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(SOC) LTD

PROPOSED DEVIATION AND REFURBISHMENT OF THE OASIS-TAAIPIT 132KV POWERLINE, EXTENDING FROM THE EXISTING OASIS SUBSTATION TO THE TAAIPIT SUBSTATION, NORTHERN CAPE PROVINCE

J37063

DEA Ref No: 14/12/16/3/3/1/1866

Final Basic Assessment Report

February 2018

GIBB
ENGINEERING & ARCHITECTURE
People • Expertise • Excellence

PROPOSED DEVIATION AND REFURBISHMENT OF THE OASIS-TAAIPIT 132KV POWERLINE, EXTENDING FROM THE EXISTING OASIS SUBSTATION TO THE TAAIPIT SUBSTATION, NORTHERN CAPE PROVINCE

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Disclaimer

The opinions expressed in this Report have been based on the information supplied to GIBB (Pty) Ltd by Eskom and the consulting engineers appointed on this project on their behalf.

GIBB has exercised all due care in reviewing the supplied information, however, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied information. GIBB does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from these. Opinions presented in this report apply to the site conditions and features as these existed at the time of GIBB's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this Report, about which GIBB had no prior knowledge nor had the opportunity to evaluate.

Acronyms/Abbreviations

List of Abbreviations and Acronyms	
AIDS	Acquired Immunodeficiency Syndrome
BA	Basic Assessment
BAR	Basic Assessment Report
BBBEE	Broad-Based Black Economic Empowerment
CA	Competent Authority
CBA	Critical Biodiversity Area
CR	Critically Endangered
DEA	Department of Environmental Affairs
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMPr	Environmental Management Programme
FEPA	Freshwater Ecosystem Priority Area
GNR	Government Notice Regulation
GIS	Geographic Information Systems
HIV	Human Immunodeficiency Virus
HRA	Heritage Resources Authority
IAIAsa	International Association for Impact Assessors South Africa
I&APs	Interested and Affected Parties
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM: BA	National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004)
NGO	Non-Government Organisation
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
O&M	Operation and Maintenance
PA	Protected Area
PAIA	Promotion of Access to Information Act, 2000 (Act No. 2 of 2000)
PHRA	Provincial Heritage Resources Agency
PPP	Public Participation Process
PSEDS	Provincial Spatial Economic Development Strategy
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework
SIA	Social Impact Assessment
ToR	Terms of Reference

List of Abbreviations and Acronyms	
WSP	Water Services Provider
WSA	Water Service Authorities
WULA	Water Use License Application

Glossary of Terms

List of Abbreviations and Acronyms	
Applicant	Any person who applies for an authorisation to undertake an activity or to cause such activity to be undertaken as contemplated in sections 24(5), 24M and 44 of the National Environmental Management Act, 19998 (Act No. 107 of 1998).
Ecology	The study of the interrelationships between organisms and their environments.
Environment	The surroundings within which humans exist and that are made up of – (i) the land, water and atmosphere of the earth; (ii) micro-organisms, plant and animal life; (iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and (iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.
Environmental Impact Assessment	Systematic process of identifying, assessing and reporting environmental impacts associated with an activity and includes basic assessment and S&EIR.
Environmental Management Programme	A working legally binding document on environmental and socio-economic mitigation measures, which must be implemented by several responsible parties during all the phases of the proposed project.
Interested and Affected Party	Any person or groups of persons who may express interest in a project or be affected by the project, positively or negatively.
Key Stakeholder	Any person who acts as a spokesperson for his/her constituency and/or community/organization, has specialized knowledge about the project and/or area, is directly or indirectly affected by the project or who considers himself/herself a key stakeholder.Competent Authority
Social Impact	Something that is experienced or felt by humans. It can be positive or negative. Social impacts can be experienced in a physical or perceptual sense.
Social Change Process	A discreet, observable and describable process which changes the characteristics of a society, taking place regardless of the societal context (that is, independent of specific groups, religions etc.) These processes may, in certain circumstances and depending on the context, lead to the experience of social impacts.
Social Impact Assessment	The processes of analysing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by these interventions. Its primary purpose is to bring about a more sustainable and equitable biophysical and human environment.
Stakeholder	Any person or group of persons whose live(s) may be affected

	by a project or have an interest in the establishment of the proposed development.
Study Area	Refers to the entire study area encompassing all the alternatives as indicated on the study area or locality map.
State Department	Any department or administration in the national or provincial sphere of government exercising functions that involve the management of the environment.
Water Use License	A Water Use License is an application made to DWA in terms of Section 21 of the National Water Act (36 of 1998) for activities listed in the act, that are likely to impact on South Africa's water resources. These activities include, but are not limited to the abstraction and storage of water, impeding or diverting flow in a watercourse and altering the bed banks, course or characteristics of a watercourse.

PURPOSE OF DOCUMENT

The purpose of this Final Basic Assessment Report (BAR) is to provide all registered Interested and Affected Parties (I&APs) and relevant State Departments with an opportunity to review the assessment of potential impacts associated with the proposed development and comment on the assessment, specialist findings and recommendations put forward by the Environmental Assessment Practitioner (EAP) for the Competent Authority to make an informed decision. A period of 30 calendar days from **Thursday, 18 January 2018 to Friday, 16 February 2018 inclusive**, was provided to the registered I&APs and the general public for the review and commenting phase of the Draft BAR. All registered I&APs and State Departments were notified of this review period, as well as the public meeting held at the NG Church Kakamas, Cnr. 10th Avenue and Voortrekker Way, Kakamas, 8870 at 16:00 on 31 January 2018.

The purpose of the public meeting was to present the Draft BAR; the presentation included the following information:

- Basic Assessment Reporting (BAR) process to-date, including details of the public participation process;
- Findings of the specialist studies;
- Overall assessment of identified impacts; and
- EAP's opinion and recommendations.

The Final BAR can be viewed at the following venues:

Place	Address	Contact Person	Telephone
Kakamas Public Library	28 Voortrekker Street, Kakamas, 8870	The Librarian	054 431 6300
Keimoes Hospital	459 Main Road, Keimoes, 8860	Rejane Petersen	054 461 1004

The Final BAR will also be made available on the GIBB website at the following link:

- **https://projects.gibb.co.za/Eskom_Oasis_Taaipit_132KV_Powerline_FBAR**
- **A CD copy is available upon request (Contact: Mr. Richard Myburgh 012 471 8916)**

All comments received during the review and commenting phase have been addressed within the Final BAR for consideration by the competent authority, the National Department Environmental Affairs (DEA).

<table>
<tr><th colspan="2">PROJECT SUMMARY</th></tr>
<tr><td>Project Name</td><td>The proposed deviation and refurbishment of the Oasis-Taaipit 132kv powerline from the Oasis substation to the Taaipit substation, Kai !Garib Local Municipality, Northern Cape province</td></tr>
<tr><td>Brief Project Overview</td><td>GIBB (Pty) Ltd (GIBB) has been appointed by Eskom Holdings SOC Ltd, Eskom Distribution – Northern Cape Operating Unit (Eskom) to undertake an environmental authorisation process in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended (NEMA) and the Environmental Impact Assessment Regulations of 2014, as amended for the deviation of the existing 132kV powerline from the Oasis substation to the Taaipit substation, Northern Cape Province. A 200m corridor will be assessed along each of the proposed alternatives to determine the environmental impacts and significance of these impacts associated with the proposed development. Eskom has applied for environmental authorisation from the National Department of Environmental Affairs (DEA), Reference number: 14/12/16/3/3/1/1866.

