



**PROPOSED ESKOM BOICHOKO SUBSTATION AND
ASSOCIATED OVERHEAD 132 KV POWER LINES
BETWEEN KUMBA AND VAALBOS SUBSTATIONS, NEAR
POSTMASBURG, NORTHERN CAPE PROVINCE**

FINAL BASIC ASSESSMENT REPORT

DEA Reference No. 14/12/16/3/3/1/1504

January 2016

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environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

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File Reference Number:

Application Number:

Date Received:

Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2014, 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, 2014 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 **08 December 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.
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.

DOCUMENT CONTROL

Date	January 2016
Project	Proposed Eskom Boichoko Substation and associated overhead 132 kV power lines between Kumba and Vaalbos Substations, near Postmasburg, Northern Cape Province
Document Title	Final Basic Assessment Report for Decision
Author	Tara Lockwood
Document Revision	Rev 01

ABBREVIATIONS

BAR	Basic Assessment Report
DEA	Department of Environmental Affairs
DoE	Department of Energy
EAP	Environmental Assessment Practitioner
EMPr	Environmental Management Programme
EIA	Environmental Impact Assessment
ERA	Electricity Regulation Act (No. 4 of 2006)
GN	Government Notice
Ha	Hectares
HIA	Heritage Impact Assessment
I&AP's	Interested and Affected Parties
IPP	Independent Power Producer
MW	Megawatts
NEMA	National Environmental Management Act (No. 107 of 1998) (as amended)
NHRA	National Heritage Resources Act (No. 25 of 1999)
NWA	National Water Act (No 36 of 1998)
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework

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DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

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EAP Qualifications	BSc (Hons)		

Details of the EAP's expertise to carry out Basic Assessment procedures

Envirolution Consulting (Pty) Ltd was contracted by Eskom Holdings SOC Ltd as the independent environmental consultant to undertake the Environmental Basic Assessment process for the proposed project. Envirolution Consulting Pty Ltd is not a subsidiary of or affiliated to Eskom. Furthermore, Envirolution Consulting does not have any interests in secondary developments that may arise out of the authorisation of the proposed project.

Envirolution Consulting is a specialist environmental consulting company providing holistic environmental management services, including environmental impact assessments and planning to ensure compliance with environmental legislation and evaluate the risk of development; and the development and implementation of environmental management tools. Envirolution Consulting benefits from the pooled resources, diverse skills and experience in the environmental field held by its team.

We offer solutions to environmental issues that are key during our clients' planning and decision-making processes

The Envirolution Consulting team have considerable experience in environmental impact assessments and environmental management, and have been actively involved in undertaking environmental studies, for a wide variety of projects throughout South Africa, including those associated with linear developments.

The EAPs from Envirolution Consulting who are responsible for this project are (refer to **Appendix I** for CVs):

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

- Ms. Tara Lockwood the principle author of this Basic Assessment Report holds a BSc. Honours degree from the University of Cape. She has 3 years of experience consulting in the environmental field. Her key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; environmental auditing and compliance reporting; the identification of environmental management solution and mitigation/risk minimising measures; environmental auditing, monitoring and reporting compliance. Tara has been a project scientist for various EIA's in South Africa and Southern Africa. Tara is currently a Project Manager and Environmental Consultant at Envirolution Consulting Pty Ltd.

BASIC ASSESSMENT REPORT FOR REVIEW

This Basic Assessment Report has been prepared by Envirolution Consulting in order to assess the potential environmental impacts associated with the proposed activities. This process is being undertaken in support of an application for Environmental Authorisation in terms of the National Environmental Management Act (NEMA, Act 107 of 1998).

Members of the public, local communities and stakeholders were invited to comment on the Draft Basic Assessment Report. The 30-day period for review of the Draft Basic Assessment report was from the **13 November to 14 December 2015**. Comments received from the public during this period and throughout the process were included in this Final Report.

Table 1: Legal requirements in terms of the EIA Regulations

EIA REGULATIONS 2014 GNR 982: Appendix 1, Item 2: CONTENT OF THE BASIC ASSESSMENT REPORT	Cross-reference in this BAR
a.) details of— (i) the EAP who prepared the report; and (ii) the expertise of the EAP to carry out scoping procedures; including a curriculum vitae	In FBAR pg 6
b.) the location of the activity, including: (i) the 21 digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the co-ordinates of the boundary of the property or properties;	Section B pg 35-40
(c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale; or if it is: (i) a linear activity, a description and co-ordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the co-ordinates within which the proposed activity is to be undertaken;	Section A pg 13 and 17
(d) a description of the scope of the proposed activity, including – (i) all listed and specified activities triggered and being applied for; and (ii) a description of the activities to be undertaken including associated structures and infrastructure;	Section A (b) pg 16
(e) a description of the policy and legislative context within which the development is proposed, including- (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation and policy context, guidelines, tools, frameworks and instruments;	Section A pg 22-30
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section A pg 11
(g) a motivation for the preferred site, activity and technology alternative	Section C, Appendix E6

EIA REGULATIONS 2014 GNR 982: Appendix 1, Item 2: CONTENT OF THE BASIC ASSESSMENT REPORT	Cross-reference in this BAR
<p>(h) a full description of the process followed to reach the proposed preferred alternative within the site, including-</p> <ul style="list-style-type: none"> (i) details of all the alternatives considered; (ii) details of the public participation process undertaken in terms of Regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; (iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- <ul style="list-style-type: none"> (aa) can be reversed (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; (vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; (vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (viii) the possible mitigation measures that could be applied and level of residual risk; (ix) the outcome of the site selection matrix; (x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and (xi) a concluding statement indicating the preferred alternatives 	<p>Section D (2) pg 92</p>
<p>(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including-</p> <ul style="list-style-type: none"> (i) description of all environmental issues and risks that were identified during the environmental impact process; and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures; 	<p>Appendix D and F</p>
<p>(j) an assessment of each identified potentially significant impact and risk, including-</p> <ul style="list-style-type: none"> (i) cumulative impacts; (ii) the nature significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be avoided, managed or mitigated; 	<p>Appendix F</p>
<p>(k) where applicable, a summary of findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations</p>	<p>Section D(1) pg 55 Appendix G</p>

EIA REGULATIONS 2014 GNR 982: Appendix 1, Item 2: CONTENT OF THE BASIC ASSESSMENT REPORT	Cross-reference in this BAR
and an indication as to how these findings and recommendations have been included in the final report;	
(l) an environmental impact statement which contains- (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of positive and negative impacts and risks of the proposed activity and identified alternatives;	Section D(2)
(m) based on the assessment, and where applicable, impact management measures from the specialist reports, the recording of the impact management objectives and the impact management outcomes for the development for inclusion in the EMPr;	Appendix G
(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of the authorisation;	Section E pg 99
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Appendix D Section E
(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation	Section E pg 99
(q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be conducted and the post construction monitoring requirements finalised;	Appendix F and G
(r) an undertaking under oath or affirmation by the EAP in relation to: (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from the stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to the comments or inputs made by interested and affected parties;	Appendix H3
(s) where applicable, details of any financial provisions for the rehabilitation, closure and ongoing post decommissioning management of negative environmental impacts	Not applicable
(t) any specific information that may be required by the competent authority; and	No comments received
(u) any other matters required in terms of section 24(4)(a) and (b) of the Act	Not applicable

SECTION A: ACTIVITY INFORMATION

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 the specialist appointed and attach in Appendix I.

1. Project Description

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

1.1 Background Information

Eskom Holdings SOC Ltd is proposing to construct the Boichoko substation and associated 132kV distribution power line which will span between the proposed Boichoko substation and the existing Kumba and Vaalbos substations, near Postmasburg, Northern Cape Province (proposed development hereafter). The site is situated approximately 2 km north east of Postmasburg in the Northern Cape Province and falls within the jurisdiction of the Tsantsebane Local Municipality. The objective of the proposed power line and substation is to strengthen the electricity supply to Sishen Iron Ore Mine and the Tsantsabane Local Municipality.

One power line route and one substation (Boichoko substation) are required for the purposes of this development. Three route alternatives (*Route A1, Route A2 and Route A3*) have therefore been considered for the proposed power line; and three sites (*Substation Alternative A, Substation Alternative B, and Substation Alternative C*), have been considered for the location of the substation. Power line route A1 and Substation Alternative A are the most preferred alternatives by Eskom. Please refer to the locality map (Figure 1.1) for further details. This Basic Assessment Report (BAR) covers the findings of the site assessment and impacts identified for the proposed power line and the alternative sites for the proposed construction of the substation.

A detailed description of the proposed development is highlighted in **Section 1.2** of this report.

1.2 Project Description and Routes and Substation Description

The proposed development will include the construction of one 132 kV double circuit distribution power line of approximately 35km long, from the existing Kumba Substation into the proposed Boichoko Substation and then finally on to the Vaalbos substation. Steel monopole structures will be used to span the lines. A substation of an area of 100x100m will be constructed to receive the power lines.

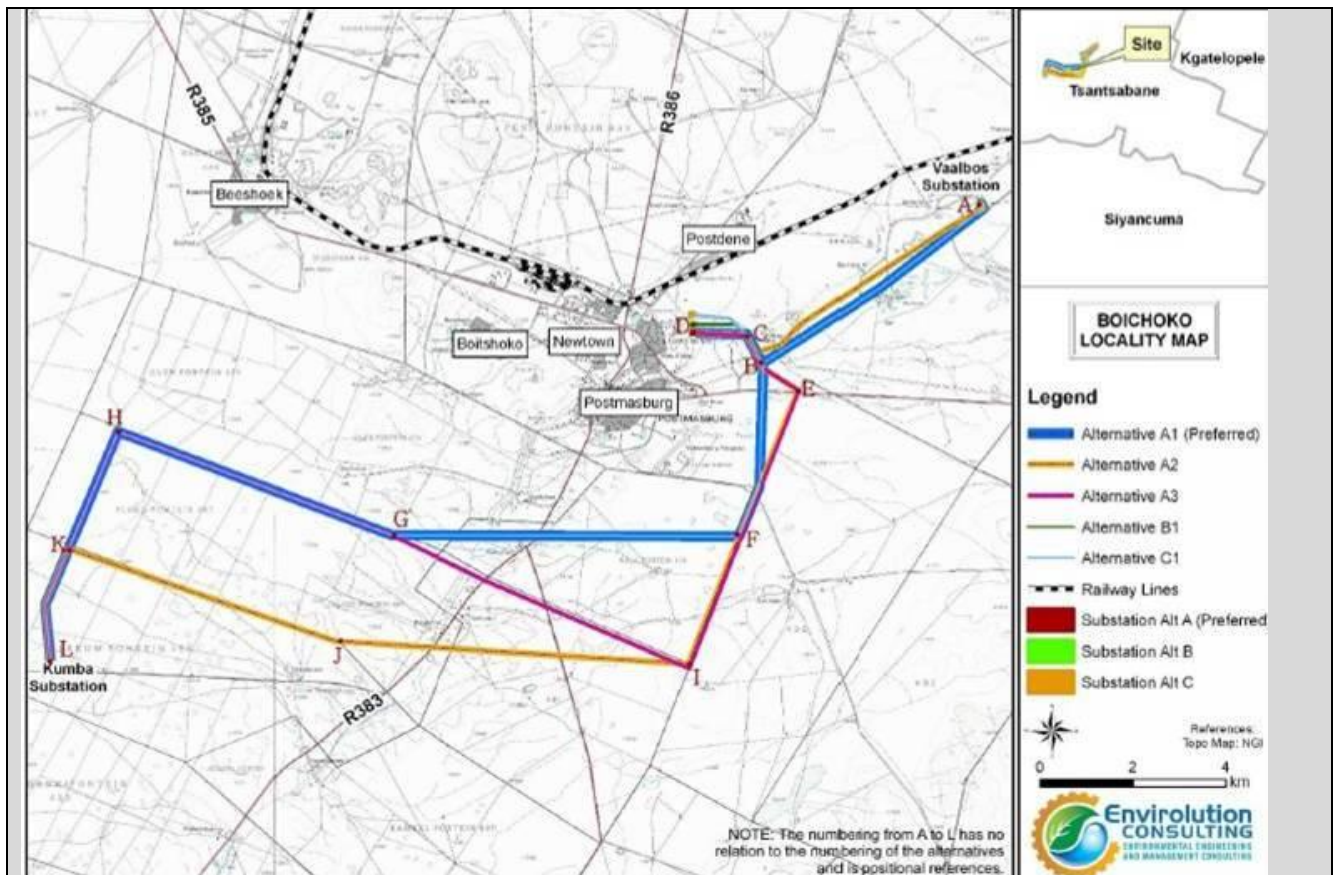


Figure 1.1: Locality map showing the Boichoko substation site and associated power lines as well as the alternatives.

1.2.1. Substations A (preferred substation site)

This alternative is located approximately 2km east of Postmasburg, on Postmasburg Erf 3753 and is located in close proximity (100m) to the other substation alternatives (B & C). The Postmasburg residential area is to the south-east of this substation site. The proposed substation sites will occupy a footprint of approximately 100m x 100m. The proposed substation alternative sites will be located on farm Postmasburg Erf 3753.

1.2.2. Substations B and C (alternative substation sites)

Similar to the substation alternative A (preferred), both these substation alternatives are also situated approximately 2km east of Postmasburg, on Postmasburg Erf 3753 and located within close proximity (100m) of each other. The substation sites are also located close to residential area of Postmasburg. The Postmasburg Stone Crushers and the West End Mine are located to the east of these sites. These substation sites will require a footprint of approximately 100m x 100m.

1.2.3. Loop-in/Loop-out Tie-in diversions of A1, B1 and C1 (portion highlighted in green and pale blue on Figure 1.1 and 1.2)

Tie-in sections B1 & C1 are diversions of A1 from point (C) with the only change being the different loop-in/loop out tie points with the substation alternatives B and C. These route diversions will pass through farms Plaas 492 and Postmasburg 1

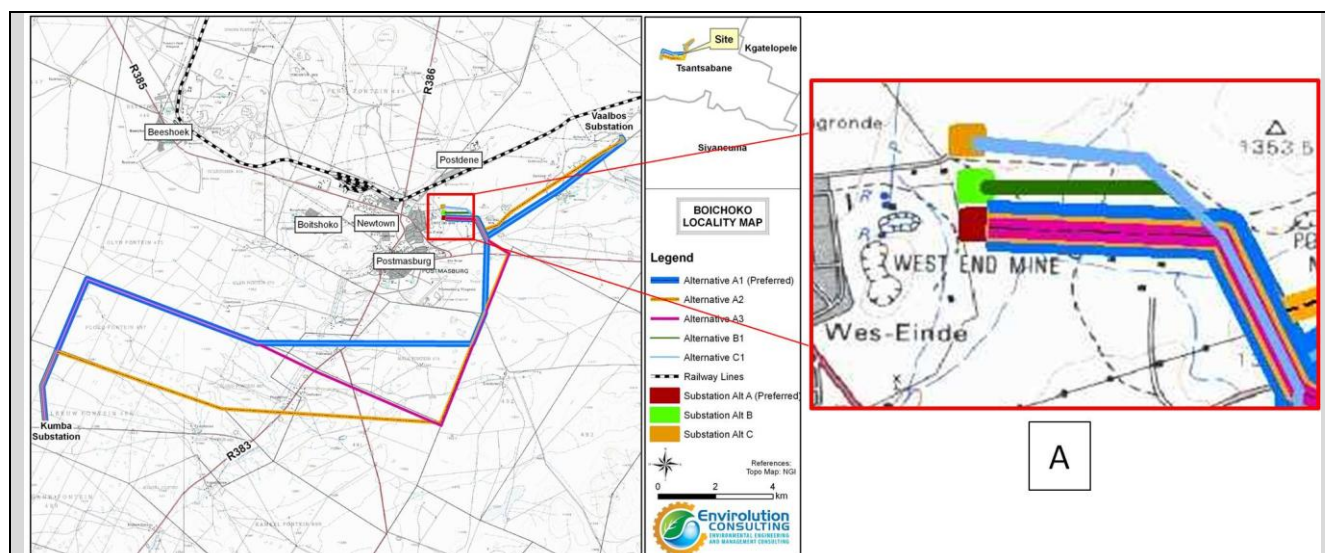


Figure 1.2: A closer view of the Boichoko loop-in /loop-out tie-in diversions of A1 (B1 and C1) (inset A) into the substation alternatives

1.2.4. Power line Route A1 (preferred) (Blue route)

Route A1 starts at the existing Vaalbos Substation and kinks south-west towards the proposed Boichoko substation, it then connects to the one of the substation alternatives via loop-in/loop-out tie in diversions either A1, B1 or C1 (each of these route diversions is approximately 1km in length). The power line route then heads south (F) for approximately 5km passing the Postmasburg town in the easterly direction. The route then bends west for about 8km towards point G (on Figure 1.1) and then heads slightly south-east for about 6km towards point H and then bends southwards to connect into the existing Kumba substation. Power line route A1 will transect various farms, namely Plaas 492, Postmasburg 1, Strydfontein 614, Leeuw Fontein 488, Ploeg Fontein 487 and Olyn Fontein 475/2.

1.2.5. Power line Route A2 (alternative) (Orange route)

Route A2 also starts at the existing Vaalbos Substation, however the line lies slightly to the north of Route A1 and crosses the R385 at a location 700m to the west (E). Route A2 continues to kink south-west towards the proposed Boichoko substation, it then will also connect to one of the substation alternatives via loop-in/loop-out tie in diversions either A1, B1 or C1 (diversion routes are approximately 1km in length each). The power line route then follows the same alignment as Route A1 when exiting the proposed Boichoko substation, but it travels a further 2km in a south-easterly direction to point E. The route then kinks south-west for approximately 8km to point I. The route then bends west for approximately 8.5 km (J) and then heads slightly south-east for about 6km towards the H point and then bends southwards to connect into the existing Kumba substation. Power line route A2 will transect various farms, namely Plaas 492, Postmasburg 1, Strydfontein 614, Leeuw Fontein 488, Ploeg Fontein 487, Soefffontein 606, and Kalkfontein 474.

1.2.6. Power line Route A3 (alternative) (Red route)

Route A3 is a diversion of Route A1. Starting at the existing Vaalbos Substation, the route kinks south-west towards the proposed Boichoko substation, it then connects to one of the substation alternatives via loop-in/loop-out tie in diversions A1, B1 or C1 (each of these deviation routes is 1km in length). The power line route then follows the same alignment as Route A1 when exiting the proposed Boichoko substation, but similarly to Route A2, it travels a further 2km in a south-easterly direction to point E. The route then kinks south-west for approximately 8km to point I. Instead of continuing on

the same route alignment as Route A2, the route makes a sharp bend in a north-westerly direction, travelling for approximately 10km to point G. The route then continues along the same alignment as Route A1, heading slightly in south-east for about 6km towards the H point and then bends southwards to connect into the existing Kumba substation. Power line route A3 will transect various farms, namely Plaas 492, Postmasburg 1, Strydfontein 614, Leeuw Fontein 488, Ploeg Fontein 487, Olyn Fontein 475/2, Soetfontein 606, and Kalkfontein 474.

1.3 Listed Activities triggered by the proposed development

In terms of Sections 24(2) and 24(D) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and as read with EIA Regulations 2014 of GN R982-985, a Basic Assessment is required to be undertaken for the proposed project. The need for a Basic Assessment is triggered by the following listed activities:

GNR. 983, Listing Notice 1 of 2014

- **Activity 11:** The development of facilities or infrastructure for the transmission and distribution of electricity –
(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts;
- **Activity 27:** The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation;

Please also note that a Water Use Licence or a General Authorisation Application with the Department of Water and Sanitation may be required in terms of the National Water Act No. 36 of 1998 for the following water uses:

- Section 21 (c): impeding or diverting the flow of water in a watercourse; and
- Section 21 (i): altering the bed, banks, course or characteristics of a watercourse.

The Water use Licence Application will be undertaken as a separate application and will be submitted to the Department of Water and Sanitation.

1.4 Specialist studies

Several specialist studies have been undertaken to provide more detailed information on the environment aspects that may be affected by the proposed project. Specialist Ecological (Flora and Fauna), Avifaunal, Wetland, Visual and Heritage Assessments were undertaken during the Basic Assessment and their reports are attached in **Appendix D**.

1.5 Servitude Requirements

The servitude width required by Eskom for the 132kV overhead distribution line is 31 metres (15.5 metres from the centre of the power line) while the separation distance between a 132kV line and any other line is 21m.

Vegetation clearance for the proposed distribution power lines will be minimal due to the mainly grassland habitat. The Eskom Standard and specifications for vegetation clearance and invasive alien plant management for new power line construction specifications have been incorporated into the Environmental Management Programme (EMPr), which will guide the construction, operational and maintenance phases of the project. A 132kV distribution substation normally requires a footprint of about 10000m².

1.6 Required Services

Establishment of Construction Camps

The establishment of construction camps will be done in accordance to the stipulations of the final Environmental Management Plan and negotiations with the affected landowners.

Water

Water will be required for potable use and in the construction of the foundations for the towers. The water will be sourced from municipality points at locations closest to the area of construction.

Sewerage

The generation of sewerage is anticipated for the duration of construction. Onsite treatment will be undertaken through the use of chemical toilets. The toilets will be serviced periodically by the supplier and effluent will be collected for disposal into the registered Waste Water Treatment Works.

Roads

Existing roads will be utilised as far as possible during construction and operation. No roads that trigger NEMA Regulations Listed Activities will be required. The use of roads on landowner property is subject to the provisions of an EMPr and will be determined based on discussions with landowners should it be necessary

Solid Waste Disposal

Eskom has a strong commitment to waste minimisation and recycling. All solid waste will be collected at a central location at each construction site, and will be disposed at the registered waste site or stored temporarily until removal for recycling or disposal at an appropriately permitted landfill site in the vicinity of the construction site.

Foundations

The excavations shall be kept covered or barricaded in a manner accepted by the Supervisor to prevent injury to people or livestock. Failure to maintain proper protection of excavations may result in the suspension of excavation work until proper protection has been restored.

Stringing

Once towers have been erected, cables will be strung between the towers.

Bird Flight Diverters

Bird flight deflectors will be fitted on the structures during the construction phase.

Electricity

Diesel generators will be utilised for the provision of electricity where electricity connection is not readily available.

