Wetland Habitat Loss	Negative	High	Low
	Vehicle and Machinery Impacts: Wetland Compaction and Degradation	Negative	Medium	Low
	Human degradation impacts: Wetland Fauna and Flora Physical Degradation	Negative	Low	Low
	Increased Run-off, Erosion and Sedimentation Impacts	Negative	Low	Low
	Vehicle Degradation Impacts: stringing of power lines through surface water resources	Negative	Low	Low
<b>Soil and Agriculture</b>	Loss of agricultural land and / or production as a result of the proposed power line construction	Negative	Medium	Low
	Loss of agricultural land and / or production as a result of the proposed substation construction	Negative	Medium	Low
<b>Visual</b>	Madlanzini TS: Large construction	Negative	Low	Low

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Type of Impact	Description	Status	Significance Rating Pre-Mitigation	Status after mitigation
	vehicles and equipment during the construction phase may change the visual character of the study area and expose sensitive receptors to visual impacts associated with the construction phase.			
	88kV turn-in power line: Large construction vehicles and equipment during the construction phase may change the visual character of the study area and expose sensitive receptor locations to visual impacts associated with the construction phase.	Negative	Low	Low
	400kV turn-in / turn-out power line: Large construction vehicles and equipment during the construction phase may change the visual character of the study area and expose sensitive receptor locations to visual impacts associated with the construction phase.	Negative	Low	Low
<b>Heritage</b>	Three cemeteries and one grave yard occur in the footprint, however it would be possible to shift the power lines slightly in order to accommodate heritage conservation principles.	Negative	High	Low
<b>Dust</b>	Dust impacts on surrounding environment associated with construction activities.	Negative	Low	Low
<b>Noise</b>	Noise impacts on surrounding environment associated with construction activities.	Negative	Low	Low
<b>Waste</b>	Generating of additional waste / Litter and building rubble or hazardous material during the construction phase.	Negative	Medium	Low
<b>Socio Economic</b>	Positive economic impacts as a result of higher coal export tonnage, as well as temporary and permanent employment opportunities, thereby contributing positively to the expansion and strengthening of local economic activities.	Positive	Medium	Medium

The impacts rated for the **OPERATIONAL PHASE**:

The impact rating summary for all the power line and substation alternatives during the operational phase:

Type of Impact	Description	Status	Significance Rating Pre-Mitigation	Status after mitigation
<b>Botanical</b>	Impact on habitat for floral species	Negative	Low	Low
	Impact on floral diversity	Negative	Low	Low
	Impact on important species	Negative	Low	Low
<b>Surface Water</b>	Service Road Establishment and	Negative	Low	Low

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Type of Impact	Description	Status	Significance Rating Pre-Mitigation	Status after mitigation
	Subsequent Vehicle Degradation Impacts			
<b>Avifauna</b>	Electrocution of birds on pylons/towers on the 88kV lines and in the substation yard.	Negative	Medium	Low
	Collision of birds with overhead power line cables, in particular the earth wire.	Negative	High	Low
<b>Visual</b>	Madlanzini TS: Change to the visual character of the surrounding area on potentially sensitive receptors.	Negative	Low	Low
	88kV turn-in power line: Change to the visual character of the surrounding area on potentially sensitive receptors.	Negative	Medium	Low
	400kV turn-in / turn-out power line: Change to the visual character of the surrounding area on potentially sensitive receptors.	Negative	Medium	Low
<b>Socio - Economic</b>	Positive socio-economic impacts as a result of constant, adequate, reliable supply of electricity to the area, thereby contributing positively to the expansion and strengthening of local economic activities.	Positive	Medium	Medium

### The impact rated for the NO-GO Alternative:

Type of Impact	Description	Status	Significance Rating Pre-Mitigation	Status after mitigation
<b>Socio - Economic</b>	Negative socio-economic impacts as a result of inadequate supply of electricity to the Transnet railway system thereby preventing an increased export tonnage of coal. This will prevent job creation in the Piet Retief area and hinder South Africa's economic growth in the coal export sector.	Negative	High	High

To summarise, the negative environmental impacts associated with the proposed development (Preferred Substation Site and Route Alternatives) are generally considered to be local of nature and can be mitigated to a low level of significance in accordance with the detailed EMP<sub>r</sub> (Appendix G). The project will however, result in positive cumulative impacts on a national, regional and local level as a result of increased economic output in the coal export sector as well as temporary and permanent job creation.

**Substation Alternative 3** and the associated **Power Line Alternative 3** is the preferred alternative as this route avoids the sensitive wetland, it contains a smaller total area of new power line and a larger percentage of refurbished power line, and it is associated with fewer negative environmental impacts.

### **CONCLUSION AND RECOMMENDATIONS**

The findings of the specialist studies undertaken within this BA provide an assessment of both the potential benefits and potential negative impacts anticipated as a result of the proposed development. The findings conclude that there are no environmental fatal flaws that should prevent the proposed project from proceeding. Areas of special concern have however been identified which will require site specific mitigation measures. These are included within the EMPr to ensure that these areas receive special attention.

The proposed development has an overall positive benefit to the socio-economic development of the region as well potential botanical advantages through alien clearing along the proposed power line route. The project is aligned with the objectives of the policies and frameworks at both Provincial and local level.

Substation Alternative 3 and the associated Power Line Alternative 3 is the preferred alternative as this route avoids the sensitive wetland, it contains a smaller total area of new power line and a larger percentage of refurbished power line, and it is associated with fewer negative environmental impacts.

The Environmental Assessment Practitioner is therefore of the opinion that the negative environmental impacts associated with the proposed preferred route can be mitigated in accordance with the detailed EMPr (Appendix G).

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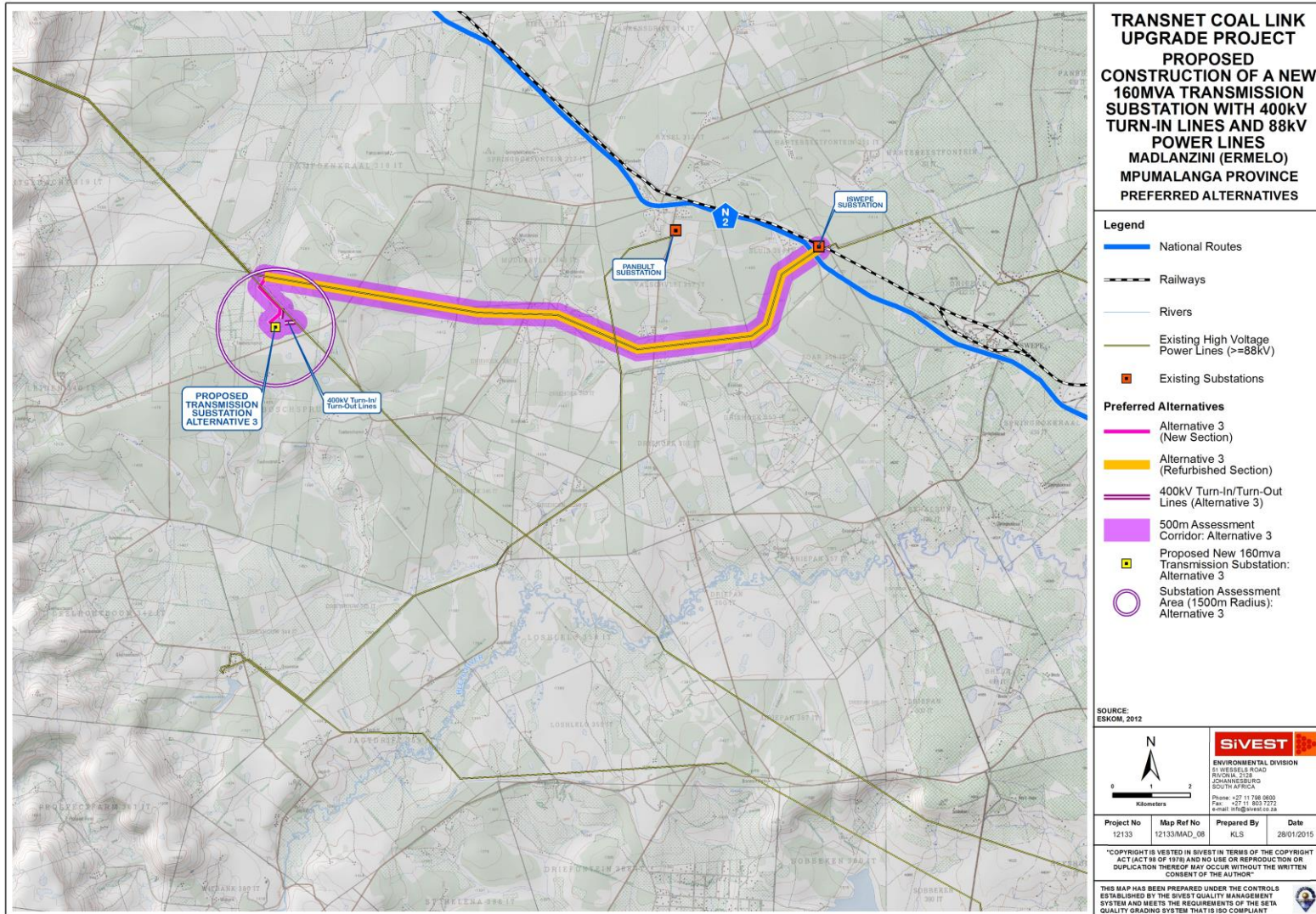


Figure 4: Preferred Alternative Map





## environmental affairs

Department:  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA

(For official use only)

**File Reference Number:**

14/12/16/3/3/2/634

**Application Number:**

**Date Received:**

Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2010, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

### Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2010 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. This report format is current as of **1 August 2014**. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority
3. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
4. Where applicable **tick** the boxes that are applicable in the report.
5. An incomplete report may be returned to the applicant for revision.
6. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
7. This report must be handed in at offices of the relevant competent authority as determined by each authority.
8. No faxed or e-mailed reports will be accepted.
9. The signature of the EAP on the report must be an original signature.
10. The report must be compiled by an independent environmental assessment practitioner.
11. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
12. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.
13. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.

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14. Two (2) colour hard copies and one (1) electronic copy of the report must be submitted to the competent authority.
15. Shape files (.shp) for maps must be included in the electronic copy of the report submitted to the competent authority.

## SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section?

✓YES

If YES, please complete the form entitled "Details of specialist and declaration of interest" for the specialist appointed and attach in Appendix I.

### 1. PROJECT DESCRIPTION

#### a) Describe the project associated with the listed activities applied for

The Applicant, Eskom Holdings (SOC) Ltd. is making an Application for Environmental Authorisation for the development of a 400/88 kV, 160MVA electrical substation and associated 88kV and 400kV turn-in power lines near Piet Retief, Mpumalanga, in terms of the National Environmental Management Act, Act No. 107 of 1998 (as amended). This Application for Environmental Authorisation is being made to the Competent Authority, namely, the National Department of Environmental Affairs (DEA), and is required since the proposed development includes activities which are listed in terms of the NEMA Environmental Impact Assessment (EIA) Regulations 2010 (as amended).

SiVEST Environmental has been appointed by Trans-Africa Projects Pty Ltd, on behalf of Eskom Holdings (SOC) Ltd (herein after referred to as the Applicant) to undertake a Basic Assessment Process for the above-mentioned project.

#### **Motivation to Downgrade Proposed Project from an EIA to a BA process**

The proposed project is an existing EIA application (DEA Ref. NO. 12/12/20/1263) with a long history, including a 54 month inactive period up until 15 November 2013. SiVEST and the clients (Eskom and TAP) met with DEA representatives on 12 November 2013 to discuss the way forward. SiVEST proposed to downgrade the EIA applications to BA applications, in order to streamline the process, and start "afresh" to avoid confusion amongst stakeholders and to reduce the risk of appeals. The project components triggering a Listing Notice 2 Activity are considered less significant than the new 88kV power line corridors proposed, which trigger Listing Notices 1 and 3. The proposed downgrade from an EIA to a BA for the proposed Madlanzini power line and Substation was granted by DEA on 24 March 2014. (Appendix J2)

#### **Background**

The proposed Madlanzini transmission substation and associated power lines are part of a suite of projects collectively known as the Ermelo-Richards Bay Coal Line Upgrade.

Transnet is South Africa's sole provider of rail transport infrastructure for coal transportation. One of South Africa's largest foreign exchange earners is the export of high quality coal products to China. The Transnet rail link between the coal fields in Mpumalanga Province and the export node, the Richards' Bay Coal Terminal, is one of the busiest railway links in South Africa.

The increase in demand for South Africa's high quality coal necessitates an increase in production, which in turn increases demand on the railway network infrastructure. In response to the increased demand for South Africa's coal in the global market place, Transnet intends to increase the volume of coal that is being transported between the Mpumalanga coal fields and the Richard's Bay Coal Terminal. This increase will be facilitated through capital expenditure on two fronts, the supporting infrastructure, i.e. the electrical network supplying the locomotives and the locomotives themselves.

Accordingly, Transnet intends to upgrade the power supply to various traction substations between Ermelo and Richards Bay to facilitate the introduction of the new, larger locomotives that will be added to increase the volume of coal being transported and exported. Eskom Holdings (SOC) Ltd, the main supplier of electrical energy in South Africa, has been tasked by Transnet to supply the additional energy requirements to these traction substations.

### **Project Description:**

The proposed development entails the establishment of a 400/88 kV, 160MVA electrical substation and associated 400 kV turn-in power lines along the existing Camden – Normandie 400 kV line, with the associated development of two turn-in power lines tying into the existing 88kV power line. This connection will provide an extra injection point to the 88kV Transnet Coal Link backbone.

The proposed new Madlanzini Main transmission substation study area site is located north-west of Piet Retief. The proposed development entails the construction of one of two proposed substation alternatives, as well as an associated power line corridor that is recommended as preferred through this Basic Assessment Process.

The “South-East” substation alternative (Alternative 1) of the proposed development entails the construction of the afore-mentioned substation, a small section of a 400kV turn-in power line, and one of the three 88kV power line alternatives (approximately 13 km to 14 km). Each of these corridor alternatives consists of a section of new power line and a shorter section of power line which entails the refurbishment of an existing 88kV power line.

The “North-West” substation alternative (Alternative 3) of the proposed development entails the construction of the substation Alternative 3, and power line Alternative 3; including a shorter new 88kV and 400kV power lines and the longer refurbishment of an existing 88kV power line (approximately 17.5km).

Alternative 2 was an alternative with the substation situated close to Alternative 3. Alternative 2 was ruled out by the project proponent and was not assessed as a part of the Basic Assessment Process.

All the above mentioned power line alternatives terminate at the existing Iswepe substation.

It is proposed that the 88kV power lines will be constructed with steel monopole type towers. All 88kV power lines will be constructed with 132kV capacity but operated at 88kV at inception, in order to cater for future capacity increases.

The following construction strategies are proposed for the power line refurbishment:

**1. Servitude Swap.** This will include:

- Negotiating a new servitude within 250m of either side of the existing servitude with land owner/s (where possible);
- Registering the new servitude;
- Building a new line in the new negotiated servitude;
- Energising the new line;
- Dismantling the old line and rehabilitate the associated servitude; and
- Handing over of the old servitude to land owner/s.

**2. Line Bypass.** This will include:

- Building a line bypass within 25m of the existing servitude;
- The bypass line should then span the entire length of the line that will be upgraded;

- Dismantling of the old line;
- Building a new line;
- Energising the new line;
- Dismantling the bypass line; and
- Rehabilitating the temporary servitude (if needed).

**3. Line Section Bypass.** This will include:

- Building a line section/s bypass within 25m of the existing servitude;
- Bypassing line section/s will be limited to strain section/s of the line that will be upgraded; Dismantling of the old line section/s;
- Building the new line section/s;
- Energising the new line section/s;
- Dismantling the bypass line section/s;
- Rehabilitating the temporary servitude (if needed); and
- Proceeding to the next line section/s that needs to be upgraded.

**4. Servitude Widening.** This will include:

- Widening the servitude by 25m

Where applicable the procedure for the recycling and rehabilitation of the dismantled power line will be in line with the Eskom process.

The dismantled towers and power line hardware will be stored at a local Eskom depot. All steel material and conductors will be removed by an accredited Eskom supplier and recycled. All non-ferrous material will be returned to the Eskom stores and disposed of from there by an accredited scrap dealer.

The footprint for the 400/88 kV 160 MVA substation site is approximately 48 000m<sup>2</sup>, or 48ha. The minimum size (footprint) of the proposed Madlanzini transmission substation site is 600 m x 800 m, which needs to accommodate:

- One (1) 400 kV Transmission power lines exiting and entering the proposed substation ;
- Two (2) 88 kV Distribution power lines entering and exiting the proposed substation; and
- One (1) 400/88kV transformer bay.
- One (1) transformer bay, which will be reserved for the future;
- Stormwater drainage systems;
- Earth mat underlying the proposed substation at approximately 1m depth to ensure earthing/grounding of the substation;
- Associated control room building housing support services infrastructure; and
- All 88kV infrastructure will be constructed at 132kV.

Access to the site is to comprise a single lane access road that will be constructed off the Main Road, and the exact position and type of road will be determined once the power line positions have been confirmed through the negotiation process.

At the location of proposed substation sites, earth mats (grounds mats) will be installed underground to provide a uniform potential gradient over the substation sites. This is needed so that individuals who are walking in the area are not exposed to excessive voltages across the length of a stride ('step potential') or when they touch a metallic structure ('reach potential'). Additional earth mats also provide a connection to the earth through which lightning or system fault currents can be dissipated. In effect, this objective amounts to managing the potential different relative to a remote location.

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In an electrical substation a ground (earth) mat is a mesh of conductive material installed at places where a person would stand to operate a switch or other apparatus; it is bonded to the local supporting metal structure and to the handle of the switchgear, so that the operator will not be exposed to a high differential voltage due to a fault in the substation. Earthing mats normally consist of a rectangular (or square) grid of copper wires that are buried in underground trenches. This grid must lie underneath the entire area to be protected, and must extend beyond any security fencing that may be present to prevent intrusion by civilians.

The soil resistivity will be measured and the detail design of the earth mat completed, once the substation platform has been established. Adherence to the Eskom standard, D-DT 5240, regarding substation earth mats, will be monitored. Additionally, the detailed drainage design will be completed as soon as the site is confirmed, the relevant survey information received and the detailed design aspect of the project underway. Terrace slopes are usually designed with a 1% slope. This allows for adequate storm water run-off to cut-off drains. These flow towards natural drainage courses around the substations.