<u>Study Area:</u>

At a regional level, the study area lies within the Northern Cape Province and is situated within the Kai !Garib Local Municipality. The route for the proposed powerline deviation extending from the Oasis substation to the Taaipit substation, is an approximate distance of 42.5km. The study site consists of two alternatives for the powerline route deviation. The deviation is located along the line near Lutzburg and has two alternatives. Alternative 1 is approximately 1 020m long and Alternative 2 (preferred) is approximately 700m long. The entire route, including the deviation is to be upgraded from the wooden 5-pole pylon structure to the steel monopole pylon structures.

The proposed project involves the construction of:
• Deviation of either 1020m (Alternative 1) or 700m (Alternative 2 – Preferred) on the existing 132kV overhead single circuit distribution powerline from the Oasis substation to the Taaipit substation, near Lutzburg;
• The upgrading of the entire line and the deviation from the existing wooden 5-ploe pylon structures to new steel monopole pylon structures;
• The re-alignment of the powerline at the Oasis substation.

The GPS Co-ordinates for the proposed deviation alternatives and route realignment are as follows:
<u>Alternative 1 GPS Co-ordinates:</u>
<table>
<tr><th><u>Point</u></th><th><u>Latitude</u></th><th><u>Longitude</u></th></tr>
<tr><td><u>Start</u></td><td>28°44' 13.98" S</td><td>20°40' 19.23" E</td></tr>
<tr><td><u>Middle</u></td><td>28°44' 09.50" S</td><td>20°39' 54.03" E</td></tr>
<tr><td><u>End</u></td><td>28°44' 15.78" S</td><td>20°39' 44.62" E</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><td></td><td>
<u>Alternative 2 (preferred) GPS Co-ordinates:</u>
<table>
<tr><th>Point</th><th>Latitude</th><th>Longitude</th></tr>
<tr><td>Start</td><td>28°44' 13.98" S</td><td>20°40' 19.23" E</td></tr>
<tr><td>Middle</td><td>28°44' 12.86" S</td><td>20°40' 6.78" E</td></tr>
<tr><td>End</td><td>28°44' 18.54" S</td><td>20°39' 58.19" E</td></tr>
</table>
<u>Route realignment GPS Co-ordinates:</u>
<table>
<tr><th>Point</th><th>Latitude</th><th>Longitude</th></tr>
<tr><td>Start</td><td>28°41' 24.28" S</td><td>20°58' 37.55" E</td></tr>
<tr><td>Middle</td><td>28°41' 31.68" S</td><td>20°58' 42.50" E</td></tr>
<tr><td>End</td><td>28°41' 35.52" S</td><td>20°58' 45.92" E</td></tr>
</table>
</td></tr>
<tr><td>Development footprint</td><td>
• Deviation of either 1020m (Alternative 1) or 700m (Alternative 2 – Preferred) on the existing 132kV overhead single circuit distribution powerline from the Oasis substation to the Taaipit substation, near Lutzburg;
• The upgrading of the entire line and the deviation from the existing wooden 5-ploe pylon structures to new steel monopole pylon structures
• The re-alignment of the powerline at the Oasis substation.
</td></tr>
<tr><td>Site Photographs</td><td>Attached in Appendix B.</td></tr>
<tr><td colspan="2">ADDITIONAL AUTHORISATIONS REQUIRED</td></tr>
<tr><td>Water Use Licence Application</td><td>
Due to the nature of the powerline, stretching across various wetland features, water uses in terms of the National Water Act, 1998 (Act No. 36 of 1998) are triggered as follows:

• Section 21 (c) impeding or diverting the flow of water in a watercourse;
• Section 21 (i) altering the bed, banks, course or characteristics of a watercourse.
</td></tr>
<tr><td colspan="2">CONFIRMATION OF CAPACITY REQUIREMENTS</td></tr>
<tr><td>Infrastructure Services</td><td>
No additional services will be required to cater for the new electricity infrastructure. During the construction phase, workers will be accommodated and housed within the town of Keimoes or Kakamas or adjacent towns.

Water will be sourced commercially and locally from the municipality; however large volumes will not be required. During the construction
</td></tr>
</table>

	phase, water will only be used for concrete batching activities and potable water will be required for drinking and cleaning activities. The relevant local municipality has been provided an opportunity to comment on the Draft BAR. Proof of this communication (request for comments from the Municipality) have been included in Appendix D4 of this Final BAR submitted to the competent authority (DEA) for decision making.

Legal requirements for BAR content as detailed in NEMA GNR 326

Legal requirements as per the NEMA GNR 928	Relevant Report Section
Details of the EAP who prepared the report.	Section 1.5.2 of Chapter 1 and Appendix H (CVs)
Details of the expertise of the EAP, including curriculum vitae	Section 1.5.2 of Chapter 1 and Appendix H (CVs)
A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or	Figure 1-1
A description of the scope of the proposed activity, including- (i) All listed and specified activities triggered and being applied for; and	Section 2.1.2 of Chapter 2
(ii) A description of the associated structures and infrastructure related to the development;	Section 1.2.1 and Section 1.2.8 of Chapter 1
A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;	Chapter 2
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 development footprint within the approved site;	Section 1.3 of Chapter 1
A full description of the process followed to reach the proposed development footprint within the approved site, including:	
(iii) Details of the development footprint alternatives considered;	Chapter 3
(iv) Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 4.2 of Chapter 4
(v) 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;	Section 4.2.4 of Chapter 4
(vi) The environmental attributes associated with	Chapter 5

Legal requirements as per the NEMA GNR 928	Relevant Report Section
the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	
(vii) The impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts— (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	Chapter 6
(viii) The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;	Chapter 6
(ix) 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;	Chapter 6
(x) The possible mitigation measures that could be applied and level of residual risk;	Section 7.2 of Chapter 7
(xi) if no alternative development footprints for the activity were investigated, the motivation for not considering such; and	Chapter 3
(xii) a concluding statement indicating the location of the preferred alternative development footprint within the approved site as contemplated in the accepted scoping report;	Chapter 7
A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred development footprint on the approved site through the life of the activity, including—	
(xiii) A description of all environmental issues and risks that were identified during the environmental impact assessment process; and	Chapter 6
(xiv) 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	Chapter 6