1.7 Construction Process

Generally, the construction of the power line is expected to consist of the following sequential phases:

- Step 1: Feasibility and identification of line alternatives.
- Step 2: Basic Assessment input and environmental permitting.
- Step 3: Negotiation of final route with affected landowners.
- Step 4: Survey of the proposed route.
- Step 5: Selection of structures suited to the terrain and ground conditions.
- Step 6: Final design of the distribution line and placement of towers.
- Step 7: Issuing of tenders and eventually appointment of contractors for the project.
- Step 8: Vegetation clearance and construction of access roads (if required).
- Step 9: Pegging of structures.
- Step 10: Construction of foundations.
- Step 11: Assembly and erection of structures.
- Step 12: Stringing of conductors.
- Step 13: Rehabilitation of disturbed areas and protection of erosion sensitive areas.
- Step 14: Testing and commissioning.
- Step 15: Operation and routine maintenance.

It is estimated that the construction period for this project will be 18-24 months.

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

Detailed description of listed activities associated with the project	
Listed activity as described in GN 983, 984 and 985	Description of project activity that triggers listed activity – if activities in GN 983 are triggered, indicate the triggering criteria as described in the second column of GN 983
GN983 Item 11 (i): <i>The development of facilities or infrastructure for the distribution and distribution of electricity – outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts;</i>	The proposed 132kV power line will be constructed outside an urban area.
GN983 Item 27: <i>The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation;</i>	An area of about 100m x100m (1hectare) is required to construct the proposed substation and Eskom will clear above 10000m² for the purposes of substation construction.

1. 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 Appendix 1 (3)(h), Regulation 2014. 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

1. Substations A, B and C

Alternative 1 (preferred)		
Description	Lat (DDMMSS)	Long (DDMMSS)
Substation A	28°19'8.67"S	23° 4'52.92"E
Alternative 2 (alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
Substation B	28°19'8.78"S	23° 4'54.01"E
Alternative 3 (alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
Substation C	28°19'9.67"S	23° 4'56.02"E

In the case of linear activities:

2. Power lines A1, A2 and A3:

Route A1 (preferred)

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

Latitude (S):

Longitude (E):

28°22'51.73"S	22°57'21.42"E
28°21'30.26"S	23° 5'3.38"E
28°17'38.56"S	23° 8'9.17"E

Route A2 (alternative)

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

28°22'51.73"S	22°57'21.42"E
28°21'30.26"S	23° 5'3.38"E
28°19'7.83"S	23° 4'52.92"E

Route A3 (alternative)

- Starting point of the activity

28°22'51.73"S	22°57'21.42"E
---------------	---------------

• Middle/Additional point of the activity	28°21'30.27"S	23° 5'12.61"E
• End point of the activity	28°19'33.36"S	23° 5'40.49"E

**3. Loop-in/Loop-out tie- in diversions
A1, B1 and C1:**

Latitude (S):

Longitude (E):

(associated with substations A, B and C respectively)

Route A1 (preferred)

• Starting point of the activity	28°21'0.72"S	23° 5'34.95"E
• Middle/Additional point of the activity	28°20'52.96"S	23° 5'37.25"E
• End point of the activity	28°19'8.67"S	23° 4'52.92"E

Route B1 (alternative)

• Starting point of the activity	28°21'0.72"S	23° 5'34.95"E
• Middle/Additional point of the activity	28°20'53.01"S	23° 5'37.34"E
• End point of the activity	28°19'8.78"S	23° 4'54.01"E

Route C1 (alternative)

• Starting point of the activity	28°21'0.72"S	23° 5'34.95"E
• Middle/Additional point of the activity	28°20'53.25"S	23° 5'37.45"E
• End point of the activity	28°19'9.67"S	23° 4'56.02"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. Addendum has been included in **Appendix A**.

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 of this form.

b) Lay-out alternatives

Alternative 1 (preferred alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
Alternative 2		
Description	Lat (DDMMSS)	Long (DDMMSS)
Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)

c) Technology alternatives

Alternative 1 (preferred alternative)
Alternative 2
Alternative 3

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

Alternative 1 (preferred alternative)		
Alternative 2		
Alternative 3		

e) No-go alternative: Boichoko Substation and associated Power line

The No-go option implies that the project does not proceed, and will thus comprise of Eskom not going ahead with the construction of the proposed power lines and substation. Ideally this would be the preferred alternative as the status quo of the environment remains unchanged, however due to the growing demand for energy and activities that will require electricity in the area, this alternative is not feasible. Should Eskom rely on the existing network to supply future demand it is highly likely that present supply will be compromised due to the increased load on the network. Although the no-go alternative has been considered, it is not a practical project alternative in terms of providing stable electricity supply for the mines in the area and for additional mines that are also being planned in the immediate vicinity as it implies a continuation of the current situation or the status quo, therefore, it doesn't render any positive outcomes.

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

2. PHYSICAL SIZE OF THE ACTIVITY

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

Substations:

- Substation A¹** (preferred)
- Substation B** (alternative)
- Substation C** (alternative)

Size of the activity:

	100x100 m ²
	100x100 m ²
	100x100 m ²

For linear activities:

Power lines:

- Route A1** (preferred)
- Route A2** (alternative)
- Route A3** (alternative)

Length of the activity:

	29km
	30km
	35km

¹ "Alternative A.." refer to activity, process, technology or other alternatives.

Loop-in/Loop-out tie- in diversions A1, B1 and C1:

Length of the activity:

Route A1 (preferred)
Route B1 (alternative)
Route C1 (alternative)

	1km
	1km
	1km

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

Substations:

Size of the activity:

Substation A² (preferred)
Substation B (alternative)
Substation C (alternative)

100x100 m ²
100x100 m ²
100x100 m ²

For linear activities:

Power lines:

Size of the activity:

Route A1 (preferred)
Route A2 (alternative)
Route A3 (alternative)

29 000m x 31m
30 000m x 31m
35 000m x 31m

Loop-in/Loop-out tie- in diversions A1, B1 and C1:

Size of the activity:

Route A1 (preferred)
Route B1 (alternative)
Route C1 (alternative)

1000m x 31m
1000m x 31m
1000m x 31m

3. SITE ACCESS

Does ready access to the site exist?

YES ✓	NO
m	

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

Describe the type of access road planned:

Access to the substation site is available through the existing Jenn-Heaven road that can be accessed directly from the Postmasburg residential area.
Access to the power line routes is available via existing district roads that divert from the R385. Permission from landowners may be required to access some portions of the line as the farm roads will be considered private access. Eskom will need to negotiate this before construction commences.

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.

² "Alternative A.." refer to activity, process, technology or other alternatives.

4. 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).

5. 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.

6. 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 DWS);
- 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.

7. 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.

8. 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.

9. ACTIVITY MOTIVATION

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

1. Is the activity permitted in terms of the property's existing land use rights?	YES ✓	NO	Please explain
The proposed routes and substations are located on privately owned agricultural and mining land. Once the proposed overhead line and substation have been constructed, limited impacts are expected. Eskom will acquire servitudes and affected property owners will be permitted to use areas underneath the lines for activities such as animal grazing. Other activities, except the construction of buildings and tall structures and growing of trees, may also continue below the lines.			

2. Will the activity be in line with the following?			
(a) Provincial Spatial Development Framework (PSDF)	YES <input checked="" type="checkbox"/>	NO	Please explain
<p>The PSDF for Northern Cape Province aims at 'building a prosperous, sustainable growing provincial economy to reduce poverty and improve social development'. Additionally the province aims to develop the required industrial amenities and infrastructure in the defined development corridors which respond to the availability of Environmental Capital (e.g. water, suitable agricultural soil, mining resources, etc.) and Infrastructural Capital (e.g. roads, electricity, bulk engineering services, etc.). Economic development typically responds to the availability of <i>Environmental Capital</i> (e.g. water, suitable agricultural soil, mining resources, etc.) and <i>Infrastructural Capital</i> (e.g. roads, electricity, bulk engineering services, etc.). The basic driving force behind a town's growth is provided by its specific economic activities, which generate job opportunities, capital, buildings and infrastructure (Badcock 2002: 66). Therefore the proposed project will address these needs and assist the Northern Cape Province in achieving these goals in the Tsantsabane Local Municipality by providing electricity to the mines and the surrounding towns thus ensuring that one of the main sources of industry continue in operation which will have a positive economic impact at a local and regional scale. Additionally, the project will assist in maintaining access to electricity for the towns of Postdene and Postmasburg. According to the Census 2005 and Community Survey 2007, the Northern Cape has 245 086 and 264 653 households respectively, 70% of which have access to electricity, which is higher than the national average of 66%. Therefore constructing the proposed development will ensure this statistic is maintained.</p>			
(b) Urban edge / Edge of Built environment for the area	YES	NO <input checked="" type="checkbox"/>	Please explain
<p>The proposed site for the Boichoko substation is situated approximately 1km outside of Postmasburg and will then lie on the urban edge. The power lines however, traverse rural and agricultural land and will not impact the urban edge.</p>			
(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?).	YES	NO <input checked="" type="checkbox"/>	Please explain
<p>The proposed development will not compromise the IDP and SDF (2011-2016) of the Tsantsabane Local Municipality. According to the SDF, future residential extensions of Postdene and Postmasburg are planned and an increase in electricity supply will be needed to support the new households. Tsantsabane is characterized by a mixture of land uses of which agriculture and mining is dominant within the rural areas, with mining being a significant economic driver for the area. Although diamonds have been mined here since 1892, the most important mineral currently mined is manganese. According to the LED Framework considerable attention has to be given to the following activities and the development potential of Tsantsabane Municipality; mineral deposits and mining related development in the area, where mining accounts for 55% of the GDP within the region. Tsantsabane is located on a mining belt stretching through to Kathu and Kuruman. Mining related legislation also presents other economic opportunities through Social and Labour Plans. Due to the increase in mining activities, the demand for housing has also increased. Approximately 750 people will be employed by the mine, with a further 3000 jobs created at the peak of the construction phase. Indirect job creation is estimated to be in the region of 4000 jobs. The mine will have a positive impact on the economy of the Northern Cape and in particular Postmasburg. Therefore the upgrade of the electricity distribution within the Tsantsabane Local Municipality region will ensure that the mines remain active and continue to contribute to economic growth in the region.</p>			

(d) Approved Structure Plan of the Municipality	YES√	NO	Please explain
<p>The proposed project entails electricity infrastructure, which is compatible with the Tsantsabane Local Municipality IDP (2011-2016) which outlines the two following KPA's, namely:</p> <p>KPA 1: Service Delivery.</p> <p>Physical Infrastructure and Energy Efficiency –to ensure <i>efficient infrastructure and energy supply</i> that will contribute to the improvement of quality of life for all citizens of Tsantsabane.</p> <p>KPA 2: Local Economic Development,</p> <p>Economic Growth and Development – to facilitate sustainable economic empowerment for all communities within Tsantsabane municipality and enabling a viable and <i>conducive economic environment</i> through the development of <i>related initiatives</i> including job creation and skills development.</p>			
(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?)	YES	NO√	Please explain
<p>No EMF could be located for the project area.</p>			
(f) Any other Plans (e.g. Guide Plan)	YES√	NO	Please explain
<p>The proposed development is aligned with Eskom's Integrated Strategic Electricity Planning (ISEP) process, which is intended to provide strategic projections of supply-side and demand-side options to be implemented in order to meet long-term load forecasts. It provides the framework for Eskom to investigate a wide range of new supply-side and demand-side technologies with a view to optimising investments and returns.</p>			
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)?	YES√	NO	Please explain
<p>The Tsantsabane IDP (2001-2016) is characterized by a mixture of land uses of which agriculture and mining is dominant within the rural areas and aims to <i>“ensure efficient infrastructure and energy supply that will contribute to the improvement of quality of life for all citizens of Tsantsabane”</i>. As the project is proposed to support the mining industry and the impact on the land use itself can be minimized, the land use is in line with the projects and programmes proposed as priorities.</p>			
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.)	YES√	NO	Please explain
<p>The power line and substation is required to be built to provide extra electricity for the mines in the area and to increase supply for the residential areas of Postmasburg and Postdene (see item 2d of this Table). Since mining is the major employer in the municipality, providing electricity to the mines can be considered a societal priority.</p>			

<p>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.)</p>	<p>YES ✓</p>	<p>NO</p>	<p>Please explain</p>
<p>The proposed project is the construction of a 132kV substation and associated overhead distribution power lines. It will not require any capacity for services such as water and sanitation from relevant Municipalities. It will however provide additional electricity capacity to the area.</p>			
<p>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.)</p>	<p>YES ✓</p>	<p>NO</p>	<p>Please explain</p>
<p>The Tsantsabane Local Municipality aims to improve the provision of applicable infrastructure and the maintenance of basic services (Tsantsabane IDP 2011-2016), and therefore the development will be in line with the planning of the municipalities. Additionally, providing the mines with electricity and so ensuring there continued operation will assist with alleviating the unemployment within the municipality boundaries.</p>			
<p>7. Is this project part of a national programme to address an issue of national concern or importance?</p>	<p>YES ✓</p>	<p>NO</p>	<p>Please explain</p>
<p>The upgrading of the electricity network and infrastructure especially the substations and transmission and distribution lines is a strategic priority towards addressing the shortage of electricity in South Africa.</p>			
<p>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.)</p>	<p>YES ✓</p>	<p>NO</p>	<p>Please explain</p>
<p>The proposed substation will be constructed on the boundaries of the mining land. The Vaalbos Substation, northeast of Postmasburg, and the Kumba Substation, at Kolomela Mine, are existing substations. Surprisingly few power lines are otherwise noticeable in the study area and those that are present, are fairly inconspicuous gum pole structures. A monopole distribution line is noticeable between Postmasburg and the mine south of Beeshoek. A steel lattice tower is also noticeable near Vaalbos Substation, coming from the coming from the northeast and heading to the northwest. The addition of the project will still be in line with the land use for most of the study area.</p>			
<p>9. Is the development the best practicable environmental option for this land/site?</p>	<p>YES ✓</p>	<p>NO</p>	<p>Please explain</p>
<p>The current status quo is the best practicable environmental option.</p>			
<p>10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?</p>	<p>YES ✓</p>	<p>NO</p>	<p>Please explain</p>
<p>The potential benefit of the proposed power lines and substation to the area lies in the stimulation of the local economy through a reliable electricity supply to the mines, which will increasingly benefit the provision of services. The provision of electricity may promote local economic development and investment in the area. Provision of electricity is critical for economic development, related employment and sustainable development in South Africa. In the context of the project improvement of the 132kV supply is critical to the improvement of provision of the mines' electricity source.</p>			

11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?	YES	NO✓	Please explain
The proposed substation and power lines are being developed to provide electricity to the mines in the area. Additionally, due to the presence of existing power lines in the surrounding area indicates that the development will not set a precedent for similar activities as it will not change the character of the study area.			
12. Will any person's rights be negatively affected by the proposed activity/ies?	YES	NO✓	Please explain
The proposed Boichoko substation and associated power lines will not negatively affect any person's rights. The servitude rights for the line will be acquired by Eskom and financial compensation will be paid where applicable.			
13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?	YES	NO✓	Please explain
The proposed site for the Boichoko substation is situated approximately 1km outside of Postmasburg and will then lie on the urban edge. The power lines however, traverse rural and agricultural land. The urban edge will not be compromised.			
14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?	YES✓	NO	Please explain
<p>The project will conform to the objectives of the following SIP:</p> <p>SIP 10: Electricity transmission and distribution for all Expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development. Align the 10-year transmission plan, the services backlog, the national broadband roll-out and the freight rail line development to leverage off regulatory approvals, supply chain and project development capacity.</p>			
15. What will the benefits be to society in general and to the local communities?	Please explain		
As mining constitutes a major employer in the affected municipality, providing electricity to the mines will benefit the local communities by generating more employment opportunities as the mines will continue to operate. As a benefit to society in general, the continued operation of the mines will provide necessary products to sell and thus increase the capital within South Africa, which will then boost the economy.			
16. Any other need and desirability considerations related to the proposed activity?	Please explain		
The proposed project will ensure that economic growth continues in the region.			

17. How does the project fit into the National Development Plan for 2030?	Please explain
<p>Due to a reduction in capital spending from effect, South Africa has missed a generation of capital investment in roads, rail, ports, electricity, water, sanitation, public transport and housing. To grow faster and in a more inclusive manner, the country needs a higher level of capital spending.</p> <p>Chapter 4: Economic Infrastructure</p> <p>The proportion of people with access to the electricity grid should rise to at least 90 percent by 2030, with non-grid options available for the rest.</p> <p>Action 20 of The National Development Plan also considers the Ring-fencing the electricity distribution businesses of the 12 largest municipalities (which account for 80 percent of supply), resolve maintenance and refurbishment backlogs and develop a financing plan, alongside investment in human capital.</p> <p>Action 21 aims to revise national electrification plan and ensure 90 percent grid access by 2030 (with balance met through off-grid technologies).</p>	
18. Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.	
<p>This report serves as a Basic Assessment Report that will investigate all potential impacts (social, economic and environmental) that may result from the development including alternatives, assess and evaluate and further provide a mitigation plan for all identified potential impacts.</p> <p>Ecological, heritage, avifaunal, visual and wetland specialists were appointed to investigate potential environmental impacts. Identified environmental impacts were assessed and mitigation measures provided to control and manage these environmental impacts. Interested and Affected parties, land owners and relevant stakeholders were identified and involved throughout the Basic Assessment process and their comments will be addressed and recorded as part of this assessment.</p>	

10. 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 (NEMA), No. 107 of 1998	<p>In terms of the Duty of Care provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with this project is avoided, stopped or minimised.</p> <p>In terms of NEMA, it has become the legal duty of a project proponent to consider a project holistically, and to consider the cumulative effect of a variety of impacts.</p> <p>In terms of GNR 983 of December 2014, a Basic Assessment process is required to be undertaken for the proposed project</p>	Department of Environmental Affairs	1998
National Environmental Management Biodiversity Act, No. 10 of 2004 of 1989	<p>Three government notices have been published, i.e. GN R 150 (Commencement of Threatened and Protected Species Regulations, 2007), GN R 151 (Lists of critically endangered, vulnerable and protected species) and GN R 152 (Threatened or Protected Species Regulations).</p> <p>Provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (National Environmental Management: Biodiversity Act: National list of ecosystems that are threatened and in need of protection, (G 34809, GN 1002), 9 December 2011).</p> <p>This Act also regulates alien and invader species.</p> <p>Some natural vegetation will need to be cleared for the construction phase of the project; therefore in terms of GNR 152 specialist flora and fauna studies were undertaken as part of the EIA process.</p> <p>A permit will be required should any protected plant species on site be disturbed or destroyed because of the proposed development.</p>	Department of Environmental Affairs	1999
National Water Act No 36 of 1998	There may have been water courses on the proposed project site therefore a wetland specialist and ecological specialist were appointed to delineate any potential water courses.	Department of Water Affairs	1998
National Environmental Management: Air Quality Act No 39 of 2004	While no permitting or licensing requirements arise from this legislation, this Act will find application during the construction phase of the project. Dust control regulations promulgated in November 2013	Department of Environmental Affairs	2004

	may require the implementation of a dust management plan.		
National Environmental Management Waste Act No 59 of 2008	<p>Makes provision for the sound management of general and hazardous waste in South Africa, through the integration of a sufficient range of complementary waste management options, in line with the waste management hierarchy and internationally accepted principles of best environmental practice; waste will be generated during the construction phase of the project.</p> <p>No waste license activities are applicable to this project. The developer will however be required to store and manage waste in accordance with the requirements of this Act and associated Standards.</p>	Department of Environmental Affairs	2008
National Heritage Resources Act No. 25 of 1999	<p>The Act aims to promote an integrated system for the identification, assessment and management of the heritage Resources in South Africa.</p> <p>Under section 38. (1) of the NHRA any person who intends to construct a powerline or other linear development exceeding 300m in length must notify the responsible heritage resources agency of its intention.</p> <p>As the power lines proposed exceeds 300 m in length, a Heritage Assessment has been undertaken as part of this Basic Assessment (refer to Appendix G). No identified heritage sites were reported on site. However, should any heritage sites be unearthed during excavations, a permit would be required to be obtained from SAHRA. A heritage specialist was appointed for this project.</p>	SAHRA	1999
Northern Cape Nature Conservation Act, No. 9 of 2009	<p>This Act provides for the sustainable utilisation of wild animals, aquatic biota and plants; as well as the offences and penalties for contravention of the Act and the appointment of nature conservators to implement the provisions of the Act. The Act also provides lists of protected species for the Province.</p> <p>Permits are required for protected plant and animal species impacted by the project.</p>	NC DENC	2009
Occupational Health and Safety Act No. 85 of 1993	<p>The OHSA governs and ensures the protection of employees in the workplace. A number of permanent and contract skilled and semi-skilled workers will be involved in the construction of the different aspects of the project. Their appointment and work periods will be subject to the provisions of the OHSA.</p> <p>While no permitting or licensing requirements arise from this legislation, this Act will find application during the construction phase of the project. Healthy and safety precautions measures must be</p>	Department of Labour	1963

	put in place for the construction crew and the general public.		
The Conservation of Agricultural Resources Act No 43 of 1983	To provide for the conservation of the natural agricultural resources of the Republic of South Africa by the preservation of the production potential of land, by the combating and prevention of erosion and weakening or destruction of the water sources, and by the protection of the vegetation and the combating of weeds and invader plants. This act will regulate construction activities to prevent the spreading of invasive species and to ensure successful rehabilitation of the receiving environment.	Department of Agriculture, Forestry and Fisheries	1983
Public Access to Information Act No 2 of 2000	Provides the constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights; and to provide for matters connected therewith. Eskom needs to acquire servitude from existing land owners, any individual owner has the right to access to any information pertaining to the project No permitting is required the act finds applicability during the public participation process phase of the basic assessment process.	Department of Justice	2000
National Forests Act No. 84 of 1998	According to this Act, the Minister may declare a tree, group of trees, woodland or a species of trees as protected. The prohibitions provide that 'no person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a license granted by the Minister'. GN 1042 provides a list of protected tree species. No protected tree species have been recorded within the site.	National Department of Agriculture, Forestry and Fisheries (DAFF)	1998

11. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

a) Solid waste management

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

YES ✓	NO
1000m ³	

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

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

Construction rubble/ solid waste will be temporarily stored on site in designated waste skips and then removed by an appropriate waste contractor appointed by the main construction contractor to an approved landfill site. This will be managed through the EMP.

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

General waste removed from site will be disposed of at the Kathu Landfill Site in Kathu which is the nearest registered landfill. Safe disposal certificates must be obtained and kept on site for the duration of the construction phase.

Will the activity produce solid waste during its operational phase?