**b) Provide a detailed description of the listed activities associated with the project as applied for**

Listed activity as described in GN R.544, 545 and 546	Description of project activity
<p><b>GN R544, Activity 10 (i):</b> The construction of facilities or infrastructure for the transmission and distribution of electricity - (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts</p>	<p>The capacity of the new turn-in distribution power lines is 88kV. The construction of the distribution power lines will occur outside an urban area.</p>
<p><b>GN R544, Activity 11 (xi):</b> The construction of: (xi) infrastructure or structures covering 50 square metres or more</p> <p>where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</p>	<p>The surface water assessment identified 50 natural wetlands, two artificial wetlands and the Hlelo and the Ngwempisi Rivers. The erection of the pylons may fall within 32m of a watercourse.</p>
<p><b>GN R545, Activity 8:</b> The construction of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.</p>	<p>The capacity of the new transmission lines is 400kV. The proposed new substation will need to accommodate this. This proposed development is located outside of an urban area or industrial complex.</p> <p>As previously mentioned; although this listed Activity stipulates that a full EIA is required for the proposed development; a motivation was drafted and subsequently accepted by the DEA for a Basic Assessment process to be undertaken instead of a full EIA (Appendix J2)</p>

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<p><b>GN R546, Activity 12 (b):</b> The clearance of an area of 300 square metres or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation:</p> <p>(b) Within critical biodiversity areas identified in bioregional plans;</p>	<p>The biodiversity assessment identified that the majority of the study area falls within a Critical Biodiversity Area (CBA) that is irreplaceable and that the remaining part of the study areas fall within an Other Natural Area (ONA). Additionally a CBA wetland is present in the vicinity of Substation Alternative 1. The construction of the substation and/or power lines may require the clearance of an area of 300 square meters where 75% of the vegetation is indigenous within a critical biodiversity area. The extent of affected areas containing indigenous vegetation has been confirmed during the specialist studies.</p>
<p><b>GN R546, Activity 13 (a):</b> The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for:</p> <p>(2) the undertaking of a linear activity falling below the thresholds mentioned in Listing Notice 1 in terms of GN No. 544 of 2010.</p> <p>(a) Critical biodiversity areas and ecological support areas as identified in systematic biodiversity plans adopted by the competent authority.</p>	<p>The biodiversity assessment identified that the majority of the study area falls within a CBA that is irreplaceable and that the remaining part of the study areas fall within an ONA. Additionally a CBA wetland is present in the vicinity of Substation Alternative 1.</p> <p>The construction of the substation and/or power lines may require the clearance of an area of 1 hectare where 75% of the vegetation is indigenous within a critical biodiversity area and ecological support area. The extent of affected areas has been confirmed during the specialist studies.</p>
<p><b>GN R546, Activity 14 (3)(a)(i):</b> The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for:</p> <p>(3) the undertaking of a linear activity falling below the thresholds mentioned in Listing Notice 1 in terms of GN No. 544 of 2010.</p> <p>(a) In Mpumalanga i. All areas outside urban areas.</p>	<p>The biodiversity assessment identified that the majority of the study area falls within a CBA that is irreplaceable and that the remaining part of the study areas fall within an ONA. Additionally a CBA wetland is present in the vicinity of Substation Alternative 1.</p> <p>The construction of the substation and/or power lines may require the clearance of an area of 5 hectares where 75% of the vegetation is indigenous outside an urban area.</p>
<p><b>GN R546, Activity 16 (iv)(a)(ii)(ff):</b> The construction of: (vi) infrastructure or structures covering 10 square metres or more</p> <p>where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction</p>	<p>The surface water assessment identified 50 natural wetlands, two artificial wetlands and the Hlelo and the Ngwempisi Rivers. The erection of the pylons may fall within 32m of a watercourse.</p> <p>The biodiversity assessment identified that the majority of the study area falls within a CBA that is irreplaceable and that the remaining part of the study areas fall within an ONA. Additionally a</p>

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will occur behind the development setback line.  (a) In Mpumalanga  (ii) Outside urban areas, in:  (ff) Critical biodiversity areas or ecosystem service areas identified in systematic biodiversity plans adopted by the competent authority or in biological plans.	CBA wetland is present in the vicinity of Substation Alternative 1.
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## 2. FEASIBLE AND REASONABLE ALTERNATIVES

**“alternatives”**, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

- (a) the property on which or location where it is proposed to undertake the activity;
- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

Describe alternatives that are considered in this application as required by Regulation 22(2)(h) of GN R.543. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

The determination of whether site or activity (including different processes, etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the, competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

The identification of alternatives should be in line with the Integrated Environmental Assessment Guideline Series 11, published by the DEA in 2004. Should the alternatives include different locations and lay-outs, the co-ordinates of the different alternatives must be provided. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.



a) Site alternatives

**Please note:** Each substation location alternative is associated with a power line route alternative. Therefore the substation location alternatives with their respective power line route alternatives are presented in separate sections.

Substation Site Alternative 1 ("South-East Option")		
Description	Lat (DDMMSS)	Long (DDMMSS)
<b>Alternative Substation Site 1 (not preferred)</b>	<b>26° 55' 1.238" S</b>	<b>30° 27' 11.196" E</b>

In the case of linear activities:

**Alternative:**

**400kV Route Alternative 1**

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

**Latitude (S):**

**Longitude (E):**

26° 55' 1.238" S	30° 27' 11.196" E
26° 55' 6.133" S	30° 27' 7.883" E
26° 55' 11.029" S	30° 27' 4.569" E

**Route Alternative 1A new 88kV**

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

26° 55' 1.238" S	30° 27' 11.196" E
26° 52' 37.360" S	30° 28' 19.373" E
26° 50' 20.121" S	30° 28' 9.972" E

**Route Alternative 1A refurbished 88kV**

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

26° 50' 20.121" S	30° 28' 9.972" E
26° 49' 39.562" S	30° 28' 23.421" E
26° 49' 15.372" S	30° 28' 59.017" E

**Route Alternative 1C new 88kV**

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

26° 55' 1.238" S	30° 27' 11.196" E
26° 52' 41.378" S	30° 28' 11.223" E
26° 50' 29.652" S	30° 27' 55.707" E

**Route Alternative 1C refurbished 88kV**

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

26° 50' 29.652" S	30° 27' 55.707" E
26° 49' 47.704" S	30° 28' 20.721" E
26° 49' 15.372" S	30° 28' 59.017" E

**Route Alternative 2A new 88kV**

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

26° 55' 1.238" S	30° 27' 11.196" E
26° 52' 50.210" S	30° 26' 45.120" E
26° 50' 38.644" S	30° 26' 26.491" E

**Route Alternative 2A refurbished 88kV**

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

26° 50' 38.644" S	30° 26' 26.491" E
26° 50' 26.055" S	30° 28' 1.090" E
26° 49' 15.372" S	30° 28' 59.017" E

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<b>Substation Site Alternative 3 (“North-West Option”) (Preferred)</b>		
Description	Lat (DDMMSS)	Long (DDMMSS)
<b>Alternative Substation Site 3 (preferred)</b>	<b>26° 50' 20.605" S</b>	<b>30° 20' 31.310" E</b>

In the case of linear activities:

	Latitude (S):	Longitude (E):
<b>Alternative:</b>		
<b>400kV Route Alternative 3 (preferred)</b>		
<b>North</b>		
• Starting point of the activity	26° 50' 20.605" S	30° 20' 31.310" E
• Middle/Additional point of the activity	26° 50' 13.539" S	30° 20' 36.061" E
• End point of the activity	26° 50' 4.488" S	30° 20' 36.996" E
<b>South</b>		
• Starting point of the activity	26° 50' 20.605" S	30° 20' 31.310" E
• Middle/Additional point of the activity	26° 50' 16.885" S	30° 20' 39.824" E
• End point of the activity	26° 50' 16.164" S	30° 20' 49.583" E
<b>Route Alternative 3 New (preferred) 88kV</b>		
• Starting point of the activity	26° 50' 20.605" S	30° 20' 31.310" E
• Middle/Additional point of the activity	26° 49' 59.731" S	30° 20' 30.049" E
• End point of the activity	26° 49' 37.712" S	30° 20' 21.229" E
<b>Route Alternative 3 Refurbished (preferred) 88kV</b>		
• Starting point of the activity	26° 49' 37.712" S	30° 20' 21.229" E
• Middle/Additional point of the activity	26° 50' 13.622" S	30° 25' 0.542" E
• End point of the activity	26° 49' 15.372" S	30° 28' 59.017" E

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

In the case of an area being under application, please provide the co-ordinates of the corners of the site as indicated on the lay-out map provided in Appendix A.

**Please refer to Appendix J3 for the bend point coordinates of the power line corridor for each alignment.**

**b) Lay-out alternatives**

<b>Alternative 1</b>		
Description	Lat (DDMMSS)	Long (DDMMSS)
<b>N/A</b>		
<b>Alternative 3</b>		
Description	Lat (DDMMSS)	Long (DDMMSS)
<b>N/A</b>		

**c) Technology alternatives**

<b>Alternative 1</b>
N/A
<b>Alternative 2</b>
N/A

**d) Other alternatives (e.g. scheduling, demand, input, scale and design alternatives)**

<b>Alternative 1</b>
N/A
<b>Alternative 3</b>
N/A

**e) No-go alternative**

The No-Go Alternative refers to the option of not implementing the proposed infrastructure development and ultimately the continuation of the current *status quo*. However, should Eskom and Transnet not proceed with the development of the proposed Madlanzini Main transmission substation and associated power lines, the necessary electrical input into the Transnet railway system will not be present. This will prevent Transnet from increasing the locomotive traffic between Richards Bay (KwaZulu-Natal) and Ermelo (Mpumalanga) and subsequently prevent increased coal transport to Richards Bay harbour for export. The proposed project is part of a Strategic Infrastructure Plan, aimed at increasing the coal mining industry and economic profile of South Africa, with a total CAPEX value of over 1 billion Rand and an employment opportunity value of over 48 million Rand, 80% of which is to be allocated to previously disadvantaged individuals. The Ermelo-Richards Bay Coal Link Upgrade Project is therefore a major economic undertaking from which South African citizens can benefit. Trans-Africa Projects, on behalf of Eskom Pty Ltd and Transnet Railways, is therefore proposing the above mentioned Madlanzini Main transmission substation and associated power lines, in order to provide the necessary electrical infrastructure in the Piet Retief area, to allow for the increase in coal transport between Richards Bay and Ermelo.

Paragraphs 3 – 13 below should be completed for each alternative.

**3. PHYSICAL SIZE OF THE ACTIVITY**

a) Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

**Substation Site Alternative 1 (“South-East Option”)**

**Alternative 1: Substation**  
 Substation Alternative 1  
 Alternative A2 (if any)  
 Alternative A3 (if any)

**Size of the activity:**  
480 000 m<sup>2</sup>

or, for linear activities:

**Alternative 1: Power line Routes**

400kV Alternative 1  
 88kV Alternative 1A New  
 88kV Alternative 1A Refurbished  
 88kV Alternative 1C New  
 88kV Alternative 1C Refurbished  
 88kV Alternative 2A New  
 88kV Alternative 2A Refurbished

**Length of the activity:**

	0,35 km
	10,79 km
	2,52 km
	10,26 km
	3,01 km
	8,56 km
	5,49 km

**Substation Site Alternative 3 (“North-West Option”) (Preferred)**

**Alternative 3: Substation**

Substation Alternative 3 (Preferred)  
 Alternative A2 (if any)  
 Alternative A3 (if any)

**Size of the activity:**

	480 000 m <sup>2</sup>

or, for linear activities:

**Alternative 3: Power line Routes**

400kV Alternative 3 North (Preferred)  
 400kV Alternative 3 South (Preferred)  
 88kV Alternative 3 New (Preferred)  
 88kV Alternative 3 Refurbished (Preferred)

**Length of the activity:**

	0,54km
	0,54km
	1,73 km
	15,82 km

**b) Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):**

**Alternative:**

Alternative 1, 2 & 3 **88kV**  
 Alternative 1 & 3 **400kV**  
 Alternative A3 (if any)

**Size of the site/servitude:**

	55m servitude
	77m servitude

**4. SITE ACCESS**

Does ready access to the site exist?

If NO, what is the distance over which a new access road will be built

✓YES	
	N/A

Describe the type of access road planned:

**Access to substation site alternative 1 from Piet Retief can be gained by travelling north to north-west via the N2 for approximately 45 kilometres, and turning left onto an unnamed dirt road approximately 1km before the Panbult Silo turn off. After 6.5km the road splits and the site is accessed via the left hand road. After approximately 1.9km the road splits and the site is located approximately 3.5km along the right hand road, on the right-hand (western) side of the gravel road, approximately 300m into the veld.**

**Access to substation site alternative 3 from Piet Retief can be gained by travelling north to north-west via the N2 for approximately 45 kilometres, and taking a left turn-off at the Panbult Silo onto the Amersfoort Road. After approximately 1.5km, the road splits and the site is located approximately 10 km along the right hand road, on the right-hand (northern) side of the road, approximately 200m into the veld.**

**The exact position and type of access roads cannot be determined until the power line positions have been confirmed through the servitude negotiation process. It is therefore recommended that the final road and power line alignments be submitted to the competent authority once these are confirmed and prior to construction.**

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site. SEE ABOVE

## **5. LOCALITY MAP**

An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.). The map must indicate the following:

- an accurate indication of the project site position as well as the positions of the alternative sites, if any;
- indication of all the alternatives identified;
- closest town(s);
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection).

**A locality map is included in Appendix A.**

## 6. LAYOUT/ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

- the property boundaries and numbers of all the properties within 50 metres of the site;
- the current land use as well as the land use zoning of the site;
- the current land use as well as the land use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);
- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

**A Site Layout map indicating the alternative route alignments is included Appendix A.**

## 7. SENSITIVITY MAP

The layout/route plan as indicated above must be overlain with a sensitivity map that indicates all the sensitive areas associated with the site, including, but not limited to:

- watercourses;
- the 1:100 year flood line (where available or where it is required by DWA);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species); and
- critical biodiversity areas.

The sensitivity map must also cover areas within 100m of the site and must be attached in Appendix A.

**Various sensitivity maps for the proposed site alternatives are included in Appendix A.**

## 8. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this report. It must be supplemented with additional photographs of relevant features on the site, if applicable.

**Site Photographs taken along the alternative power lines and substation sites are included in Appendix B. Key features of the site are depicted in the site photographs.**

## 9. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of at least 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

**A schematic drawing of the proposed tower types is included in Appendix C.**

**10. ACTIVITY MOTIVATION**

Motivate and explain the need and desirability of the activity (including demand for the activity):

<b>1. Is the activity permitted in terms of the property's existing land use rights?</b>	<b>✓YES</b>	
<p>The majority of land on which the proposed planned substation are to be stationed, is currently zoned as agricultural or natural veld. However, Eskom is a Statutory Body and as such is exempt in terms of Section 23 of the Land Use Planning Ordinance, 1985 (Ordinance 15 of 1985) from rezoning and subdivision application procedures, therefore no application for rezoning will be undertaken.</p>		
<b>2. Will the activity be in line with the following?</b>		
<b>(a) Provincial Spatial Development Framework (PSDF)</b>	<b>✓YES</b>	
<p>Reference is made to the <b>Mpumalanga Economic Growth and Development Path (2011) Section 3.7.1</b> that mentions that the Integrated Resource Plan will help improve the economic efficiency and create jobs. In order to facilitate growth and job creation in the agricultural sector <b>Section 4.3.2.2 of the Mpumalanga Economic Growth and Development Path (2011)</b> places emphasis on infrastructure development including electricity. The electricity production industry of Mpumalanga is contributing directly and indirectly to the economic growth and job creation as eleven of the currently operational coal-fired power stations in the country are situated in Mpumalanga and contribute roughly 76% of the total electricity generated in South Africa (<b>Mpumalanga Economic Growth and Development Path (2011) Section 4.3.2.4 on Mining and energy industries</b>).</p> <p>The main purpose of the proposed development is for electricity distribution to the railway for coal transport to Richard's Bay. Revenue will be generated for the province by exporting coal to Richard's Bay via the railway. The electricity from the proposed substations will be for the primary use by the railway line as currently this electricity is too unstable to be used for public/commercial use.</p> <p>The Coal Rail Link is identified as one of the existing infrastructures that greatly complement and expand existing opportunities for manufacture and trade, if upgraded and further developed. The proposed Power line and Substation is considered an upgrade of the Coal Link railway line by providing additional electricity capacity to increase the operational capacity of the railway line.</p>		
<b>(b) Urban edge / Edge of Built environment for the area</b>		<b>✓ Please explain</b>
<p>The proposed power line routes and substation sites, lie outside the urban edge/built environment.</p>		

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<b>(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).</b>	✓YES	
<p>The proposed development runs through the following local and district municipalities: Mkhondo Local Municipality and Gert Sibande District Municipality.</p> <p>The <b>Mkhondo Local Municipality IDP (2011-2016)</b>, recognises the strategic position of the Local Municipality in respect of rail freight transport. The IDP is aligned with the Government Priority Outcomes announced by Cabinet in 2010. The IDP aims to contribute to Outcome 6, “an Efficient, Competitive and Responsive Economic Infrastructure Network”, by maintaining and expanding the road and rail network, and the efficiency, capacity and competitiveness of sea ports.</p> <p>The <b>Gert Sibande District Municipality IDP (2014-2015)</b> references the Mpumalanga Economic Growth and Development Path and includes the specific objective of upgrading and maintaining the regional coal haulage network, particularly rail.</p> <p>In terms of Development Principle number two of the <b>Gert Sibande District Municipality SDF 2009</b>, the District needs to “optimally capitalise on the strategic location of the District and its five key economic strips/corridors, and to functionally link all towns and settlements to one another through establishing and maintaining a strategic road and rail network comprising internal and external linkages”.</p> <p>The proposed project is in line with the respective IDPs and SDF of the local and district municipalities, and in several aspects will contribute to achieving the objectives laid out therein.</p>		
<b>(d) Approved Structure Plan of the Municipality</b>	✓NO	
N/A: no approved structure plans exist for the area in question.		
<b>(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)</b>	✓NO	
<p>An EMF is not available for this area. The proposed development would not compromise the integrity of the environmental management priorities for the area. No environmental fatal flaws were identified and it was established that the impacts can be suitably mitigated to low levels. In addition, the development would result in socio-economic benefits for the area at large.</p>		
<b>(f) Any other Plans (e.g. Guide Plan)</b>	✓NO	
N/A: no further plans are available for the area in question.		