Legal requirements as per the NEMA GNR 928	Relevant Report Section
addressed by the adoption of mitigation measures;	
An assessment of each identified potentially significant impact and risk, including—	
(xv) cumulative impacts; (xvi) the nature, significance and consequences of the impact and risk; (xvii) the extent and duration of the impact and risk; (xviii) the probability of the impact and risk occurring; (xix) the degree to which the impact and risk can be reversed; (xx) the degree to which the impact and risk may cause irreplaceable loss of resources; and (xxi) the degree to which the impact and risk can be mitigated;	Chapter 6
Where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;	Chapter 5 and Section 7.2 of Chapter 7
An environmental impact statement which contains—	
(xxii) a summary of the key findings of the environmental impact assessment: (xxiii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint on the approved site indicating any areas that should be avoided, including buffers; and (xxiv) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Chapter 6
Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of	Chapter 5 and Section 7.2 of Chapter 7

Legal requirements as per the NEMA GNR 928	Relevant Report Section
authorisation;	
The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;	Section 3.2 of Chapter 3 and Section 7.2 of Chapter 7
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 authorisation;	Sections 7.1 and 7.2 of Chapter 7
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 7.1 of Chapter 7
Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalized	Section 1.2.1 of Chapter 1

Executive Summary

Introduction

GIBB (Pty) Ltd (GIBB) has been appointed by Eskom Holdings SOC Ltd, Eskom Distribution – Northern Cape Operating Unit (Eskom) (via Trans-Africa Projects), to undertake an environmental authorisation process in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended (NEMA) and the Environmental Impact Assessment Regulations of 2014, as amended for the deviation and refurbishment of the existing 132kV powerline from the Oasis substation to the Taaipit substation, Northern Cape Province (refer to Figure 1). A 200m corridor has been assessed along each of the proposed routes to determine the environmental impacts and significance of these impacts associated with the proposed development. Eskom has applied for environmental authorisation from the National Department of Environmental Affairs (DEA), Reference number: **14/12/16/3/3/1/1866.**

Study Area:

At a regional level, the study area lies within the Northern Cape Province and is situated within the Kai !Garib Local Municipality. The route for the proposed powerline deviation extending from the Oasis substation to the Taaipit substation, is an approximate distance of 42.5km. The deviation is located along the line near Lutzburg and has two alternatives. Alternative 1 is approximately 1 020m long and Alternative 2 (preferred) is approximately 700m long. The entire route, including the deviation is to be upgraded from the wooden 5-pole pylon structure to the steel monopole pylon structures.

The proposed project involves the construction of:

- Deviation of either 1020m (Alternative 1) or 700m (Alternative 2 – Preferred) on the existing 132kV overhead single circuit distribution powerline from the Oasis substation to the Taaipit substation, near Lutzburg;
- The upgrading of the entire line and deviation from the existing wooden 5-ploe pylon structures to new steel monopole pylon structures; and
- The re-alignment of the powerline at the Oasis substation.

The Basic Assessment Reporting (BAR) process is based on triggered listed activities within the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended, (NEMA), and the Environmental Impact Assessment (EIA) Regulations of 2014 as amended.

The Water Use License (WUL) process complies with the requirements of the National Water Act, 1998 (Act No. 36 of 1998) which requires permitting of the impeding and diverting of water flow as a result of the deviation and refurbishment of the powerline.

This BAR process considers the potential positive and negative environmental and social impacts associated with the refurbishment and deviation of the existing Oasis-Taaipit 132kv Powerline and proposes measures to mitigate the negative impacts of the proposed project on the receiving environment and community.

This Final BAR has been prepared in accordance with the NEMA EIA Regulations (GNR 326 of 2014), as amended.

Alternatives

There are 2 route alternatives for the deviation between the Oasis and Taaipit substations.

Alternative 1:

Alternative 1 is approximately 1 020m in length and is made up of the proposed deviation to the existing 132Kv Oasis-Taaipit Powerline. The deviation will turn off from the existing route and travel for approximately 700m in a West North West direction before turning South West and traveling the remaining 320 meters to join in with the existing powerline.

Alternative 2 (Preferred alternative):

Alternative 2 (preferred) is approximately 700m in length and is made up of the proposed deviation to the existing 132Kv Oasis-Taaipit Powerline. The deviation is located along the powerline near Lutzburg and is approximately 700 meters in length. The deviation will turn off from the existing route and travel for approximately 377m in a West North West direction before turning South West and traveling the remaining 323 meters to join in with the existing powerline.

No – Go Alternative

This option assumes that a conservative approach would ensure that the environment is not impacted upon any more than is currently the case. It is important to state that this assessment is informed by the current condition of the area. Should the decision-making authority decline the application, the 'No-Go' option will be followed and the status quo of the sites will remain.

Environmental Impact Summary

It has been illustrated that with the implementation of the mitigation measures and Environmental Management Programme, all the identified impacts can be mitigated to acceptable levels. As such, environmental impacts associated with all deviation alternatives can be successfully mitigated to acceptable levels if the recommended mitigation measures in the EMPr are adhered to. Through the identified consequences, we can see that the majority of them are Moderate to Moderate-Low with some falling under the High rating.

With a Moderate rating, the DEA must consider that the Project can be authorised but with conditions and routine inspections. With the High ratings, the Project can be authorised but with strict conditions and high levels of compliance and enforcement.

In summary and based on this detailed assessment and the various specialist studies, it is the EAP's opinion that the proposed project with ***Alternative 2 (preferred)*** be authorised with strict conditions

and routine inspections stipulated within the authorisation. This will ensure that all impacts are monitored efficiently.

Conclusion

In accordance with EIA Regulations, 2014 (as amended), the Environmental Impact Phase for the proposed Project has identified and assessed the potential impacts caused by the proposed development. The ability to mitigate identified impacts are also addressed and summarised into a working / dynamic Environmental Management Programme (EMPr) (**Appendix I**).

The Final BAR will be made available to the public at the same venues as the DBAR. All correspondence received during the Draft BAR public review period have been updated into the Comments and Response Report, which contains adequate responses to all comments received on the project to date. Comments and/or concerns identified by I&APs during the public review period of the Draft BAR have been incorporated into the Final BAR submitted to DEA for consideration and decision-making.

The Final BAR has assessed and mitigated all potential impacts associated with the proposed development to acceptable levels. The EAP therefore recommends that the DEA grant environmental authorisation for the proposed development with conditions as suggested in Chapter 7.

Assumptions and limitations

The following assumptions and limitations apply to this report:

- Please note that this report was informed by the information provided by the applicant, project engineers, specialist studies and site investigations undertaken at the time of compilation of this report.
- The specialist studies conducted meet the minimum requirements and as such no additional studies were undertaken.
- All spatial data available to the EAP was utilised in the assessment of the proposed project. It was not deemed necessary for additional spatial data to be obtained.

CHAPTER 1: INTRODUCTION

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1 Introduction

GIBB (Pty) Ltd (GIBB) has been appointed by Eskom Holdings SOC Ltd, Eskom Distribution – Northern Cape Operating Unit (Eskom) (via Trans-Africa Projects), to undertake an environmental authorisation process in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended (NEMA) and the Environmental Impact Assessment Regulations of 2014, as amended for the deviation and refurbishment of the existing 132kV powerline from the Oasis substation to the Taaipit substation, Northern Cape Province (refer to Figure 1). A 200m corridor was assessed along the existing 132 kV 42 km powerline route and each of the proposed deviation routes to determine the environmental impacts and significance of these impacts associated with the proposed development. Eskom has applied for environmental authorisation from the National Department of Environmental Affairs (DEA), Reference number: **14/12/16/3/3/1/1866.**

Study Area:

At a regional level, the study area lies within the Northern Cape Province and is situated within the Kai !Garib Local Municipality. The route for the proposed powerline deviation extending from the Oasis substation to the Taaipit substation, is an approximate distance of 42.5km. The deviation is located along the line near Lutzburg and has two alternatives. Alternative 1 is approximately 1 020m long and Alternative 2 (preferred) is approximately 700m long. The entire route, including the deviation is to be upgraded from the wooden 5-pole pylon structure to the steel monopole pylon structures.