YES	NO <input checked="" type="checkbox"/>
m ³	

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

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

--

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

Kathu Municipality Landfill (licence no.: B33/2/350/18/P116)

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

N/A please refer to the above

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?

YES	NO <input checked="" type="checkbox"/>
-----	--

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?

YES	NO <input checked="" type="checkbox"/>
-----	--

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?

YES	NO <input checked="" type="checkbox"/>
-----	--

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

m³

Will the activity produce any effluent that will be treated and/or disposed of on site?

YES	NO <input checked="" type="checkbox"/>
-----	--

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?

YES	NO <input checked="" type="checkbox"/>
-----	--

If YES, provide the particulars of the facility:

Facility name:			
Contact person:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	

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

--

c) Emissions into the atmosphere

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

YES	NO✓
-----	-----

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

YES	NO✓
-----	-----

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:

Emissions generated will be in the form of dust, carbon dioxide and other vehicle emissions generated by diesel powered machinery and trucks during the construction process i.e. tip trucks, TLB's, excavators and dust from the movement of the construction vehicles. These emissions will be composed primarily of CO₂ and will be of a low concentration. However these emissions will have a short term impact on the immediate surrounding area and thus no authorisation will be required for such emissions. Appropriate dust suppression measures must be implemented (e.g. removal of vegetation in a phased manner and implementing appropriate dust suppression measures to reduce the impacts). It is recommended that construction vehicles are regularly serviced and kept in good mechanical condition to minimise possible exhaust emissions.

d) Waste permit

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

YES	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✓	NO
------	----

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

YES	NO✓
-----	-----

Describe the noise in terms of type and level:

Short term noise impacts are anticipated during the construction phase of the project. It is however anticipated that the noise will be localised and contained within the construction site. The noise levels are anticipated to be less during the day lower during night time as required for rural districts with in terms of SANS 10103 thus no authorisation will be required.

In order to minimise the impacts of noise during the construction phase, construction activities should be restricted to between 07H00 and 17H00 Monday to Friday. This is required in order to avoid noise and lighting disturbances outside of normal working hours. All construction equipment must be maintained and kept in good working order to minimise associated noise impacts. If required, adequate noise suppression measures (i.e. screens, etc) must be erected around the point source of construction to reduce noise to an acceptable level. No noise will be generated during the operational phase of the development.

12. WATER USE

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

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

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

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

litres	
YES	NO <input checked="" type="checkbox"/>

13. ENERGY EFFICIENCY

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

Electricity - Apart from the use of energy efficient lighting at the substation, no other measures are considered. The distribution line does not use energy.

Eskom however has introduced and champions the 49m campaign which aims to reduce National energy usage by 10%, which would be as effective as the construction of a new power station, without the potential carbon emission or cost.

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

Energy efficient lighting will be used where practical at the substation.

SECTION B: SITE 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.

NB: Please note that the substation site differs in receiving environment as compared to the power line routes. As shown in Figure 2.1, the power line routes A1, A2 and A3 are found with the Postmasburg Thornveld vegetation type, whereas the Substation localities and loop-in/loop-out tie-in diversions A1, B1 and C1 are found within the Kuruman Thornveld vegetation type. It must be stated that loop-in/loop-out tie-in sections B1 & C1 are diversions of A1 with the only change being the different tie points with the substation B and C. Therefore, 2 copies of Section B have been created, namely the power line routes A1, A2 and A3 (1) and the Substation sites (2).

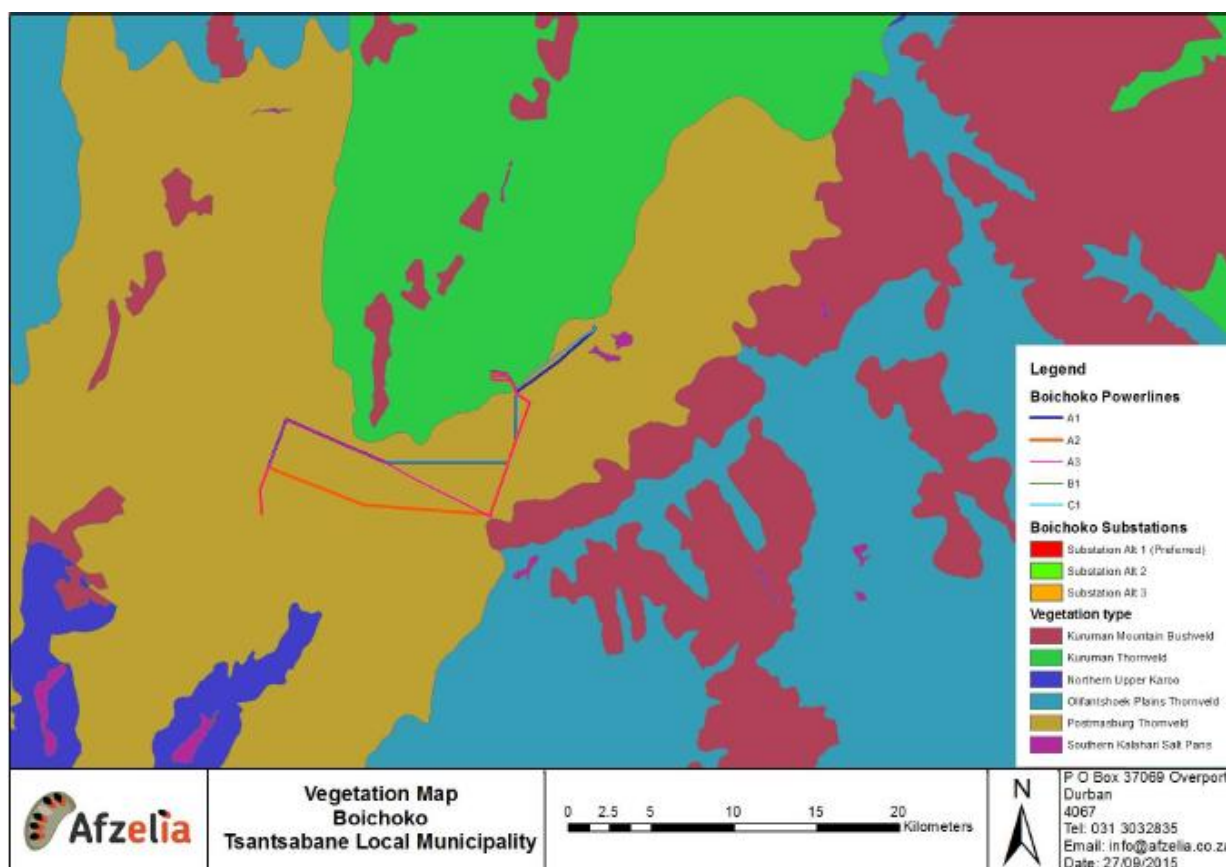


Figure 3.1: Vegetation map of the study area (Courtesy Afzelia Consulting, 2015).

Section B Copy 1: Power line routes Environment

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

**Alternative
route A1,
A2 & A3
(power line
routes)**

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 <input checked="" type="checkbox"/>	NO <input type="checkbox"/>
---	-----------------------------

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:**

Province	Northern Cape
District Municipality	Siyanda (ZF Mgcawu) District Municipality
Local Municipality	Tsantsabane Local Municipality
Ward Number(s)	Wards 1,2 and 4
Farm name and number	Strydfontein 614 (Power lines A1, A2 and A3), Leeuwfontein 488RE (Power lines A1, A2 and A3) Leeuwfontein 488/1 (Power lines A1, A2 and A3) PloegFontein 487 (Power lines A1, A2 and A3) OlynFontein 475/2 (Power lines A1, A2 and A3), Soetfontein 606 (Power lines A1, A2 and A3) Kalkfontein 474 (Power lines A1, A2 and A3) Plaas 492 (Power lines A1 and A2) Postmasburg 1 ((Power lines A1 and A2)
Portion number	N/A
SG Code	C03100000000061400000 C03100000000048800000 C03100000000048800001 C03100000000048700000 C03100000000047500002 C03100000000060600000 C03100000000047400000 C03100000000049200000 C0310000000000100000

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 (Attached).

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

Strydfontein 614 (Mining),
Leeuwfontein 488RE (Mining)
Leeuwfontein 488/1 (Mining)
PloegFontein 487 (Agricultural)
OlynFontein 475/2 (Agricultural),
Soetfontein 606 (Agricultural)
Kalkfontein 474 (Agricultural)
Plaas 492 (Agricultural)
Postmasburg 1 (Commonage)

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.

Power line route A1 (preferred)

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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Power line route A2 (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
-----------	-------------	-------------	-------------	--------------	-------------	------------------

Power line route A3 (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
-----------	-------------	-------------	-------------	--------------	-------------	------------------

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 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 checked="" 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?

Power line Routes:

	Route A1 (preferred):		Route A2 (alternative):		Route A3 (alternative):	
Shallow water table (less than 1.5m deep)	YES	NO ✓	YES	NO ✓	YES	NO
Dolomite, sinkhole or doline areas	YES	NO ✓	YES	NO ✓	YES	NO
Seasonally wet soils (often close to water bodies)	YES ✓	NO	YES ✓	NO	YES ✓	NO
Unstable rocky slopes or steep slopes with loose soil	YES	NO ✓	YES	NO ✓	YES	NO
Dispersive soils (soils that dissolve in water)	YES	NO ✓	YES	NO ✓	YES	NO
Soils with high clay content (clay fraction more than 40%)	YES	NO ✓	YES	NO ✓	YES	NO
Any other unstable soil or geological feature	YES	NO ✓	YES	NO ✓	YES	NO
An area sensitive to erosion	YES	NO ✓	YES	NO ✓	YES	NO

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.

4. GROUNDCOVER

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).

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

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.

5. SURFACE WATER

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

Perennial River	YES	NO ✓	UNSURE
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Non-Perennial River	YES ✓	NO	UNSURE
Permanent Wetland	YES	NO ✓	UNSURE
Seasonal Wetland	YES	NO ✓	UNSURE
Artificial Wetland	YES	NO ✓	UNSURE
Estuarine / Lagoonal wetland	YES	NO ✓	UNSURE

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

One 'B' section channel, the Groenwaterspruit, and fifteen 'A' Section channels were identified within the study area (Figure 5). 'A' section channels are channels that do not have base flow regularly; this is dependent on climatic conditions, level of saturation and the height of the water table. At the site, these are expected to only flow briefly after a storm event. Surface flow will percolate through the apedal soils found in the study site quickly 'drying' these channels.

'B' Section channels are in contact with the zone of saturation often enough to have vegetation associated with saturated conditions. They can be described as ephemeral in nature as flowing water only occurs during and for a short duration, after precipitation events in a typical year. Generally ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for these channels and permanent pools do not occur. Run-off from rainfall is the primary source of water for stream flow.

'B' Section channels are considered hydrologically sensitive as they are associated with riparian habitats. The riparian zone associated with the Groenwaterspruit 'B' Section channel has been classified as Class D with a large loss of natural habitat, biota and basic ecosystem functions. This is as a result of extensive agriculture along the ephemeral stream, the development of Postmasburg and to a lesser extent the presence of alien invasive species.

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 ^H
Medium density residential	School	Landfill or waste treatment site
High density residential	Tertiary education facility	Plantation
Informal residential ^A	Church	Agriculture ✓
Retail commercial & warehousing	Old age home	River, stream or wetland ✓
Light industrial	Sewage treatment plant ^A	Nature conservation area
Medium industrial ^{AN}	Train station or shunting yard ^N	Mountain, koppie or ridge
Heavy industrial ^{AN}	Railway line ^N	Museum
Power station	Major road (4 lanes or more) ^N	Historical building
Office/consulting room	Airport ^N	Protected Area
Military or police base/station/compound	Harbour	Graveyard

Spoil heap or slimes dam ^A	Sport facilities	Archaeological site
Quarry, sand or borrow pit	Golf course	Other land uses (describe)

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:

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:

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:

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

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

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

Section B Copy 2: Substation (Alternative substation sites A, B and C and loop-in/loop-out tie-in dieversions A1, B1 and C1

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

2
(Substation
Alternatives
A, B and C)
and loop-
in/loop-out
tie-in
dieversions
A1, B1 and C1

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

5. 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:

Province	Northern Cape
District Municipality	Siyanda (ZF Mgcawu) District Municipality
Local Municipality	Tsantsabane Local Municipality
Ward Number(s)	Wards 1,2 and 4
Farm name and number	Postmasburg Erf 3753 Substation and Power line routes B1 and C1
Portion number	N/A
SG Code	C03100000000375300000

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 (Attached).

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

Postmasburg Erf 3753 Substations (Open 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
-----------------	-----------

7. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Substation A (preferred)

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 B (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
-----------	-------------	-------------	-------------	--------------	-------------	------------------

Substation C (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
-----------	-------------	-------------	-------------	--------------	-------------	------------------

Loop-in/Loop-out tie-in line A1 (preferred)

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
-----------	-------------	-------------	-------------	--------------	-------------	------------------

Loop-in/Loop-out tie-in line B1 (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
-----------	-------------	-------------	-------------	--------------	-------------	------------------

Loop-in/Loop-out tie-in line C1 (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
-----------	-------------	-------------	-------------	--------------	-------------	------------------

8. 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 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 checked="" type="checkbox"/>	2.9 Seafont	<input type="checkbox"/>
2.10 At sea	<input type="checkbox"/>				

9. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

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

Substation Site Alternatives

	Substation A (preferred):		Substation B (alternative):		Substation C (alternative):	
Shallow water table (less than 1.5m deep)	YES	NO✓	YES	NO✓	YES	NO
Dolomite, sinkhole or doline areas	YES	NO✓	YES	NO✓	YES	NO
Seasonally wet soils (often close to water bodies)	YES	NO✓	YES	NO✓	YES	NO✓
Unstable rocky slopes or steep slopes with loose soil	YES	NO✓	YES	NO✓	YES	NO
Dispersive soils (soils that dissolve in water)	YES	NO✓	YES	NO✓	YES	NO
Soils with high clay content (clay fraction more than 40%)	YES	NO✓	YES	NO✓	YES	NO
Any other unstable soil or geological feature	YES	NO✓	YES	NO✓	YES	NO
An area sensitive to erosion	YES	NO✓	YES	NO✓	YES	NO

Loop-in/Loop-out tie-in line alternatives:

	Loop-in/Loop-out tie-in line A1 (preferred):		Loop-in/Loop-out tie-in line B1 (alternative):		Loop-in/Loop-out tie-in line C1 (alternative):	
Shallow water table (less than 1.5m deep)	YES	NO✓	YES	NO✓	YES	NO
Dolomite, sinkhole or doline areas	YES	NO✓	YES	NO✓	YES	NO
Seasonally wet soils (often close to water bodies)	YES	NO✓	YES	NO✓	YES	NO✓
Unstable rocky slopes or steep slopes with loose soil	YES	NO✓	YES	NO✓	YES	NO
Dispersive soils (soils that dissolve in water)	YES	NO✓	YES	NO✓	YES	NO
Soils with high clay content (clay fraction more than 40%)	YES	NO✓	YES	NO✓	YES	NO
Any other unstable soil or geological feature	YES	NO✓	YES	NO✓	YES	NO
An area sensitive to erosion	YES	NO✓	YES	NO✓	YES	NO

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.

10. GROUNDCOVER

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).

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

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.

11. SURFACE WATER

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

Perennial River	YES	NO√	UNSURE
Non-Perennial River	YES	NO√	UNSURE
Permanent Wetland	YES	NO√	UNSURE
Seasonal Wetland	YES	NO√	UNSURE
Artificial Wetland	YES	NO√	UNSURE
Estuarine / Lagoonal wetland	YES	NO√	UNSURE

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

--

12. 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 ^H
Medium density residential	School	Landfill or waste treatment site
High density residential	Tertiary education facility	Plantation
Informal residential ^A	Church	Agriculture√
Retail commercial & warehousing	Old age home	River, stream or wetland
Light industrial	Sewage treatment plant ^A	Nature conservation area
Medium industrial ^{AN}	Train station or shunting yard ^N	Mountain, koppie or ridge
Heavy industrial ^{AN}	Railway line ^N	Museum
Power station	Major road (4 lanes or more) ^N	Historical building
Office/consulting room	Airport ^N	Protected Area
Military or police base/station/compound	Harbour	Graveyard
Spoil heap or slimes dam ^A	Sport facilities	Archaeological site

Quarry, sand or borrow pit	Golf course	Other land uses (describe)
----------------------------	-------------	----------------------------

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:

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:

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:

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

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

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

13. 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 ✓	NO
	Uncertain	

Based on available information it can provisionally be said that the possibility of the proposed development to impact on any sites, features or object of cultural significance over most of the study area is very low. It has been determined that very low densities of Stone Age material - stone tools - occur sporadically all over the region. As these are all surface finds, the material is deemed not to be in its original context anymore and is therefore viewed to have low significance. Important archaeological sites are known to exist in the region, e.g. Blinkklipkop east of Postmasburg, where specularite was mined during pre-colonial times. Such site should be avoided at all costs.

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?

YES	NO ✓
-----	------

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

YES	NO ✓
-----	------

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

14. 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:

Tsantsabane Local Municipality

According to the studies in the IDP (2011-2016),

According to the stats the unemployment figure has drastically reduced from 4466 in 2001 to 3795 in 2011 which shows a decrease of -15% . Employment has increase with 69% in 2011, which translates in more people working in 2011 than 2001. If the jobs are permanent than it attributes to higher level of skills.

Economic profile of local municipality:

According to Statistics SA Census Data (2011) the population of Tsantsabane slightly increased from 30862 in 2001 to 35093 in 2011. The age structure also indicates the population of Tsantsabane as predominantly young (IDP 2011-2016). The group of people older than 60yrs of age is rather small in relation but could still cause a dependency burden. The age structure further indicates that $\pm 31\%$ of the population is under 14 years and $\pm 33\%$ is between 15 and 34 years. If it is accepted that 70% of the under-20 are dependant, it would cause that $\pm 30\%$ of the residents of the economically active part of the population is dependant. The large amount of unemployed, especially amongst the disadvantaged group, worsens the influence of this problem. The population figures in terms of census 2011 is 35093 compare to 31014 in 2001. The male population has increased with 24% while the female population has increased with only 2.7% since 2001.

These increases can be relatively influenced by job migration and other factors. Mineral deposits and mining related development in the area – mining accounts for 55% of the GDP within the region. Tsantsabane is located on a mining belt stretching through to Kathu and Kuruman. Mining related legislation also presents other economic opportunities through Social and Labour Plans.

Level of education:

The statistics indicate that although a high number of students enrolling for primary school a very low number of students complete grade 12 (Tsantsabane IDP 2011-2016). This result in a very low probability for employment. Only 5% of those who enrolled for grade 1 make it into tertiary. Less than 15% of the population

has a tertiary qualification or have completed Grade 12. It must, however, be mentioned that the education level is affected negatively by the urbanization process, in the past since it mostly involves matriculates and those with a better qualification, due to the local lack of job opportunities.

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R40,624,845.07
What is the expected yearly income that will be generated by or as a result of the activity?	R To be provided at a later stage.
Will the activity contribute to service infrastructure?	YES <input checked="" type="checkbox"/> NO
Is the activity a public amenity?	YES <input checked="" type="checkbox"/> NO
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	Eskom does an open tender to employ suitable contractors to carry out the construction. Contractors are required to employ local unskilled labourers for non-specialized work.
What is the expected value of the employment opportunities during the development and construction phase?	This can only be established once the contractor is appointed
What percentage of this will accrue to previously disadvantaged individuals?	>= 90 %
How many permanent new employment opportunities will be created during the operational phase of the activity?	None. Eskom will maintain the powerline once constructed.
What is the expected current value of the employment opportunities during the first 10 years?	N/A
What percentage of this will accrue to previously disadvantaged individuals?	N/A

15. 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. 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.

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
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Critical Biodiversity Area (CBA)	Ecological Support Area (ESA)	Other Natural Area (ONA) ✓	No Natural Area Remaining (NNR)	

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	85%	The site is dominated by open thornveld.
Near Natural (includes areas with low to moderate level of alien invasive plants)	%	
Degraded (includes areas heavily invaded by alien plants)	%	
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	15%	Some of the site area has been transformed by mining activities prevalent in the area.

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								
Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	Critical	Wetland (including rivers, depressions, channelled and unchanneled wetlands, flats, seeps pans, and artificial wetlands)			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)

Vegetation Type:

The study site is located within the Postmasburg Thornveld (powerline routes) and Kuruman Thornveld vegetation type (substation site).

The Postmasburg Thornveld vegetation type is characterised by flats surrounded by mountains supporting open, shrubby thornveld characterised by a dense shrub layer and often lacking a tree layer; the grass layer is very sparse. Shrubs are generally low and with a karroid affinity (Mucina & Rutherford, 2006). The Kuruman Thornveld vegetation type is characterised by flat rocky plains and some sloping hills with a very well-developed, closed shrub layer and well-developed open tree stratum consisting of *Acacia erioloba* (Mucina & Rutherford, 2006).

The vegetation along the proposed power line consists of shrubby thornveld with a limited grass layer. The dominant tree species are *Acacia melifera* (Black thorn) and *Tarchonanthus camphiratus* (Wild camphor bush). Other tree species include *Ziziphus mucronata* (Buffalo-thorn), *Acacia karroo* (Sweet thorn), *Searsia lancea* (Karee) and *Diospyros lycioides* (Bluebush). Grass species found in the area are *Stipagrostis uniplumis* (Silky bushman grass), *Cymbopogon plurinodis* (Narrow leaf turpentine grass), *Enneapogon scoparius* (Bottlebrush grass), *Aristida diffusa* (Iron grass), *Heteropogon contortus* (Spear grass) and *Eragrostis curvula* (Weeping love grass). The dominant herb species present is *Gnidia polycephala*. Other herb species include *Aptosimum* spp., *Asparagus* spp., *Gezania krebsiana* (Common Gazania). Succulent species found in this area are *Aloe grandidentata* and *Euphorbia* spp. One species of conservation importance was encountered during the site survey namely *Aloe grandidentata* (Photo plate 1) which is protected under the Northern Cape Nature Conservation Act (Act No 9 of 2009). A permit is required to remove these plants if they fall within the construction site. The authority controlling the issuing of permits is the Northern Cape Province: Department of Environment and Nature Conservation (DENC).



Photo plate 1: *Aloe grandidentata* was the only protected plant species found during the ecological survey. (Photo courtesy: Afzelia Consulting).