<p><b>3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?</b></p>	<p>✓YES</p>	
<p>The <b>Mkhondo Local Municipality IDP (2011-2016)</b>, recognises the strategic position of the Local Municipality in respect of rail freight transport. The IDP is aligned with the Government Priority Outcomes announced by Cabinet in 2010. The IDP aims to contribute to Outcome 6, “an Efficient, Competitive and Responsive Economic Infrastructure Network”, by maintaining and expanding the road and rail network, and the efficiency, capacity and competitiveness of sea ports.</p> <p>Further, the proposed development is part of the SIP’s (Strategic Infrastructure Projects) which are of national importance, providing large capital input and economic growth on a local, regional and national level by increasing the national export capacity within the South African coal mining sector. This will provide employment opportunities throughout the construction and operation of the proposed development. The proposed Coal Link Madlanzini Power line and substation are considered within the timeframe of the SIP’s as per the South African National Infrastructure Plan (2012).</p>		
<p><b>4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)</b></p>		<p>✓NO</p>
<p>The proposed project is not a societal priority, however the proposed project is necessary to increase the electricity capacity of the Transnet railway between Richards Bay and Mpumalanga to respond to increased coal transport demands. This project is designated as part of a “Strategic Infrastructure Project” to aid in the continued development of the mining and export industry of South Africa. Therefore, this project will impact positively on the local, provincial and national economies and ensure that South Africa continues to improve its national transport system, hereby increasing economic output and revenue.</p>		
<p><b>5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)</b></p>	<p>✓YES</p>	
<p>The proposed development does not require municipal services.</p> <p>The proposed power line will require water and electricity resources, however these will be provided through trucked water and diesel generators.</p> <p>Construction waste will be generated during the construction process. Any excavated material not suitable for re-use will be disposed of at a land-fill site. Hazardous material generation is not anticipated, however should small quantities be produced, these would be disposed of at a licensed Hazardous Materials Landfill site. Proof of capacity from the Municipality for the waste disposal services will be included in the Final BAR PPP Proof package.</p>		

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<p><b>6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)</b></p>		<p>✓NO</p>	
<p>The proposed development is not provided for in the infrastructure planning of the municipality as it is a national-level SIP project that is not provided for on a municipal level. Eskom has identified the need to develop the Madlanzini substation and power line in order to meet the increasing electricity demands for coal railway transport.</p>			
<p><b>7. Is this project part of a national programme to address an issue of national concern or importance?</b></p>	<p>✓YES</p>		
<p>This project forms part of a suite of projects throughout Mpumalanga and Kwazulu-Natal, collectively known as the Ermelo-Richards Bay Coal Link Upgrade Project. This project will significantly increase the volume of coal that South Africa can export, meeting the international demand for South African coal. This suite of projects are further considered to form part of the National Strategic Infrastructure Projects and falls within the parameters of <b>SIP 2</b> and <b>SIP 10</b>, thus this proposed development is considered to be of national importance. The proposed development is further in line with the <b>National Spatial Development Perspective</b> which states that “South Africa will become a nation in which investment in infrastructure...support government’s growth and development objectives: by focusing economic growth...in areas where it is most effective and sustainable; by fostering development on the basis of local potential...”.</p>			
<p><b>8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)</b></p>	<p>✓YES</p>		
<p>The site is largely comprised of low value agricultural land and the construction of the proposed substations and power lines would have very little impact on agriculture in the area. Additionally, the area already contains electrical infrastructure and the proposed development would not constitute a vast change in land use. Therefore location factors do favour this land use.</p>			
<p><b>9. Is the development the best practicable environmental option for this land/site?</b></p>	<p>✓YES</p>		
<p>The proposed Madlanzini power line corridors and substation sites are to be located on low-grade agricultural land and the area near the proposed development already contains 88kV and 400kV power lines and the associated servitudes as well as the Iswepe substation. The Madlanzini substation and turn-in power lines will be located close to / at the existing infrastructure. Therefore the proposed development is the best practicable option for the site.</p>			

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<b>10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?</b>	<input checked="" type="checkbox"/> YES	
<p>The negative impacts of the proposed development are low due to the location in a rural area on low grade agricultural land as well as the presence of existing power line and substation infrastructure in the immediate vicinity. Any residual environmental impacts will be mitigated based on the EMPr (Appendix G). The proposed project is necessary to increase the electricity capacity of the Transnet railway between Richards Bay and Mpumalanga to respond to increased coal transport demands. This project is designated as part of a “Strategic Infrastructure Project” to aid in the continued development of the mining and export industry of South Africa. Therefore, this project will impact positively on the local, provincial and national economies and ensure that South Africa continues to improve its national transport system, hereby increasing economic output and revenue. The positive long-term effects of increased national revenue through increased coal exports as well as local and regional job creation outweigh the low negative impacts.</p>		
<b>11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?</b>	<input checked="" type="checkbox"/> NO	
<p>No precedent will be set for future development as the proposed development will sufficiently increase electrical input into the existing Transnet railway line to transport coal for export.</p>		
<b>12. Will any person's rights be negatively affected by the proposed activity/ies?</b>	<input checked="" type="checkbox"/> NO	
<p>Landowners affected by the proposed Madlanzini power line and substation alternatives have been notified timeously (refer to Appendix E2) on the availability of the Draft BAR and EMPr for the proposed development, for comment. A public workshop is also scheduled to be held two weeks into the Draft PPP Phase. Therefore, any concerns with regards to the proposed development can be voiced by all affected I&amp;AP's. Consent for land access and construction (where applicable) will be obtained prior to the commencement of the construction phase.</p>		
<b>13. Will the proposed activity/ies compromise the “urban edge” as defined by the local municipality?</b>	<input checked="" type="checkbox"/> NO	
<p>The proposed development lies outside the urban edge.</p>		
<b>14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?</b>	<input checked="" type="checkbox"/> YES	
<p>The proposed development <b>will contribute</b> to two (2) SIP namely:  <b>SIP 2</b> on “strengthening the logistics and transport corridor between SA’s main industrial hubs” and  <b>SIP 10:</b> Electricity Transmission and Distribution for all – <i>“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.”</i></p>		
<b>15. What will the benefits be to society in general and to the local communities?</b>	<input checked="" type="checkbox"/> Please explain	
<p>The proposed Madlanzini power line and substation, as part of the Coal Link Upgrade, will ensure that electricity capacity to the Ermelo, Mpumalanga – Richards Bay, KwaZulu-Natal railway line contributes to the increase in coal transport capacity for export. Therefore, increased national revenue will benefit the South African society in general, while local and regional job creation will provide employment to the region.</p>		

## BASIC ASSESSMENT REPORT

<b>16. Any other need and desirability considerations related to the proposed activity?</b>	✓ Please explain
No, all need and desirability aspects have been considered in this report.	
<b>17. How does the project fit into the National Development Plan for 2030?</b>	✓ Please explain
With reference to <b>Chapter 4 – Economic infrastructure</b> , sub-chapter “The energy reality” (pg. 164) the NDP notes that “The quality of market competition and regulation in the energy sector has been far from optimal” and that the “crippling [rail] transport constraints” result in “the lack of rail capacity that constrain[s]...the expansion of coal exports.” It is further noted that the export capacity at the Richard’s Bay coal terminal is one third higher than the rail capacity from the coal fields. Therefore, the proposed Madlanzini substation and power line, as part of the Ermelo-Richards Bay Coal Link Upgrade Project, directly contribute to alleviating the identified coal export constraints outlined in the NDP for 2030.	

**18. Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.**

- a) *Promote the integration of the principles of environmental management set out in section 2 into the making of all decisions which may have a significant effect on the environment;*
- **This Basic Assessment process takes into account all the general objectives of Integrated Environmental Management. The social, economic, cultural and biophysical impacts have been considered and evaluated. The impacts will be mitigated and managed according to a detailed Environmental Management Programme.**
- b) *Identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts, maximising benefits and promoting compliance with the principles of environmental management set out in section 2;*
- **Impacts associated with the proposed development of the proposed Madlanzini substation and power line (construction and operational phases and decommissioning where applicable) have been identified, assessed and mitigation measures provided (detailed in Section D of this BAR).**
- c) *Ensure that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them;*
- **This Application is being undertaken in accordance with the NEMA EIA Regulations (2010), the provisions of which themselves take into account the general objectives of Integrated Environmental Management in Section 23 of the NEMA.**
  - **Please also refer to the attached Environmental Management Programme (Appendix G).**
- d) *Ensure that adequate and appropriate opportunity for public participation in decisions that may affect the environment;*
- **This Application has been undertaken in accordance with the Public Participation Requirements (and proposed deviations) set out in the NEMA EIA Regulations (2010).**
  - **Please refer to Section C of this BAR for details relating to PPP.**
- e) *Ensure the consideration of environmental attributes in management and decision-making which may have a significant effect on the environment; and*
- **This Basic Assessment process takes into account all the general objectives of Integrated Environmental Management. The social, economic, cultural and biophysical impacts have been considered and evaluated. The impacts will be mitigated and managed according to a detailed Environmental Management Programme.**
- f) *Identify and employ the modes of environmental management best suited to ensuring that a particular activity is pursued in accordance with the principles of environmental management set out in section*
- **This Basic Assessment process takes into account all the general objectives of Integrated Environmental Management. The social, economic, cultural and biophysical impacts have been considered and evaluated. The impacts will be mitigated and managed according to the detailed Environmental Management Programme attached at Appendix G.**

**19. Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.**

The principles of environmental management as set out in section 2 of the NEMA require that environmental management must place people and their needs at the forefront of development and that development must be socially, environmentally and economically sustainable. As described above; these principles have been taken into account by undertaking a thorough PPP in order to ensure that all Interested and Affected Parties (I&APs) are given the opportunity to be involved in the BA process and ultimately that their comments are taken into consideration by the DEA when reviewing the application. Several specialist studies were also undertaken to ensure that the development is sustainable and that disturbance to the environment is avoided where possible, minimised through appropriate mitigation measures and remedied via appropriate measures.

**11. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES**

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
National Environmental Management Act, 107 of 1998 (as amended)  NEMA EIA Regulations (Government Notices 543; 544; 546) (as amended)	Identification of activities triggered by the proposed project for a Basic Assessment/Environmental Authorisation	Department of Environmental Affairs	1998  2010
National Water Act, 36 of 1998	A General Authorisation/Water Use License Application may be required for the altering or temporary impedance of watercourses during the construction phase.	Department of Water Affairs	1998
National Heritage Act, 25 of 1999	Authorisation from SAHRA for commencement of construction and for a permit if required	SAHRA	1999
Mpumalanga Economic Growth and Development Path (2011)	Identifies the need for additional electricity supply based on spatial development information on a provincial level.	Mpumalanga Province Government	2011
Gert Sibande District Municipality Integrated Development Plan (2014-2015)	Utilised for socio-economic status of the receiving environment	Gert Sibande District Municipality	2014
Census 2011 Municipal report	Utilised for socio-economic	Statistics South Africa	2011

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Mpumalanga	status of the receiving environment		
The Mkhondo Local Municipality IDP (2011-2016),	Identifies the importance of rail freight transport in the municipality.	Mkhondo Local Municipality	2011
Gert Sibande District Municipality SDF 2009	Identifies the importance of developing a rail network comprising internal and external linkages.	Gert Sibande District Municipality	2009
South African National Infrastructure Plan (2012).	Identifies the importance of the proposed development in terms of national planning.	South African National Government	2012
Biodiversity Sector Plan (CBA Maps)	Identifies the extent of CBA's at the proposed development site	SANBI	2010
The Vegetation of South Africa, Lesotho and Swaziland. Mucina & Rutherford (2006). SANBI, Pretoria	Utilised as a reference guide for the identification of upgrade-specific environmental information	SANBI	2006
Mpumalanga Nature Conservation Act (MNCA) (Act 10 of 1998)	Permits must be obtained from the Mpumalanga Tourism and Parks Agency (MTPA).	Mpumalanga Tourism and Parks Agency (MTPA).	1998

### 12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

#### a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

✓YES	
Approx. 10 m <sup>3</sup>	

If YES, what estimated quantity will be produced per month?

How will the construction solid waste be disposed of (describe)?

**Solid waste (minimal construction waste and regular household waste) will be collected by independent contractors and disposed of at a registered licensed municipal landfill site with proof of safe disposal required.**

Where will the construction solid waste be disposed of (describe)?

**Solid waste (construction waste and builders rubble) will be collected by independent contractors and disposed of at the registered licensed municipal landfill site with proof of safe disposal required.**

Will the activity produce solid waste during its operational phase?

	✓NO
N/A	

If YES, what estimated quantity will be produced per month?

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How will the solid waste be disposed of (describe)?

N/A

If the solid waste will be disposed of into a municipal waste stream, indicate which registered landfill site will be used.

N/A

Where will the solid waste be disposed of if it does not feed into a municipal waste stream (describe)?

N/A

*If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.*

Can any part of the solid waste be classified as hazardous in terms of the NEM:WA? [REDACTED] ✓NO

If YES, inform the competent authority and request a change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

Is the activity that is being applied for a solid waste handling or treatment facility? [REDACTED] ✓NO

If YES, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

### b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system? [REDACTED] ✓NO

If YES, what estimated quantity will be produced per month? m<sup>3</sup>

Will the activity produce any effluent that will be treated and/or disposed of on site? [REDACTED] ✓NO

*If YES, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.*

Will the activity produce effluent that will be treated and/or disposed of at another facility? [REDACTED] ✓NO

If YES, provide the particulars of the facility:

<b>Facility name:</b>	N/A		
<b>Contact person:</b>	N/A		
<b>Postal address:</b>	N/A		
<b>Postal code:</b>	N/A		
<b>Telephone:</b>	N/A	<b>Cell:</b>	N/A
<b>E-mail:</b>	N/A	<b>Fax:</b>	N/A

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

N/A



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### c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere other than exhaust emissions and dust associated with construction phase activities?

NO

If YES, is it controlled by any legislation of any sphere of government?

If YES, the applicant must consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If NO, describe the emissions in terms of type and concentration:

N/A

### d) Waste permit

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA?

NO

If YES, please submit evidence that an application for a waste permit has been submitted to the competent authority

### e) Generation of noise

Will the activity generate noise?

YES

If YES, is it controlled by any legislation of any sphere of government?

NO

Describe the noise in terms of type and level:

**Noise, during normal working hours associated with the construction phase of the project is anticipated. Any equipment used during the construction or operational phase will not exceed a noise level of 80 decibel amperes (dbA). The noise effect of the corona (substation component) during the operational phase is not significant due to the isolated location of Substation Alternative Site 1 and the Preferred Alternative Site 3.**

## 13. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

Municipal	Water board	Groundwater	River, stream, dam or lake	Other	<input checked="" type="checkbox"/> <b>The activity will not use water</b>
-----------	-------------	-------------	----------------------------	-------	--

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

litres

Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs?

YES

If YES, please provide proof that the application has been submitted to the Department of Water Affairs.

**Awaiting comments from Department of Water and Sanitation (DWS) on the Draft BAR to confirm if a water use authorisation is required for construction activities at/near watercourses. Should an application be necessary, proof of submission to DWS will be provided in due course. A minimal amount of water may be required during the construction phase, this water will be supplied by the Municipality and will be trucked to the site. The amount of water is assumed to be negligible and only required for the foundations. The Municipality will be consulted in this regard through the Public Participation Process.**

#### **14. ENERGY EFFICIENCY**

Describe the design measures, if any, which have been taken to ensure that the activity is energy efficient:

**The proposed development does not have specific energy efficient measures implemented.**

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

**The proposed development does not contain any alternative energy sources, as the development is an electricity transmission and distribution infrastructure.**

**SECTION B: SITE/AREA/PROPERTY DESCRIPTION**

**Important notes:**

1. For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section B and indicate the area, which is covered by each copy No. on the Site Plan.

Section B Copy No. (e.g. A):

2. Paragraphs 1 - 6 below must be completed for each alternative.

3. Has a specialist been consulted to assist with the completion of this section?  YES  NO  
 If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix I. All specialist reports must be contained in Appendix D.

**Property description/physical address:**

<b>Province</b>	Mpumalanga	
<b>District Municipality</b>	Gert Sibande District Municipality	
<b>Local Municipality</b>	Mkhondo Local Municipality	
<b>Ward Number(s)</b>	15	
<b>Farm name and number</b>	Please refer to list in Appendix E3	
<b>Portion number</b>	Please refer to list in Appendix E3	
<b>SG Code</b>	Please refer to list in Appendix E3	

Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application including the same information as indicated above.

**Current land-use zoning as per local municipality IDP/records:**

**Agriculture and Open Natural Space**

In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to, to this application.

Is a change of land-use or a consent use application required?  YES  NO

**1. GRADIENT OF THE SITE**

Indicate the general gradient of the site.

**Substation Site Alternative 1 (“South-East Option”)**

**Alternative 1: Substation Site “South-East” option**

Flat	✓1:50 1:20	–	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
------	---------------	---	-------------	-------------	--------------	-------------	------------------

**400kV Route Alternative 1 “South-East” option**

Flat	✓1:50 1:20	–	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
------	---------------	---	-------------	-------------	--------------	-------------	------------------

**Route Alternative 1A: 88kV “South-East” option**

Flat	✓1:50 1:20	–	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
------	---------------	---	-------------	-------------	--------------	-------------	------------------

**Route Alternative 1C: 88kV “South-East” option**

Flat	✓1:50 1:20	–	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
------	---------------	---	-------------	-------------	--------------	-------------	------------------

**Route Alternative 2A: 88kV “South-East” option**

Flat	✓1:50 1:20	–	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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**Substation Site Alternative 3 (“North-West Option”) (Preferred Alternative)**

**Alternative 3: Substation Site “North-West” option (Preferred Alternative)**

Flat	✓1:50 1:20	–	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
------	---------------	---	-------------	-------------	--------------	-------------	------------------

**400kV Route Alternative 3 (Preferred Alternative)**

Flat	✓1:50 1:20	–	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
------	---------------	---	-------------	-------------	--------------	-------------	------------------

**Route Alternative 3: 88kV (Preferred Alternative)**

Flat	✓1:50 1:20	–	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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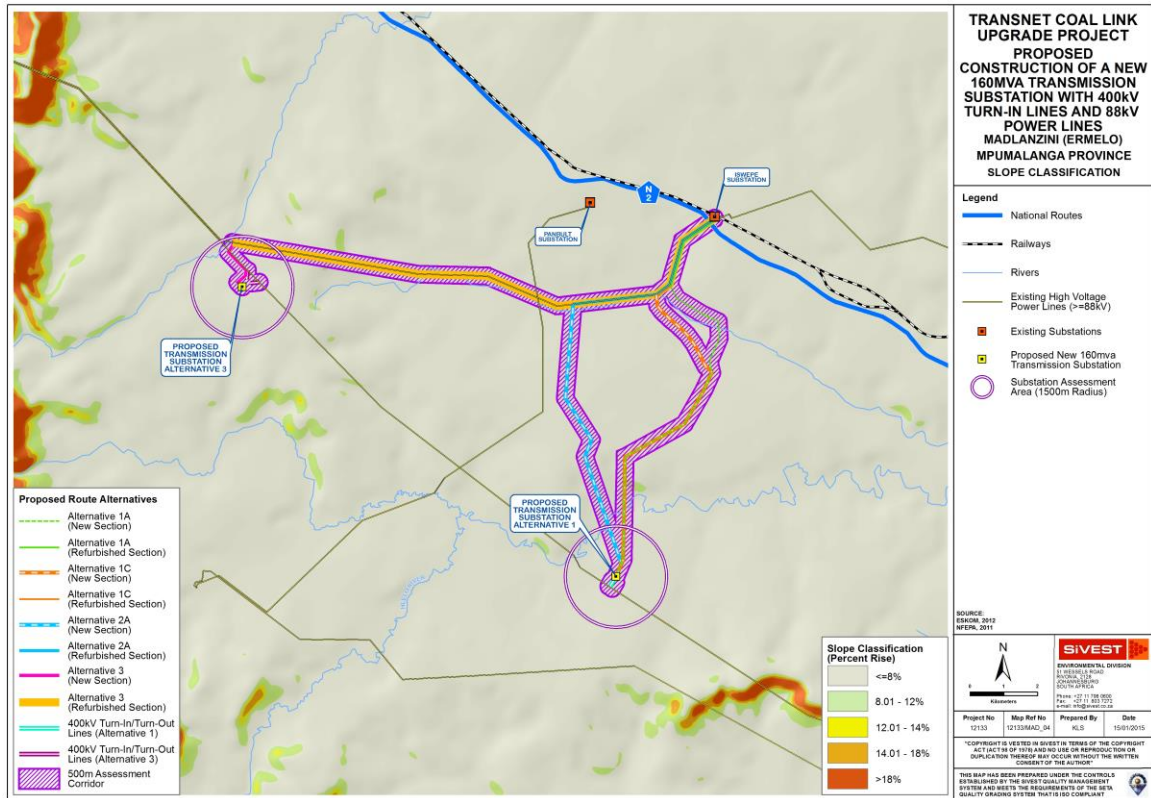