The proposed project involves the construction of:

- Deviation of either 1020m (Alternative 1) or 700m (Alternative 2 – Preferred) on the existing 132kV overhead single circuit distribution powerline from the Oasis substation to the Taaipit substation, near Lutzburg;
- The upgrading of the entire line and deviation from the existing wooden 5-ploe pylon structures to new steel monopole pylon structures; and
- The re-alignment of the powerline at the Oasis substation.

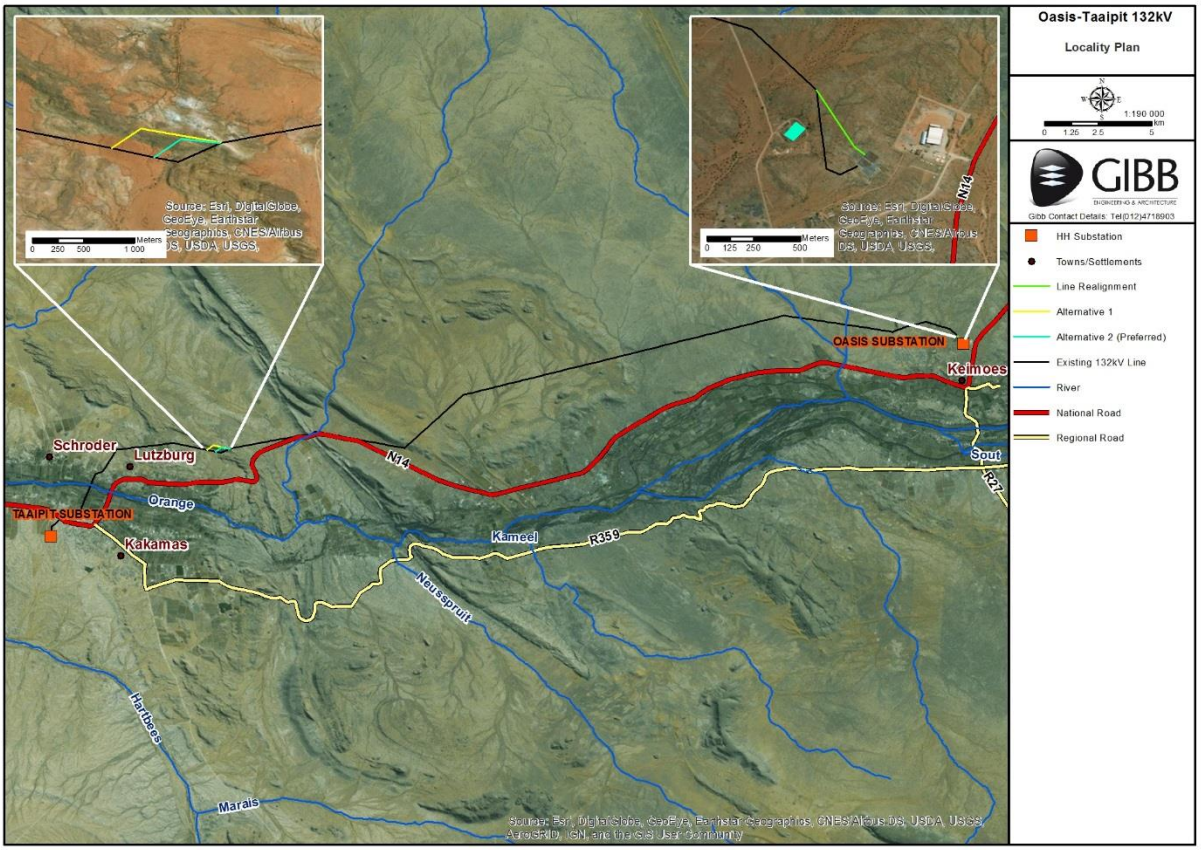

Figure 1-1: Oasis-Taaipit 132kV powerline locality map

The Basic Assessment (BA) process is based on triggered listed activities within the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended, (NEMA), and the Environmental Impact Assessment (EIA) Regulations of 2014 as amended.

The Water Use License (WUL) process complies with the requirements of the National Water Act, 1998 (Act No. 36 of 1998) which requires permitting of the impeding and diverting of water flow as a result of the construction of the deviation and refurbishment to the powerline.

The BA and WULA will be submitted to the DEA and DWS, respectively.

This BA process considers the potential positive and negative environmental and social impacts associated with the refurbishment and deviation to the existing Oasis-Taaipit 132kv Powerline and proposes measures to mitigate the negative impacts of the proposed project on the receiving environment and community.

This Final Basic Assessment Report (BAR) has been prepared in accordance with the NEMA EIA Regulations of 2014, as amended. The Draft BAR has been compiled in a diligent and independent manner. **Table 1-1** below indicates the relevant GNR requirements and corresponding sections within this report.

Table 1-1: Legal requirements for BAR content as detailed in NEMA GNR 326

Legal requirements as per the NEMA GNR 326	Relevant Report Section
Details of the EAP who prepared the report.	Section 1.5.2 of Chapter 1 and Appendix A (CVs)
Details of the expertise of the EAP, including curriculum vitae	Section 1.5.2 of Chapter 1 and Appendix A (CVs)
A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is (i) A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or	Figure 1-1 and Chapter 1
A description of the scope of the proposed activity, including- (i) All listed and specified activities triggered and being applied for; and	Section 2.1.2 of Chapter 2
(ii) A description of the associated structures and infrastructure related to the development;	Section 1.2.1 and Section 1.2.8 of Chapter 1
A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;	Chapter 2
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 development footprint within the approved site;	Section 1.3 of Chapter 1
A full description of the process followed to reach the proposed development footprint within the approved site, including:	
(i) Details of the development footprint alternatives considered;	Chapter 3
(ii) Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 4.2 of Chapter 4
(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;	Section 4.2.4 of Chapter 4
(iv) The environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage	Chapter 5

Legal requirements as per the NEMA GNR 326	Relevant Report Section
and cultural aspects;	
(v) The impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts— (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	Chapter 6
(vi) The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;	Chapter 6
(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;	Chapter 6
(viii) The possible mitigation measures that could be applied and level of residual risk;	Section 7.2 of Chapter 7
(ix) If no alternative development footprints for the activity were investigated, the motivation for not considering such; and	Chapter 3
(x) A concluding statement indicating the location of the preferred alternative development footprint within the approved site	Chapter 7
A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred development footprint on the approved site through the life of the activity, including—	
(i) A description of all environmental issues and risks that were identified during the environmental impact assessment process; and	Chapter 6
(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;	Chapter 6
An assessment of each identified potentially significant impact and risk, including—	
(i) Cumulative impacts; (ii) The nature, significance and consequences of the impact	Chapter 6