Alien species found in this area include *Opuntia ficus-indica* (Sweet prickly pear), *Salsola kali* (Russian tumbleweed) and *Argemone ochroleusa* (Mexican poppy). The entire area has been subjected to anthropogenic disturbance and is considered to be of low sensitivity. The vegetation in the drainage lines consist of *Populus spp.*, *Phragmites australis* (Common reed), *Acacia karroo* (Sweet thorn), *Gomphocarpus fruticosus* (Milkweed) and *Bromus catharticus* (Rescue grass).

In terms of Section 15(1) of the National Forests Act, 1998, no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a licence or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated. No protected tree species have been recorded within the site. However, it has been noted by the Department of Forestry and Fisheries (DAFF) (Appendix E) that Postmasburg Thornveld and Kuruman Thornveld may both contain the nationally protected *Acacia (Vachellia) erioloba* trees. Additionally, Postmasburg Thornveld is known to contain provincially protected *Boophone disticha*. Kuruman Thornveld is characterised by the presence of protected *Boscia albitrunca* and *Harpagophytum procumbens* subsp. *procumbens*. Keeping the development footprint dimensions in mind, these species may be encountered. It is recommended that a botanist be appointed prior to development, to do a search and rescue of conservation worthy plants, should they be encountered, after obtaining a permit or license to do so.

DAFF has also recommended that should protected trees be encountered, efforts should be made to retain large individual trees. If this is not feasible, then a license must be applied for and granted prior to disturbance.

Aquatic Ecosystem:

As a result of this some portions of the power line route being associated with riparian areas as well as drainage channels, riparian delineations were also conducted. These delineations were undertaken according to 'A Practical Field Procedure for Identification and Delineation of Wetland and Riparian Areas – Edition 1' (Department of Water Affairs, 2005), which requires the following to be taken into account:

Topography associated with the watercourse. This assesses changes in topography associated with the watercourse and is used in identifying the outer bank of the macro channel;

Vegetation is the main indicator of a riparian area and is associated with changes in species composition between the channel, the riparian area adjacent to the channel and the terrestrial areas;

Alluvial soils and deposited material. Riparian areas often have recent deposits of sand, silt or clay, set down by flowing water. This is not always used as a primary indicator to accurately delineate riparian areas but can be used to confirm topographical and vegetation indicators.

The Boichoko development is situated within the D73A quaternary catchment which is part of the Molopo Sub Water Management Area and the Lower Vaal Water Management Area. The Lower Vaal water management area lies in the north-western part of South Africa and borders on Botswana in the north. Mining and farming activities dominate the area with Kimberley being the largest urban centre in the Water Management Area. Water courses associated with the site include the Groenwaterspruit and the Skeifonteinspruit. Both are intermittent streams with flow being dependant on the amount of rainfall in their catchments.

All soils identified were of the calcic variety, gravelly in nature with poor water-holding properties. No hydric soils were identified in any of the soil samples taken along the routes or within the proposed development site of the substations with the exception of samples taken in the B Section drainage channel associated with the Groenwaterspruit.

The depressions/pan systems were not categorised as wetland systems due to the lack of hydric soils and hydrophytic vegetation associated with these areas. The scope of work of this section of the report has therefore changed to the delineation and assessment of drainage channels associated with the site.

Drainage lines were delineated based on topographic setting, vegetative indicators as well as the presence or absence of alluvial soils as described in 'A Practical Field Procedure for Identification and Delineation of Wetland and Riparian Areas – Edition 1' (DWAf, 2005) requirements. This manual separates the classification of watercourses into three (3) separate types of channels or sections defined by their position relative to the zone of saturation in the riparian area. The classification system separates channels into those that do not have baseflow (A Sections) from those that sometimes have baseflow (B Sections) to those that always have baseflow (C Sections).

One 'B' section channel, the Groenwaterspruit, and fifteen 'A' Section channels were identified within the study area (Figure 4.1). 'A' section channels are channels that do not have base flow regularly; this is dependent on climatic conditions, level of saturation and the height of the water table. At the site, these are expected to only flow briefly after a storm event. Surface flow will percolate through the apedal soils found in the study site quickly 'drying' these channels.

'B' Section channels are in contact with the zone of saturation often enough to have vegetation associated with

saturated conditions. They can be described as ephemeral in nature as flowing water only occurs during and for a short duration, after precipitation events in a typical year. Generally ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for these channels and permanent pools do not occur. Run-off from rainfall is the primary source of water for stream flow.

'B' Section channels are considered hydrologically sensitive as they are associated with riparian habitats. The National Water Act defines a riparian habitat as: "Riparian habitat includes the physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterised by alluvial soils and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas"

The proximity of the proposed development to the existing watercourses will trigger the need for a Section 21 (c) and (i) Water Use Authorisation under the National Water Act (Act 36 of 1998). Consultation with the Department of Water and Sanitation is recommended.

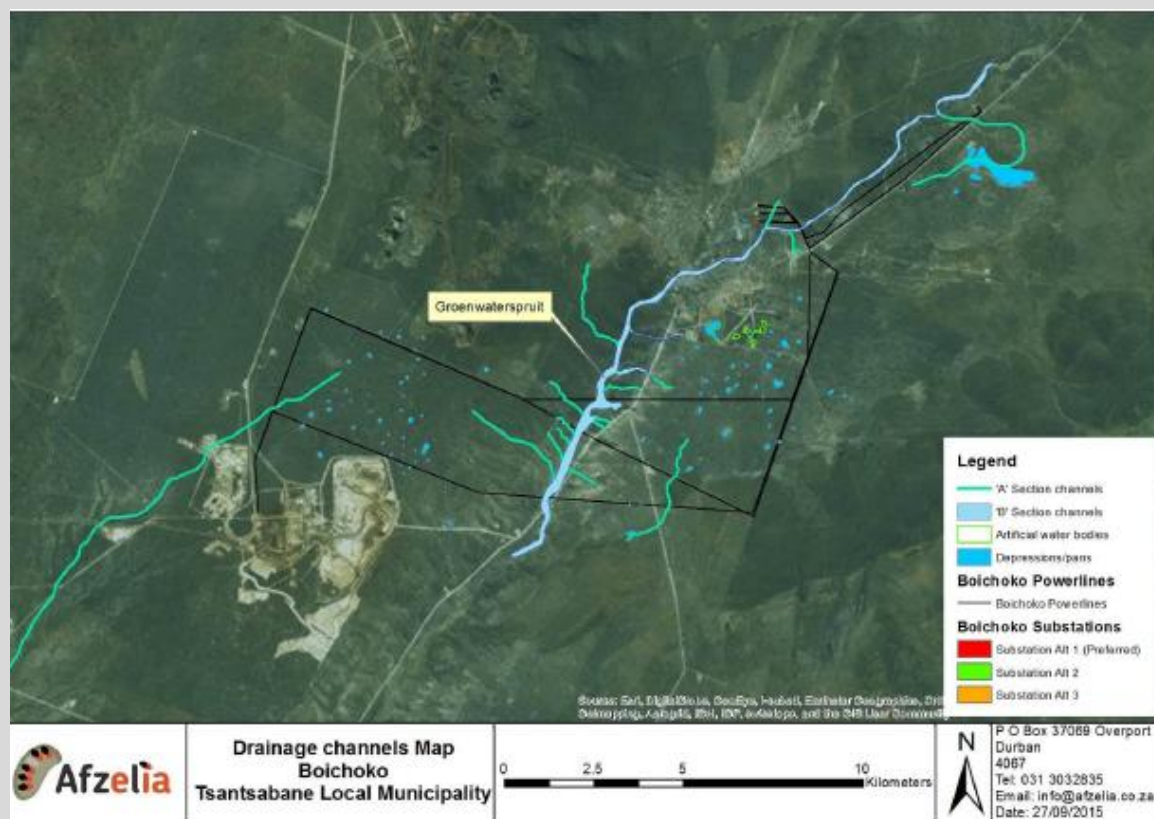


Figure 3.2: Channel Classification (from Afzelia Consulting)

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT AND NOTICE

Publication name	Ghaapkoerant	
Date published	Project Notification: 16 October 2015	
Site notice position	Latitude	Longitude
	28°23'19.74"S	23° 1'14.67"E
	28°22'48.39"S	23° 1'48.23"E
	28°22'0.80"S	23° 2'24.17"E
	28°21'38.36"S	23° 2'55.96"E
	28°23'9.70"S	22°59'28.30"E
	28°19'0.32"S	23° 4'29.70"E
	28°18'57.73"S	23° 4'46.85"E
	28°19'6.75"S	23° 5'29.17"E
	28°22'57.62"S	23° 3'18.84"E
	28°19'52.90"S	23° 6'3.99"E
	28°20'22.36"S	23° 4'36.09"E
28°17'43.53"S	23° 8'11.32"E	
Date placed	16 October 2015	

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 41(2)(e) and 41(6) of GN 982.

The Methodology that has been adopted to ensure a highly consultative and interactive public participation process is outlined below.

Identification of Interested and Affected Parties (I&APs)

The interested and affected parties (I&APs) in and around the study area have been identified and a dedicated stakeholder database for the project has been developed. The stakeholder database has been split in two, i.e. one for the landowners and the other for the various I&APs, NGOs, Government departments, etc. A dedicated stakeholder database for the project is fundamental to the ultimate success of the consultation process.

The proposed project and its BAR processes were announced in the study area in the following ways:

Media Announcements

An English newspaper Advertisement was compiled and placed on the Ghaap Koerant on 16 October 2015 informing stakeholders about the proposed project and inviting them to participate and register as interested and affected parties (**see Appendix E1**).

Land Owner Letters

Letters to land owners introduced the project provided the rationale for the project, the BAR and public participation processes to be followed in the project, etc. The information was available in English. (see Appendix E2 for Letters & distribution list).

Notice boards

Site notices were fixed at various conspicuous areas along the route alternatives for both Power Line projects. (see Appendix E1 for proof of Site Notices).

Key stakeholders (other than organs of state) identified in terms of Regulation 41(2)(b) of GN 982

Refer to stakeholder list attached within Appendix E5

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)

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.

Please refer to Appendix E2.

3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Comments received are included in the Comments and Responses Report contained in **Appendix E3**

Summary of main issues raised by I&APs	Summary of response from EAP
<p>Comments from SOIC –</p> <ol style="list-style-type: none"> 1. Proposed route A1 is preferred from the SOIC perspective. SOIC however reserves its rights to still object at a later stage should further investigations demonstrate it will cause SOIC undue harm. 2. The other proposed routes (Alternative A2 and A3) on the same map are all not acceptable as it will result in : <ul style="list-style-type: none"> • The sterilization of mineral resources; • Impact negatively on SOIC's planned mining operations and infrastructure; • Create unacceptable risks for SOIC from a Mine, Health and Safety perspective. 	<p>Thank you for your comments. I will include them in my Basic Assessment report and keep SIOC apprised of the progress of the project. The comments received from SOIC have been sent to the client (Eskom) for consideration.</p>

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.

Comments received are included in the Comments and Responses Report contained in **Appendix E3**.

5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

Refer to Organ of State list attached within Appendix E5

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address

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.

Please refer to Appendix E5.

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. **Please refer to Appendix E5.**

Copies of any correspondence and minutes of any meetings held must be included in Appendix E6. **Please refer to Appendix E6.**

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014 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.

Table 1.1: Impact Summary related to the construction and operation of the proposed development for both the preferred and alternative sites.

**** All three substation site alternatives are located within close proximity (100m) of each other. Similarly, loop-in/loop-out tie-in diversions of A1; B1 and C1 are also located within the same environment as the substation sites. The sites are located on the outskirts of Postmasburg and in close proximity to residential development and infrastructure as well as Postmasburg Stone Crushers and the West End Mine. As a result the area often experiences high levels of disturbance. Additionally, due to their close proximity to one another, it was found that the impacts associated with the proposed site are the same. It is for this reason that these substation and loop-in/loop-out tie-in sites will be assessed together**

Impacts Associated with Substations A1 (preferred, A2 and A3 (alternatives) and the loop-in/loop-out tie-in diversions of A1, B1 and C1**			
CONSTRUCTION PHASE			
Activity	Impact summary	Significance (after mitigation)	Proposed mitigation
<i>Ecological Impacts: Soil erosion and sedimentation of drainage systems</i>	Direct impacts: Construction activities (i.e. excavations and vegetation clearing) expose soil to environmental factors including rainfall and wind which can lead to the removal of topsoil resulting in soil erosion and the deposition of sediment along the banks and into surrounding watercourses. Sedimentation poses a risk to the geomorphological/functional integrity of these systems.	Moderate	<ul style="list-style-type: none"> • Use existing tracks and roads to gain access to the work servitude as much as possible; • In the event of infilling, replacement of subsoil must precede the topsoil replacement, and all material must be well compacted; • No stockpiling of any materials may take place within or directly adjacent to the channel systems; • Erosion control measures must be implemented in areas sensitive to erosion such as near water supply points, edges of slopes, etc. These measures include but are not limited to - the use of sand bags, geo-textiles such as soil cells which are used in the protection of slopes, hessian sheets, silt fences and retention or replacement of vegetation; • Disturbed sites must be rehabilitated as soon as construction in an area is complete or near complete and not left until the end of the project to be rehabilitated; • Vegetation clearing within 50m of any channel must only be undertaken when construction activity is actually being undertaken at this point and such areas must be rehabilitated within 2 weeks of initial clearing occurring. Vegetation clearing must be limited to the servitude width required for the power lines; • There shall be no mining of soil/sand required for construction purposes from the banks of drainage channels and wetland areas. Soil must be brought in, if needed, for construction purposes. This must also be stockpiled away from the watercourses' and wetland's edge.
	Indirect impacts: Changes made to the bed or banks of watercourse channels will cause unstable channel conditions causing erosion, meandering, increased potential for flooding and movement of bed material, which will result in property damage adjacent to and downstream of the construction site.	Moderate	
	Cumulative impacts: sedimentation of watercourses is destructive to many faunal species affecting their habitat; breeding and feeding cycles. Deposition of sediment also results in an unstable watercourse substrate which will lead to erosion of the bed of the	Moderate	

	channel.		
<i>Ecological Impacts: Pollution of watercourses and soil</i>	Direct impacts: Mismanagement of waste and pollutants like hydrocarbons, construction waste and other hazardous chemicals will result in these substances entering and polluting sensitive natural environments either directly through surface runoff during rainfall events, or subsurface water movement.	Moderate	<ul style="list-style-type: none"> All waste generated during construction is to be disposed of as per the Environmental Management Programme and no washing of paint brushes, containers, wheelbarrows, spades, picks or any other equipment adjacent or in drainage channel is permitted. Proper management and disposal of construction waste must occur during the lifespan of the project, including during maintenance of the power lines and substations. No release of any substance i.e. cement, oil, that could be toxic to fauna or faunal habitats within the watercourses. Portable toilets must be placed 30m away from the edge of the channels. Do not locate the construction camp or any depot for any substance which causes or is likely to cause pollution within a distance of 50m from a channel. Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly drained and disposed of using proper solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil must be removed and the affected area rehabilitated immediately – consult with a wetland/aquatic specialist if spills occur.
	Indirect impacts: Pollution and reduction of water quality which will have an impact on the faunal and floral communities.	Moderate	
	Cumulative impacts: An increase in pollutants will lead to a decline in the water quality of the watercourses, particularly the larger Groenwaterspruit affecting its ability to act as an ecological corridor in the larger landscape.	Moderate	
<i>Ecological Impacts: Proliferation of Alien invasive species</i>	Direct impacts: Alien invasive species will quickly encroach into disturbed areas, particularly adjacent to drainage areas. Alien species generally out-compete indigenous species for water, light, space and nutrients as they are adaptable to changing conditions and are able to easily invade a wide range of ecological niches (Bromilow, 2010).	Moderate	<ul style="list-style-type: none"> An alien invasive management programme must be incorporated into the Environmental Management Programme; Ongoing alien plant control must be undertaken along the power line servitude route; Areas which have been disturbed will be quickly colonised by invasive alien species. An ongoing management plan must be implemented for the clearing/eradication of alien species. Monitor all sites disturbed by construction activities for colonisation by exotics or invasive plants and control these as they emerge.
	Indirect impacts: Change in species diversity.	Moderate	
	Cumulative impacts: Alien invader plant species pose an ecological threat as they alter habitat structure, lower biodiversity (both number and “quality” of species), change nutrient cycling and productivity, and modify food webs (Zedler, 2004).	Moderate	
<i>Ecological Impacts: Loss of indigenous</i>	Direct impacts: During the construction phase the area for the substation will be	Moderate	<ul style="list-style-type: none"> Disturbed areas must be rehabilitated immediately after construction has been

<p><i>vegetation due to clearing of the footprint area</i></p>	<p>cleared of vegetation. The removal of vegetation will also expose soil increasing the risk of erosion. The vegetation on the site is disturbed, as a result of human activities and no sensitive habitat was identified. With the implementation of mitigation measures this impact will be minimized. Kuruman Thornveld may contain the nationally protected <i>Acacia (Vachellia) erioloba</i> trees as well as <i>Boscia albitrunca</i> and <i>Harpagophytum procumbens subsp. procumbens</i>. These protected plant species might be encountered during construction. A permit will be required to remove them from the impacted area.</p>		<p>completed in that area by planting appropriate indigenous plant species;</p> <ul style="list-style-type: none"> • The clearing of vegetation must be kept to a minimum and within the power line servitude; • During the construction phase workers must be limited to areas under construction and access to the undeveloped areas must be strictly controlled; • Rehabilitated areas must be monitored to ensure the establishment of re-vegetated areas. • It is recommended that a qualified botanist be appointed prior to development, to do search and rescue of conservation worthy plants, should they be encountered, that can be relocated successfully, after obtaining a permit or license to do so.
	<p>Indirect impacts: Loss of indigenous vegetation.</p>	<p>Moderate</p>	
	<p>Cumulative impacts: Habitat fragmentation.</p>	<p>Low</p>	
<p><i>Ecological Impacts: Loss of faunal habitat and ecological structure</i></p>	<p>Direct impacts: The construction phase of the substation will result in the loss of faunal habitats within the area. This impact relates to the complete removal or partial destruction/disturbance of existing vegetation by machinery and workers, impacting directly on the ecological condition of natural vegetation and habitat availability. These activities will have an impact on foraging and breeding ecology of faunal species. Loss of vegetation generally affects nutrient cycles, removes the organic litter layer and results in habitat fragmentation and destruction of wildlife corridors. The habitat is however already largely transformed and fragmented due to the adjacent mining activities and the site is not a unique habitat within the landscape. It is not</p>	<p>Moderate</p>	<ul style="list-style-type: none"> • All construction and maintenance activities must be carried out according to the generally accepted environmental best practice and the temporal and spatial footprint of the development must be kept to a minimum. • The boundaries of the development footprint areas are to be clearly demarcated and it must be ensured that all activities remain within the demarcated footprint area. • Edge effects of all construction and operational activities, such as erosion and alien plant species proliferation, which will affect faunal habitats adjacent to the development area, need to be strictly managed. • Any natural areas beyond the development footprint, which have been affected by the construction activities, must be rehabilitated using indigenous plant species. • Education and awareness campaigns on faunal species and their habitat are recommended to help increase awareness, respect and responsibility towards the environment for all staff and contractors.

	<p>envisaged that any Red Data species will be displaced by the habitat transformation that will take place as a result of the construction and operation of the proposed development. The impact on smaller, non-Red Data species that are potentially breeding in the area will be local in extent, in that it will not have a significant effect on regional or national populations. The proposed development will have a limited impact on the loss of faunal habitat, despite the majority of the study area having been transformed.</p>		
	Indirect impacts: Loss of species diversity.	Moderate	
	Cumulative impacts: Limited impact on ecological diversity in the vicinity.	Low (operational also low)	
<i>Ecological Impacts: Direct faunal impacts</i>	<p>Direct impacts: Activities involving the clearing/harvesting of natural vegetation will result in the loss of faunal species. Faunal diversity within the study area has been negatively impacted as a result of historic and on-going disturbances associated with mining practices. It is not envisaged that any Red data species will be present on the site and thus directly impacted as a result of the development.</p>	Moderate to High	<ul style="list-style-type: none"> • It is recommended that a speed limit of 30km/h is implemented on all roads running through the study area during all phases in order to minimise risk to fauna from vehicles. • No trapping or hunting of fauna is to take place. Access control must be implemented to ensure that no illegal trapping or poaching takes place. • Should any Red Data faunal species be noted within the development footprint areas, these species must be relocated to similar habitat within the vacant land to the west of the development area with the assistance of a suitably qualified ecologist. • Any fauna directly threatened by the construction activities must be removed to a safe location by the ECO or qualified Ecologist. • All staff and contractors must undergo an environmental induction course held by the ECO as well as faunal education and awareness programmes.
	Indirect impacts: Loss of species diversity.	Moderate to High	
	Cumulative impacts: Movement of species from one area into another.	Moderate – operational phase as well	
<i>Ecological Impacts: Disturbance-noise pollution</i>	<p>Direct impacts: Disturbance created by noise-pollution associated with workers and construction activities can affect local wildlife utilising adjacent habitats, particularly mammalian species. This is likely to be short-lived during the construction phase but will continue to have an impact during the</p>	Moderate	<ul style="list-style-type: none"> • Strict control must be maintained over all activities during construction, in line with an approved Construction EMPr. • Any Red Data species identified in this report observed to be roosting and/or breeding in the vicinity, the ECO must be notified.

	<p>operational life span of the development. The proposed development area is located within close proximity to the Kumba Mine, therefore, species within this landscape often experience disturbance. As a result disturbance of fauna by the proposed development during the construction phase is anticipated to be of moderate significance. Species are particularly sensitive to disturbance during the breeding season and this must be borne in mind during both the construction and operational phases.</p>		
	Indirect impacts: Loss of species diversity.	Moderate	
	Cumulative impacts: Movement of species from one area into another.	Low	
<i>Avifaunal Impacts: Habitat Destruction</i>	<p>Direct impacts: During the construction phase of the substation, some habitat destruction and alteration will occur due to the clearing of servitudes and vegetation at the substation site. These activities have an impact on foraging, breeding and roosting ecology of avian species within the area through modification of habitat. It is not envisaged that any Red Data species will be displaced by the habitat transformation that will take place as a result of the construction of the power line. The impact on smaller, non-Red Data species that are potentially breeding in the area will be local in extent, in that it will not have a significant effect on regional or national populations.</p>	Low	<ul style="list-style-type: none"> • All construction and maintenance activities must be carried out according to the generally accepted environmental best practice and the temporal and spatial footprint of the development should be kept to a minimum. In particular, care must be taken in the vicinity of the drainage lines and existing roads must be used as much as possible for access during construction. • The boundaries of the development footprint areas are to be clearly demarcated and it must be ensured that all activities remain within the demarcated footprint area. • Provide adequate briefing for site personnel. • Any bird nests that are found during the construction period must be reported to the Environmental Control Officer (ECO). • The above measures must be covered in a site specific EMP and controlled by an ECO.
	Indirect impacts: None	Low	
	Cumulative impacts: Loss of species diversity	Low	
<i>Avifaunal Impacts: Disturbance</i>	Direct impacts: disturbance of birds by the proposed substation is anticipated to be of low significance as birds will move away from	Low	<ul style="list-style-type: none"> • Strict control must be maintained over all activities during construction, in line with an approved Construction EMP.