Figure 5: Slope classification Map

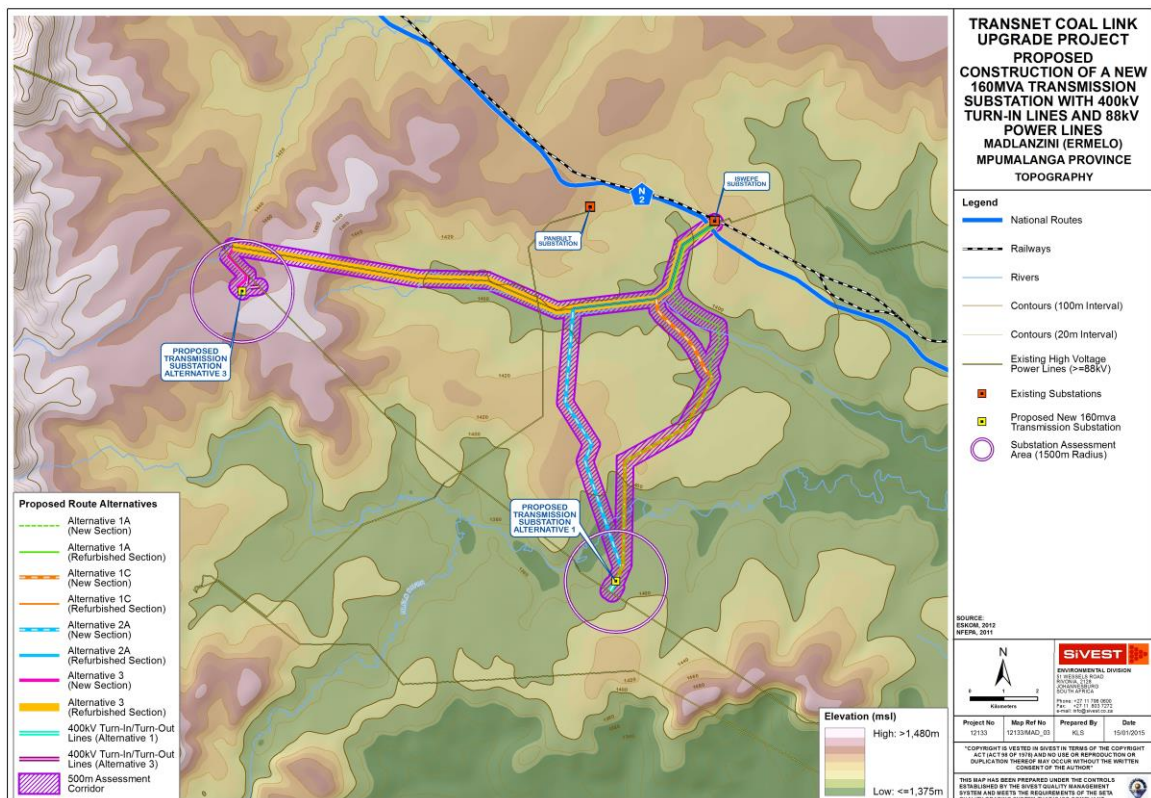


Figure 6: Topography Map

**2. LOCATION IN LANDSCAPE**

Indicate the landform(s) that best describes the site:

2.1 Ridgeline	<input type="checkbox"/>	2.4 Closed valley	<input type="checkbox"/>	2.7 Undulating plain / low hills	<input checked="" type="checkbox"/>
2.2 Plateau	<input type="checkbox"/>	2.5 Open valley	<input type="checkbox"/>	2.8 Dune	<input type="checkbox"/>
2.3 Side slope of hill/mountain	<input type="checkbox"/>	2.6 Plain	<input type="checkbox"/>	2.9 Seafront	<input type="checkbox"/>
2.10 At sea	<input type="checkbox"/>				

**3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE**

Is the site(s) located on any of the following?

	Alternative 1: Substation "South-East" option	Alternative 1: 400kV power line option	Alternative 1A: 88kV power line option
Shallow water table (less than 1.5m deep)	<input checked="" type="checkbox"/> YES	<input checked="" type="checkbox"/> YES	<input checked="" type="checkbox"/> YES
Dolomite, sinkhole or doline areas	<input type="checkbox"/> NO	<input type="checkbox"/> NO	<input type="checkbox"/> NO
Seasonally wet soils (often close to water bodies)	<input checked="" type="checkbox"/> YES	<input checked="" type="checkbox"/> YES	<input checked="" type="checkbox"/> YES
Unstable rocky slopes or steep slopes with loose soil	<input type="checkbox"/> NO	<input type="checkbox"/> NO	<input type="checkbox"/> NO
Dispersive soils (soils that dissolve in water)	<input type="checkbox"/> NO	<input type="checkbox"/> NO	<input type="checkbox"/> NO
Soils with high clay content (clay fraction more than 40%)	<input type="checkbox"/> NO	<input type="checkbox"/> NO	<input type="checkbox"/> NO
Any other unstable soil or geological feature	<input type="checkbox"/> NO	<input type="checkbox"/> NO	<input type="checkbox"/> NO
An area sensitive to erosion	<input checked="" type="checkbox"/> YES	<input checked="" type="checkbox"/> YES	<input checked="" type="checkbox"/> YES

	Alternative 1C: 88kV power line option	Alternative 2A: 88kV power line option
Shallow water table (less than 1.5m deep)	<input checked="" type="checkbox"/> YES	<input checked="" type="checkbox"/> YES
Dolomite, sinkhole or doline areas	<input type="checkbox"/> NO	<input type="checkbox"/> NO
Seasonally wet soils (often close to water bodies)	<input checked="" type="checkbox"/> YES	<input checked="" type="checkbox"/> YES
Unstable rocky slopes or steep slopes with loose soil	<input type="checkbox"/> NO	<input type="checkbox"/> NO
Dispersive soils (soils that dissolve in water)	<input type="checkbox"/> NO	<input type="checkbox"/> NO
Soils with high clay content (clay fraction more than 40%)	<input type="checkbox"/> NO	<input type="checkbox"/> NO
Any other unstable soil or geological feature	<input type="checkbox"/> NO	<input type="checkbox"/> NO
An area sensitive to erosion	<input checked="" type="checkbox"/> YES	<input checked="" type="checkbox"/> YES

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	<b>Alternative 3: Substation “North-West” option</b>	<b>Alternative 3: 88kV power line option</b>	<b>Alternative 3: 400kV power line option</b>
Shallow water table (less than 1.5m deep)	✓YES	✓YES	✓YES
Dolomite, sinkhole or doline areas	✓NO	✓NO	✓NO
Seasonally wet soils (often close to water bodies)	✓YES	✓YES	✓YES
Unstable rocky slopes or steep slopes with loose soil	✓NO	✓NO	✓NO
Dispersive soils (soils that dissolve in water)	✓NO	✓NO	✓NO
Soils with high clay content (clay fraction more than 40%)	✓NO	✓NO	✓NO
Any other unstable soil or geological feature	✓NO	✓NO	✓NO
An area sensitive to erosion	✓YES	✓YES	✓YES

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted.

**A geotechnical assessment of the proposed substation sites was conducted by W. Kretzinger, L Fitschen and M. Richter of WorleyParsons RSA (Pty) Ltd and is included in Appendix D.**

The geology of the two substation alternative sites are similar, and they are underlain by silty slightly clayey sand topsoils to depths up to 0.50m, underlain by silty sandy gravels of the ferricrete and hardpan ferricrete layers, and further underlain by clayey silty sands, silty sandy clays or clayey silts forming residual sandstones and residual shales. The sites are generally characterised by being topographically very gently sloping.

Due to the higher abundance of a hardpan ferricrete horizon, no evidence of groundwater and generally flatter topography, Site Substation Alternative 1 can be considered to be the less problematic, and likely the better option for the proposed development, provided that the necessary foundation requirements are met. Site Substation Alternative 1 also has more occurrences of soils suitable for use in bulk fills. Founding conditions will be similar on Substation Alternative sites.

However Site Substation Alternative 3 is also acceptable.

**4. GROUND COVER**

Indicate the types of groundcover present on the site. The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

**Alternative 1: Substation Site, 88kV and 400kV power lines**

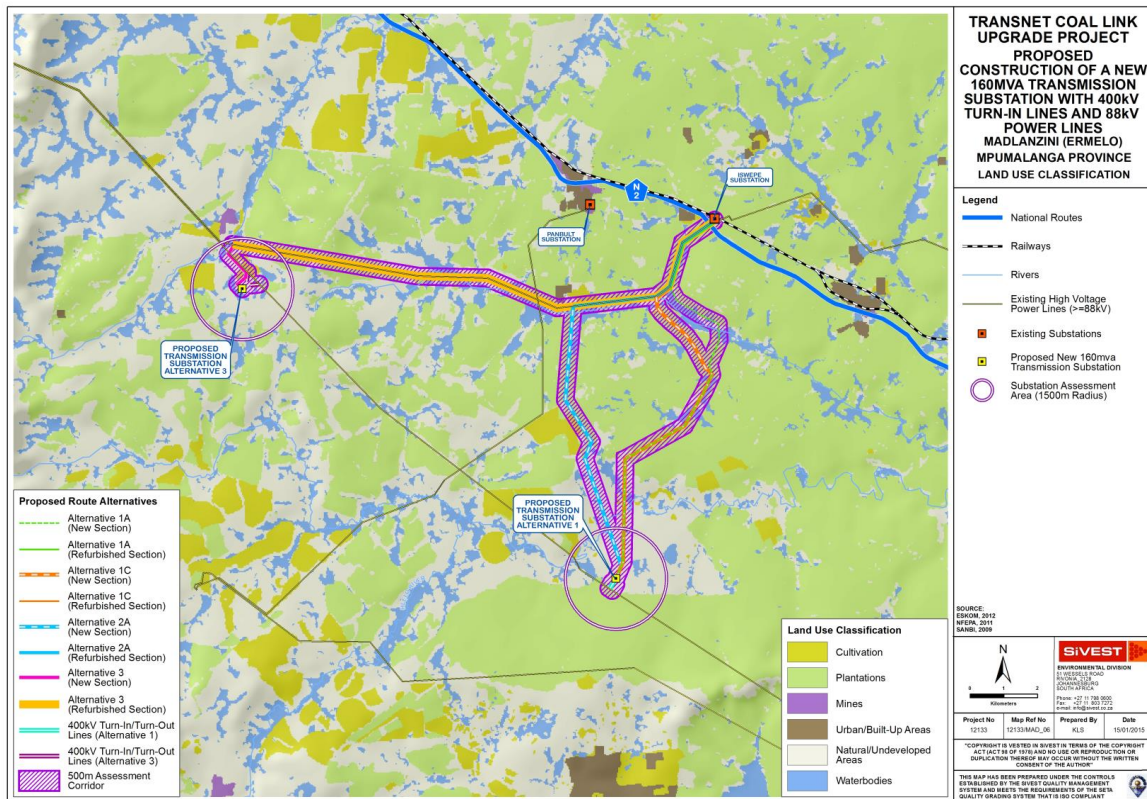
Natural veld - good condition <sup>E</sup>	Natural veld with scattered aliens <sup>E</sup>	Natural veld with heavy alien	Veld dominated by alien species <sup>E</sup>	Gardens
--	---	-------------------------------	--	---------

# BASIC ASSESSMENT REPORT

		infestation <sup>E</sup>		
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

### Alternative 3: Preferred Substation Site, 88kV and 400kV power lines

Natural veld - good condition <sup>E</sup>	Natural veld with scattered aliens <sup>E</sup>	Natural veld with heavy alien infestation <sup>E</sup>	Veld dominated by alien species <sup>E</sup>	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil



**Figure 7: Land Use Map**

If any of the boxes marked with an “E” is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn’t have the necessary expertise.

**The full biodiversity specialist report is included in Appendix D.**

## 5. SURFACE WATER

Indicate the surface water present on and or adjacent to the site and alternative sites?

Perennial River	✓YES	
Non-Perennial River	✓YES	



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Permanent Wetland	✓ YES	
Seasonal Wetland	✓ YES	
Artificial Wetland		✓ NO
Estuarine / Lagoonal wetland		✓ NO

If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse.

Surface Water Features on site included:

- Twelve (12) channelled valley-bottom wetlands,
- Fifteen (15) depression wetlands,
- One (1) floodplain wetland associated with the Hlelo River,
- Twelve (12) hillslope seep wetlands,
- Ten (10) un-channelled valley-bottom wetlands,
- The Ngwempisi River and associated riparian corridor, and
- Two (2) man-made impoundments.

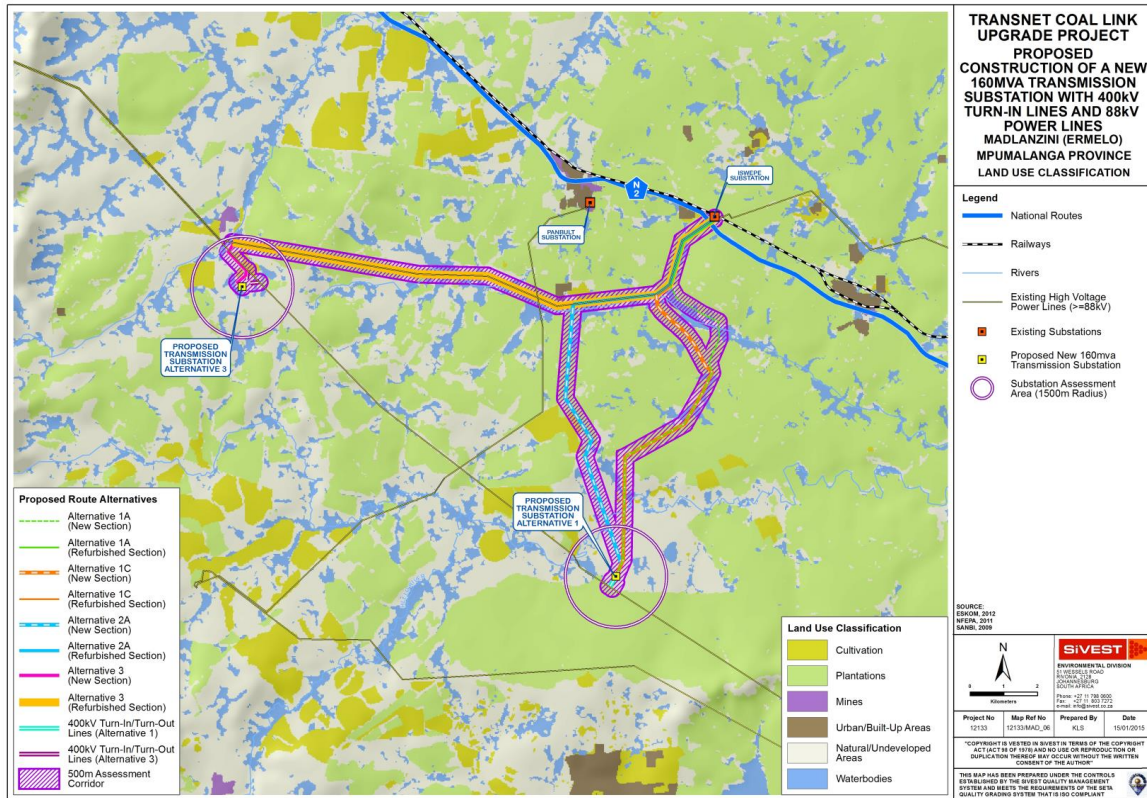
**The full surface water specialist report is included in Appendix D.**

### 6. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

✓ Natural area	Dam or reservoir	Polo fields
Low density residential	Hospital/medical centre	Filling station <sup>H</sup>
Medium density residential	School	Landfill or waste treatment site
High density residential	Tertiary education facility	✓ Plantation
Informal residential <sup>A</sup>	Church	✓ Agriculture
Retail commercial & warehousing	Old age home	✓ River, stream or wetland
Light industrial	Sewage treatment plant <sup>A</sup>	Nature conservation area
Medium industrial <sup>AN</sup>	Train station or shunting yard <sup>N</sup>	✓ Mountain, koppie or ridge
Heavy industrial <sup>AN</sup>	✓ Railway line <sup>N</sup>	Museum
Power station	Major road (4 lanes or more) <sup>N</sup>	Historical building
Office/consulting room	Airport <sup>N</sup>	Protected Area
Military or police base/station/compound	Harbour	✓ Graveyard
Spoil heap or slimes dam <sup>A</sup>	Sport facilities	✓ Archaeological site
Quarry, sand or borrow pit	Golf course	Other land uses (describe)

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**Figure 7: Land Use Map**

If any of the boxes marked with an "N" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

**Railway: the refurbished 88kV power line associated with all power line alternatives will terminate at the existing Iswepe Traction substation located next to the railway line. The proposed refurbishment of the power line will not negatively impact the railway line. The proposed power line is to supply additional power to the Iswepe Traction substation in order to supply the railway line with additional electricity to operate more locomotives.**

If any of the boxes marked with an "An" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

N/A

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

N/A

Does the proposed site (including any alternative sites) fall within any of the following:

Critical Biodiversity Area (as per provincial conservation plan)	✓YES	
Core area of a protected area?		✓NO
Buffer area of a protected area?		✓NO
Planned expansion area of an existing protected area?		✓NO
Existing offset area associated with a previous Environmental Authorisation?		✓NO

Buffer area of the SKA?

✓NO

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A.

## 7. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or paleontological sites, on or close (within 20m) to the site? If YES, explain:

✓YES

**Frans Prins and Sidney Miler from Active Heritage cc. undertook a Heritage Impact Assessment dated 23 January 2015. It was concluded that three Cemeteries and one Grave Yard occur within the assessed corridors for the power line alternatives, however that it would be adequately accommodated to maintain large enough buffers around heritage features that they are not affected by the proposed development. The specialist report stated that there is no archaeological reason that the development may not proceed on the remainder of the footprint as planned.**

**The full heritage report is included in Appendix D.**

If uncertain, conduct a specialist investigation by a recognised specialist in the field (archaeology or palaeontology) to establish whether there is such a feature(s) present on or close to the site. Briefly explain the findings of the specialist:

Will any building or structure older than 60 years be affected in any way?

✓NO

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

✓NO

If YES, please provide proof that this permit application has been submitted to SAHRA or the relevant provincial authority.