Legal requirements as per the NEMA GNR 326	Relevant Report Section
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 mitigated;	
Where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;	Chapter 5 and Section 7.2 of Chapter 7
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 development footprint on the approved site indicating any areas that should be avoided, including buffers; and (iii) A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Chapter 6
Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;	Chapter 5 and Section 7.2 of Chapter 7
The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;	Section 3.2 of Chapter 3 and Section 7.2 of Chapter 7
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 authorisation;	Sections 7.1 and 7.2 of Chapter 7
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	Section 7.1 of Chapter 7

Legal requirements as per the NEMA GNR 326	Relevant Report Section
that authorisation;	
Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalized	Chapter 7

1.2 Project Description

GIBB (Pty) Ltd (GIBB) has been appointed by Eskom Holdings SOC Ltd, Eskom Distribution – Northern Cape Operating Unit (Eskom) to undertake an environmental authorisation process in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended (NEMA) and the Environmental Impact Assessment Regulations of 2014, as amended for the deviation of the existing 132kV powerline from the Oasis substation to the Taaipit substation, Northern Cape Province (refer to Figure 1). The existing 5 – wooden pole structures will be replaced with steel monopoles and there will be a realignment of the powerline at the Oasis substation for better configuration and future expansion. A 200m corridor was assessed along the existing 132 kV 42 km powerline route and each of the proposed deviation routes to determine the environmental impacts and significance of these impacts associated with the proposed development. Eskom has applied for environmental authorisation from the National Department of Environmental Affairs (DEA), Reference number: **14/12/16/3/3/1/1866.**

1.2.1 Proposed construction and associated infrastructure

132 kV Pylons:

The pylon proposed for this project is the single circuit steel mono-pole structure (Figure 2). These self-supporting mono-pole structures will comprise the following characteristics:

- The footprint for the self-supporting mono-pole structures is approximately 1m^2 in size;
- The mono-pole structures will be buried to a depth of between 1.2m and 2.0m;
- The height of the mono-pole structures will range between 18m and 24m;
- The span lengths between the mono-pole structures will vary on average between 225m and 250m depending on terrain. Span lengths can be longer than 250m if the topography allows for this. These variations are due to a number of factors including the structure, the terrain, ground clearance requirements, topology and geology; and
- The operation and construction servitudes will be 31.0m (i.e. 15.5m on either side of the centre line).

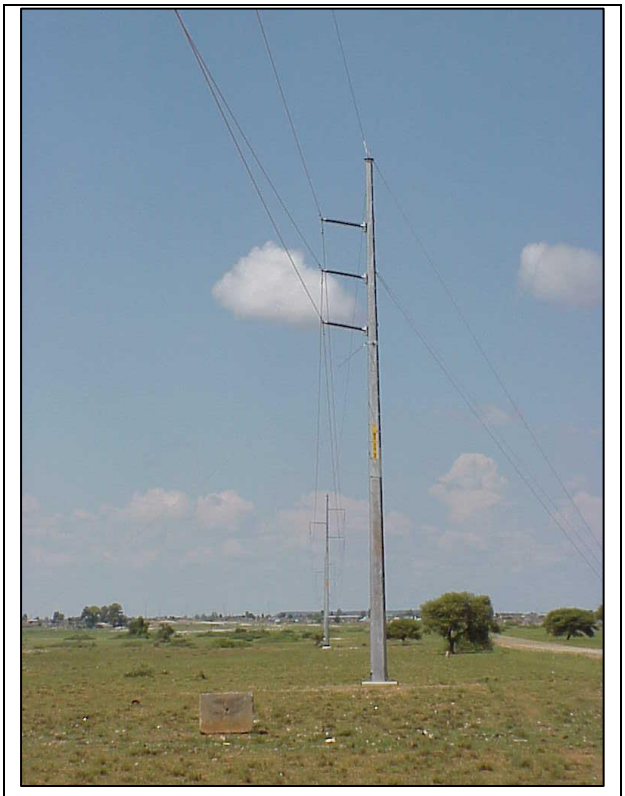

Figure 1-2: Single circuit steel mono-pole structures to be used for the Pylon structures

In addition to this, various tower types can be used depending on the terrain and powerline profile. These tower types constitute the following:

- Mono-pole guyed intermediate suspension structures;
- Mono-pole self-supporting intermediate suspension structures;
- Mono-pole angle suspension structures;
- Mono-pole strain structures;
- H-Pole structures; and
- 3 Pole strain structures.

The pylons will be composed of steel and the average span between two towers can vary between 200m and 375m depending on the ground profile and the terrain it covers. The size of the foundation footprint is related to the type of structure to be used. The steel mono-pole structure has a concrete cap at the foot of each steel mono-pole structure (Figure 3) with a diameter of 750mm and 500m deep.

Figure 1-3: Single circuit steel mono-pole structures to be used for the Pylon structures

It is proposed that the Steel Mono-pole structures will be used along with the Intermediate structures located in between them, depending on the terrain. Please note that this will be finalised prior to construction.

Servitude Requirements and Clearances:

The servitude width for a 132 kV distribution line is 31 m (15.5 m on either side of the centre line of the powerline). The minimum vertical clearance to buildings, poles and structures not forming part of the powerline must be 3.8 m, while the minimum vertical clearance between the conductors and the ground is 6.7 m. The minimum distance of a 132 kV distribution line running parallel to proclaimed public roads is 95 m from the centreline of the distribution line servitude to the centreline of the road servitude. The minimum distance between any part of a tree or shrub and any bare phase conductor of a 132 kV distribution line must be 3.8 m to allow for the possible lateral movement of this vegetation that could be a potential hazard for distribution lines that are operational and energised. The Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) provides for statutory clearances. Table 2 summarizes some of the key clearances relevant to the proposed 132 kV powerline.

Table 1-2: Clearance specifications (Eskom, 2007)

Clearances	Minimum Clearance Distance (m)
Ground clearance	6.7
Building structures not part of powerline	3.8
Above roads in townships, proclaimed roads	7.5
Telkom telephone lines	2.0
Spoornet Tracks	10.9

Should the preferred distribution line alternative receive positive environmental authorisation from the DEA, and following on from successful negotiations with landowners, the final delineation of the centreline for the distribution line and co-ordinates of each bend

in the line will be determined. Optimal tower sizes and positions will be identified and verified through comprehensive ground survey of the preferred route and these positions will be reflected in, and appropriate management actions incorporated into the periodically updated Environmental Management Programme (EMPr).

Trees and large shrubs causing clearance issues will be trimmed or cleared. If any tree or shrub in other areas interferes with the operation and/or reliability of the distribution line it will be trimmed or completely cleared. In areas where distribution lines cross existing orchards or agricultural lands in use, the footprint of the structures will be minimised and full scale clearing of the servitude avoided to allow continued use of the arable land, unless otherwise negotiated with the affected farmer/s. Clearing of vegetation will take place along approved profiles and in accordance with the approved EMPr and the Eskom Vegetation Management Standard 240-52456757.