	<p>the area temporarily. Species sensitive to disturbance and ground-nesting species resident within the development footprint will be particularly susceptible. Disturbance can also influence the community structure of avifauna within close proximity to the development as certain species will be displaced and forced to find alternative territories. Avian species with small territories are particularly susceptible.</p> <p>The substation is unlikely to have a significant impact on avifauna. However, species are particularly sensitive to disturbance during the breeding season and this must be borne in mind during both the construction and operational (maintenance) phases.</p>		<ul style="list-style-type: none"> • During Construction, if any of the Red Data species identified in this report are observed to be roosting and/or breeding in the vicinity, the ECO must be notified. • The construction camps must be as close to the site as possible • Contractors and working staff should stay within the development footprint and movement outside these areas including avian micro-habitats must be restricted. • Driving must take place on existing roads and a speed limit of 30km/h must be implemented on all roads running through the study area during all phases
	Indirect impacts: None		
	Cumulative impacts: Loss of species diversity		
<i>Visual Impacts</i>	<p>Direct impacts: The location of the proposed Boitchoko Substation will have a major influence on the visual change that observers from Postdene and Postmasburg will experience.</p>	Moderate	<ul style="list-style-type: none"> • Locate construction camps and stockyards in areas that are already disturbed instead of stripping more vegetation to allow for these facilities. It will be most preferred to locate the construction camps on some of the mining sites; • Establish limits of disturbances during construction through demarcating of the tower and substation footprints in order to prevent unnecessary damage to vegetation; • Keep to existing road infrastructure as far as possible to minimise the physical damage to vegetation in the power line servitude; • Implement rehabilitation of disturbed areas as soon as possible to limit the duration of exposed surfaces and the risk of erosion; and • Previously rehabilitated areas must be monitored to prevent the infestation of weeds that may become an unsightly feature.
	Indirect impacts: None	N/A	
	Cumulative impacts: Change in the landscape visual quality.	Moderate	
<i>Heritage Impacts:</i>	Direct impacts: It has been determined that only a very few sites, features or objects of	Low	<ul style="list-style-type: none"> • Important archaeological sites are known to exist in the region, e.g. Blinkklipkop east

	<p>cultural significance dating to the historic period occur sporadically all over the region. As these features are all visible, it would be easy to avoid them. Based on the above statement, the proposed development would have little to no impact on any heritage artefacts and/or sites. None of the proposed power line route alternatives would have an impact on sites, features or objects of dating to the historic period and any one of the route alternatives can be used</p> <p>From a heritage point of view it is recommended that the proposed development be allowed to continue. Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.</p>		<p>of Postmasburg, where specularite was mined during pre-colonial times. Such site should be avoided at all costs.</p> <ul style="list-style-type: none"> Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.
	Indirect impacts: None	N/A	
	Cumulative impacts: Should significant archaeological deposits be located then cumulative impacts will be experienced	Low	
Dust Impacts	<p>Direct impacts: Construction machinery and heavy vehicles which are likely to make use of the existing farm roads to transport equipment and material to the construction site, are likely to generate dust which is likely to be perceptible by adjacent residents. Trucks may potentially distribute dust along internal access roads</p>	Low	<ul style="list-style-type: none"> Continuous watering of the site should be carried out to prevent dust pollution during windy and dry conditions. A continuous dust monitoring process needs to be undertaken during construction. Speed restriction of 20km/h must be implemented for all construction vehicles. All vehicles transporting friable materials such as sand, rubble etc must be covered by a tarpaulin or wet down. Construction work to be undertaken during weekdays as far as practical.
	Indirect impacts: None identified.	N/A	
	Cumulative impacts: None identified.	N/A	
Noise Impacts	Direct impacts: Vehicles transporting materials to and from the site will potentially cause an additional noise burden to adjacent	Medium	<ul style="list-style-type: none"> The contractor must ensure that noise levels remain within acceptable limits Construction activities must be limited to normal working hours and according to municipal

	residents as well as along internal access roads.		<p>bylaws, i.e. working hours must be limited to weekdays as far as possible.</p> <ul style="list-style-type: none"> • If construction is required on the weekend; permission from adjacent landowners will be required prior to construction.
	Indirect impacts: None identified	N/A	
	Cumulative impacts: None identified	N/A	
Impacts on traffic and local roads	Direct impacts: Traffic will be congested as a result of construction activities. In addition, traffic increase can lead to road damage, erosion, accidents and even traffic delays Construction machinery and heavy vehicles are likely to generate dust which is likely to be perceptible by adjacent residents. Trucks may potentially distribute dust along internal access roads.	Medium	<ul style="list-style-type: none"> • Vehicular movement beyond the property boundaries may not occur during peak hour traffic times (07h30 – 08h30 and 16h00 – 17h00). • It must be ensured that a backlog of traffic does not develop at the access points during peak hours through the upgrade to the road system and the implementation of an efficient and effective access control system. • Speed restriction of 20km/h must be implemented for all construction vehicles. • Implement dust suppression measures (wetting or application of soil binding compound) in all areas that will be affected by construction • activities and where dust will be generated
	Indirect impacts: None identified	N/A	
	Cumulative impacts: None identified	N/A	
Impact on socio-economics	Direct impacts: Impact on nearby residential areas - Influx of workers in the area may raise concerns from neighbouring residents	Medium	<ul style="list-style-type: none"> • All adjacent landowners must be informed of the construction processes prior to commencement of construction activities. • Adjacent land owners must be informed timeously of any service stoppages in their areas. • Notification must include possible timeframes for stoppages. • Consequences of such stoppages must be clearly indicated to all surrounding/affected land owners. • Affected land owners must be timeously informed of any/all maintenance of the bulk water services supply which may result in service stoppages to their properties. Again this must include possible timeframes so alternatives can be provided.
	Indirect impacts: None identified	N/A	
	Cumulative impacts: None identified	N/A	
OPERATIONAL PHASE			
Activity	Impact summary	Significance (after mitigation)	Proposed mitigation
<i>Avifaunal impacts during the operational phase (Substation)</i>	Direct impacts: Since there is live hardware in the substation yard, the potential exists for birds to bridge the gap between two phases and earth resulting in electrocution. However, very few electrocutions have been recorded	Moderate	<ul style="list-style-type: none"> • A "Bird Friendly" monopole structure, with a bird perch (as per standard Eskom guidelines) should be used for the tower structures. • All relevant perching surfaces should be fitted with bird guards as deterrents

	<p>on transmission substations. Raptors such as Southern Pale Chanting Goshawk are sometimes attracted into substation yards in pursuit of species nesting there such as sparrows and canaries.</p> <p>The impact assessment found the impact of electrocution on substation infrastructure to be of low significance once mitigation in the form of bird friendly structures and bird deterrent measures have been put in place. Species likely to be affected are crows and other non-threatened species with the majority of threatened species (Martial Eagle) avoiding the substation yard as they are sensitive to disturbances.</p>		
	Indirect impacts: Effect on nesting birds outside the vicinity of the site.	Low	
	Cumulative impacts: Moderate as there is a high level of existing disturbance in the vicinity.	Low	
<i>Faunal Impacts</i>	<p>Direct impacts: It is not envisaged that any Red data species will be present on the site and thus directly impacted as a result of the development. During the operational phase, a further loss of faunal diversity and ecological integrity will occur due to the increase in human activity and potential poaching. Additionally, alien invasive species will quickly encroach into disturbed areas, particularly adjacent to drainage areas.</p>	Low-Moderate	<ul style="list-style-type: none"> • No trapping or hunting of fauna is to take place. Access control must be implemented to ensure that no illegal trapping or poaching takes place. • Should any Red Data faunal species be noted within the development footprint areas, these species must be relocated to similar habitat within the vacant land to the west of the development area with the assistance of a suitably qualified ecologist. • Any fauna directly threatened by the construction activities must be removed to a safe location by the ECO or qualified Ecologist. • All staff and contractors must undergo an environmental induction course held by the ECO as well as faunal education and awareness programmes. • Ongoing alien plant control must be undertaken along the power line servitude route;
	Indirect impacts: Loss of indigenous vegetation.	Low-Moderate	
	Cumulative impacts: Habitat fragmentation	Low-Moderate	
<i>Visual Impacts: Lighting</i>	Direct impacts: Obtrusive lighting is very challenging to predict and requires the service of a lighting engineer in order to	Low-Moderate	<ul style="list-style-type: none"> • Do not over illuminate areas. Use the correct illumination intensity for the purpose intended.

	quantify potential obtrusive lighting impacts. The risk of obtrusive lighting may be low.		
	Indirect impacts: Light Pollution	Moderate	
	Cumulative impacts: Neighbour nuisance	Moderate	
DECOMMISSIONING PHASE			
Decommissioning and closure phase has not been considered as part of this application as the end use of the site and required decommissioning activities are not known at this time; it is therefore not possible to predict the potential environmental impacts. If decommissioning phase is considered in future, the developer will undertake the required actions as prescribed by the legislation at the time and comply with all relevant requirements administered by any relevant authority and competent authority at that time			

Impacts Associated with power line route A1 (preferred)			
CONSTRUCTION PHASE			
Activity	Impact summary	Significance (after mitigation)	Proposed mitigation
<i>Ecological Impacts: Soil erosion and sedimentation of drainage systems</i>	Direct impacts: Construction activities (i.e. excavations and vegetation clearing) expose soil to environmental factors including rainfall and wind which can lead to the removal of topsoil resulting in soil erosion and the deposition of sediment along the banks and into surrounding watercourses. Sedimentation poses a risk to the geomorphological/functional integrity of these systems.	Moderate	<ul style="list-style-type: none"> • Where possible the pylon must be constructed outside of drainage channels or at their narrowest point; • Use existing tracks and roads to gain access to the work servitude as much as possible; • In the event of infilling, replacement of subsoil must precede the topsoil replacement, and all material must be well compacted; • No stockpiling of any materials may take place within or directly adjacent to the channel systems; • Erosion control measures must be implemented in areas sensitive to erosion such as near water supply points, edges of slopes, etc. These measures include but are not limited to - the use of sand bags, geotextiles such as soil cells which are used in the protection of slopes, hessian sheets, silt fences and retention or replacement of vegetation; • Install sediment barriers across the entire construction right of way at all watercourse where necessary to prevent sediment flow into the channels; • Disturbed sites must be rehabilitated as soon as construction in an area is complete or near complete and not left until the end of the project to be rehabilitated; • Vegetation clearing within 50m of any channel must only be undertaken when construction activity is actually being undertaken at this point and such areas must be rehabilitated within 2 weeks of initial clearing occurring. Vegetation clearing must be limited to the servitude width required for the power lines; • There shall be no mining of soil/sand required for construction purposes from the
	Indirect impacts: Changes made to the bed or banks of watercourse channels will cause unstable channel conditions causing erosion, meandering, increased potential for flooding and movement of bed material, which will result in property damage adjacent to and downstream of the construction site.	Moderate	
	Cumulative impacts: sedimentation of watercourses is destructive to many faunal species affecting their habitat; breeding and feeding cycles. Deposition of sediment also results in an unstable watercourse substrate	Moderate	

	which will lead to erosion of the bed of the channel.		banks of drainage channels and wetland areas. Soil must be brought in, if needed, for construction purposes. This must also be stockpiled away from the watercourses' and wetland's edge.
<i>Ecological Impacts: Pollution of watercourses and soil</i>	Direct impacts: Mismanagement of waste and pollutants like hydrocarbons, construction waste and other hazardous chemicals will result in these substances entering and polluting sensitive natural environments either directly through surface runoff during rainfall events, or subsurface water movement.	Moderate	<ul style="list-style-type: none"> All waste generated during construction is to be disposed of as per the Environmental Management Programme and no washing of paint brushes, containers, wheelbarrows, spades, picks or any other equipment adjacent or in drainage channel is permitted. Proper management and disposal of construction waste must occur during the lifespan of the project, including during maintenance of the power lines and substations. No release of any substance i.e. cement, oil, that could be toxic to fauna or faunal habitats within the watercourses. Portable toilets must be placed 30m away from the edge of the channels. Do not locate the construction camp or any depot for any substance which causes or is likely to cause pollution within a distance of 50m from a channel. Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly drained and disposed of using proper solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil must be removed and the affected area rehabilitated immediately – consult with a wetland/aquatic specialist if spills occur.
	Indirect impacts: Pollution and reduction of water quality which will have an impact on the faunal and floral communities.	Moderate	
	Cumulative impacts: An increase in pollutants will lead to a decline in the water quality of the watercourses, particularly the larger Groenwaterspruit affecting its ability to act as an ecological corridor in the larger landscape.	Moderate	
<i>Ecological Impacts: Proliferation of Alien invasive species</i>	Direct impacts: Alien invasive species will quickly encroach into disturbed areas, particularly adjacent to drainage areas. Alien species generally out-compete indigenous species for water, light, space and nutrients as they are adaptable to changing conditions and are able to easily invade a wide range of ecological niches (Bromilow, 2010).	Moderate	<ul style="list-style-type: none"> An alien invasive management programme must be incorporated into the Environmental Management Programme; Ongoing alien plant control must be undertaken along the power line servitude route; Areas which have been disturbed will be quickly colonised by invasive alien species. An ongoing management plan must be implemented for the clearing/eradication of alien species. Monitor all sites disturbed by construction activities for colonisation by exotics or invasive plants and control these as they emerge.
	Indirect impacts: Change in species diversity.	Moderate	
	Cumulative impacts: Alien invader plant species pose an ecological threat as they alter habitat structure, lower biodiversity (both number and “quality” of species), change nutrient cycling and productivity, and modify food webs (Zedler, 2004).	Moderate	
<i>Ecological Impacts:</i>	Direct impacts: During the construction	Moderate	<ul style="list-style-type: none"> Disturbed areas must be rehabilitated immediately after construction has been

<p><i>Loss of indigenous vegetation due to clearing of the footprint area</i></p>	<p>phase the area for the power line will be cleared of vegetation. This will result in the loss of indigenous species, disturbance of species of conservation concern and the fragmentation of vegetation communities. The removal of vegetation will also expose soil increasing the risk of erosion.</p> <p>The vegetation on the site is disturbed, particularly with regard to route A1 as a result of human activities and no sensitive habitat was identified. With the implementation of mitigation measures this impact will be minimized.</p> <p>Postmasburg Thornveld may contain the nationally protected <i>Acacia (Vachellia) erioloba</i> trees as well as the provincially protected <i>Boophone disticha</i>. These protected plant species might be encountered during construction. A permit will be required to remove them from the impacted area.</p>		<p>completed in that area by planting appropriate indigenous plant species;</p> <ul style="list-style-type: none"> • The clearing of vegetation must be kept to a minimum and within the power line servitude; • During the construction phase workers must be limited to areas under construction and access to the undeveloped areas must be strictly controlled; • Rehabilitated areas must be monitored to ensure the establishment of re-vegetated areas. • It is recommended that a qualified botanist be appointed prior to development, to do search and rescue of conservation worthy plants, should they be encountered, that can be relocated successfully, after obtaining a permit or license to do so.
	<p>Indirect impacts: Loss of indigenous vegetation.</p>	Moderate	
	<p>Cumulative impacts: Habitat fragmentation.</p>	Low	
<p><i>Ecological Impacts: Loss of faunal habitat and ecological structure</i></p>	<p>Direct impacts: The construction phase of the power line development will result in the loss of faunal habitats within the area. This impact relates to the complete removal or partial destruction/disturbance of existing vegetation by machinery and workers, impacting directly on the ecological condition of natural vegetation and habitat availability. These activities will have an impact on foraging and breeding ecology of faunal species. Loss of vegetation generally affects nutrient cycles, removes the organic litter layer and results in habitat fragmentation and destruction of wildlife corridors.</p>	Moderate	<ul style="list-style-type: none"> • All construction and maintenance activities must be carried out according to the generally accepted environmental best practice and the temporal and spatial footprint of the development must be kept to a minimum. • The boundaries of the development footprint areas are to be clearly demarcated and it must be ensured that all activities remain within the demarcated footprint area. • Edge effects of all construction and operational activities, such as erosion and alien plant species proliferation, which will affect faunal habitats adjacent to the development area, need to be strictly managed. • Any natural areas beyond the development footprint, which have been affected by the construction activities, must be rehabilitated using indigenous plant species. • Education and awareness campaigns on faunal species and their habitat are recommended to help increase awareness, respect and responsibility towards the environment for all staff and contractors.

	<p>The habitat is however already largely transformed and fragmented due to the adjacent mining activities and the site is not a unique habitat within the landscape. It is not envisaged that any Red Data species will be displaced by the habitat transformation that will take place as a result of the construction and operation of the proposed development. The impact on smaller, non-Red Data species that are potentially breeding in the area will be local in extent, in that it will not have a significant effect on regional or national populations. The proposed development will have a limited impact on the loss of faunal habitat, despite the majority of the study area having been transformed.</p>		
	Indirect impacts: Loss of species diversity.	Moderate	
	Cumulative impacts: Limited impact on ecological diversity in the vicinity.	Low (operational also low)	
<i>Ecological Impacts: Direct faunal impacts</i>	<p>Direct impacts: Activities involving the clearing/harvesting of natural vegetation will result in the loss of faunal species. Faunal diversity within the study area has been negatively impacted as a result of historic and on-going disturbances associated with mining practices. It is not envisaged that any Red data species will be present on the site and thus directly impacted as a result of the development.</p>	Moderate to High	<ul style="list-style-type: none"> • It is recommended that a speed limit of 30km/h is implemented on all roads running through the study area during all phases in order to minimise risk to fauna from vehicles. • No trapping or hunting of fauna is to take place. Access control must be implemented to ensure that no illegal trapping or poaching takes place. • Should any Red Data faunal species be noted within the development footprint areas, these species must be relocated to similar habitat within the vacant land to the west of the development area with the assistance of a suitably qualified ecologist. • Any fauna directly threatened by the construction activities must be removed to a safe location by the ECO or qualified Ecologist. • All staff and contractors must undergo an environmental induction course held by the ECO as well as faunal education and awareness programmes.
	Indirect impacts: Loss of species diversity.	Moderate to High	
	Cumulative impacts: Movement of species from one area into another.	Moderate	
<i>Ecological Impacts: Disturbance-noise pollution</i>	<p>Direct impacts: Disturbance created by noise-pollution associated with workers and construction activities can affect local wildlife utilising adjacent habitats, particularly</p>	Moderate	<ul style="list-style-type: none"> • Strict control must be maintained over all activities during construction, in line with an approved Construction EMPr. • Any Red Data species identified in this report observed to be roosting and/or breeding

	<p>mammalian species. This is likely to be short-lived during the construction phase but will continue to have an impact during the operational life span of the development.</p> <p>The proposed development area is located within close proximity to the Kumba Mine, therefore, species within this landscape often experience disturbance. As a result disturbance of fauna by the proposed development during the construction phase is anticipated to be of moderate significance. Species are particularly sensitive to disturbance during the breeding season and this must be borne in mind during both the construction and operational phases.</p> <p>Indirect impacts: Loss of species diversity.</p> <p>Cumulative impacts: Movement of species from one area into another.</p>	<p>Moderate</p> <p>Low</p>	<p>in the vicinity, the ECO must be notified.</p>
<p><i>Avifaunal Impacts: Habitat Destruction</i></p>	<p>Direct impacts: During the construction phase of power lines, some habitat destruction and alteration will occur due to the clearing of servitudes and vegetation at the substation site. Servitudes have to be cleared of excess vegetation at regular intervals in order to allow access to the line for maintenance, to prevent vegetation intrusion and to minimise the risk of fire under the lines. These activities have an impact on foraging, breeding and roosting ecology of avian species within the area through modification of habitat.</p> <p>It is not envisaged that any Red Data species will be displaced by the habitat transformation that will take place as a result of the construction of the power line. The impact on smaller, non-Red Data species that are potentially breeding in the area will be local in extent, in that it will not have a significant effect on regional or national populations.</p>	<p>Low</p>	<ul style="list-style-type: none"> • All construction and maintenance activities must be carried out according to the generally accepted environmental best practice and the temporal and spatial footprint of the development should be kept to a minimum. In particular, care must be taken in the vicinity of the drainage lines and existing roads must be used as much as possible for access during construction. • The boundaries of the development footprint areas are to be clearly demarcated and it must be ensured that all activities remain within the demarcated footprint area. • Provide adequate briefing for site personnel. • Any bird nests that are found during the construction period must be reported to the Environmental Control Officer (ECO). • The above measures must be covered in a site specific EMP and controlled by an ECO.