**Refer to above and the specialist report in Appendix D.**

## 8. SOCIO-ECONOMIC CHARACTER

### a) Local Municipality

Please provide details on the socio-economic character of the local municipality in which the proposed site(s) are situated.

Level of unemployment:

**According to the 2011 Census Mkhondo Local Municipality has a total population of 171 982, with 59% of people of working age. The unemployment rate for the municipality is 35,9% and the youth unemployment rate is 44,6%. These unemployment rates are an improvement on the 2001 unemployment rates which were 45,8% and 53,8% respectively, however 2011 unemployment rates are still high in comparison to the Gert Sibande District Municipality in which the LM is situated**

(Stats, SA).

Reference is made to the Gert Sibande District Municipality IDP (2012 – 2016): Levels of unemployment (gender specific) are as follows:

GERT SIBANDE DM		UNEMPLOYMENT 2009 OFFICIAL DEFINITION (%)	
LABOUR		UNEMPLOYMENT RATE,	NUMBER OF UNEMPLOYED PEOPLE
Male		18.1%	34,216
Female		28.4%	40,160
<b>Total</b>		<b>22.5%</b>	<b>74,376</b>

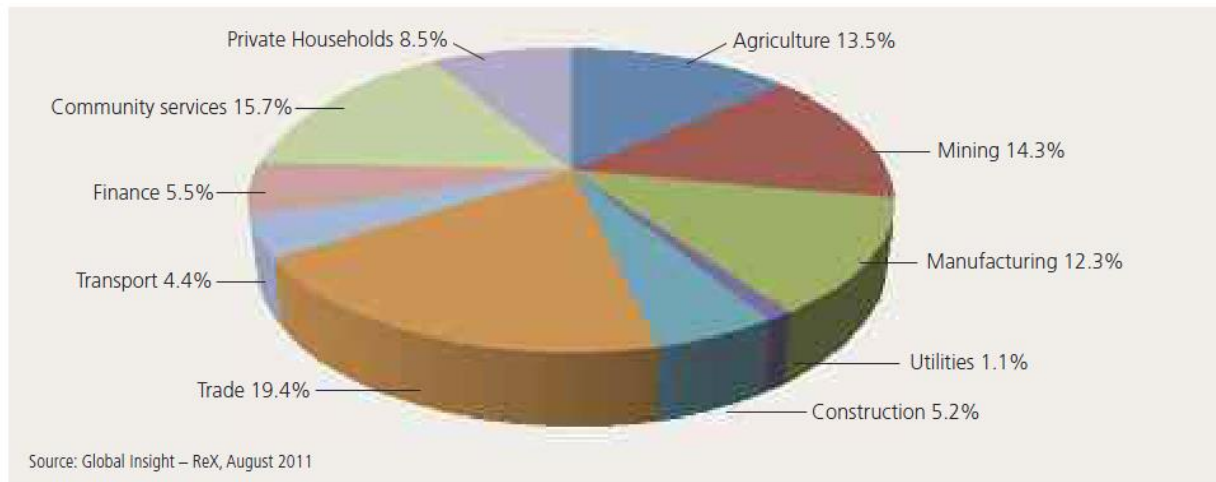
Source: Global Insight South Africa: Regional Explorer 421 (2.2j), 2010

*“The table above indicates that there are more female’s unemployed than men. While the unemployment rate for females is also much higher than men.”*

Economic profile of local municipality:

In terms of GDP the two most important employment sectors are agriculture at 36% and community services at 18%. These sectors are followed by trade at 13% and manufacturing at 12%. The economy is not very diversified and is still highly reliant on the agricultural sector (Mkhondo LM IDP, 2011 – 2016).

Reference is made to the Gert Sibande District Municipality IDP (2012 – 2016): Sector Percentage employment by industry



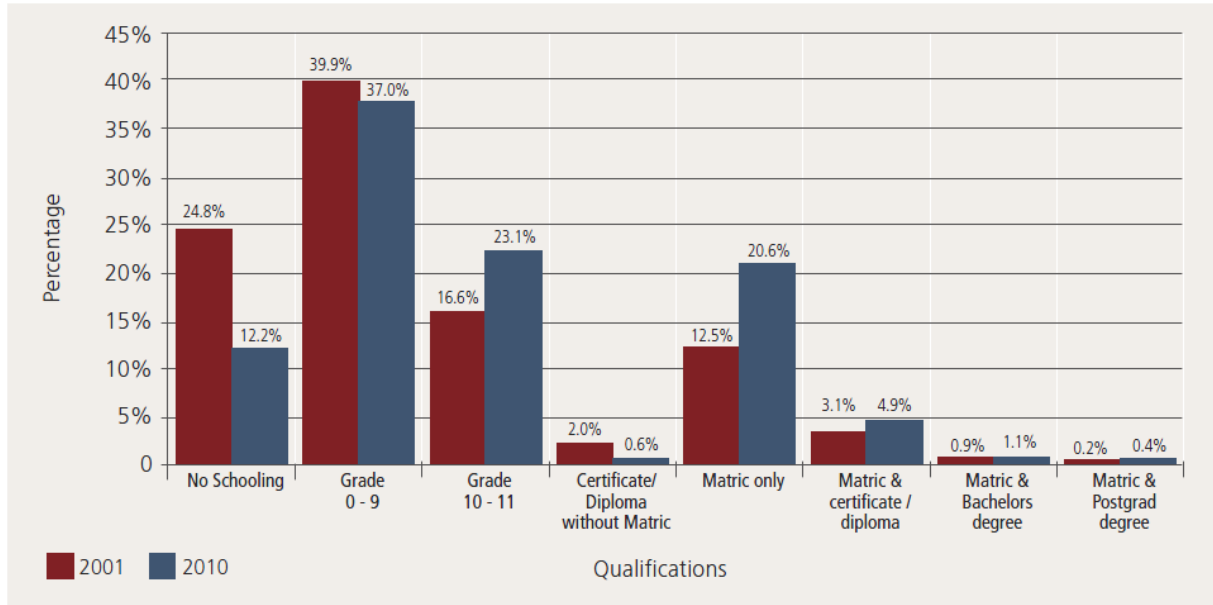
*“Employment by industry in Gert Sibande. Trade (19.4 %), community services (15.7 %), mining (14.3 %) and agriculture (13.5 %) contributed the largest shares towards employment in the district in 2010. Utilities (1.1 %) and transport (4.4 %) sectors recorded the lowest employment contributions.”*

Level of education:

As of the 2011 Census 18% of people older than 20 had no schooling. 25,5% of people older than 20 had formal education up to matric level, and 5,4% of people older than 20 had higher education.

This is an improvement since the 2001 Census when these levels were 33,7%, 12,8% and 3,6% respectively (Stats SA, 2011).

Reference is made to the Gert Sibande District Municipality IDP (2012 – 2016) on education statistics:



Source: Local Municipalities Data 2010

“The percentage of people (15 years +) with no schooling in Gert Sibande District Municipality decreased from 24.8 % in 1996 to 12.2 % in 2010 whilst the percentage of people with matric and post matric qualifications increased from 16.6 % to 27.1 % in 2010. It is also evident that the number of people with no schooling and without matric is decreasing as more people are now opting to finish their matric and continue to obtain certificates, diplomas or degrees.”

**b) Socio-economic value of the activity**

What is the expected capital value of the activity on completion?

What is the expected yearly income that will be generated by or as a result of the activity?

Will the activity contribute to service infrastructure?

Is the activity a public amenity?

How many new employment opportunities will be created in the development and construction phase of the activity/ies?

What is the expected value of the employment opportunities during the development and construction phase?

What percentage of this will accrue to previously disadvantaged individuals?

How many permanent new employment opportunities will be created during the operational phase of the activity?

What is the expected current value of the employment opportunities during the first 10 years?

<b>R 3 470 000 000</b>
<b>Transnet will be able to increase their export tonnage</b>
<b>YES ✓</b>
<b>NO ✓</b>
<b>Unknown at this stage</b>
<b>R 48 100 362</b>
<b>80%</b>
<b>Unknown at this stage</b>
<b>Unknown at this stage</b>

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What percentage of this will accrue to previously disadvantaged individuals?

80%

### 9. BIODIVERSITY

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the ecosystem status consult <http://bgis.sanbi.org> or [BGIShelp@sanbi.org](mailto:BGIShelp@sanbi.org). Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/EAP's responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as Appendix D to this report.

**(Madlanzini substation Site Alternative 1 and Power Line corridors 1A, 1C and 2A)**

- a) **Indicate the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category)**

Systematic Biodiversity Planning Category				If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
✓Critical Biodiversity Area (CBA)	✓Ecological Support Area (ESA)	✓Other Natural Area (ONA)	No Natural Area Remaining (NNR)	<p>Although the majority of the area falls within an area that is either heavily or moderately modified (ONA) due to current activities in the area, the southern portion of the site, near the Hlelo wetland, falls within a terrestrial CBA.</p> <p>Additionally there is a CBA wetland in the vicinity of Substation alternative 1. The area is an ESA in terms of surface water features.</p>

- b) **Indicate and describe the habitat condition on site**

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (Including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc.).
Natural	55%	Area contains high ecological functionality, high species diversity and intact habitat integrity.
Near Natural (incl. areas with low to moderate level of alien invasive plants)	5%	Ecological functionality and habitat integrity is moderate to low.
Degraded (incl. areas heavily	20%	The diversity of alien plant species and severe vegetation transformation result in this habitat unit having a low

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invaded by alien plants)		ecological sensitivity and little conservation value from a floral biodiversity perspective.
Transformed (incl. cultivation, dams, urban, plantation, roads, etc)	20%	Roads, existing power lines, plantations

**c) Complete the table to indicate:**

- (i) The type of vegetation, including its ecosystem status, present on the site; and
- (ii) Whether an aquatic ecosystem is present on site.

Terrestrial Ecosystems		Aquatic Ecosystems						
Eastern Highveld Grassland								
Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	Critical	Wetlands, Rivers			Estuary		Coastline	
	Endangered							
	✓Vulnerable							
	Least Threatened							
	✓YES	NO	UNSURE	YES	NO	YES	NO	

**d) Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats)**

The vegetation is short dense grassland dominated by the usual Highveld grass composition (*Aristida*, *Digitaria*, *Eragrostis*, *Themeda*, *Tristachya* etc.) with small, scattered rocky outcrops with wiry, sour grasses and some woody species (*Acacia caffra*, *Celtis africana*, *Diospyros lyciodes* subsp *lyciodes*, *Parinari capensis*, *Protea caffra*, *P. welwitschii* and *Rhus magalismsontanum*).

Red Data List (RDL) species are unlikely to occur within the study area and thus no impact on such species as a result of the proposed power line and substation development is likely. However, two regional Species of Conservation Concern (SCC) were encountered within the wetland habitat unit, namely *Zantedeschia albomaculata* and *Kniphofia porphyrantha*. Both these species are protected under the Mpumalanga Nature Conservation Act (MNCA) (Act 10 of 1998), and if any of these are to be disturbed, permits must be obtained from the Mpumalanga Tourism and Parks Agency (MTPA). Furthermore, several other species protected under this Act, such as species in the family's *Orchidiaceae*, *Iridaceae* and *Liliaceae*, are highly likely to occur within the study area, especially in the intact grassland habitat unit.

The intact grassland habitat is applicable to Alternative 1, hence the preference for Alternative 3.

**Please refer to the Biodiversity Assessment Report included in Appendix D1 of this report.**

**(Madlanzini Substation Site 3 and Power Line Corridor 3)**

- a) Indicate the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category)

Systematic Biodiversity Planning Category				If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
✓Critical Biodiversity Area (CBA)	✓Ecological Support Area (ESA)	✓Other Natural Area (ONA)	No Natural Area Remaining (NNR)	Although the majority of the area falls within an area that is either heavily or moderately modified, some surface water features on the site footprint are categorised as CBAs and ESAs.

- b) Indicate and describe the habitat condition on site

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (Including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc.).
Natural	10%	Area contains high ecological functionality, high species diversity and intact habitat integrity.
Near Natural (incl. areas with low to moderate level of alien invasive plants)	20%	Ecological functionality and habitat integrity is moderate to low.
Degraded (incl. areas heavily invaded by alien plants)	35%	The diversity of alien plant species and severe vegetation transformation result in this habitat unit having a low ecological sensitivity and little conservation value from a floral biodiversity perspective.
Transformed (incl. cultivation, dams, urban, plantation, roads, etc)	35%	Roads, existing power lines, plantations



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**c) Complete the table to indicate:**

- (i) The type of vegetation, including its ecosystem status, present on the site; and
- (ii) Whether an aquatic ecosystem is present on site.

Terrestrial Ecosystems Eastern Highveld Grassland		Aquatic Ecosystems						
<b>Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)</b>	Critical	Wetlands, Rivers			Estuary		Coastline	
	Endangered							
	<b>✓Vulnerable</b>	<b>✓YES</b>	NO	UNSURE	YES	NO	YES	NO
	Least Threatened							

**d) Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats)**

The vegetation is short dense grassland dominated by the usual Highveld grass composition (*Aristida*, *Digitaria*, *Eragrostis*, *Themeda*, *Tristachya* etc.) with small, scattered rocky outcrops with wiry, sour grasses and some woody species (*Acacia caffra*, *Celtis africana*, *Diospyros lyciodes* subsp *lyciodes*, *Parinari capensis*, *Protea caffra*, *P. welwitschii* and *Rhus magalismontanum*).

Red Data List (RDL) species are unlikely to occur within the study area and thus no impact on such species as a result of the proposed power line and substation development is likely. However, two regional Species of Conservation Concern (SCC) were encountered within the wetland habitat unit, namely *Zantedeschia albomaculata* and *Kniphofia porphyrantha*. Both these species are protected under the Mpumalanga Nature Conservation Act (MNCA) (Act 10 of 1998), and if any of these are to be disturbed, permits must be obtained from the Mpumalanga Tourism and Parks Agency (MTPA). Furthermore, several other species protected under this Act, such as species in the family's *Orchidiaceae*, *Iridaceae* and *Liliaceae*, are highly likely to occur within the study area, especially in the intact grassland habitat unit.

**Please refer to the Biodiversity Assessment Report included in Appendix D1 of this report.**

## SECTION C: PUBLIC PARTICIPATION

### 1. ADVERTISEMENT AND NOTICE

<b>Publication name</b>	Sowetan Newspaper	
	Ermelo Tribune	
	Zululand Observer	
	Paulpietersburg Advertiser	
<b>Date published</b>	Adverts will be published between the 23 <sup>rd</sup> March – 3 <sup>rd</sup> April 2015 (Final Date will be included in the FBAR)	
<b>Site notice position</b>	<b>Latitude</b>	<b>Longitude</b>
	To be included in the FBAR	
<b>Date placed</b>	Site Notices will be placed between the 23 <sup>rd</sup> March – 3 <sup>rd</sup> April 2015 (Final Date will be included in the FBAR)	

Include proof of the placement of the relevant advertisements and notices in Appendix E1.

### 2. DETERMINATION OF APPROPRIATE MEASURES

Provide details of the measures taken to include all potential I&APs as required by Regulation 54(2)(e) and 54(7) of GN R.543.

Key stakeholders (other than organs of state) identified in terms of Regulation 54(2)(b) of GN R.543:

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)
<b>Refer to Appendix E for all key stakeholder information.</b>		

Include proof that the key stakeholder received written notification of the proposed activities as Appendix E2. This proof may include any of the following:

- e-mail delivery reports;
- registered mail receipts;
- courier waybills;
- signed acknowledgements of receipt; and/or
- or any other proof as agreed upon by the competent authority.

### 3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summary of main issues raised by I&APs	Summary of response from EAP
The Public Participation Process for the Draft BAR is still to be completed. Comments and issues raised by Interested and Affected Parties, as well as responses sent by the EAP during the Public Participation Process will be incorporated into the Final Basic Assessment Report and the Comments and Responses chapter (Appendix E3) for review by all registered	

**stakeholders and for submission to the Department of Environmental Affairs.**

**4. COMMENTS AND RESPONSE REPORT**

The practitioner must record all comments received from I&APs and respond to each comment before the Draft BAR is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to the Final BAR as Appendix E3.

**Refer to Appendix E3 for Comments and Response Report.**

**5. AUTHORITY PARTICIPATION**

Authorities and organs of state identified as key stakeholders:

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
<b>Please refer to Appendix E4.</b>					

Include proof that the Authorities and Organs of State received written notification of the proposed activities as appendix E4.

In the case of renewable energy projects, Eskom and the SKA Project Office must be included in the list of Organs of State.

**6. CONSULTATION WITH OTHER STAKEHOLDERS**

Note that, for any activities (linear or other) where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub-regulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable. Application for any deviation from the regulations relating to the public participation process must be submitted prior to the commencement of the public participation process.

A list of registered I&APs must be included as appendix E5.

Copies of any correspondence and minutes of any meetings held must be included in Appendix E6.