Access:

Access is required during both the construction and operation/maintenance phases of the powerline's life cycle. Access to the 132kV powerline will be confined to the powerline servitude itself and existing access roads and tracks will be used to gain access to construction sites and the servitude. Therefore, transportation activities for construction (construction material and teams) and maintenance activities will make use of both existing access roads and the power line servitude.

It should be noted that there are existing access roads in and around the vicinity of the powerline for majority of the route. Where it is not possible to use existing tracks, transportation will occur along the approved powerline servitude.

Foundations:

The type of terrain encountered, as well as the underlying geotechnical conditions determines the choice of foundation. The actual size and type of foundation to be installed will depend on the soil bearing capacity (actual sub-soil conditions). Strain structures require more extensive foundations for support than in-line suspension structures, which contribute to the cost of the construction of the line. Foundations will be mechanically excavated then the pouring of concrete for the setting of the foundations. In areas where access to the structure position prohibits the use of concrete mixing trucks, uphill pumping or gravity feeding of concrete up to distances of 200 m will be implemented. Prior to erecting the structures and infilling of the foundations, the excavated foundations will be covered/fenced-off in order to safeguard unsuspecting animals and people from injury. All foundations are back-filled, stabilised through compaction, and capped with concrete at ground level.

Insulators:

Composite insulators have a glass-fibre core with silicon sheds for insulation and are used to connect the conductors to the towers. Glass and porcelain have been used to connect the conductors for many years, and is the most common. These products are, however, heavy and susceptible to breakage by vandals, as well as contamination by pollution. Composite insulators are lightweight and resistant to both vandalism and pollution. Composite (Long rod type) insulators with silicone based weathershed material will be used.

Construction Process for distribution lines:

The powerlines will be constructed in the following simplified sequence:

Step 1: Determination of technically feasible distribution line alternatives;
Step 2: EIA input into obtaining relevant environmental permits;
Step 3: Negotiation of final route with affected landowners;
Step 4: Survey of the route;
Step 5: Selection of best-suited structures and foundations;
Step 6: Final design of distribution line and placement of towers;
Step 7: Issuing of tenders and award of contract to construction companies;
Step 8: Vegetation clearance and construction of access roads (where 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 area and protection of erosion sensitive areas;
Step 14: Testing and commissioning; and
Step 15: Continued maintenance.

Stringing of Conductors:

Automatic stringing gear is used to string the conductors between towers. The line is strung in sections (from bend to bend). Cable drums are placed at 5 km intervals (depending on the length of the conductor) during this stringing process. In order to minimise any potential negative impacts on the surrounding area, these cable drums should be placed within the servitude.

Construction Period:

An estimated construction period of 12-18 months is envisaged. The construction period will however depend on the season and environmental conditions in which construction is undertaken and may be fast tracked.

On-going Maintenance:

During the life span of the powerlines, which is approximately 25 years, on-going maintenance will be performed from time to time. Due to the climate and weathering conditions experienced in the Northern Cape Province (less stringent), it is estimated that the lifespan the mono-pole structure will have an increased lifespan of approximately 50 years. Eskom maintenance staff and contractors employed by Eskom will undertake the maintenance works as required.

1.2.2 Site Location and Site Description

Study Area:

At a regional level, the study area lies within the Northern Cape Province and is situated within the Kai !Garib Local Municipality. The route for the proposed powerline deviation extending from the Oasis substation to the Taaipit substation, is an approximate distance of 42.5km. The study site consists of two alternatives for the powerline route deviation. The deviation is located along the line near Lutzburg and has two alternatives. Alternative 1 is

approximately 1 020m long and Alternative 2 (preferred) is approximately 700m long. The entire route, including both deviations is to be upgraded from the wooden 5-pole pylon structure to the steel monopole pylon structures.

The proposed project involves the construction of:

- Deviation of either 1020m (Alternative 1) or 700m (Alternative 2 – Preferred) on the existing 132kV overhead single circuit distribution powerline from the Oasis substation to the Taaipit substation, near Lutzburg;
- The upgrading of the entire line and deviation from the existing wooden 5-ploe pylon structures to new steel monopole pylon structures; and
- The re-alignment of the powerline at the Oasis substation.

Deviation Alternative 1 GPS Co-ordinates:

Point	Latitude	Longitude
Start	28°44' 13.98" S	20°40' 19.23" E
Middle	28°44' 09.50" S	20°39' 54.03" E
End	28°44' 15.78" S	20°39' 44.62" E

Deviation Alternative 2 (Preferred) GPS Co-ordinates:

Point	Latitude	Longitude
Start	28°44' 13.98" S	20°40' 19.23" E
Middle	28°44' 12.86" S	20°40' 06.78" E
End	28°44' 18.54" S	20°39' 58.19" E

Oasis substation Route realignment GPS Co-ordinates:

Point	Latitude	Longitude
Start	28°41' 24.28" S	20°58' 37.55" E
Middle	28°41' 31.68" S	20°58' 42.50" E
End	28°41' 35.52" S	20°58' 45.92" E

1.2.3 Property Details

Table 1-3: SG Code and Property Description

Property description/ physical address:	**Province**	Northern Cape
	District Municipality	ZF Mgcawu District Municipality
	Local Municipality	Kai !Garib Local Municipality
	Ward Number(s)	Wards 2, 3, 5 & 7
	Farm name and number	Refer to the table below
	Portion number	Refer to the table below
	SG Code	Refer to the table below

Farm / Erf	Parcel	Portion	SG Code
LOFDEEL 648	648	0	C02800000000064800000
VAAL HOEK 469	469	13	C02800000000046900013
LOXTON VALE 464	464	10	C02800000000046400010
FRIER`S DALE 466	466	32	C02800000000046600032
PLAAS 602	602	0	C02800000000060200000
WARM ZAND 468	468	20	C02800000000046800020
WARM ZAND 468	468	33	C02800000000046800033
FARM 616	616	0	C02800000000061600000
TKABIES 461	461	49	C02800000000046100049
EENDUIN 465	465	40	C02800000000046500040
EENDUIN 465	465	42	C02800000000046500042
EENDUIN 465	465	43	C02800000000046500043
EENDUIN 465	465	39	C02800000000046500039
FRIER`S DALE 466	466	1	C02800000000046600001
KRUGELS CLAIM 459	459	0	C02600000000045900000
PLAAS 584	584	1	C02800000000058400001
BAVIAANS KRANTZ 474	474	10	C02800000000047400010
ZWART BOOIS BERG SUID 652	652	0	C02800000000065200000
ZWART BOOIS BERG ANNEX 475	475	2	C02800000000047500002
ZWART BOOIS BERG ANNEX 475	475	7	C02800000000047500007
KAKAMAS NORTH SETTLEMENT	193	0	C02800050000019300000
KAKAMAS NORTH SETTLEMENT	297	0	C02800050000029700000
KEIMOES	1416	0	C02800060000141600000
KAKAMAS SOUTH SETTLEMENT	346	0	C03600070000034600000
KAKAMAS SOUTH SETTLEMENT	347	0	C03600070000034700000
KAKAMAS SOUTH SETTLEMENT	351	0	C03600070000035100000
KAKAMAS SOUTH SETTLEMENT	352	0	C03600070000035200000
KAKAMAS SOUTH SETTLEMENT	2157	0	C03600070000215700000
KEIMOES	666	0	C02800060000066600000
KAKAMAS NORTH SETTLEMENT	318	0	C02800050000031800000
KAKAMAS SOUTH SETTLEMENT	1654	0	C03600070000165400000
KAKAMAS SOUTH SETTLEMENT	2105	0	C03600070000210500000
KAKAMAS NORTH SETTLEMENT	319	0	C02800050000031900000
KAKAMAS NORTH SETTLEMENT	210	0	C02800050000021000000
KAKAMAS SOUTH SETTLEMENT	2337	0	C03600070000233700000
KAKAMAS SOUTH SETTLEMENT	349	0	C03600070000034900000
KAKAMAS SOUTH SETTLEMENT	350	0	C03600070000035000000
KAKAMAS SOUTH SETTLEMENT	358	0	C03600070000035800000
KAKAMAS NORTH SETTLEMENT	3	0	C02800050000000300000
KAKAMAS NORTH SETTLEMENT	366	0	C02800050000036600000