	<p>The habitat is already largely transformed and fragmented by existing infrastructure. Furthermore, this is not a unique habitat within the landscape. The construction of the proposed new power line should therefore have a low displacement impact from an avifaunal perspective.</p>		
	Indirect impacts: None	Low	
	Cumulative impacts:	Low	
<i>Avifaunal Impacts: Disturbance</i>	<p>Direct impacts: disturbance of birds by the proposed substation and power line is anticipated to be of low significance as birds will move away from the area temporarily. Species sensitive to disturbance and ground-nesting species resident within the development footprint will be particularly susceptible. Disturbance can also influence the community structure of avifauna within close proximity to the development as certain species will be displaced and forced to find alternative territories. Avian species with small territories are particularly susceptible. The substation and power line development is unlikely to have a significant impact on avifauna. However, species are particularly sensitive to disturbance during the breeding season and this must be borne in mind during both the construction and operational (maintenance) phases.</p>	Low	<ul style="list-style-type: none"> • Strict control must be maintained over all activities during construction, in line with an approved Construction EMP. • During Construction, if any of the Red Data species identified in this report are observed to be roosting and/or breeding in the vicinity, the ECO must be notified. • The construction camps must be as close to the site as possible • Contractors and working staff should stay within the development footprint and movement outside these areas including avian micro-habitats must be restricted. • Driving must take place on existing roads and a speed limit of 30km/h must be implemented on all roads running through the study area during all phases
	Indirect impacts: None		
	Cumulative impacts:		
<i>Visual Impacts</i>	Direct impacts: The location of the proposed	Moderate	<ul style="list-style-type: none"> • Locate construction camps and stockyards in areas that are already disturbed instead

	Boitchoko Substation will have a major influence on the visual change that observers from Postdene and Postmasburg will experience.		<p>of stripping more vegetation to allow for these facilities. It will be most preferred to locate the construction camps on some of the mining sites;</p> <ul style="list-style-type: none"> • Establish limits of disturbances during construction through demarcating of the tower and substation footprints in order to prevent unnecessary damage to vegetation; • Keep to existing road infrastructure as far as possible to minimise the physical damage to vegetation in the power line servitude; • Implement rehabilitation of disturbed areas as soon as possible to limit the duration of exposed surfaces and the risk of erosion; and • Previously rehabilitated areas must be monitored to prevent the infestation of weeds that may become an unsightly feature.
	Indirect impacts: None	N/A	
	Cumulative impacts: Change in the landscape visual quality.	Moderate	
<i>Heritage Impacts:</i>	<p>Direct impacts: It has been determined that only a very few sites, features or objects of cultural significance dating to the historic period occur sporadically all over the region. As these features are all visible, it would be easy to avoid them. Based on the above statement, the proposed development would have little to no impact on any heritage artefacts and/or sites. None of the proposed power line route alternatives would have an impact on sites, features or objects of dating to the historic period and any one of the route alternatives can be used</p> <p>From a heritage point of view it is recommended that the proposed development be allowed to continue. Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.</p>	Low	<ul style="list-style-type: none"> • Important archaeological sites are known to exist in the region, e.g. Blinkklipkop east of Postmasburg, where specularite was mined during pre-colonial times. Such site should be avoided at all costs. • Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.
	Indirect impacts: None	N/A	
	Cumulative impacts: Should significant archaeological deposits be located then cumulative impacts will be experienced	Low	
Dust Impacts	Direct impacts: Construction machinery and heavy vehicles which are likely to make use	Low	<ul style="list-style-type: none"> • Continuous watering of the site should be carried out to prevent dust pollution during windy

	of the existing farm roads to transport equipment and material to the construction site, are likely to generate dust which is likely to be perceptible by adjacent residents. Trucks may potentially distribute dust along internal access roads		and dry conditions. <ul style="list-style-type: none"> • A continuous dust monitoring process needs to be undertaken during construction. • Speed restriction of 20km/h must be implemented for all construction vehicles. • All vehicles transporting friable materials such as sand, rubble etc must be covered by a tarpaulin or wet down. • Construction work to be undertaken during weekdays as far as practical.
	Indirect impacts: None identified.	N/A	
	Cumulative impacts: None identified.	N/A	
Noise Impacts	Direct impacts: Vehicles transporting materials to and from the site will potentially cause an additional noise burden to adjacent residents as well as along internal access roads.	Medium	<ul style="list-style-type: none"> • The contractor must ensure that noise levels remain within acceptable limits • Construction activities must be limited to normal working hours and according to municipal bylaws, i.e. working hours must be limited to weekdays as far as possible. • If construction is required on the weekend; permission from adjacent landowners will be required prior to construction.
	Indirect impacts: None identified	N/A	
	Cumulative impacts: None identified	N/A	
Impacts on traffic and local roads	Direct impacts: Traffic will be congested as a result of construction activities. In addition, traffic increase can lead to road damage, erosion, accidents and even traffic delays Construction machinery and heavy vehicles are likely to generate dust which is likely to be perceptible by adjacent residents. Trucks may potentially distribute dust along internal access roads.	Medium	<ul style="list-style-type: none"> • Vehicular movement beyond the property boundaries may not occur during peak hour traffic times (07h30 – 08h30 and 16h00 – 17h00). • It must be ensured that a backlog of traffic does not develop at the access points during peak hours through the upgrade to the road system and the implementation of an efficient and effective access control system. • Speed restriction of 20km/h must be implemented for all construction vehicles. • Implement dust suppression measures (wetting or application of soil binding compound) in all areas that will be affected by construction • activities and where dust will be generated
	Indirect impacts: None identified	N/A	
	Cumulative impacts: None identified	N/A	
Impact on socio-economics	Direct impacts: Impact on nearby residential areas - Influx of workers in the area may raise concerns from neighbouring residents	Medium	<ul style="list-style-type: none"> • All adjacent landowners must be informed of the construction processes prior to commencement of construction activities. • Adjacent land owners must be informed timeously of any service stoppages in their areas. • Notification must include possible timeframes for stoppages.

	Indirect impacts: None identified	N/A	<ul style="list-style-type: none"> Consequences of such stoppages must be clearly indicated to all surrounding/affected land owners. Affected land owners must be timeously informed of any/all maintenance of the bulk water services supply which may result in service stoppages to their properties. Again this must include possible timeframes so alternatives can be provided.
	Cumulative impacts: None identified	N/A	
OPERATIONAL PHASE			
Activity	Impact summary	Significance (after mitigation)	Proposed mitigation
<i>Avifaunal impacts during the operational phase (Power lines)</i>	Direct impacts: Electrocutation of birds on associated overhead power lines is an important cause of mortality for a variety of bird species particularly storks, cranes and raptors in South Africa (Van Rooyen & Ledger 1999). Electrocutation refers to the scenario where a bird is perched or attempts to perch on the electrical structure and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components. The impact assessment found the impact of electrocution to be of moderate significance after the mitigation in the form of bird friendly structures.	Moderate	<ul style="list-style-type: none"> All relevant perching surfaces should be fitted with bird guards and perch guards as deterrents (Hunting 2002). Installation of artificial bird space perches and nesting platforms, at a safe distance from energised components (Goudie 2006; Prinsen et al. 2012). A "Bird Friendly" monopole structure, with a bird perch (as per standard Eskom guidelines) should be used for the tower structures.
	Indirect impacts: Effect on nesting birds outside the vicinity of the site.	Low	
	Cumulative impacts: Moderate as there is a high level of existing disturbance in the vicinity.	Low	
<i>Ecological Impacts</i>	Direct impacts: It is not envisaged that any Red data species will be present on the site and thus directly impacted as a result of the development. During the operational phase, a further loss of faunal diversity and ecological integrity will occur due to the increase in human activity and potential poaching. Additionally, alien invasive species will quickly encroach into disturbed areas,	Low-Moderate	<ul style="list-style-type: none"> No trapping or hunting of fauna is to take place. Access control must be implemented to ensure that no illegal trapping or poaching takes place. Should any Red Data faunal species be noted within the development footprint areas, these species must be relocated to similar habitat within the vacant land to the west of the development area with the assistance of a suitably qualified ecologist. Any fauna directly threatened by the construction activities must be removed to a safe location by the ECO or qualified Ecologist. All staff and contractors must undergo an environmental induction course held by the

	particularly adjacent to drainage areas.		<p>ECO as well as faunal education and awareness programmes.</p> <ul style="list-style-type: none"> Ongoing alien plant control must be undertaken along the power line servitude route;
	Indirect impacts: Loss of indigenous vegetation.	Low-Moderate	
	Cumulative impacts: Habitat fragmentation	Low-Moderate	
<i>Visual Impacts: Lighting</i>	Direct impacts: Obtrusive lighting is very challenging to predict and requires the service of a lighting engineer in order to quantify potential obtrusive lighting impacts. The risk of obtrusive lighting may be low but the following preventative measures should form part of the design phase of the development.	Low-Moderate	<ul style="list-style-type: none"> Confine light output within property boundaries through using specifically designed luminaires such as full cut-off luminaires to minimise upward spread of light near to and above the horizontal Tilt spotlight luminaires to direct the light to the intended spot, instead of illuminating areas outside the site perimeter Mount external spot lights on the appropriate pole height. Higher mounting heights allow lower main beam angles which can reduce glare Utilise control systems to reduce light levels during inactive periods or at predetermined times while maintaining sufficient lighting for safety and security Where vertical surfaces are illuminated, such as advertising signs or buildings façades, it is recommended that luminaires should light downwards. If up-lighting is the only alternative, the use of shields, baffles or louvers should be installed to reduce light spillage over or under the structure Do not over illuminate areas. Use the correct illumination intensity for the purpose intended.
	Indirect impacts: Light Pollution	Moderate	
	Cumulative impacts: Neighbour nuisance	Moderate	
DECOMMISSIONING PHASE			
Decommissioning and closure phase has not been considered as part of this application as the end use of the site and required decommissioning activities are not known at this time; it is therefore not possible to predict the potential environmental impacts. If decommissioning phase is considered in future, the developer will undertake the required actions as prescribed by the legislation at the time and comply with all relevant requirements administered by any relevant authority and competent authority at that time			

Impacts Associated with power line route A2 (alternative)

CONSTRUCTION PHASE			
Activity	Impact summary	Significance (after mitigation)	Proposed mitigation
<i>Ecological Impacts: Soil erosion and sedimentation of drainage systems</i>	Direct impacts: Construction activities (i.e. excavations and vegetation clearing) expose soil to environmental factors including rainfall and wind which can lead to the removal of topsoil resulting in soil erosion and the deposition of sediment along the banks and	Moderate	<ul style="list-style-type: none"> Where possible the pylon must be constructed outside of drainage channels or at their narrowest point; Use existing tracks and roads to gain access to the work servitude as much as possible; In the event of infilling, replacement of subsoil must precede the topsoil replacement,

	into surrounding watercourses. Sedimentation poses a risk to the geomorphological/functional integrity of these systems.		<p>and all material must be well compacted;</p> <ul style="list-style-type: none"> No stockpiling of any materials may take place within or directly adjacent to the channel systems; Erosion control measures must be implemented in areas sensitive to erosion such as near water supply points, edges of slopes, etc. These measures include but are not limited to - the use of sand bags, geotextiles such as soil cells which are used in the protection of slopes, hessian sheets, silt fences and retention or replacement of vegetation; Install sediment barriers across the entire construction right of way at all watercourse where necessary to prevent sediment flow into the channels; Disturbed sites must be rehabilitated as soon as construction in an area is complete or near complete and not left until the end of the project to be rehabilitated; Vegetation clearing within 50m of any channel must only be undertaken when construction activity is actually being undertaken at this point and such areas must be rehabilitated within 2 weeks of initial clearing occurring. Vegetation clearing must be limited to the servitude width required for the power lines; There shall be no mining of soil/sand required for construction purposes from the banks of drainage channels and wetland areas. Soil must be brought in, if needed, for construction purposes. This must also be stockpiled away from the watercourses' and wetland's edge.
	Indirect impacts: Changes made to the bed or banks of watercourse channels will cause unstable channel conditions causing erosion, meandering, increased potential for flooding and movement of bed material, which will result in property damage adjacent to and downstream of the construction site.	Moderate	
	Cumulative impacts: sedimentation of watercourses is destructive to many faunal species affecting their habitat; breeding and feeding cycles. Deposition of sediment also results in an unstable watercourse substrate which will lead to erosion of the bed of the channel.	Moderate	
<i>Ecological Impacts: Pollution of watercourses and soil</i>	Direct impacts: Mismanagement of waste and pollutants like hydrocarbons, construction waste and other hazardous chemicals will result in these substances entering and polluting sensitive natural environments either directly through surface runoff during rainfall events, or subsurface water movement.	Moderate	<ul style="list-style-type: none"> All waste generated during construction is to be disposed of as per the Environmental Management Programme and no washing of paint brushes, containers, wheelbarrows, spades, picks or any other equipment adjacent or in drainage channel is permitted. Proper management and disposal of construction waste must occur during the lifespan of the project, including during maintenance of the power lines and substations. No release of any substance i.e. cement, oil, that could be toxic to fauna or faunal habitats within the watercourses. Portable toilets must be placed 30m away from the edge of the channels. Do not locate the construction camp or any depot for any substance which causes or is likely to cause pollution within a distance of 50m from a channel. Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly drained and disposed of using proper solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil must be removed and the affected area rehabilitated immediately – consult with a wetland/aquatic specialist if spills occur.
	Indirect impacts: Pollution and reduction of water quality which will have an impact on the faunal and floral communities.	Moderate	
	Cumulative impacts: An increase in pollutants will lead to a decline in the water quality of the watercourses, particularly the larger Groenwaterspruit affecting its ability to act as an ecological corridor in the larger landscape.	Moderate	

<p><i>Ecological Impacts:</i> <i>Proliferation of Alien invasive species</i></p>	<p>Direct impacts: Alien invasive species will quickly encroach into disturbed areas, particularly adjacent to drainage areas. Alien species generally out-compete indigenous species for water, light, space and nutrients as they are adaptable to changing conditions and are able to easily invade a wide range of ecological niches (Bromilow, 2010).</p>	Moderate	<ul style="list-style-type: none"> • An alien invasive management programme must be incorporated into the Environmental Management Programme; • Ongoing alien plant control must be undertaken along the power line servitude route; • Areas which have been disturbed will be quickly colonised by invasive alien species. An ongoing management plan must be implemented for the clearing/eradication of alien species. • Monitor all sites disturbed by construction activities for colonisation by exotics or invasive plants and control these as they emerge.
	<p>Indirect impacts: Change in species diversity.</p>	Moderate	
	<p>Cumulative impacts: Alien invader plant species pose an ecological threat as they alter habitat structure, lower biodiversity (both number and “quality” of species), change nutrient cycling and productivity, and modify food webs (Zedler, 2004).</p>	Moderate	
<p><i>Ecological Impacts:</i> <i>Loss of indigenous vegetation due to clearing of the footprint area</i></p>	<p>Direct impacts: During the construction phase the area for the power line will be cleared of vegetation. This will result in the loss of indigenous species, disturbance of species of conservation concern and the fragmentation of vegetation communities. The removal of vegetation will also expose soil increasing the risk of erosion. The vegetation on the site is disturbed, particularly with regard to route A1 as a result of human activities and no sensitive habitat was identified. With the implementation of mitigation measures this impact will be minimized. Postmasburg Thornveld may contain the nationally protected <i>Acacia (Vachellia) erioloba</i> trees as well as the provincially protected <i>Boophone disticha</i>. These protected plant species might be encountered during construction. A permit will be required to remove them from the impacted area.</p>	Moderate	<ul style="list-style-type: none"> • Disturbed areas must be rehabilitated immediately after construction has been completed in that area by planting appropriate indigenous plant species; • The clearing of vegetation must be kept to a minimum and within the power line servitude; • During the construction phase workers must be limited to areas under construction and access to the undeveloped areas must be strictly controlled; • Rehabilitated areas must be monitored to ensure the establishment of re-vegetated areas. • It is recommended that a qualified botanist be appointed prior to development, to do search and rescue of conservation worthy plants, should they be encountered, that can be relocated successfully, after obtaining a permit or license to do so.
	<p>Indirect impacts: Loss of indigenous vegetation.</p>	Moderate	

	Cumulative impacts: Habitat fragmentation.	Low	
<i>Ecological Impacts: Loss of faunal habitat and ecological structure</i>	Direct impacts: The construction phase of the power line development will result in the loss of faunal habitats within the area. This impact relates to the complete removal or partial destruction/disturbance of existing vegetation by machinery and workers, impacting directly on the ecological condition of natural vegetation and habitat availability. These activities will have an impact on foraging and breeding ecology of faunal species. Loss of vegetation generally affects nutrient cycles, removes the organic litter layer and results in habitat fragmentation and destruction of wildlife corridors. The habitat is however already largely transformed and fragmented due to the adjacent mining activities and the site is not a unique habitat within the landscape. It is not envisaged that any Red Data species will be displaced by the habitat transformation that will take place as a result of the construction and operation of the proposed development. The impact on smaller, non-Red Data species that are potentially breeding in the area will be local in extent, in that it will not have a significant effect on regional or national populations. The proposed development will have a limited impact on the loss of faunal habitat, despite the majority of the study area having been transformed.	Moderate	<ul style="list-style-type: none"> • All construction and maintenance activities must be carried out according to the generally accepted environmental best practice and the temporal and spatial footprint of the development must be kept to a minimum. • The boundaries of the development footprint areas are to be clearly demarcated and it must be ensured that all activities remain within the demarcated footprint area. • Edge effects of all construction and operational activities, such as erosion and alien plant species proliferation, which will affect faunal habitats adjacent to the development area, need to be strictly managed. • Any natural areas beyond the development footprint, which have been affected by the construction activities, must be rehabilitated using indigenous plant species. • Education and awareness campaigns on faunal species and their habitat are recommended to help increase awareness, respect and responsibility towards the environment for all staff and contractors.
	Indirect impacts: Loss of species diversity.	Moderate	
	Cumulative impacts: Limited impact on ecological diversity in the vicinity.	Low (operational also low)	
<i>Ecological Impacts: Direct faunal impacts</i>	Direct impacts: Activities involving the clearing/harvesting of natural vegetation will	Moderate to High	<ul style="list-style-type: none"> • It is recommended that a speed limit of 30km/h is implemented on all roads running

	<p>result in the loss of faunal species. Faunal diversity within the study area has been negatively impacted as a result of historic and on-going disturbances associated with mining practices. It is not envisaged that any Red data species will be present on the site and thus directly impacted as a result of the development.</p> <p>Indirect impacts: Loss of species diversity.</p> <p>Cumulative impacts: Movement of species from one area into another.</p>	<p>Moderate to High</p> <p>Moderate – operational phase as well</p>	<p>through the study area during all phases in order to minimise risk to fauna from vehicles.</p> <ul style="list-style-type: none"> No trapping or hunting of fauna is to take place. Access control must be implemented to ensure that no illegal trapping or poaching takes place. Should any Red Data faunal species be noted within the development footprint areas, these species must be relocated to similar habitat within the vacant land to the west of the development area with the assistance of a suitably qualified ecologist. Any fauna directly threatened by the construction activities must be removed to a safe location by the ECO or qualified Ecologist. All staff and contractors must undergo an environmental induction course held by the ECO as well as faunal education and awareness programmes.
<p><i>Ecological Impacts: Disturbance-noise pollution</i></p>	<p>Direct impacts: Disturbance created by noise-pollution associated with workers and construction activities can affect local wildlife utilising adjacent habitats, particularly mammalian species. This is likely to be short-lived during the construction phase but will continue to have an impact during the operational life span of the development. The proposed development area is located within close proximity to the Kumba Mine, therefore, species within this landscape often experience disturbance. As a result disturbance of fauna by the proposed development during the construction phase is anticipated to be of moderate significance. Species are particularly sensitive to disturbance during the breeding season and this must be borne in mind during both the construction and operational phases.</p>	Moderate	<ul style="list-style-type: none"> Strict control must be maintained over all activities during construction, in line with an approved Construction EMP. Any Red Data species identified in this report observed to be roosting and/or breeding in the vicinity, the ECO must be notified.
	<p>Indirect impacts: Loss of species diversity.</p>	Moderate	
	<p>Cumulative impacts: Movement of species from one area into another.</p>	Low	
<p><i>Avifaunal Impacts: Habitat Destruction</i></p>	<p>Direct impacts: During the construction phase of power lines, some habitat destruction and alteration will occur due to</p>	Low	<ul style="list-style-type: none"> All construction and maintenance activities must be carried out according to the generally accepted environmental best practice and the temporal and spatial footprint

	<p>the clearing of servitudes and vegetation at the substation site. Servitudes have to be cleared of excess vegetation at regular intervals in order to allow access to the line for maintenance, to prevent vegetation intrusion and to minimise the risk of fire under the lines. These activities have an impact on foraging, breeding and roosting ecology of avian species within the area through modification of habitat.</p> <p>It is not envisaged that any Red Data species will be displaced by the habitat transformation that will take place as a result of the construction of the power line. The impact on smaller, non-Red Data species that are potentially breeding in the area will be local in extent, in that it will not have a significant effect on regional or national populations.</p> <p>The habitat is already largely transformed and fragmented by existing infrastructure. Furthermore, this is not a unique habitat within the landscape. The construction of the proposed new power line should therefore have a low displacement impact from an avifaunal perspective.</p>		<p>of the development should be kept to a minimum. In particular, care must be taken in the vicinity of the drainage lines and existing roads must be used as much as possible for access during construction.</p> <ul style="list-style-type: none"> • The boundaries of the development footprint areas are to be clearly demarcated and it must be ensured that all activities remain within the demarcated footprint area. • Provide adequate briefing for site personnel. • Any bird nests that are found during the construction period must be reported to the Environmental Control Officer (ECO). • The above measures must be covered in a site specific EMPr and controlled by an ECO.
	<p>Indirect impacts: None</p>	<p>Low</p>	
	<p>Cumulative impacts:</p>	<p>Low</p>	
<p><i>Avifaunal Impacts: Disturbance</i></p>	<p>Direct impacts: disturbance of birds by the proposed substation and power line is anticipated to be of low significance as birds will move away from the area temporarily. Species sensitive to disturbance and ground-nesting species resident within the development footprint will be particularly susceptible. Disturbance can also influence the community structure of avifauna within close proximity to the development as certain</p>	<p>Low</p>	<ul style="list-style-type: none"> • Strict control must be maintained over all activities during construction, in line with an approved Construction EMPr. • During Construction, if any of the Red Data species identified in this report are observed to be roosting and/or breeding in the vicinity, the ECO must be notified. • The construction camps must be as close to the site as possible • Contractors and working staff should stay within the development footprint and movement outside these areas including avian micro-habitats must be restricted. • Driving must take place on existing roads and a speed limit of 30km/h must be implemented on all roads running through the study area during all phases

	<p>species will be displaced and forced to find alternative territories. Avian species with small territories are particularly susceptible. The substation and power line development is unlikely to have a significant impact on avifauna. However, species are particularly sensitive to disturbance during the breeding season and this must be borne in mind during both the construction and operational (maintenance) phases.</p>		
	Indirect impacts: None		
	Cumulative impacts:		
	Indirect impacts: None	N/A	
	Cumulative impacts: Should significant archaeological deposits be located then cumulative impacts will be experienced	Low	
Dust Impacts	<p>Direct impacts: Construction machinery and heavy vehicles which are likely to make use of the existing farm roads to transport equipment and material to the construction site, are likely to generate dust which is likely to be perceptible by adjacent residents. Trucks may potentially distribute dust along internal access roads</p>	Low	<ul style="list-style-type: none"> • Continuous watering of the site should be carried out to prevent dust pollution during windy and dry conditions. • A continuous dust monitoring process needs to be undertaken during construction. • Speed restriction of 20km/h must be implemented for all construction vehicles. • All vehicles transporting friable materials such as sand, rubble etc must be covered by a tarpaulin or wet down. • Construction work to be undertaken during weekdays as far as practical.
	Indirect impacts: None identified.	N/A	
	Cumulative impacts: None identified.	N/A	
Noise Impacts	<p>Direct impacts: Vehicles transporting materials to and from the site will potentially cause an additional noise burden to adjacent residents as well as along internal access roads.</p>	Medium	<ul style="list-style-type: none"> • The contractor must ensure that noise levels remain within acceptable limits • Construction activities must be limited to normal working hours and according to municipal bylaws, i.e. working hours must be limited to weekdays as far as possible. • If construction is required on the weekend; permission from adjacent landowners will be required prior to construction.
	Indirect impacts:	N/A	

	None identified		
	Cumulative impacts: None identified	N/A	
Impacts on traffic and local roads	Direct impacts: Traffic will be congested as a result of construction activities. In addition, traffic increase can lead to road damage, erosion, accidents and even traffic delays Construction machinery and heavy vehicles are likely to generate dust which is likely to be perceptible by adjacent residents. Trucks may potentially distribute dust along internal access roads.	Medium	<ul style="list-style-type: none"> • Vehicular movement beyond the property boundaries may not occur during peak hour traffic times (07h30 – 08h30 and 16h00 – 17h00). • It must be ensured that a backlog of traffic does not develop at the access points during peak hours through the upgrade to the road system and the implementation of an efficient and effective access control system. • Speed restriction of 20km/h must be implemented for all construction vehicles. • Implement dust suppression measures (wetting or application of soil binding compound) in all areas that will be affected by construction activities and where dust will be generated
	Indirect impacts: None identified	N/A	
	Cumulative impacts: None identified	N/A	
Impact on socio-economics	Direct impacts: Impact on nearby residential areas - Influx of workers in the area may raise concerns from neighbouring residents	Medium	<ul style="list-style-type: none"> • All adjacent landowners must be informed of the construction processes prior to commencement of construction activities. • Adjacent land owners must be informed timeously of any service stoppages in their areas. • Notification must include possible timeframes for stoppages. • Consequences of such stoppages must be clearly indicated to all surrounding/affected land owners. • Affected land owners must be timeously informed of any/all maintenance of the bulk water services supply which may result in service stoppages to their properties. Again this must include possible timeframes so alternatives can be provided.
	Indirect impacts: None identified	N/A	
	Cumulative impacts: None identified	N/A	
OPERATIONAL PHASE			
Activity	Impact summary	Significance (after mitigation)	Proposed mitigation
<i>Avifaunal impacts during the operational phase (Power lines)</i>	Direct impacts: Electrocutation of birds on associated overhead power lines is an important cause of mortality for a variety of bird species particularly storks, cranes and raptors in South Africa (Van Rooyen & Ledger 1999). Electrocutation refers to the scenario where a bird is perched or attempts to perch on the electrical structure and	Moderate	<ul style="list-style-type: none"> • All relevant perching surfaces should be fitted with bird guards and perch guards as deterrents (Hunting 2002). • Installation of artificial bird space perches and nesting platforms, at a safe distance from energised components (Goudie 2006; Prinsen et al. 2012). • A “Bird Friendly” monopole structure, with a bird perch (as per standard Eskom guidelines) should be used for the tower structures.