**Refer to Appendix E for a list of registered I&APs, copies of correspondence and minutes of meetings.**

## SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

### 1. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A(2) of this report.

**Please note: Due to the homogenous nature of the area traversed by the various alternatives, both substations and all power line alternatives were assessed together.**

Activity	Impact summary	Significance	Proposed mitigation
Botanical	<b>Direct impacts:</b> Loss of floral habitat including sensitive habitat types, fragmentation of habitat.	Low negative	<ul style="list-style-type: none"> <li>▪ Avoid unnecessary clearance of vegetation, especially within sensitive habitat.</li> <li>▪ Minimise access and maintenance road wetland crossings to what is absolutely necessary.</li> <li>▪ Acute angle crossings of wetlands must be minimised.</li> <li>▪ Restrict vehicles to travelling only on designated roadways to limit the ecological footprint of the proposed development activities.</li> <li>▪ Monitor access roads and disturbed areas for erosion and implement control measures as necessary.</li> <li>▪ All soils compacted as a result of construction activities falling outside of the development footprint areas should be ripped and profiled.</li> <li>▪ To prevent the erosion of top soils, management measures may include berms, soil traps, hessian curtains and storm water diversion away from areas susceptible to erosion. It must be ensured that topsoil stockpiles are located outside of any drainage lines and areas susceptible to erosion.</li> </ul>
	<b>Indirect impacts:</b> Loss of floral diversity, increase in alien and invasive floral species	Low negative	<ul style="list-style-type: none"> <li>▪ Consider Transmission Substation Alternative 3 and associated turn-in lines and line Alternative 3 as the preferred alternatives.</li> <li>▪ Avoid unnecessary clearance of vegetation, especially within sensitive habitat.</li> <li>▪ Minimise access and maintenance road wetland crossings to what is absolutely necessary.</li> <li>▪ Restrict vehicles to travelling only on designated roadways to limit the ecological footprint of the proposed development activities.</li> <li>▪ Monitor access roads and disturbed areas for erosion and implement control measures as necessary.</li> </ul>

## BASIC ASSESSMENT REPORT

Activity	Impact summary	Significance	Proposed mitigation
			<ul style="list-style-type: none"> <li>▪ Keep the proposed development infrastructure within designated low sensitivity areas as far as possible.</li> <li>▪ Species specific and area specific alien and invasive floral eradication recommendations:</li> <li>▪ Care should be taken with the choice of herbicide to ensure that no additional impact and loss of indigenous plant species occurs due to the herbicide used;</li> <li>▪ Footprint areas should be kept as small as possible when removing alien plant species; and</li> <li>▪ No vehicles should be allowed to drive through designated sensitive wetland areas during the eradication of alien and weed species.</li> </ul>
	Loss of floral SCC and RDL species.	Low negative	<ul style="list-style-type: none"> <li>▪ Consider Transmission Substation Alternative 3 and associated turn-in lines and line Alternative 3 as the preferred alternatives.</li> <li>▪ Keep the proposed development infrastructure within designated low sensitivity areas as far as possible.</li> <li>▪ Avoid unnecessary clearance of vegetation, especially within sensitive habitat.</li> <li>▪ Minimise access and maintenance road wetland crossings to what is absolutely necessary.</li> <li>▪ Acute angle crossings of wetlands must be minimised.</li> <li>▪ Restrict vehicles to travelling only on designated roadways to limit the ecological footprint of the proposed development activities.</li> <li>▪ Monitor access roads and disturbed areas for erosion and implement control measures as necessary.</li> <li>▪ Should any RDL or other protected plant species be encountered within the study, the following should be ensured:</li> <li>▪ If any threatened species will be disturbed, ensure effective relocation of individuals to suitable offset areas; and</li> <li>▪ All rescue and relocation plans should be overseen by a suitably qualified specialist.</li> <li>▪ A site specific walk down of the preferred substation and power line alternative must be performed in the correct season, if possible, (December to March) prior to construction in order to rescue and relocate any such species.</li> <li>▪ Should the need arise to obtain permits, this process needs to be undertaken.</li> </ul>
<b>Cumulative impacts:</b>			
None identified.			
Desktop Faunal	<p><b>Direct impacts:</b></p> <p>Vegetation clearing, disturbance and the use of heavy machinery and human presence along the power line route and at substation location during construction is likely to negatively affect resident fauna directly and through habitat loss.</p>	Low negative	<ul style="list-style-type: none"> <li>▪ Construction staff should undergo environmental induction to ensure that they are aware of fauna-related issues and that no fauna are harmed during construction. This pertains especially to fauna such as snakes which are persecuted regardless of the threat they may or may not pose.</li> <li>▪ The footprint of the development in the vicinity of the rivers should be kept as low as possible and existing access roads should be used wherever possible so that new river crossings are not required.</li> <li>▪ All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.</li> <li>▪ Fires should only be allowed on site if required for construction purposes, and then only in designated areas and a controlled environment. Refer to Eskom fire management procedures.</li> </ul>

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Activity	Impact summary	Significance	Proposed mitigation
			<ul style="list-style-type: none"> <li>▪ If any parts of site such as construction camps must be lit at night, this should be done with low-UV type lights (such as most LEDs), which do not attract insects and which should be directed downwards.</li> <li>▪ An ECO should be present during construction to ensure compliance as well as ensure that any affected fauna can be removed to safety.</li> <li>▪ Any active burrows within the footprint should be checked for fauna before construction commences and should it not be possible to adjust the footprint to avoid such features, then the resident fauna should be relocated or excluded from the burrows so that they are not impacted by construction activities.</li> <li>▪ All construction vehicles should adhere to a low speed limit (30 km/h) to avoid collisions with susceptible species such as snakes and tortoises.</li> <li>▪ Regular dust suppression during construction, especially along access roads which are used frequently.</li> <li>▪ No activity should be allowed at the site between sunset and sunrise.</li> <li>▪ Any dangerous fauna (snakes, scorpions etc) that are encountered during construction should not be handled or molested by the construction staff and the ECO or other suitably qualified persons should be contacted to remove the animals to safety.</li> <li>▪ Holes and trenches should not be left open for extended periods of time and should only be dug when needed for immediate construction. Trenches that may stand open for some days, should have places where the loose material has been returned to the trench to form an escape ramp present at regular intervals to allow any fauna that fall in to escape.</li> </ul>
<b>Indirect impacts:</b>			
None identified.			
<b>Cumulative impacts:</b>			
None Identified			
Avifauna Impacts	<b>Direct impacts:</b>		
	Destruction and alteration of habitat available to birds and the area during construction of the proposed project	Low negative	<ul style="list-style-type: none"> <li>▪ All of the natural vegetation along the servitude and on the substation site should be protected as far as possible, although it is acknowledged that some removal is inevitable. It is recommended that vegetation removal is kept to an absolute minimum however.</li> <li>▪ In addition to the above exercise, general environmental best practices should suffice for reducing the disturbance of vegetation as far as possible. These include; strict management of staff, vehicles and machinery on site.</li> </ul>
	Electrocution of birds on pylons/towers on the 88kV lines and in the substation yard.	Low negative	<ul style="list-style-type: none"> <li>▪ It is essential that the monopole structure be used with an Eskom Bird Perch to provide safe perching space for large birds well above the dangerous hardware. There is a likelihood of large raptors perching on the pylons occasionally.</li> <li>▪ It will be important for Eskom to report all bird electrocutions detected during maintenance line patrols, so that the significance of this impact and the effectiveness of mitigation can be accurately evaluated.</li> <li>▪ Refer to Eskom Bird and electrocution guideline.</li> </ul>
Collision of birds with overhead power line cables, in particular the earth wire.	Low negative	<ul style="list-style-type: none"> <li>▪ An avifaunal walk through study will be required prior to construction once tower positions are final in order to identify the exact spans of line posing a collision risk.</li> <li>▪ High risk sections of line should be fitted with the best Eskom approved anti bird collision line marking device available at the</li> </ul>	

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Activity	Impact summary	Significance	Proposed mitigation
			<p>time of construction. These devices should be installed on the earth wire according to Eskom standards. These sections of line have been identified by this report.</p> <ul style="list-style-type: none"> <li>▪ It will be important for Eskom to report all bird collisions detected during maintenance line patrols, so that the significance of this impact and the effectiveness of mitigation can be accurately evaluated.</li> </ul>
<b>Indirect impacts:</b>			
	Disturbance of birds in the area during construction of the proposed project	Low negative	<ul style="list-style-type: none"> <li>▪ The avifaunal walk through should identify any breeding sensitive species along the servitudes and develop case specific management measures to reduce the effects of disturbance at such nests.</li> <li>▪ General environmental best practices should suffice for reducing the general disturbance as far as possible. These include; strict management of staff, vehicles and machinery on site; and completing construction within the shortest possible time.</li> </ul>
<b>Cumulative impacts:</b>			
None Identified			
Surface Water	<b>Direct impacts:</b>		
	Towers and substation construction in wetlands: wetland habitat loss	Low negative	<ul style="list-style-type: none"> <li>▪ Avoid all Delineated Wetlands – If possible all delineated wetlands must be avoided to prevent wetland loss. This can be achieved with careful and strategic placement of the proposed power line, towers and substation in accordance with the preferred selection of alternatives and associated recommendations in this report. If complete avoidance is not possible a Water Use License will need to be applied for.</li> <li>▪ Obtaining Relevant Authorisations and Licenses – Where wetlands will not be able to be avoided by the proposed development, before any construction or removal of soils and vegetation in the delineated wetlands and riparian habitat is undertaken, the relevant water use license and environmental authorisation is to be obtained and conditions adhered to.</li> <li>▪ Limiting Removal of Excavated Soils –Where new towers are to be constructed in the identified wetlands, riparian habitat and the associated buffer zone, excavated topsoils should be stockpiled separately from subsoils so that it can be backfilled in the correct order for rehabilitation purposes. Wetland soils must not be removed and dumped unless there is a surplus. The soils are to be re-used when back filling. Should there be a surplus of soils that are excavated, these should be taken to a registered landfill site that has sufficient capacity to assimilate the spoil. The topsoil is to be used for rehabilitation purposes and must not be removed. It is critical that when the soils are reinstated, the subsoils are to be backfilled first followed by the topsoil. The topsoil contains a natural seedbank from which the affected wetlands, riparian habitat and buffer zone can naturally rehabilitate.</li> <li>▪ Where the soils are excavated from the sensitive areas, it is preferable for them to be stockpiled adjacent to the excavation pit to limit vehicle and any other movement activities around the excavation areas.</li> <li>▪ Preventing Pollution Impacts – Any cement mixing should take place over a bin lined (impermeable) surface or alternatively in the load bin of a vehicle to prevent the direct mixing of cement with the ground of the wetlands, riparian habitat and/or the associated buffer zone. Importantly, no mixing of cement directly on the surface in the wetland, riparian habitat or the</li> </ul>

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Activity	Impact summary	Significance	Proposed mitigation
			<p>associated buffer zones are allowed in the sensitive and RoW areas.</p> <ul style="list-style-type: none"> <li>▪ Protection of Stockpiled Soils – Stockpiled soils will need to be protected from wind and water erosion. Stockpiled soils are not to exceed a 2m height and are to be banded by suitable materials. Stacked bricks surrounding the stockpiled soils can be adopted. Alternatively, wooden planks pegged around the stockpiled soils can be used.</li> <li>▪ Rehabilitation of affected areas – Affected areas in the surface water resources (wetlands and riparian habitat) must be reinstated with the wetland and riparian habitat soil. The affected areas must be levelled, or appropriately sloped and scarified to loosen the soil and allow seeds contained in the natural seedbank to re-establish. Preferably scarification is to take place before the spring and summer rainy season and not in the dry season. De-weeding will need to take place for approximately a year to allow the local graminoid species to re-establish sufficiently.</li> </ul>
	Wetland Fauna and Flora Physical Degradation	Low negative	<ul style="list-style-type: none"> <li>▪ Minimising Human Physical Degradation of Wetlands – Construction workers are not allowed in the demarcated wetland areas.</li> <li>▪ Preventing Loss or Harm to Wetland Fauna and Flora – No animals are to be hunted, captured, trapped, removed, injured, killed or eaten. Additionally, no wetland vegetation is to be removed, harvested or damaged. Should any party be found guilty of such offences, stringent penalties should be imposed. The appointed Environmental Control Officer (ECO) is to be contacted should the possible removal of any wetland fauna be required during the construction phase.</li> <li>▪ Preventing the Usage of Wetlands for Sanitation Purposes – No “long drop” or chemical toilets are allowed in any surface water features or their applicable buffers. These must be in designated areas within the construction site. Suitable temporary chemical sanitation facilities are to be provided. Temporary chemical sanitation facilities must be placed at least 100 meters from the wetlands. Temporary chemical sanitation facilities must be placed over a banded or a sealed surface area and adequately maintained to prevent pollution impacts.</li> <li>▪ Preventing Water Extraction from Wetlands – No water is to be extracted unless a water use license is granted for specific quantities.</li> </ul>
	Vehicle Degradation Impacts	Low negative	<ul style="list-style-type: none"> <li>▪ Previous recommendations to prohibit vehicle access into wetlands must be upheld. Stringing of the power lines are therefore to be undertaken by hand with the fewest possible workers allowed to cross through the wetlands, to limit trampling impacts. Once this has been undertaken, access must be strictly prohibited in the highly sensitive areas. The ECO must be on site to observe the stringing process through the wetlands to ensure that potential impacts are minimised and where required, adequate mitigation measures to address impacts are undertaken.</li> </ul>
<b>Indirect impacts:</b>			
	Construction Lay-down Area Potential Impacts: Wetland Habitat Degradation	Low negative	<ul style="list-style-type: none"> <li>▪ Seasonal Scheduling of the Construction process. It is important that wherever possible, the construction activities be scheduled to take place over the dry winter season when there is little rainfall and flows are low.</li> <li>▪ Location of the Lay-down Area. The location of the lay-down area is not to be within 100m of a wetland. All materials,</li> </ul>



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Activity	Impact summary	Significance	Proposed mitigation
			<p>machinery and vehicles are to be kept in a designated area that is located outside and at least 100m away from the identified wetlands.</p>
	Vehicle and Machinery Impacts: Wetland Compaction and Degradation	Low negative	<ul style="list-style-type: none"> <li>▪ Use of Existing Access Roads – There are several access roads that can be utilised instead of creating new access roads. Where present, these must be used during the construction phase.</li> <li>▪ Prevention of Unnecessary Entry of Vehicles and Machinery in Wetlands – As previously stated, there are existing access roads that can be utilised during the construction phase. However, where existing access roads are not present, new roads will be required. Should this be the case, new roads are not to be constructed in wetlands and strictly no vehicle may enter into or traverse a wetland. Similarly, no machinery is to be brought into or allowed to operate in a wetland or the associated buffer zone. All wetlands within close proximity (50m) of construction areas are to be demarcated as “highly sensitive” and must avoided.</li> <li>▪ Preventing Soil and Wetland Contamination – All vehicles and machinery are to be checked for oil, fuel or any other fluid leaks before entering the construction areas. All vehicles and machinery must be regularly serviced and maintained before being allowed to enter the construction areas. No fuelling, re-fuelling, vehicle and machinery servicing or maintenance is to take place in the highly sensitive areas. The construction site is to contain sufficient safety measures throughout the construction process. These include, but are not limited to, oil spill kits and fire extinguishers. Fuel, oil or hazardous substances storage areas must be bunded to prevent oil or fuel contamination of the ground and/or wetlands or associated buffer zones.</li> <li>▪ Prevention of Hazardous Materials in Wetlands – No hazardous materials are to be stored in or brought into the highly sensitive areas. Should a designated storage area be required, the storage area must be placed at the furthest location from the highly sensitive areas (ideally at the substation). Appropriate safety measures as stipulated above must be implemented.</li> </ul>
	<b>Cumulative impacts:</b>		
	Increased Run-off, Erosion and Sedimentation	Low negative	<ul style="list-style-type: none"> <li>▪ Preventing Increased Run-off, Erosion and Sedimentation Impacts – Vegetation clearing is to take place in a phased manner, only clearing areas that will require construction immediately. Vegetation clearing must not take place in areas where construction will only take place in the distant future. Vegetation must not be completely removed and must be undertaken according to standard Eskom vegetation clearance standards and policies.</li> <li>▪ All impacted construction areas near wetlands are to be adequately sloped and adequate structures must be put into place (temporary or permanent where necessary in extreme cases) to deal with run-off and sediment volumes. The use of silt fencing and potentially sandbags or hessian “sausage” nets can be used to prevent erosion in susceptible construction areas near wetlands.</li> <li>▪ Where erosion has taken place, stabilisation of the soils needs to be undertaken and re-vegetated.</li> </ul>
Agricultural Potential and Soils	<b>Direct impacts:</b>		
	Loss of agricultural land and / or	Low negative	<ul style="list-style-type: none"> <li>▪ Interact with impacted landowners to discuss where they would ideally like to see the power lines situated on their</li> </ul>

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Activity	Impact summary	Significance	Proposed mitigation
	production as a result of the proposed power line construction		<p>property to have the least impact on their farming practices, the negotiation phase should form part of the final survey / line route selection.</p> <ul style="list-style-type: none"> <li>▪ Employ a low impact routing to avoid high value agricultural land, forestry and important agricultural infrastructure. This is particularly important for the various agricultural areas identified in the agricultural specialist report.</li> <li>▪ The utilisation of optimal tower designs can further reduce the potential impacts.</li> <li>▪ Attempt to place towers on the edge of existing agricultural areas and span active agricultural fields as far as possible. Following existing roads and utilising the edge of road servitudes is highly recommended due to the existing impacts associated with these areas.</li> <li>▪ Due to the overarching route characteristics, and the nature of the proposed development, the remaining viable mitigation measures are limited and will most likely revolve around erosion control: <ul style="list-style-type: none"> <li>○ Clearing activities should be kept to a minimum.</li> <li>○ In the unlikely event that heavy rains are expected, activities should be put on hold to reduce the risk of erosion.</li> <li>○ If additional earthworks are required, any steep or large embankments that are expected to be exposed during the 'rainy' months should be armoured with fascine like structures.</li> <li>○ If earth works are required then storm water control and wind screening should be undertaken to prevent soil erosion</li> </ul> </li> </ul>
	Loss of agricultural land and / or production as a result of the proposed substation construction	Low negative	<ul style="list-style-type: none"> <li>▪ Avoid active cultivated land by building in the centre of the assessment area, which is characterised by low value agricultural land (grazing land).</li> <li>▪ Due to the overarching site characteristics and the nature of the proposed development viable mitigation measures are limited and will most likely revolve around erosion control: <ul style="list-style-type: none"> <li>○ Clearing activities should be kept to a minimum.</li> <li>○ In the unlikely event that heavy rains are expected activities should be put on hold to reduce the risk of erosion.</li> <li>○ If additional earthworks are required, any steep or large embankments that are expected to be exposed during the 'rainy' months should either be armoured with fascine like structures.</li> <li>○ If earth works are required then storm water control and wind screening should be undertaken to prevent soil loss from the site</li> </ul> </li> </ul>
<b>Indirect impacts:</b>			
None identified.			
<b>Cumulative impacts:</b>			
None identified.			
Heritage	<b>Direct impacts:</b> Three cemeteries and one grave yard occur on the footprint	Not applicable	<ul style="list-style-type: none"> <li>▪ Not applicable in this instance as it would be possible to shift the power lines slightly in order to accommodate heritage conservation principles. However, National Heritage Act requires that any operations exposing archaeological and historical residues should cease immediately pending an evaluation by the heritage authorities.</li> </ul>
<b>Indirect impacts:</b>			
None Identified.			