1.2.4 Access Roads

Access is required during both the construction and operation/maintenance phases of the powerline's life cycle. Access to the 132kV powerline will be confined to the powerline servitude itself and existing access roads and tracks will be used to gain access to construction sites and the servitude. Therefore, transportation activities for construction (construction material and teams) and maintenance activities will make use of both existing access roads and the power line servitude.

It should be noted that there are existing access roads in and around the vicinity of the powerline for majority of the route. Where it is not possible to use existing tracks, transportation will occur along the approved powerline servitude.

1.2.5 Surrounding Landuse

The proposed development is situated within the Kai !Garib Local Municipality which forms part of the ZF Mgcawu District Municipality. The IDPs for the abovementioned municipalities have identified electricity as a service delivery need and prioritises the need to provide universal access to this service. The Current land use for the affected area mostly consists of Agriculture or Open Land. Apart from farming, various projects and programmes have been identified within the credible IDPs of the abovementioned local and district municipalities, to initiate skills development, economic development, and increase social economic growth, create much needed job opportunities and promote tourism development throughout the district.

The Kai !Garib Local Municipality specifically identifies insufficient provision and maintenance of electricity as a priority concern that needs to be resolved in order to meet their objective of providing electricity to all residents in this municipal area by 2020. In the ZF Mgcawu District Municipality, insufficient electricity infrastructural development is regarded as a priority concern (Siyanda District Municipality IDP, 2011/2012). In this way, the proposed development is aligned with the priority projects and programmes identified within the IDPs for the local and district municipalities.

Based on the information outlined above, it is clear that the proposed project is aligned to the desired outcomes and objectives of the projects and programmes identified within the IDP specific to the area affected by the proposed development.

The findings of the Ecological Assessment (Fauna and Flora) have also been included in ***Appendix F.***

1.2.6 Services

No additional services will be required to cater for the new electricity infrastructure. During the construction phase, workers will be accommodated and housed within the town of Keimoes or Kakamas or adjacent towns.

Water will be sourced commercially and locally from the municipality; however large volumes will not be required. During the construction phase, water will only be used for concrete batching activities and potable water will be required for drinking and cleaning activities. The relevant local municipality has been provided an opportunity to comment on the Draft BAR. Proof of this communication (request for comments from the Municipality) has been included in Appendix D of the Final BAR to be submitted to the competent authority (DEA) for decision making.

1.2.7 Construction Schedule

An estimated construction period of 12-18 months is envisaged. The construction period will however depend on the season and environmental conditions in which construction is undertaken and may be fast tracked.

The powerlines will be constructed in the following simplified sequence:

Step 1: Determination of technically feasible distribution line alternatives;
Step 2: EIA input into obtaining relevant environmental permits;
Step 3: Negotiation of final route with affected landowners;
Step 4: Survey of the route;
Step 5: Selection of best-suited structures and foundations;
Step 6: Final design of distribution line and placement of towers;
Step 7: Issuing of tenders and award of contract to construction companies;
Step 8: Vegetation clearance and construction of access roads (where 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 area and protection of erosion sensitive areas;
Step 14: Testing and commissioning; and
Step 15: Continued maintenance.

1.2.8 Main Infrastructure Requirements

Foundations:

The type of terrain encountered, as well as the underlying geotechnical conditions determines the choice of foundation. The actual size and type of foundation to be installed will depend on the soil bearing capacity (actual sub-soil conditions). Strain structures require more extensive foundations for support than in-line suspension structures, which contribute to the cost of the construction of the line. Foundations will be mechanically excavated then the pouring of concrete for the setting of the foundations. In areas where access to the structure position prohibits the use of concrete mixing trucks, uphill pumping or gravity feeding of concrete up to distances of 200 m will be implemented. Prior to erecting the structures and infilling of the foundations, the excavated foundations will be covered/fenced-off in order to safeguard unsuspecting animals and people from injury. All foundations are back-filled, stabilised through compaction, and capped with concrete at ground level.

Insulators:

Composite insulators have a glass-fibre core with silicon sheds for insulation and are used to connect the conductors to the towers. Glass and porcelain have been used to connect the conductors for many years, and is the most common. These products are, however, heavy and susceptible to breakage by vandals, as well as contamination by pollution. Composite insulators are lightweight and resistant to both vandalism and pollution. Composite (Long rod type) insulators with silicone based weathershed material will be used.

Stringing of Conductors:

Automatic stringing gear is used to string the conductors between towers. The line is strung in sections (from bend to bend). Cable drums are placed at 5 km intervals (depending on the length of the conductor) during this stringing process. In order to minimise any potential negative impacts on the surrounding area, these cable drums should be placed within the servitude.

1.2.9 Operation and maintenance

During the life span of the powerlines, which is approximately 25 years, on-going maintenance will be performed from time to time. Due to the climate and weathering conditions experienced in the Northern Cape Province (less stringent), it is estimated that the lifespan the mono-pole structure will have an increased lifespan of approximately 50 years. Eskom maintenance staff and contractors employed by Eskom will undertake the maintenance works as required.

1.3 Need and Desirability

The five wooden pole structures are failing and these failures most commonly come from the cross arms. The normal ground inspection is not adequate to identify the cracks on top of the lines or structures. Aerial inspection has been identified as an appropriate method to identify these cracks and/or defects. However, the Aerial inspection is quiet expensive as the helicopter is being used during the inspection. The cost of rebuilding these lines are very high and not justified as no return will be realized from rebuilding them. Pole replacement is the only reasonable and cost effective strategy at this point time. There is a need to deviate the line due to the inaccessibility of structure OA/TA 151. Also, the realignment at the substation is needed to enhance the arrangement of the substation.

1.4 Specialist Studies

In order to comprehensively investigate the impact of the proposed deviation and refurbishment of the Oasis-Taaipit 132Kv Powerline on the receiving environment, a number of Specialist Studies have been undertaken by independent specialists for the Basic Assessment Reporting (BAR) Phase.