	<p>causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components (van Rooyen 2004). The impact assessment found the impact of electrocution to be of moderate significance after the mitigation in the form of bird friendly structures.</p>		
	<p>Indirect impacts: Effect on nesting birds outside the vicinity of the site.</p>	Low	
	<p>Cumulative impacts: Moderate as there is a high level of existing disturbance in the vicinity.</p>	Low	
<i>Ecological Impacts</i>	<p>Direct impacts: It is not envisaged that any Red data species will be present on the site and thus directly impacted as a result of the development. During the operational phase, a further loss of faunal diversity and ecological integrity will occur due to the increase in human activity and potential poaching. Additionally, alien invasive species will quickly encroach into disturbed areas, particularly adjacent to drainage areas.</p>	Low-Moderate	<ul style="list-style-type: none"> No trapping or hunting of fauna is to take place. Access control must be implemented to ensure that no illegal trapping or poaching takes place. Should any Red Data faunal species be noted within the development footprint areas, these species must be relocated to similar habitat within the vacant land to the west of the development area with the assistance of a suitably qualified ecologist. Any fauna directly threatened by the construction activities must be removed to a safe location by the ECO or qualified Ecologist. All staff and contractors must undergo an environmental induction course held by the ECO as well as faunal education and awareness programmes. Ongoing alien plant control must be undertaken along the power line servitude route;
	<p>Indirect impacts: Loss of indigenous vegetation.</p>	Low-Moderate	
	<p>Cumulative impacts: Habitat fragmentation</p>	Low-Moderate	
<i>Visual Impacts: Lighting</i>	<p>Direct impacts: Obtrusive lighting is very challenging to predict and requires the service of a lighting engineer in order to quantify potential obtrusive lighting impacts. The risk of obtrusive lighting may be low but the following preventative measures should form part of the design phase of the development.</p>	Low-Moderate	<ul style="list-style-type: none"> Do not over illuminate areas. Use the correct illumination intensity for the purpose intended.
	<p>Indirect impacts: Light Pollution</p>	Moderate	

	Cumulative impacts: Neighbour nuisance	Moderate	
DECOMMISSIONING PHASE			
Decommissioning and closure phase has not been considered as part of this application as the end use of the site and required decommissioning activities are not known at this time; it is therefore not possible to predict the potential environmental impacts. If decommissioning phase is considered in future, the developer will undertake the required actions as prescribed by the legislation at the time and comply with all relevant requirements administered by any relevant authority and competent authority at that time			

Impacts Associated with power line route A3 (alternative)			
CONSTRUCTION PHASE			
Activity	Impact summary	Significance (after mitigation)	Proposed mitigation
<i>Ecological Impacts: Soil erosion and sedimentation of drainage systems</i>	Direct impacts: Construction activities (i.e. excavations and vegetation clearing) expose soil to environmental factors including rainfall and wind which can lead to the removal of topsoil resulting in soil erosion and the deposition of sediment along the banks and into surrounding watercourses. Sedimentation poses a risk to the geomorphological/functional integrity of these systems.	Moderate	<ul style="list-style-type: none"> • Where possible the pylon must be constructed outside of drainage channels or at their narrowest point; • Use existing tracks and roads to gain access to the work servitude as much as possible; • In the event of infilling, replacement of subsoil must precede the topsoil replacement, and all material must be well compacted; • No stockpiling of any materials may take place within or directly adjacent to the channel systems; • Erosion control measures must be implemented in areas sensitive to erosion such as near water supply points, edges of slopes, etc. These measures include but are not limited to - the use of sand bags, geotextiles such as soil cells which are used in the protection of slopes, hessian sheets, silt fences and retention or replacement of vegetation; • Install sediment barriers across the entire construction right of way at all watercourse where necessary to prevent sediment flow into the channels; • Disturbed sites must be rehabilitated as soon as construction in an area is complete or near complete and not left until the end of the project to be rehabilitated; • Vegetation clearing within 50m of any channel must only be undertaken when construction activity is actually being undertaken at this point and such areas must be rehabilitated within 2 weeks of initial clearing occurring. Vegetation clearing must be limited to the servitude width required for the power lines; • There shall be no mining of soil/sand required for construction purposes from the banks of drainage channels and wetland areas. Soil must be brought in, if needed, for construction purposes. This must also be stockpiled away from the watercourses' and wetland's edge.
	Indirect impacts: Changes made to the bed or banks of watercourse channels will cause unstable channel conditions causing erosion, meandering, increased potential for flooding and movement of bed material, which will result in property damage adjacent to and downstream of the construction site.	Moderate	
	Cumulative impacts: sedimentation of watercourses is destructive to many faunal species affecting their habitat; breeding and feeding cycles. Deposition of sediment also results in an unstable watercourse substrate which will lead to erosion of the bed of the channel.	Moderate	

<i>Ecological Impacts: Pollution of watercourses and soil</i>	Direct impacts: Mismanagement of waste and pollutants like hydrocarbons, construction waste and other hazardous chemicals will result in these substances entering and polluting sensitive natural environments either directly through surface runoff during rainfall events, or subsurface water movement.	Moderate	<ul style="list-style-type: none"> All waste generated during construction is to be disposed of as per the Environmental Management Programme and no washing of paint brushes, containers, wheelbarrows, spades, picks or any other equipment adjacent or in drainage channel is permitted. Proper management and disposal of construction waste must occur during the lifespan of the project, including during maintenance of the power lines and substations. No release of any substance i.e. cement, oil, that could be toxic to fauna or faunal habitats within the watercourses. Portable toilets must be placed 30m away from the edge of the channels. Do not locate the construction camp or any depot for any substance which causes or is likely to cause pollution within a distance of 50m from a channel. Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly drained and disposed of using proper solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil must be removed and the affected area rehabilitated immediately – consult with a wetland/aquatic specialist if spills occur.
	Indirect impacts: Pollution and reduction of water quality which will have an impact on the faunal and floral communities.	Moderate	
	Cumulative impacts: An increase in pollutants will lead to a decline in the water quality of the watercourses, particularly the larger Groenwaterspruit affecting its ability to act as an ecological corridor in the larger landscape.	Moderate	
<i>Ecological Impacts: Proliferation of Alien invasive species</i>	Direct impacts: Alien invasive species will quickly encroach into disturbed areas, particularly adjacent to drainage areas. Alien species generally out-compete indigenous species for water, light, space and nutrients as they are adaptable to changing conditions and are able to easily invade a wide range of ecological niches (Bromilow, 2010).	Moderate	<ul style="list-style-type: none"> An alien invasive management programme must be incorporated into the Environmental Management Programme; Ongoing alien plant control must be undertaken along the power line servitude route; Areas which have been disturbed will be quickly colonised by invasive alien species. An ongoing management plan must be implemented for the clearing/eradication of alien species. Monitor all sites disturbed by construction activities for colonisation by exotics or invasive plants and control these as they emerge.
	Indirect impacts: Change in species diversity.	Moderate	
	Cumulative impacts: Alien invader plant species pose an ecological threat as they alter habitat structure, lower biodiversity (both number and “quality” of species), change nutrient cycling and productivity, and modify food webs (Zedler, 2004).	Moderate	
<i>Ecological Impacts: Loss of indigenous vegetation due to clearing of the</i>	Direct impacts: During the construction phase the area for the power line will be cleared of vegetation. This will result in the loss of indigenous species, disturbance of	Moderate	<ul style="list-style-type: none"> Disturbed areas must be rehabilitated immediately after construction has been completed in that area by planting appropriate indigenous plant species; The clearing of vegetation must be kept to a minimum and within the power line

<p><i>footprint area</i></p>	<p>species of conservation concern and the fragmentation of vegetation communities. The removal of vegetation will also expose soil increasing the risk of erosion. The vegetation on the site is disturbed, particularly with regard to route A1 as a result of human activities and no sensitive habitat was identified. With the implementation of mitigation measures this impact will be minimized.</p> <p>Postmasburg Thornveld may contain the nationally protected <i>Acacia (Vachellia) erioloba</i> trees as well as the provincially protected <i>Boophone disticha</i>. These protected plant species might be encountered during construction. A permit will be required to remove them from the impacted area.</p>		<p>servitude;</p> <ul style="list-style-type: none"> • During the construction phase workers must be limited to areas under construction and access to the undeveloped areas must be strictly controlled; • Rehabilitated areas must be monitored to ensure the establishment of re-vegetated areas. • It is recommended that a qualified botanist be appointed prior to development, to do search and rescue of conservation worthy plants, should they be encountered, that can be relocated successfully, after obtaining a permit or license to do so.
<p><i>Ecological Impacts: Loss of faunal habitat and ecological structure</i></p>	<p>Direct impacts: The construction phase of the power line development will result in the loss of faunal habitats within the area. This impact relates to the complete removal or partial destruction/disturbance of existing vegetation by machinery and workers, impacting directly on the ecological condition of natural vegetation and habitat availability. These activities will have an impact on foraging and breeding ecology of faunal species. Loss of vegetation generally affects nutrient cycles, removes the organic litter layer and results in habitat fragmentation and destruction of wildlife corridors.</p> <p>The habitat is however already largely transformed and fragmented due to the adjacent mining activities and the site is not a</p>	<p>Moderate</p>	<ul style="list-style-type: none"> • All construction and maintenance activities must be carried out according to the generally accepted environmental best practice and the temporal and spatial footprint of the development must be kept to a minimum. • The boundaries of the development footprint areas are to be clearly demarcated and it must be ensured that all activities remain within the demarcated footprint area. • Edge effects of all construction and operational activities, such as erosion and alien plant species proliferation, which will affect faunal habitats adjacent to the development area, need to be strictly managed. • Any natural areas beyond the development footprint, which have been affected by the construction activities, must be rehabilitated using indigenous plant species. • Education and awareness campaigns on faunal species and their habitat are recommended to help increase awareness, respect and responsibility towards the environment for all staff and contractors.
	<p>Indirect impacts: Loss of indigenous vegetation.</p>	<p>Moderate</p>	
	<p>Cumulative impacts: Habitat fragmentation.</p>	<p>Low</p>	

	<p>unique habitat within the landscape. It is not envisaged that any Red Data species will be displaced by the habitat transformation that will take place as a result of the construction and operation of the proposed development. The impact on smaller, non-Red Data species that are potentially breeding in the area will be local in extent, in that it will not have a significant effect on regional or national populations. The proposed development will have a limited impact on the loss of faunal habitat, despite the majority of the study area having been transformed.</p>		
	Indirect impacts: Loss of species diversity.	Moderate	
	Cumulative impacts: Limited impact on ecological diversity in the vicinity.	Low (operational also low)	
<i>Ecological Impacts: Direct faunal impacts</i>	<p>Direct impacts: Activities involving the clearing/harvesting of natural vegetation will result in the loss of faunal species. Faunal diversity within the study area has been negatively impacted as a result of historic and on-going disturbances associated with mining practices. It is not envisaged that any Red data species will be present on the site and thus directly impacted as a result of the development.</p>	Moderate to High	<ul style="list-style-type: none"> • It is recommended that a speed limit of 30km/h is implemented on all roads running through the study area during all phases in order to minimise risk to fauna from vehicles. • No trapping or hunting of fauna is to take place. Access control must be implemented to ensure that no illegal trapping or poaching takes place. • Should any Red Data faunal species be noted within the development footprint areas, these species must be relocated to similar habitat within the vacant land to the west of the development area with the assistance of a suitably qualified ecologist. • Any fauna directly threatened by the construction activities must be removed to a safe location by the ECO or qualified Ecologist. • All staff and contractors must undergo an environmental induction course held by the ECO as well as faunal education and awareness programmes.
	Indirect impacts: Loss of species diversity.	Moderate to High	
	Cumulative impacts: Movement of species from one area into another.	Moderate – operational phase as well	
<i>Ecological Impacts: Disturbance-noise pollution</i>	<p>Direct impacts: Disturbance created by noise-pollution associated with workers and construction activities can affect local wildlife utilising adjacent habitats, particularly mammalian species. This is likely to be short-lived during the construction phase but will</p>	Moderate	<ul style="list-style-type: none"> • Strict control must be maintained over all activities during construction, in line with an approved Construction EMPr. • Any Red Data species identified in this report observed to be roosting and/or breeding in the vicinity, the ECO must be notified.

	<p>continue to have an impact during the operational life span of the development. The proposed development area is located within close proximity to the Kumba Mine, therefore, species within this landscape often experience disturbance. As a result disturbance of fauna by the proposed development during the construction phase is anticipated to be of moderate significance. Species are particularly sensitive to disturbance during the breeding season and this must be borne in mind during both the construction and operational phases.</p>		
	<p>Indirect impacts: Loss of species diversity.</p>	<p>Moderate</p>	
	<p>Cumulative impacts: Movement of species from one area into another.</p>	<p>Low</p>	
<p><i>Avifaunal Impacts: Habitat Destruction</i></p>	<p>Direct impacts: During the construction phase of power lines, some habitat destruction and alteration will occur due to the clearing of servitudes and vegetation at the substation site. Servitudes have to be cleared of excess vegetation at regular intervals in order to allow access to the line for maintenance, to prevent vegetation intrusion and to minimise the risk of fire under the lines. These activities have an impact on foraging, breeding and roosting ecology of avian species within the area through modification of habitat. It is not envisaged that any Red Data species will be displaced by the habitat transformation that will take place as a result of the construction of the power line. The impact on smaller, non-Red Data species that are potentially breeding in the area will be local in extent, in that it will not have a significant effect on regional or national populations. The habitat is already largely transformed and fragmented by existing infrastructure.</p>	<p>Low</p>	<ul style="list-style-type: none"> • All construction and maintenance activities must be carried out according to the generally accepted environmental best practice and the temporal and spatial footprint of the development should be kept to a minimum. In particular, care must be taken in the vicinity of the drainage lines and existing roads must be used as much as possible for access during construction. • The boundaries of the development footprint areas are to be clearly demarcated and it must be ensured that all activities remain within the demarcated footprint area. • Provide adequate briefing for site personnel. • Any bird nests that are found during the construction period must be reported to the Environmental Control Officer (ECO). • The above measures must be covered in a site specific EMP and controlled by an ECO.

	<p>Furthermore, this is not a unique habitat within the landscape. The construction of the proposed new power line should therefore have a low displacement impact from an avifaunal perspective.</p>		
	Indirect impacts: None	Low	
	Cumulative impacts:	Low	
<i>Avifaunal Impacts: Disturbance</i>	<p>Direct impacts: disturbance of birds by the proposed substation and power line is anticipated to be of low significance as birds will move away from the area temporarily. Species sensitive to disturbance and ground-nesting species resident within the development footprint will be particularly susceptible. Disturbance can also influence the community structure of avifauna within close proximity to the development as certain species will be displaced and forced to find alternative territories. Avian species with small territories are particularly susceptible. The substation and power line development is unlikely to have a significant impact on avifauna. However, species are particularly sensitive to disturbance during the breeding season and this must be borne in mind during both the construction and operational (maintenance) phases.</p>	Low	<ul style="list-style-type: none"> • Strict control must be maintained over all activities during construction, in line with an approved Construction EMPr. • During Construction, if any of the Red Data species identified in this report are observed to be roosting and/or breeding in the vicinity, the ECO must be notified. • The construction camps must be as close to the site as possible • Contractors and working staff should stay within the development footprint and movement outside these areas including avian micro-habitats must be restricted. • Driving must take place on existing roads and a speed limit of 30km/h must be implemented on all roads running through the study area during all phases
	Indirect impacts: None		
	Cumulative impacts:		
<i>Visual Impacts</i>	<p>Direct impacts: The location of the proposed Boitchoke Substation will have a major influence on the visual change that observers</p>	Moderate	<ul style="list-style-type: none"> • Locate construction camps and stockyards in areas that are already disturbed instead of stripping more vegetation to allow for these facilities. It will be most preferred to

	from Postdene and Postmasburg will experience.		<ul style="list-style-type: none"> locate the construction camps on some of the mining sites; Establish limits of disturbances during construction through demarcating of the tower and substation footprints in order to prevent unnecessary damage to vegetation; Keep to existing road infrastructure as far as possible to minimise the physical damage to vegetation in the power line servitude; Implement rehabilitation of disturbed areas as soon as possible to limit the duration of exposed surfaces and the risk of erosion; and Previously rehabilitated areas must be monitored to prevent the infestation of weeds that may become an unsightly feature.
	Indirect impacts: None	N/A	
	Cumulative impacts: Change in the landscape visual quality.	Moderate	
<i>Heritage Impacts:</i>	<p>Direct impacts: It has been determined that only a very few sites, features or objects of cultural significance dating to the historic period occur sporadically all over the region. As these features are all visible, it would be easy to avoid them. Based on the above statement, the proposed development would have little to no impact on any heritage artefacts and/or sites. None of the proposed power line route alternatives would have an impact on sites, features or objects of dating to the historic period and any one of the route alternatives can be used</p> <p>From a heritage point of view it is recommended that the proposed development be allowed to continue. Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.</p>	Low	<ul style="list-style-type: none"> Important archaeological sites are known to exist in the region, e.g. Blinkklipkop east of Postmasburg, where specularite was mined during pre-colonial times. Such site should be avoided at all costs. Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.
	Indirect impacts: None	N/A	
	Cumulative impacts: Should significant archaeological deposits be located then cumulative impacts will be experienced	Low	
Dust Impacts	Direct impacts: Construction machinery and heavy vehicles which are likely to make use of the existing farm roads to transport	Low	<ul style="list-style-type: none"> Continuous watering of the site should be carried out to prevent dust pollution during windy and dry conditions.

	equipment and material to the construction site, are likely to generate dust which is likely to be perceptible by adjacent residents. Trucks may potentially distribute dust along internal access roads		<ul style="list-style-type: none"> • A continuous dust monitoring process needs to be undertaken during construction. • Speed restriction of 20km/h must be implemented for all construction vehicles. • All vehicles transporting friable materials such as sand, rubble etc must be covered by a tarpaulin or wet down. • Construction work to be undertaken during weekdays as far as practical.
	Indirect impacts: None identified.	N/A	
	Cumulative impacts: None identified.	N/A	
Noise Impacts	Direct impacts: Vehicles transporting materials to and from the site will potentially cause an additional noise burden to adjacent residents as well as along internal access roads.	Medium	<ul style="list-style-type: none"> • The contractor must ensure that noise levels remain within acceptable limits • Construction activities must be limited to normal working hours and according to municipal bylaws, i.e. working hours must be limited to weekdays as far as possible. • If construction is required on the weekend; permission from adjacent landowners will be required prior to construction.
	Indirect impacts: None identified	N/A	
	Cumulative impacts: None identified	N/A	
Impacts on traffic and local roads	Direct impacts: Traffic will be congested as a result of construction activities. In addition, traffic increase can lead to road damage, erosion, accidents and even traffic delays Construction machinery and heavy vehicles are likely to generate dust which is likely to be perceptible by adjacent residents. Trucks may potentially distribute dust along internal access roads.	Medium	<ul style="list-style-type: none"> • Vehicular movement beyond the property boundaries may not occur during peak hour traffic times (07h30 – 08h30 and 16h00 – 17h00). • It must be ensured that a backlog of traffic does not develop at the access points during peak hours through the upgrade to the road system and the implementation of an efficient and effective access control system. • Speed restriction of 20km/h must be implemented for all construction vehicles. • Implement dust suppression measures (wetting or application of soil binding compound) in all areas that will be affected by construction • activities and where dust will be generated
	Indirect impacts: None identified	N/A	
	Cumulative impacts: None identified	N/A	
Impact on socio-economics	Direct impacts: Impact on nearby residential areas - Influx of workers in the area may raise concerns from neighbouring residents	Medium	<ul style="list-style-type: none"> • All adjacent landowners must be informed of the construction processes prior to commencement of construction activities. • Adjacent land owners must be informed timeously of any service stoppages in their areas. • Notification must include possible timeframes for stoppages. • Consequences of such stoppages must be clearly indicated to all surrounding/affected land
	Indirect impacts:	N/A	