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Activity	Impact summary	Significance	Proposed mitigation
	<b>Cumulative impacts:</b>		
	None Identified.		
Visual	<b>Direct Impacts</b>		
	Large construction vehicles and equipment during the construction phase may change the visual character of the study area and expose sensitive receptors to visual impacts associated with the construction phase.	Low negative	<ul style="list-style-type: none"> <li>▪ Locate construction camp and storage areas in zones of low visibility i.e. behind tall trees or in lower lying areas.</li> <li>▪ Minimise vegetation clearing and rehabilitate cleared areas as soon as possible.</li> <li>▪ Maintain a neat construction site by removing rubble and waste materials regularly.</li> <li>▪ Make use of existing gravel access roads where possible.</li> </ul>
	<b>Indirect impacts:</b>		
	Change to the visual character of the surrounding area and visual impact on potentially sensitive visual receptors that may perceive the substation to be an unwelcome intrusion.	Low negative	<ul style="list-style-type: none"> <li>▪ Locate the substation within the tall commercial forestry plantation, if possible.</li> <li>▪ Locate the substation as far away from sensitive receptor locations as possible (i.e. at site alternative 1).</li> <li>▪ Locate the substation as close to the existing 400kV power line as possible.</li> <li>▪ Align the power line as far away from sensitive receptor locations as possible. Should this not be possible, align the power line so that it is not directly within the primary focus / orientation of visually sensitive receptors.</li> <li>▪ Align the power line to run parallel to existing power lines and other linear impacts such as existing power lines, where possible.</li> <li>▪ Avoid crossing areas of high elevation, especially ridges, koppies or hills, where possible.</li> <li>▪ Align the power line within the tall commercial forestry plantation, where possible.</li> </ul>
	<b>Cumulative impacts:</b>		
	None Identified		
Socio-economic	<b>Direct Impacts</b>		
	Positive economic impacts as a result of higher coal export tonnage, as well as temporary and permanent employment opportunities, thereby contributing positively to the expansion and strengthening of local economic activities.	Medium positive	<ul style="list-style-type: none"> <li>▪ N/A: Mitigation not required.</li> </ul>
	<b>Indirect impacts:</b>		
	None identified.		
	<b>Cumulative impacts:</b>		
	None identified.		
Dust	<b>Direct impacts:</b>		
	None identified.		
	<b>Indirect impacts:</b>		
Dust impacts on	Low negative	<ul style="list-style-type: none"> <li>▪ Generation of dust shall be minimised and dust nuisance for</li> </ul>	

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Activity	Impact summary	Significance	Proposed mitigation
	surrounding environment associated with construction activities		<p>the surrounding areas shall be kept to a minimum wherever possible.</p> <ul style="list-style-type: none"> <li>▪ Dust from exposed soil surfaces shall be minimised at all times, only using water spray during extremely windy conditions</li> <li>▪ Reasonable measures must be undertaken by the contractor to ensure that any exposed areas and material stockpiles are adequately protected against the wind.</li> <li>▪ Dust screens of a suitable height should be erected wherever required and possible.</li> <li>▪ All exposed surfaces should be minimised in terms of duration of exposure to wind and storm water.</li> </ul>
	<b>Cumulative impacts:</b>		
	None identified.		
Noise	<b>Direct impacts:</b>		
	None identified.		
	<b>Indirect impacts:</b>		
	Noise impacts on surrounding environment associated with construction activities (Construction vehicles and equipment)	Low negative	<ul style="list-style-type: none"> <li>▪ The contractor shall adhere to the local by-laws and regulations regarding the noise and associated hours of operations.</li> <li>▪ The contractor shall limit noise levels (e.g. install and maintain silencers on machinery). The provisions of sans 1200a sub-clause 4.1 regarding "built-up" area shall apply to all areas within audible distance of residents whether in urban, peri-urban or rural areas.</li> <li>▪ Construction and demolition activities generating output of 85db or more, shall be limited to normal working hours and not allowed during weekends.</li> <li>▪ Should the contractor need to work outside normal working hours, any affected individuals shall be informed prior to the work taking place.</li> <li>▪ No amplified music shall be allowed on site.</li> </ul>
	<b>Cumulative impacts:</b>		
	None identified.		
Waste	<b>Direct impacts:</b>		
	None identified.		
	<b>Indirect impacts:</b>		
	Generation of additional waste/litter and building rubble/hazardous material during the construction phase	Low negative	<ul style="list-style-type: none"> <li>▪ Waste management mitigation measures as detailed in the EMPr (attached in Appendix G) includes:</li> <li>▪ Solid waste (construction waste and builders rubble) will be collected by independent contractors and disposed of at the registered licensed municipal landfill site in with proof of safe disposal as required.</li> <li>▪ The contractor shall ensure that all litter is collected from the work area. Similarly, all bins shall be emptied regularly and the waste disposed of at a permitted landfill site.</li> <li>▪ The contractor shall ensure that the construction site, working and eating areas are maintained in a clean, hygienic and orderly state.</li> <li>▪ Separate bins should be provided for various materials to facilitate recycling. The bins should have liner bags for easy control and safe disposal of waste.</li> <li>▪ The excavation and use of rubbish pits on site is forbidden.</li> <li>▪ The burning of waste is forbidden.</li> <li>▪ All vehicles and equipment must be maintained in a good condition in order to minimise the risk of leakage and possible contamination of the soil or storm water by fuels, oils and hydraulic fluids.</li> <li>▪ Sufficient quantities of suitable hydrocarbon absorption or</li> </ul>

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Activity	Impact summary	Significance	Proposed mitigation
			remediation materials must be present on site at all times.
	<b>Cumulative impacts:</b>		
	None identified.		
<b>No-go option</b>			
Socio-economic	<b>Direct impacts:</b>		
	Socio - Economic	Medium Negative	<ul style="list-style-type: none"> <li>▪ Negative socio-economic impacts as a result of inadequate supply of electricity to the Transnet railway system thereby preventing an increased export tonnage of coal. This will prevent job creation in the Piet Retief area and hinder South Africa's economic growth in the coal export sector</li> </ul>
	<b>Indirect impacts:</b>		
	None identified.		
	<b>Cumulative impacts:</b>		
None identified.			

A complete impact assessment in terms of Regulation 22(2)(i) of GN R.543 must be included as Appendix F.

**Please note:** Due to the generic nature of the study area and the fact that the routes run in close proximity to each other (overlapping in part) for large portions of the alignments the impacts for each proposed alternative are relatively equal. A complete impact assessment in terms of Regulation 22(2)(i) of GN R.543 is included in Appendix F.

## 2. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

### Substation Alternative 3 (preferred alternative)

Botanical	<p>There are three possible impacts on the floral ecology within the study area (1) Impact on habitat for floral species, (2) Impact on floral diversity, and (3) Impact on important species. From the impact assessment it is evident that impacts in the construction phase will be of medium significance without mitigation and the operational phases will be of low significance without mitigation. If mitigation measures are adhered to, the impact significance may be reduced to a low level.</p> <p>Power line Alternative 3 and Transmission Substation Alternative 3 are likely to have the least significant impact on the receiving floral environment.</p>
Faunal	Power line Alternative 3 and Transmission Substation Alternative 3 is the preferred alternative for all faunal groups largely as a result of the presence of the existing servitude and line along this route, which would reduce the overall impact of the refurbished section. In addition to this, this alternative does not affect the sensitive Hlelo wetland.
Avifaunal	This project is proposed for a relatively sensitive part of the country in terms of avifauna. A variety of grassland and wetland habitat potentially makes the site important to several Red Listed bird species. However much of the site is

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	<p>afforested which significantly reduces its' sensitivity to developments such as these. The most significant risk to avifauna posed by the project is that of bird collision. The most sensitive area is the Hlelo wetland crossing. This report recommends that any alternatives which require a new power line to be constructed across this wetland not be considered further, due to the risk they would pose to avifauna. If mitigation measures are adhered to, the significance of avifaunal impacts will be reduced from high, medium and low, to low.</p> <p>The preferred option for this project from an avifaunal perspective is the Alternative 3 substation site, with associated predominantly refurbished (not new) power line. This alternative avoids the Hlelo wetland area, and also requires the least nett length of new power line to be constructed, and therefore the least nett new risk to avifauna in the area.</p>
Surface Water	<p>There is one (1) wetland, namely a hillslope wetland, located on the proposed substation alternative 3 location, with an additional unchannelled valley-bottom wetland located roughly 100m to the northwest. The assessment of the 1.5km radius of the substation alternative revealed a total of sixteen (16) surface water resources, widely scattered within close proximity. The current location of substation alternative 3 is not preferred, however, it is strongly recommended that the substation location be moved roughly 350 m to the east, towards the existing dirt road. <b>If the recommendation is adhered to, this substation alternative 3 location would be the preferred option, as the change in location to the east would avoid all identified surface water resources, and the closer proximity to the existing dirt road would further reduce any potential impacts to the surrounding environment.</b></p>
Agricultural	<p>The impact will be relatively insignificant. The centre of substation assessment area influences unimproved grazing land and natural veld. This alternative is preferred due to the preference given to the associated power line option.</p>
Heritage	<p>Various heritage sites occur on the proposed project footprint, however mitigation is not applicable in this instance as it would be possible to shift the power lines slightly in order to accommodate heritage conservation principles. The National Heritage Act requires that any operations exposing archaeological and historical residues should cease immediately pending an evaluation by the heritage authorities.</p>
Visual	<p>Most of the substation assessment area traverses zones of high or moderate visual exposure. Several potentially sensitive receptors are located within close proximity to the proposed substation site. Due to the nature of the prevailing short grassland vegetation used for agricultural grazing the substation would be highly visible in this part of the study area, however the visual impact would be reduced due to the presence of the existing 400kV power line in close proximity.</p>
Geotechnical	<p>The geology of the two substation sites is similar, and they are underlain by silty slightly clayey sand topsoils to depths up to 0.50m, underlain by silty sandy gravels of the ferricrete and hardpan ferricrete layers, and further underlain by clayey silty sands, silty sandy clays or clayey silts forming residual sandstones and residual shales. The sites are generally characterised by being orographically very gently sloping.</p> <p>Due to the evident higher abundance of a more competent hardpan ferricrete horizon, no evidence of groundwater and generally flatter topography,</p>

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	substation alternative 1 can be considered to be the less problematic, and likely the better option for the proposed development, provided that the necessary foundation requirements are met. Substation alternative 1 also has more occurrences of soils suitable for use in bulk fills. Founding conditions will be similar on both sites.
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### Power line Alternative 3 (preferred alternative)

Botanical	<p>There are three possible impacts on the floral ecology within the study area (1) Impact on habitat for floral species, (2) Impact on floral diversity, and (3) Impact on important species. From the impact assessment it is evident that impacts in the construction and operational phases will be of low to medium significance without mitigation. If mitigation measures are adhered to, the impact significance may be reduced to a low level.</p> <p>Route Alternative 3 and Transmission Station Alternative 3 are likely to have the least significant impact on the receiving floral environment.</p>
Faunal	Alternative 3 is the preferred alternative for all faunal groups largely as a result of the presence of the existing servitude and line along this route, which would reduce the overall impact of the refurbished section. In addition to this, this alternative does not affect the sensitive Hlelo wetland.
Avifaunal	<p>This project is proposed for a relatively sensitive part of the country in terms of avifauna. A variety of grassland and wetland habitat potentially makes the site important to several Red Listed bird species. However much of the site is afforested which significantly reduces its' sensitivity to developments such as these. The most significant risk to avifauna posed by the project is that of bird collision. The most sensitive area is the Hlelo wetland crossing. This report recommends that any alternatives which require a new power line to be constructed across this wetland not be considered further, due to the risk they would pose to avifauna. If mitigation measures are adhered to, the significance of avifaunal impacts will be reduced from high, medium and low, to low.</p> <p>The preferred option for this project from an avifaunal perspective is the Alternative 3 substation site, with associated predominantly refurbished (not new) power line. This alternative avoids the Hlelo wetland area, and also requires the least nett length of new power line to be constructed, and therefore the least nett new risk to avifauna in the area.</p>
Surface Water	<p>There are a total of twenty (20) surface water resources that can be found along Alternative 3, of which five (5) channelled valley-bottom wetlands and one (1) unchannelled valley-bottom wetland will need to be spanned. Importantly, alternative 3 contains a smaller section that requires the construction of a new power line, and for the most part comprises of the refurbishment of an existing power line where a servitude has already been created. A negative to the refurbishment, however, will be the need to construct a single pole power line to enable continued current to pass through to the current substation, while the refurbishment of the existing power takes place. This will result in excavation impacts on wetland soils for the temporary towers. Furthermore, once the refurbishment is complete, the single pole power line with need to be decommissioned.</p> <p><b>However refurbishing the existing power line within the existing</b></p>

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	<p><b>servitude would greatly reduce possible impacts in comparison to other alternatives which require a greater extent of new power lines to be constructed and more impacts to wetlands. Additionally, all wetlands are narrow enough to be spanned for this alternative, and no tower locations would need to be placed within any of the identified surface water resources. Thus alternative 3 is considered the preferred alternative due to the least likelihood of impacts on surface water resources in comparison to alternative 1A, 1C and 2A.</b></p>
Agricultural	<p>The impact will be relatively insignificant. Route crosses low value agricultural land (natural veld, unimproved grazing) with pockets of moderate value agricultural land which can be avoided. For most of its length it utilises and existing power line corridor.</p>
Heritage	<p>Various heritage sites occur on the proposed project footprint, however mitigation is not applicable in this instance as it would be possible to shift the power lines slightly in order to accommodate heritage conservation principles. The National Heritage Act requires that any operations exposing archaeological and historical residues should cease immediately pending an evaluation by the heritage authorities.</p>
Visual	<p>The alternative involves refurbishing the existing 88kV power line for most of the proposed route. The power line would therefore impact the area in a way that is barely perceptible as the refurbished section of the line would follow the same route as the existing line which has already transformed the visual environment. As such, the surrounding residents would be accustomed to the visual impact of the existing power line and would be unlikely to object to the visual impact of the refurbished power line.</p> <p>Commercial forestry plantations will screen some views toward the proposed power line.</p> <p>The power line traverses some zones of negligible visual exposure.</p>

### Substation Alternative 1

Botanical	<p>There are three possible impacts on the floral ecology within the study area (1) Impact on habitat for floral species, (2) Impact on floral diversity, and (3) Impact on important species. From the impact assessment it is evident that impacts in the construction and operational phases will be of low to medium significance without mitigation. If mitigation measures are adhered to, the impact significance may be reduced to a low level.</p> <p>Route Alternatives 1A, 1C and 2A and Transmission Station Alternative 1 will have a more significant impact than the other alternative.</p>
Faunal	<p>Substation Alternative 1 is not the preferred alternative because the impacts associated with the Hlelo wetland will be significant if this alternative is selected. Additionally the power line alternatives associated with substation alternative 1 have longer sections of new line compared to power line alternative 3 which is predominantly refurbished.</p>
Avifaunal	<p>This project is proposed for a relatively sensitive part of the country in terms of avifauna. A variety of grassland and wetland habitat potentially makes the site important to several Red Listed bird species. However much of the site is afforested which significantly reduces its' sensitivity to developments such as</p>



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	<p>these. The most significant risk to avifauna posed by the project is that of bird collision. The most sensitive area is the Hlelo wetland crossing. This report recommends that any alternatives which require a new power line to be constructed across this wetland not be considered further, due to the risk they would pose to avifauna. If mitigation measures are adhered to, the significance of avifaunal impacts will be reduced from high, medium and low, to low.</p> <p>Alternative 1 and all its variations are not preferred due to the need for new power line to cross the sensitive Hlelo wetland. This option should not be considered further.</p>
Surface Water	<p>There are no surface water resources located on the proposed substation alternative 1. However, there are two (2) wetlands, namely one (1) depression wetland and one (1) unchannelled valley-bottom wetland, within 100m of the proposed development area boundary. Assessment of the 1.5km radius revealed a total of ten (10) surface water resources, widely scattered within close proximity. <b>Due to the large size of the respective wetlands, and limited existing roads in the direct vicinity, substation alternative 1 is viewed as not preferred in comparison to substation alternative 3</b></p>
Agricultural	<p>The impact will be relatively insignificant. The centre of substation assessment area influences unimproved grazing land and natural veld.</p>
Heritage	<p>Various heritage sites occur on the proposed project footprint, however mitigation is not applicable in this instance as it would be possible to shift the power lines slightly in order to accommodate heritage conservation principles. The National Heritage Act requires that any operations exposing archaeological and historical residues should cease immediately pending an evaluation by the heritage authorities.</p>
Visual	<p>Almost the entire substation assessment area is located within a zone of negligible visual exposure. No potentially sensitive visual receptors are located within close proximity to the proposed substation site. The visual impact would be reduced due to the presence of the existing 400kV power line in close proximity. Commercial forestry plantations located directly to the south would screen views of the substation from the south.</p>
Geotechnical	<p>The geology of the two substation sites is similar, and they are underlain by silty slightly clayey sand topsoils to depths up to 0.50m, underlain by silty sandy gravels of the ferricrete and hardpan ferricrete layers, and further underlain by clayey silty sands, silty sandy clays or clayey silts forming residual sandstones and residual shales. The sites are generally characterised by being orographically very gently sloping.</p> <p>Due to the evident higher abundance of a more competent hardpan ferricrete horizon, no evidence of groundwater and generally flatter topography, substation alternative 1 can be considered to be the less problematic, and likely the better option for the proposed development, provided that the necessary foundation requirements are met. Substation alternative 1 also has more occurrences of soils suitable for use in bulk fills. Founding conditions will similar on both sites.</p>

### Power line Alternative 1A

Botanical	<p>There are three possible impacts on the floral ecology within the study area (1) Impact on habitat for floral species, (2) Impact on floral diversity, and (3)</p>
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	<p>Impact on important species. From the impact assessment it is evident that impacts in the construction and operational phases will be of low to medium significance without mitigation. If mitigation measures are adhered to, the impact significance may be reduced to a low level.</p> <p>Route Alternatives 1A, 1C and 2A and Transmission Station Alternative 1 will have a more significant impact than the other alternative.</p>
Faunal	<p>Substation Alternative 1 is not the preferred alternative because the impacts associated with the Hlelo wetland will be significant if this alternative is selected. Additionally the power line alternatives associated with substation alternative 1 have longer sections of new line compared to power line alternative 3 which is predominantly refurbished.</p>
Avifaunal	<p>This project is proposed for a relatively sensitive part of the country in terms of avifauna. A variety of grassland and wetland habitat potentially makes the site important to several Red Listed bird species. However much of the site is afforested which significantly reduces its' sensitivity to developments such as these. The most significant risk to avifauna posed by the project is that of bird collision. The most sensitive area is the Hlelo wetland crossing. This report recommends that any alternatives which require a new power line to be constructed across this wetland not be considered further, due to the risk they would pose to avifauna. If mitigation measures are adhered to, the significance of avifaunal impacts will be reduced from high, medium and low, to low.</p> <p>Alternative 1 and all its variations are not preferred due to the need for new power line to cross the sensitive Hlelo wetland. This option should not be considered further.</p>
Surface Water	<p>There are a total of eight (8) surface water resources that can be found along Alternative 1A, of which two (2) channelled valley-bottom wetlands and one (1) unchannelled valley-bottom wetland will need to be spanned. Additionally, one (1) floodplain wetland and one (1) depression wetland are too wide to be spanned, and as a result, tower structures will most likely be required to be constructed within each wetland, respectively. Most wetlands can be avoided by routing the proposed power line around the wetlands. The prevailing landscape in this alternative is used primarily for pastoral land and plantations, and contains existing roads, which the proposed alternative can for the most part route along. <b>Re-routing the alternative along the existing roads would minimise possible impacts, and thus this alternative is considered favourable due to the lesser likelihood of impacts on surface water resources in the broader area.</b></p>
Agricultural	<p>The impact will be relatively insignificant. Route crosses low value agricultural land (natural veld, unimproved grazing and scrub plantation).</p>
Heritage	<p>Various heritage sites occur on the proposed project footprint, however mitigation is not applicable in this instance as it would be possible to shift the power lines slightly in order to accommodate heritage conservation principles. The National Heritage Act requires that any operations exposing archaeological and historical residues should cease immediately pending an evaluation by the heritage authorities.</p>
Visual	<p>A large portion of the route traverses an area where no receptor locations are present and which is classified as having a negligible or low visual sensitivity.</p>

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	<p>The northern part of the route involves refurbishing the existing 88kV power line. The power line would therefore impact this area in a way that is barely perceptible as the refurbished section of the line would follow the same route as the existing line which has already transformed the visual environment. As such, the surrounding residents would be accustomed to the visual impact of the existing power line and would be unlikely to object to the visual impact of the refurbished power line.</p> <p>Commercial forestry plantations will screen views toward the proposed power line in the central and northern parts of the route (the line traverses zones of negligible visual exposure).</p> <p>The route is not regarded as preferred due to its close proximity to Iswepe Game and the fact that it will be highly visible and potentially alter the natural character of the Hlelo River Flood Plain.</p>
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### Power line Alternative 1C