	None identified		owners.
	Cumulative impacts: None identified	N/A	<ul style="list-style-type: none"> Affected land owners must be timeously informed of any/all maintenance of the bulk water services supply which may result in service stoppages to their properties. Again this must include possible timeframes so alternatives can be provided.
OPERATIONAL PHASE			
Activity	Impact summary	Significance (after mitigation)	Proposed mitigation
<i>Avifaunal impacts during the operational phase (Power lines)</i>	Direct impacts: Electrocutation of birds on associated overhead power lines is an important cause of mortality for a variety of bird species particularly storks, cranes and raptors in South Africa. The impact assessment found the impact of electrocution to be of moderate significance after the mitigation in the form of bird friendly structures.	Moderate	<ul style="list-style-type: none"> All relevant perching surfaces should be fitted with bird guards and perch guards as deterrents A "Bird Friendly" monopole structure, with a bird perch (as per standard Eskom guidelines) should be used for the tower structures.
	Indirect impacts: Effect on nesting birds outside the vicinity of the site.	Low	
	Cumulative impacts: Moderate as there is a high level of existing disturbance in the vicinity.	Low	
<i>Ecological Impacts</i>	Direct impacts: It is not envisaged that any Red data species will be present on the site and thus directly impacted as a result of the development. During the operational phase, a further loss of faunal diversity and ecological integrity will occur due to the increase in human activity and potential poaching. Additionally, alien invasive species will quickly encroach into disturbed areas, particularly adjacent to drainage areas.	Low-Moderate	<ul style="list-style-type: none"> No trapping or hunting of fauna is to take place. Access control must be implemented to ensure that no illegal trapping or poaching takes place. Should any Red Data faunal species be noted within the development footprint areas, these species must be relocated to similar habitat within the vacant land to the west of the development area with the assistance of a suitably qualified ecologist. Any fauna directly threatened by the construction activities must be removed to a safe location by the ECO or qualified Ecologist. All staff and contractors must undergo an environmental induction course held by the ECO as well as faunal education and awareness programmes. Ongoing alien plant control must be undertaken along the power line servitude route;
	Indirect impacts: Loss of indigenous vegetation.	Low-Moderate	
	Cumulative impacts: Habitat fragmentation	Low-Moderate	
<i>Visual Impacts:</i>	Direct impacts: Obtrusive lighting is very	Low-Moderate	<ul style="list-style-type: none"> Do not over illuminate areas. Use the correct illumination intensity for the purpose

<i>Lighting</i>	challenging to predict and requires the service of a lighting engineer in order to quantify potential obtrusive lighting impacts. The risk of obtrusive lighting may be low but the following preventative measures should form part of the design phase of the development.		intended.
	Indirect impacts: Light Pollution	Moderate	
	Cumulative impacts: Neighbour nuisance	Moderate	
DECOMMISSIONING PHASE			
Decommissioning and closure phase has not been considered as part of this application as the end use of the site and required decommissioning activities are not known at this time; it is therefore not possible to predict the potential environmental impacts. If decommissioning phase is considered in future, the developer will undertake the required actions as prescribed by the legislation at the time and comply with all relevant requirements administered by any relevant authority and competent authority at that time			

A complete impact assessment in terms of Regulation 19(3) of GN 982 must be included as 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.

Boichoko Substation and associated power lines (preferred and alternative sites):

The proposed activities assessed within this Basic Assessment Report are required to provide essential infrastructure associated with the development of the Boichoko Substation and associated power lines. In summary, the Basic Assessment has assessed potential impacts and indentified appropriate management and mitigation measures. No environmental fatal flaws and no significant negative impacts have been indentified to be associated with the proposed project (**for both the preferred and alternative sites**). The Impact Assessment section of this report indicates that the indentified environmental impacts associated can be effectively mitigated to have a low significance impact rating provided the recommended mitigation and management measures are implemented.

Based on the preceding discussion, the specialists concluded their proposed routes and alternative assessment as follows:

Substation A1 (preferred) and Site alternatives A2 and A3 as well as loop-in/loop-out tie-in diversions of A1; B1 and C1:

Ecological Impacts

All three substation site alternatives are located within close proximity (100m) of each other. Similarly, loop-in/loop-out tie-in diversions of A1; B1 and C1 are also located within the same environment as the substation sites. The sites are located on the outskirts of Postmasburg and in close proximity to residential development and infrastructure as well as Postmasburg Stone Crushers and the West End Mine. As a result the area often experiences high levels of disturbance. Additionally, due to their close proximity to one another, it was found that the impacts associated with the proposed site are the same. The topography of the site is flat and the vegetation is dominated by *Acacia melifera* (Blackthorn) which is an indicator of bush encroachment, *Tarchonanthus camphoratus* (Common Camphor Bush) and *Gnidia polycephala*. The soils were sparsely vegetated and comprised of rocky Mispah soils. There are no sensitive avifaunal micro-habitats within close proximity of the substation and the other substation site alternatives. No Red Data Listed species were recorded within this area. Due to the high levels of habitat transformation and disturbance levels by human activities any one of the substation layout alternatives is suitable and as such will not predicted to have a significant impact on faunal or floral populations within the area. No significant impact on any drainage channels will occur at any of the substation sites or tie-in routes.

Avifaunal Impacts

The study site is not considered unique and is not considered critical for the conservation of Red Data species.

Therefore, the proposed development is unlikely to have any long-term significant impacts on avifaunal species within the study area. During the site visit, predominantly common bird species were recorded (Cape Sparrow, White-browed Sparrow-weaver and various granivorous species) and no Red Data listed species were recorded. Any site alternative is suitable for the construction of the substation. This is largely due to the homogenous nature of the site, high levels of disturbance due to the residential development with Postmasburg, as well as the low avian diversity and abundance observed. The impact of displacement due to habitat transformation will be moderate, and should only affect a few non-Red Data species at a local level. Given the relative homogeneity of the habitat within the study area as well as existing levels of disturbance, the proposed development is unlikely to have a significant, long-term impact on the local avifauna.

Visual Impacts

The new project may adversely affect the existing qualities of the landscape and it will introduce elements that are uncharacteristic. For these individuals, the intrusion on their views is expected to be significant and will be experienced over the lifetime of the project. The location of the proposed Boitchoko Substation will have a major influence on the visual change that observers from Postdene and Postmasburg will experience. The visual specialist recommends that if feasible, the substation should preferably be located closer to the Jean Heaven Road. A location further south, between Jean Heaven road and the R385 is most ideal. This location is significantly further from the town and located in an area with almost no sensitive visual receptors. If the moving of the substation site is not feasible, then the visual specialist recommends screen planting along the perimeter of the substation will greatly assist in the concealment of the substation. Screen planting along the northern and southern perimeter will be most affective to limit views from Postdene and Postmasburg. A major concern has been flagged in the 2 km stretch between the proposed Boitchoko Substation and the Jenn Heaven road, of which the loop-in/loop-out tie-in lines will form part of. It is expected that two parallel lines will be in this corridor. Views from Klip Diepwater, Postdene and Postmasburg will experience a severe change in their views due to the introduction of new elements in the landscape that are uncharacteristic to the prevailing character. A mitigating factor is the dense vegetation cover surrounding Klip Diepwater as well as the distance between Postdene and Postmasburg. The latter are just outside the 1 km zone of maximum visual impact, but the cumulative impact of the substation and two power lines is considered intrusive without necessary mitigation measures in place.

Taking into consideration the proposed mitigation measure, substation alternative A and its associated tie-in line, A1 is the most preferred for the proposed development in terms of visual impacts.

Table 1.1 Boichoko Substation preferences as per the Visual Impact Assessment

Boichoko Substation Sites	
Most preferred	Substation A (preferred)
↓	Substation B
Least preferred	Substation C
Boichoko Loop-in/Loop-out tie-in lines	
Most preferred	Tie-in line A1 (preferred)
↓	Tie-in line B1
Least preferred	Tie-in line C1

Heritage Impact

It has been determined that only a very few sites, features or objects of cultural significance dating to the historic period occur sporadically all over the region. As these features are all visible, it would be easy to avoid them. Based on the above statement, the proposed development would have little to no impact on any heritage artefacts and/or sites. None of the proposed loop-in/loop-out tie-in line diversions - A1, B1 or C1 – would have an impact on sites, features or objects of dating to the historic period and any of them can be used. None of the proposed substation locations – Alternatives A or B or C – would have an impact on sites, features or objects of cultural heritage significance and any of them can be used for the development of the substation. From a heritage point of view it is recommended that the proposed development be allowed to continue. Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

In summary, substation alternative A and loop-in/loop-out tie-in line A1 are the most preferred alternatives in terms of ecological, avifaunal, visual and heritage perspective. With mitigation, the impacts will be minimal for the ecological, avifaunal and heritage impacts and moderate in terms of visual impacts.

Power line Route Alternative A1 (preferred)

Ecological Impact

Power line Route A1 runs in close proximity to existing 132kV and 400kV power lines. The sum of impacts on faunal species from the existing infrastructure and proposed power line within close proximity of one another may be significantly lower than if these structures were separate in the landscape. This route also runs adjacent to an existing road with limited vegetation cover. The final route of the power line traverses through open Postmasburg thornveld. The only sensitive faunal micro-habitat within close proximity of the proposed power line route is the ephemeral drainage line and stream. The power line will cross the 'B' Section channel twice and pass through one 'A' Section channel. The power line routes are the closest route to the degraded area around the town. Due to the current levels of disturbance and degree of transformation within close proximity of the proposed site, it is unlikely to sustain high species richness. This is the preferred power line route alternative from a watercourse, fauna and flora perspective.

Avifaunal Impacts

The power line alternative A1 runs in close proximity to existing 132kV and 400kV power lines. The sum of impacts on avian species from the existing infrastructure and proposed power line within close proximity of one another may be significantly lower than if these structures were separate in the landscape. This route also runs adjacent to an existing road. The route of the power line traverses through open Postmasburg Thornveld. There are no sensitive avian micro-habitats within close proximity of the proposed power line route and likely to have low sensitivity for avifauna. The power line routes will pose a limited threat to the potential Red Data listed populations within the area, which have a high susceptibility to collision with overhead power lines. The power line route is the closest route to the degraded area around the town. Due to the current levels of disturbance and degree of transformation within close proximity of the proposed site, it is unlikely that resident Red Listed avian species will utilise the area. Therefore, Alternative A1 is the preferred power line route from an avifaunal

perspective.

Visual Impacts:

The power line route A1 traverses different land uses of which parts are disturbed by mining or is within mining property. The remainder is farmland that consists mostly of the natural vegetation cover. The sensitive viewpoints are views from:

- Eastern perimeter of Postmasburg between Groenwaterspruit and the R385 T-junction;
- The farmsteads along Groenwaterspruit near the R309 (Witsand Road) as well as the Soetfontein Guest Farm.

As such this route alternative is not the most preferred route by a small margin, due to the crossing over the Groenwaterspruit. All of these viewpoints are within, or very close to the zone of maximum visual impact. The intensity of the project is classified as medium.

Table 1.2 Power line route preferences (Kumba-Boichoko) as per the Visual Impact Assessment

	Power line routes between Kumba- and Boichoko Substations
Most preferred	Alternative A2
↓	Alternative A1
Least preferred	Alternative A3

Heritage Impact

It has been determined that only a very few sites, features or objects of cultural significance dating to the historic period occur sporadically all over the region. As these features are all visible, it would be easy to avoid them. Based on the above statement, the proposed development would have little to no impact on any heritage artefacts and/or sites. None of the proposed power line route alternatives would have an impact on sites, features or objects of dating to the historic period and any one of the route alternatives can be used. From a heritage point of view it is recommended that the proposed development be allowed to continue. Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

Power line Route Alternative A2 (alternative)

Ecological Impacts

This power line route alternative traverses through natural Postmasburg Thornveld vegetation type and within the vicinity of elevated landforms (Kuruman Mountain Bushveld) and drainage channels. Floral biodiversity is significantly higher in this area as compared to the more disturbed Route of A1 which runs closer to Postmasburg. There are also a variety of faunal micro-habitats within close proximity of the power line and human disturbance is much lower than experienced in Route A1. Due to the limited levels of disturbance and the increased probability of faunal species (particularly reptiles within the rocky outcrops) being present within the open landscape, this route poses a higher risk to local fauna and is not preferred from an ecological perspective.

Avifaunal Impacts

There are a variety of avian micro-habitats within close proximity of the Route A2 and human disturbance is much lower than experienced at Route A1. Due to the limited levels of disturbance and the increased probability of Red Data species such as Kori Bustard and Martial Eagle being present within the open landscape, this route poses a higher risk to avifauna. Therefore this route alternative is not preferred.

Visual Impacts

The project site traverses different land uses of which parts are disturbed by mining or is within mining property. The remainder is farmland that consists mostly of the natural vegetation cover. The landscape character is described as mundane with very little interesting or valued characteristics. Most parts consist of the grassland and shrub vegetation cover that portrays an arid savannah-type landscape character. The sensitive viewpoints are views from:

- Eastern perimeter of Postmasburg between Groenwaterspruit and the R385 T-junction;
- The farmsteads along Groenwaterspruit near the R309 (Witsand Road) as well as the Soetfontein Guest Farm.

All of these viewpoints are within, or very close to the zone of maximum visual impact. The intensity of the project is classified as medium. A mitigating factor is the dense vegetation cover surrounding Klip Diepwater as well as the distance between Postdene and Postmasburg. The latter are just outside the 1 km zone of maximum visual impact. A low sensitivity prevails in the areas near the existing mines. This is the areas between Vaalbos Substation and the proposed Boitchoko Substation, as well as the area between the Beeshoek and Kolomela Mines. The landscape character in these areas is blighted with surface disturbances and the presence of large material stockpiles, thereby maintaining a low sensitivity. This power line route is considered compatible in character or will not result in significant value loss due to the already low aesthetic value, and is therefore the preferred option for the line to run (Table 1.2).

Heritage Impact

It has been determined that only a very few sites, features or objects of cultural significance dating to the historic period occur sporadically all over the region. As these features are all visible, it would be easy to avoid them. Based on the above statement, the proposed development would have little to no impact on any heritage artefacts and/or sites. None of the proposed power line route alternatives would have an impact on sites, features or objects of dating to the historic period and any one of the route alternatives can be used. From a heritage point of view it is recommended that the proposed development be allowed to continue. Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

Power line Route Alternative A3 (alternative)

Ecological Impacts

Route A3 follows the same route as A2 with a north eastern deviation in the route within proximity of the R325. Due to the limited levels of disturbance associated with the central route of the power line, this route also

poses a higher risk to the floral biodiversity of this area and the local fauna and is therefore not a preferred option.

Avifaunal Impacts

This route alternative follows the same route as A2 with a north eastern deviation in the route within proximity of the R325. This route traverses through relatively undisturbed habitats that may have resident or transient Red Data species. Due to the limited levels of disturbance associated with the central route of the power line, this route poses a higher risk to avifauna.

Visual Impacts

The project site traverses different land uses of which parts are disturbed by mining or is within mining property. The remainder is farmland that consists mostly of the natural vegetation cover. The landscape character is described as mundane with very little interesting or valued characteristics. The sensitive viewpoints are views from:

- Eastern perimeter of Postmasburg between Groenwaterspruit and the R385 T-junction;
- The farmsteads along Groenwaterspruit near the R309 (Witsand Road) as well as the Soetfontein Guest Farm.

All of these viewpoints are within, or very close to the zone of maximum visual impact. The intensity of the project is classified as medium and a mitigating factor is the dense vegetation cover surrounding Klip Diepwater as well as the distance between Postdene and Postmasburg. The latter are just outside the 1 km zone of maximum visual impact. However, from a visual perspective, this route is not preferred.

Heritage Impact

It has been determined that only a very few sites, features or objects of cultural significance dating to the historic period occur sporadically all over the region. As these features are all visible, it would be easy to avoid them. Based on the above statement, the proposed development would have little to no impact on any heritage artefacts and/or sites. None of the proposed power line route alternatives would have an impact on sites, features or objects of dating to the historic period and any one of the route alternatives can be used. From a heritage point of view it is recommended that the proposed development be allowed to continue. Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

In summary, the preferred power line route alternative is Route A1 in terms of ecological, avifaunal and heritage impacts, which after mitigation will be minimal. From a visual impact however, route alternative A2 is preferred. But considering that the impact can be seen as moderate for route alternative A1 in terms of visual impacts and the negative cumulative impact in terms of ecological and avifaunal impacts will be high, it is recommended that power line route alternative A1 be considered the preferred option from an environmental impact perspective.

Alternative B

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Alternative C

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No-go alternative (compulsory)

This is the option of not undertaking the proposed activities. This option will result in limited or no impacts occurring on the biophysical environment (i.e. the avifaunal communities). However, not constructing the Boichoko substation and associated power lines may have a negative effect on the running and operations of the mines and it will compromise the ability of a reliable source of electricity being provided to Postmasburg and Postdene. This could therefore have a significant impact on the economic profile of the region, thus placing additional pressure on existing resources and municipal capabilities due to the existing high level of unemployment in the region. The negative impacts of this option are therefore expected to outweigh the benefits. This option is therefore not preferred.

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)?

YES ✓	NO
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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).

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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.

This Final BAR has provided a comprehensive assessment of the potential environmental impacts associated with the proposed power line and substation project for Boichoko. These impacts have been identified by the EIA team (including specialists) and I&APs. The key findings are discussed in this report. In general, the proposed development will have an impact of low significance provided that there is effective application of the mitigation measures proposed in this BAR and the EMPr.

The proximity of the proposed development to the existing watercourses will trigger the need for a Section 21 (c) and (i) Water Use Authorisation under the National Water Act (Act 36 of 1998). Consultation with the Department of Water and Sanitation is recommended.

The findings of the specialists as summarised in Section 2 (Environmental Impact Statement) of this report indicate that there are no significant environmental fatal flaws associated with the proposed development and thus, with the application of effective mitigation measures, the proposed project is regarded to be feasible and sustainable.

Due to the moderate level of sensitivity, which can be reduced to a lower level of sensitivity when taking the recommended mitigation measures into consideration, the preferred power line route alternative is power line route A1. From a visual impact however, route alternative A2 is preferred. But considering that the impact can be seen as moderate for route alternative A1 in terms of visual impacts and the negative cumulative impact in terms of ecological and avifaunal impacts will be high, it is recommended that power line route alternative A1 be considered the preferred option from an environmental impact perspective.

All three substation site alternatives and associated loop-in/loop-out tie-in lines are located within close proximity (100m) of each other. Therefore, from an ecological (including wetland considerations), avifaunal, visual and heritage perspective, any one of the three site alternatives is recommended for development. Mitigation measures such as plant screening is recommended from a visual perspective to lower the visual impact of the substation site.

As such, Envirolution Consulting (Pty) Ltd recommends that the preferred Substation A and power line route A1 be considered for approval as no environmental fatal flaws have been recorded and subject to the following conditions:

- EMPr for this application be made a binding document for the contractors and managers on site;
- An independent ECO should be present during construction to monitor the implementation of the EMPr and the environmental authorization once issued;
- Compliance with the mitigation measures outlined in this BA report and EMPr;
- Clearance of the area should be as minimal as possible and construction activities be confined to the development footprint to prevent negative impact of the surrounding environment;
- As far as possible, the entire servitude should not be cleared of all vegetation, but rather only the area directly below the power line and up to 4 metres on either side of the line or as required for stringing purposes;
- All waste generated during construction is to be disposed of as per the Environmental Management Programme and no washing of paint brushes, containers, wheelbarrows, spades, picks or any other equipment adjacent to any drainage channel is permitted.
- Ongoing alien plant control must be undertaken;
- Disturbed areas must be rehabilitated immediately after construction has been completed in that area by planting appropriate indigenous plant species;
- Any natural areas beyond the development footprint, which have been affected by the construction activities, must be rehabilitated using indigenous plant species.
- Education and awareness campaigns on faunal species and their habitat are recommended to help increase awareness, respect and responsibility towards the environment for all staff and contractors.
- Should any Red Data faunal species be noted within the development footprint areas, these species must be relocated to similar habitat within the vacant land to the west of the development area with the assistance of a suitably qualified ecologist;
- Any fauna directly threatened by the construction activities must be removed to a safe location by the ECO or qualified ecologist;
- Driving must take place on existing roads and a speed limit of 30km/h must be implemented;
- A "Bird Friendly" monopole structure, with a bird perch (as per standard Eskom guidelines) should be used for the tower structures;
- Mark sections of line in high sensitivity areas with anti-collision marking devices (diurnal and nocturnal diverters) to increase the visibility of the power line and reduce likelihood of collisions. Marking devices should be spaced 10 m apart;
- Vegetation clearing within 50m of any channel must only be undertaken when construction activity is actually being undertaken at this point and such areas must be rehabilitated within 2 weeks of initial clearing occurring. Vegetation clearing must be limited to the servitude width required for the power lines;
- There shall be no mining of soil/sand required for construction purposes from the banks of drainage channels and wetland areas. Soil must be brought in, if needed, for construction purposes. This must also be stockpiled away from the watercourses' and wetland's edge.
- Locate construction camps and stockyards in areas that are already disturbed instead of stripping more vegetation to allow for these facilities. It will be most preferred to locate the construction camps on some of the mining sites;
- Establish limits of disturbances during construction through demarcating of the tower and substation

footprints in order to prevent unnecessary damage to vegetation;

- Keep to existing road infrastructure as far as possible to minimise the physical damage to vegetation in the power line servitude;
- Confine light output within property boundaries through using specifically designed lighting structures;
- Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

Is an EMPr attached?

YES ✓	NO
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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.

Tara Lockwood

NAME OF EAP



SIGNATURE OF EAP

26 January 2016

DATE

SECTION F: APPENDICES

The following appendices must be attached:

Appendix A: Maps

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports (including terms of reference)

Appendix E: Public Participation

Appendix F: Impact Assessment

Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and expertise

Appendix I: Specialist's declaration of interest

Appendix J: Additional Information