Botanical	<p>There are three possible impacts on the floral ecology within the study area (1) Impact on habitat for floral species, (2) Impact on floral diversity, and (3) Impact on important species. From the impact assessment it is evident that impacts in the construction and operational phases will be of low to medium significance without mitigation. If mitigation measures are adhered to, the impact significance may be reduced to a low level.</p> <p>Route Alternatives 1A, 1C and 2A and Transmission Station Alternative 1 will have a more significant impact than the other alternative.</p>
Faunal	<p>Substation Alternative 1 is not the preferred alternative because the impacts associated with the Hlelo wetland will be significant if this alternative is selected. Additionally the power line alternatives associated with substation alternative 1 have longer sections of new line compared to power line alternative 3 which is predominantly refurbished.</p>
Avifaunal	<p>This project is proposed for a relatively sensitive part of the country in terms of avifauna. A variety of grassland and wetland habitat potentially makes the site important to several Red Listed bird species. However much of the site is afforested which significantly reduces its' sensitivity to developments such as these. The most significant risk to avifauna posed by the project is that of bird collision. The most sensitive area is the Hlelo wetland crossing. This report recommends that any alternatives which require a new power line to be constructed across this wetland not be considered further, due to the risk they would pose to avifauna. If mitigation measures are adhered to, the significance of avifaunal impacts will be reduced from high, medium and low, to low.</p> <p>Alternative 1 and all its variations are not preferred due to the need for new power line to cross the sensitive Hlelo wetland. This option should not be considered further.</p>
Surface Water	<p>There are a total of ten (10) surface water resources that can be found along Alternative 1C, of which two (2) channelled valley-bottom wetlands, one (1) depression wetland and one (1) unchannelled valley-bottom wetland will need to be spanned. Additionally, one (1) floodplain wetland and one (1) depression wetland are too wide to be spanned, and as a result, tower structures will most</p>

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	likely be required to be constructed within each wetland, respectively. Most wetlands can be avoided by routing the proposed power line around the wetlands. The prevailing landscape in this alternative is used primarily for pastoral land and plantations, and contains existing roads, which the proposed alternative can route along. <b>Re-routing the alternative along the existing roads would minimise possible impacts. However, due to the comparatively greater number of potential surface water resources to be spanned, Alternative 1C is not preferred.</b>
Agricultural	The alternative will result in a high impact / increase the impact. Route crosses low value agricultural land (natural veld, unimproved grazing and small subsistence fields) but also includes a section of 2.3 km through moderate value agricultural land which will lead to the loss of ±16 ha of plantations.
Heritage	Various heritage sites occur on the proposed project footprint, however mitigation is not applicable in this instance as it would be possible to shift the power lines slightly in order to accommodate heritage conservation principles. The National Heritage Act requires that any operations exposing archaeological and historical residues should cease immediately pending an evaluation by the heritage authorities.
Visual	<p>A large portion of the route traverses an area where no receptor locations are present and which is classified as having a negligible or low visual sensitivity.</p> <p>The northern part of the route involves refurbishing the existing 88kV power line. The power line would therefore impact this area in a way that is barely perceptible as the refurbished section of the line would follow the same route as the existing line which has already transformed the visual environment. As such, the surrounding residents would be accustomed to the visual impact of the existing power line and would be unlikely to object to the visual impact of the refurbished power line.</p> <p>Commercial forestry plantations will screen views toward the proposed power line in the central and northern parts of the route (the line traverses zones of negligible visual exposure).</p> <p>The route is not regarded as preferred due to its close proximity to Iswepe Game and the fact that it will be highly visible and potentially alter the natural character of the Hlelo River Flood Plain.</p>

**Power line Alternative 2A**

Botanical	<p>There are three possible impacts on the floral ecology within the study area (1) Impact on habitat for floral species, (2) Impact on floral diversity, and (3) Impact on important species. From the impact assessment it is evident that impacts in the construction and operational phases will be of low to medium significance without mitigation. If mitigation measures are adhered to, the impact significance may be reduced to a low level.</p> <p>Route Alternatives 1A, 1C and 2A and Transmission Station Alternative 1 will have a more significant impact than the other alternative.</p>
Faunal	Substation Alternative 1 is not the preferred alternative because the impacts associated with the Hlelo wetland will be significant if this alternative is selected. Additionally the power line alternatives associated with substation

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	<p>alternative 1 have longer sections of new line compared to power line alternative 3 which is predominantly refurbished.</p>
Avifaunal	<p>This project is proposed for a relatively sensitive part of the country in terms of avifauna. A variety of grassland and wetland habitat potentially makes the site important to several Red Listed bird species. However much of the site is afforested which significantly reduces its' sensitivity to developments such as these. The most significant risk to avifauna posed by the project is that of bird collision. The most sensitive area is the Hlelo wetland crossing. This report recommends that any alternatives which require a new power line to be constructed across this wetland not be considered further, due to the risk they would pose to avifauna. If mitigation measures are adhered to, the significance of avifaunal impacts will be reduced from high, medium and low, to low.</p> <p>Alternative 1 and all its variations are not preferred due to the need for new power line to cross the sensitive Hlelo wetland. This option should not be considered further.</p>
Surface Water	<p>There are a total of twelve (12) surface water resources that can be found along Alternative 2A, of which two (2) channelled valley-bottom wetlands will need to be spanned. Additionally, one (1) floodplain wetland and one (1) depression wetland are too wide to be spanned, and as a result, tower structures will most likely be required to be constructed within each wetland respectively. Most wetlands can be avoided by routing the proposed power line around the wetlands. The prevailing landscape in this alternative is used primarily for pastoral land and plantations, and contains existing roads, which the proposed alternative can for the most part route along. <b>Re-routing the alternative along the existing roads would minimise possible impacts, and thus this alternative is considered favourable due to the lesser likelihood of impacts on surface water resources in comparison to Alternative 1C.</b></p>
Agricultural	<p>The impact will be relatively insignificant. Route crosses low value agricultural land (natural veld, unimproved grazing) with pockets of moderate value agricultural land which can be avoided.</p>
Heritage	<p>Various heritage sites occur on the proposed project footprint, however mitigation is not applicable in this instance as it would be possible to shift the power lines slightly in order to accommodate heritage conservation principles. The National Heritage Act requires that any operations exposing archaeological and historical residues should cease immediately pending an evaluation by the heritage authorities.</p>
Visual	<p>A large portion of the route traverses an area where no receptor locations are present and which is classified as having a negligible or low visual sensitivity.</p> <p>The northern part of the route involves refurbishing the existing 88kV power line. The power line would therefore impact this area in a way that is barely perceptible as the refurbished section of the line would follow the same route as the existing line which has already transformed the visual environment. As such, the surrounding residents would be accustomed to the visual impact of the existing power line and would be unlikely to object to the visual impact of the refurbished power line.</p> <p>Commercial forestry plantations will screen views toward the proposed power</p>

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	<p>line in the central and northern parts of the route (the line traverses zones of negligible visual exposure).</p> <p>The route is not regarded as preferred due to its close proximity to Iswepe Game and the fact that it will be highly visible and potentially alter the natural character of the Hlelo River Flood Plain.</p>
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### **No-go alternative (compulsory)**

Socio Economic	-	Negative socio-economic impacts as a result of inadequate supply of electricity to the Transnet railway system thereby preventing an increased export tonnage of coal. This will prevent job creation in the Piet Retief area and hinder South Africa's economic growth in the coal export sector.
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**SECTION E. RECOMMENDATION OF PRACTITIONER**

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?



If “NO”, indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment).

If “YES”, please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application.

**Botanical**

**Development footprint**

- The boundaries of the development footprint areas are to be clearly defined and it should be ensured that all activities remain within defined footprint areas.
- Edge effects of all construction and operational activities, such as erosion and alien plant species proliferation, which may affect floral habitat, need to be strictly managed.
- No dumping of waste material should be allowed within the study area at any stage of the development, and all building materials should be removed when construction is completed. Designated areas should be set out for waste material and regularly removed to an appropriate authorised dumping facility.

**Flora**

- Proliferation of alien and invasive species is expected within any disturbed areas. These species should be eradicated and controlled to prevent their spread beyond the development footprint areas. Alien plant seed dispersal within the top layers of the soil within footprint areas, has to be controlled.
- Species specific and area specific eradication recommendations:
  - Care should be taken with the choice of herbicide to ensure that no additional impact and loss of indigenous plant species occurs due to the herbicide used.
  - Footprint areas should be kept as small as possible when removing alien plant species.
- The floral species *Zantedeschia albomaculata* and *Kniphofia porphyrantha* were identified within the wetland habitat unit. Both these species are protected under the MNCA (Act 10 of 1998), and if any of these are to be disturbed, permits must be obtained from the Mpumalanga Tourism and Parks Agency (MTPA). Furthermore, several other species protected under this Act, such as species in the family’s Orchidiaceae, Iridaceae and Liliaceae, are highly likely to occur within the study area, especially in the intact grassland habitat unit.
- Thus, it is recommended that a site-specific walk down of the preferred substation and power line alternative is performed in the correct season (December to March) prior to construction in order to rescue and relocate any such species.
- Should any other floral SCC or RDL species be encountered within study area, the following should be ensured:
  - If any threatened species, or nationally or provincially protected floral will be disturbed, ensure effective relocation of individuals to suitable similar habitat. Arrangement with the relevant authorities needs to take place to rescue and relocate the species.

- All rescue and relocation plans should be overseen by a suitably qualified specialist.

### **Avifauna**

- To mitigate for the risk of bird electrocution, particularly for large raptors and vultures, it is recommended that the steel monopole structure be used with a Bird Perch on all pylons.
- To mitigate for disturbance of birds it will be important for a suitably qualified avifaunal specialist to conduct an avifaunal walk through assessment just before construction in order to determine whether any Red-Listed bird species are breeding on the servitude. This could include breeding on the existing power line tower structures. If such breeding birds are identified case specific management recommendations must be developed by the specialist. In addition to the above exercise, general environmental best practices should suffice for reducing the disturbance as far as possible. These include; strict management of staff, vehicles and machinery on site; and completing construction within the shortest possible time.

### **Surface Water**

- With regard to substation alternative 3, it is strongly recommended that the proposed substation location be moved roughly 350m eastwards to firstly avoid all surface water resources, and secondly, be located within closer proximity to the existing dirt road, thus reducing any potential impacts on the environment.
- Additionally, as per previous recommendations, the final proposed power line route is to avoid surface water resources as far as possible to prevent towers being placed within these surface water resource habitats. The mitigation measures stipulated in the EMPr must be implemented and enforced.
- Importantly, this study has only focussed on the delineation of surface water resources within the proposed corridors of the power lines and substation, aquatic studies of fish, invertebrates, amphibians etc. have not been included. Given the aim of the study, the inclusion of these components is not seen as important. However, once the final alternative(s) have been selected, these components might have to be included, especially as the Ngwempisi River, Hlelo River and selected tributaries may be effected. These systems drain into Swaziland, and international obligations regarding water quality will have to be considered during construction. A rehabilitation plan will have to be developed once the alternative(s) have been selected. This is especially important as current land use activities have already altered surface roughness and additional impacts may cause further erosion and sedimentation problems.
- Final specialist recommendations focus on adopting the proposed preferred alternative corridor and recommended substation location. Additionally, it is recommended that consultation with the Department of Water Affairs will be required to determine the need for any authorisations (for example, a Water Use License) once the final tower positions have been determined. Given the above, it will be likely that a follow-up wetland specialist assessment will need to be undertaken that meets with the requirements of the required authorisation or license. The scope of the follow up assessment is likely to include a Present Ecological Status (PES) assessment, Ecological Importance and Sensitivity Classification (EISC) determination and an Eco-services assessment. Additionally, site specific impacts should also be determined if towers are located within any wetlands or the riparian habitat identified.
- Specific mitigation measures are highlighted in the EMPr and should be adhered to through all stages of the development.

### **Agriculture and Soils**

#### **Power lines**

- Interact with impacted landowners to discuss where they would ideally like to see the power



lines situated on their property to have the least impact on their farming practices, the negotiation phase should form part of the final survey / line route selection.

- Employ a low impact routing to avoid high value agricultural land, forestry and important agricultural infrastructure. This is particularly important for the various agricultural areas identified in the Agricultural specialist report.
- The utilisation of optimal tower designs can further reduce the potential impacts.
- Attempt to place towers on the edge of existing agricultural areas and span active agricultural fields as far as possible. Following existing roads and utilising the edge of road servitudes is highly recommended due to the existing impacts associated with these areas.
- Due to the overarching route characteristics, and the nature of the proposed development, the remaining viable mitigation measures are limited and will most likely revolve around erosion control:
  - Clearing activities should be kept to a minimum.
  - In the unlikely event that heavy rains are expected, activities should be put on hold to reduce the risk of erosion.
  - If additional earthworks are required, any steep or large embankments that are expected to be exposed during the 'rainy' months should be armoured with fascine like structures.
  - If earth works are required then storm water control and wind screening should be undertaken to prevent soil erosion.

### **Substation**

- Avoid active cultivated land by building in the centre of the assessment area, which is characterised by low value agricultural land (grazing land).
- Due to the overarching site characteristics and the nature of the proposed development viable mitigation measures are limited and will most likely revolve around erosion control:
  - Clearing activities should be kept to a minimum.
  - In the unlikely event that heavy rains are expected activities should be put on hold to reduce the risk of erosion.
  - If additional earthworks are required, any steep or large embankments that are expected to be exposed during the 'rainy' months should either be armoured with fascine like structures.
  - If earth works are required then storm water control and wind screening should be undertaken to prevent soil loss from the site

### **Heritage**

#### **Cemetery 1**

- Maintain a buffer of 50m
- Shift the proposed substation and power line trajectory at least 50m to the south of its present trajectory
- Erect a sturdy fence with an entrance gate on the western border of Cemetery 1.

#### **Cemetery 2**

- Maintain a buffer of at least 50m
- Shift the proposed power line trajectory at least 50m south of its present trajectory
- Erect a sturdy fence with an entrance gate on the southern border of Cemetery 2.

#### **Grave Yard 1**

- Maintain a buffer zone of at least 50m
- Shift the associated power line at least 50m to the south of its present trajectory.
- Erect a sturdy fence with an entrance gate on the southern border of Grave Yard 1

#### **Cemetery 4**

- Maintain a buffer of 50m (Alternative Route 3)

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- Replace existing fence with a sturdy fence including entrance gate.

### **Visual**

- Carefully plan to reduce the construction period.
- Locate construction camp and storage areas in zones of low visibility i.e. behind tall trees or in lower lying areas.
- Minimise vegetation clearing and rehabilitate cleared areas as soon as possible.
- Maintain a neat construction site by removing rubble and waste materials regularly.
- Make use of existing gravel access roads where possible.
- Locate the substation within the tall commercial forestry plantation, if possible.
- Locate the substation as far away from sensitive receptor locations as possible (i.e. at site alternative 1).
- Locate the substation as close to the existing 400kV power line as possible.
- Align the power line as far away from sensitive receptor locations as possible. Should this not be possible, align the power line so that it is not directly within the primary focus / orientation of visually sensitive receptors.
- Align the power line to run parallel to existing power lines and other linear impacts such as existing power lines, where possible.
- Avoid crossing areas of high elevation, especially ridges, koppies or hills, where possible.
- Align the power line within the tall commercial forestry plantation, where possible.

### **General Recommendations of the EAP**

- All feasible mitigation measures recommended by the various specialists should be strictly implemented, where applicable to the authorised power line alignment.
- Final EMPr should be approved by DEA prior to construction.
- It is recommended that a five (5) year validity period be granted for the Environmental Authorisation

Is an EMPr attached?

✓YES

The EMPr must be attached as Appendix G.

The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process must be included as Appendix H.

If any specialist reports were used during the compilation of this BAR, please attach the declaration of interest for each specialist in Appendix I.

Any other information relevant to this application and not previously included must be attached in Appendix J.

Jenny Barnard - SiVEST (Pty) Ltd

NAME OF EAP



SIGNATURE OF EAP

23 March 2015

DATE

## **SECTION F: APPENDIXES**

The following appendixes must be attached:

### **Appendix A: Maps**

### **Appendix B: Photographs**

### **Appendix C: Facility illustration(s)**

### **Appendix D: Specialist reports**

- Appendix D1: Biodiversity Impact Assessment
- Appendix D2: Desktop faunal Review
- Appendix D3: Surface Water Impact Assessment
- Appendix D4: Agricultural Potential and Soils Assessment
- Appendix D5: Heritage Impact Assessment
- Appendix D6: Visual Impact Assessment
- Appendix D7: Geotechnical Impact Assessment

### **Appendix E: Public Participation**

- Appendix E1: Proof of Advertisements and Site Notices
- Appendix E2: Proof of Written Notification to Stakeholder
- Appendix E3: Comments and Response Report **(To be included in the FBAR)**
- Appendix E4: Proof of Written Notification to Authorities and Organs of State
- Appendix E5: I&APs Database
- Appendix E6: Correspondence and Meeting Minutes **(To be included in the FBAR)**

### **Appendix F: Impact Assessment**

### **Appendix G: Environmental Management Programme (EMPr)**

### **Appendix H: Details of EAP and expertise**

### **Appendix I: Specialist's declaration of interest**

### **Appendix J: Additional Information**

- Appendix J1: Competent Authority Consultation
- Appendix J2: EIA Downgrade Motivation
- Appendix J3: Coordinate Spreadsheets
- Appendix J4: Eskom Guideline Documents

### **List of abbreviations**

BA	Basic Assessment
BAR	Basic Assessment Report
BSA	Basic Social Assessment
C&RR	Comments and Response Report
CBA	Critical Biodiversity Area
ESA	Ecological Support Area
DAFF	Department of Agriculture, Forestry and Fisheries
DBAR	Draft Basic Assessment Report
DS	Distribution Station
DWA	Department of Water Affairs
EMF	Electric and Magnetic Fields
EMPr	Environmental Management Programme
FBAR	Final Basic Assessment Report
GIS	Geographic Information System
GN	Government Notice
HIA	Heritage Impact Assessment
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
kV	Kilovolt
MTS	Main Transmission Substation
NCDTEC	Northern Cape Department of Environmental Affairs and Nature Conservation NEMA National Environmental Management Act, 1998 (Act No.107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NFA	National Forests Act, 1998 (Act No. 84 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NNR	No Natural Area Remaining
NPAES	National Protected Area Expansion Strategy
NWA	National Water Act, 1998 (Act No. 36 of 1998)
ONA	Other Natural Area
PPP	Public Participation Process
PV	Photovoltaic
REIPPP	Renewable Energy Independent Power Producer Programme
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute

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SANRAL South African National Roads Agency SOC Limited  
SDF Spatial Development Framework  
SG Surveyor General  
SOC State Owned Company