The following specialist studies have been conducted during the BAR phase of the project and incorporated into this Draft BAR:

Table 1-4: Specialist Studies

Theme	Specialist
Wetland Assessment	Sativa Travel and Environmental Consultants (Pty) Ltd
Heritage Assessment	Sativa Travel and Environmental Consultants (Pty) Ltd
Avifauna Assessment	Sativa Travel and Environmental Consultants (Pty) Ltd
Ecological Assessment	Sativa Travel and Environmental Consultants (Pty) Ltd
Visual Assessment	GIBB (Pty) Ltd

Further details of the proposed studies are provided in **Chapter 5**. The results of the specialist studies have been incorporated to form part of this BAR in the detailed Impact Assessment phase of the BA process.

1.5 Details of Role Players

1.5.1 Details of the Applicant

Eskom Holdings SOC Ltd, Eskom Distribution – Northern Cape Operating Unit (Eskom) is the Applicant for the proposed deviation and refurbishment of the Oasis-Taaipit 132Kv Powerline. The details of the Applicant can be found in **Table 1-5** below.

Table 1-5: Details of the Applicant

Project Applicant:	**Eskom**		
Contact Person:	Andrea Van Gensen		
Physical Address:	4 George Street, Kimberley		
Postal Address:	P.O. Box 606, Kimberley,		
Postal code:	8301	Fax:	086 539 5177
Telephone:	086 539 5177		
E-mail:	vgenseal@eskom.co.za		

1.5.2 Details of Independent Environmental Assessment Practitioner (EAP)

GIBB (Pty) Ltd (GIBB) is an integrated group of scientists, project managers, engineers and architects providing cost-effective solutions and specialist services in a wide range of disciplines. The multi-disciplinary consulting, management and design approach allows for the execution of projects in a holistic way, as this is believed to be the best approach to fully meet the needs of our Clients.

The GIBB Environmental Services Division has a formidable track record and comprises highly qualified and experienced technical staff *viz*, Environmental Scientists and Specialists, which collectively form the National Environmental Team. The team members have broad experience in terms of working on a range of environmental projects within the public and private sector across South Africa. Refer to **Table 1-6** for the contact details of the lead EAP.

Table 1-6: Details of the Independent Environmental Assessment Practitioner (EAP)

Project EAP:	**GIBB (Pty) Ltd**
Contact Person:	Tashriq Naicker
Role in Project:	Project leader EAP
Physical Address:	Podium at Menlyn, 43 Ingersol Road, Menlyn
Postal Address:	PO Box 35007, Menlo Park

Postal code:	0102	**Fax:**	012 348 5878
Telephone:	012 471 8918		
Email:	tnaicker@gibb.co.za		

1.5.3 Details of Competent/Relevant Authority

The National Department of Environmental Affairs (DEA) is the Competent Authority (CA) for this application.

The project was registered and the DEA issued the project with reference number **14/12/16/3/3/1/1866.**

Table 1-7: Details of Competent Authority

Competent Authority:	**National Department of Environmental Affairs (DEA**		
Case Officer: District Manager	Salome Mambane		
Reference Number:	14/12/16/3/3/1/1866		
Postal Address:	Private Bag X447, Pretoria		
Postal code:	0001	**Fax:**	--
Telephone:	012 399 9385	**Cell:**	--
E-mail	SMambane@environment.gov.za		

CHAPTER 2: LEGAL REQUIREMENTS

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2 Legal Requirements

This chapter of the Final Basic Assessment Report details the applicable legal provisions and the policy context for the Basic Assessment Reporting (BAR) process. It provides a review of relevant legislation, regulations and policy documents, which are applicable to (*or have implications for*) the proposed deviation to the Eskom Oasis-Taaipit 132Kv Powerline.

The authorisation process associated with the project will be carried out in compliance with South Africa's environmental legislation. The legal framework applicable to this project is diverse. A summary of the key environmental legislation and relevant policies and/or guidelines is provided in the following sections.

One of the main focus points of the section is on the provisions of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended (NEMA). NEMA is the primary South African legislation governing the requirements for environmental impact assessment. In the context of the Project, the provisions of NEMA and associated EIA Regulations, regarding Basic Assessments are of fundamental relevance.

2.1 National Legislation

2.1.1 Constitution of the Republic of South Africa (No. 108 of 1996)

The Constitution of the Republic of South Africa is the legal source for all law, including environmental law, in South Africa. The Constitution enshrines the basic, fundamental and inalienable rights of the citizens of the Republic.

2.1.2 National Environmental Management Act, 1998 (Act No. 107 Of 1998)

The National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended (NEMA) is the primary South African legislation governing the requirements for Environmental Impact Assessment (EIA). In the context of the project, the provisions of NEMA and the associated EIA Regulations (regarding Basic Assessments) have reference.

NEMA is the most significant single piece of legislation dealing with environmental management in the Republic of South Africa (RSA). The stated purpose of NEMA is, amongst other things, "to provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote cooperative governance and procedures for co-ordinating environmental functions exercised by organs of state..."[1]

[1] Long title of NEMA. Section 239 of the Constitution defines an "organ of state" as:

a) any department of state or administration in the national, provincial or local sphere of government; or
b) any other functionary or institution-
    i. exercising a power or performing a function in terms of the Constitution or a provincial constitution; or
    ii. Exercising a public power or performing a public function in terms of any legislation, but does not include a court or a judicial officer.

NEMA takes the form of "framework" legislation. It establishes a set of 18 principles which apply throughout the RSA to the actions of all organs of state that may significantly affect the environment. NEMA also contains provisions on the creation of environmental management plans and environmental implementation plans and stipulates the respective organs of state responsible for doing so, as well as the content to be incorporated in such management and implementation plans[2].

Chapter 5 of NEMA, entitled "Integrated Environmental Management" establishes the environmental impact assessment regime in the RSA. Since 3 July 2006, the procedural and substantive requirements for undertaking EIAs in South Africa have been regulated in terms of the provisions contained in section 24 of NEMA and the NEMA EIA Regulations 2014 (as amended 2017).

The NEMA 2014 EIA Regulations (amended 2017) identify lists of activities which have a potential to result in detrimental environmental impacts and thus require either "Basic Assessment" or "Scoping and Environmental Impact Reporting Assessment"; and prescribe the procedural and substantive requirements for the undertaking of EIAs and the issue of environmental authorisations. Activities identified in terms of section 24(2)(a) and (d) of NEMA, which may not commence without environmental authorisation from the Competent Authority (CA) and in respect of which the investigation, assessment and communication of the potential impact of such activities must thus follow the procedure as described in the NEMA 2014 EIA Regulations (as amended 2017).

In terms of the amendments to the EIA Regulations of 2014, activities listed in GNR 324, GNR 325 and GNR 327 require Environmental Authorisation (EA) before they can proceed and be implemented, and the following listed activities are deemed applicable to the proposed development.

Table 2-1: Listed activities in terms of NEMA EIA Regulations (2014), as amended, which are triggered by the Project

Listed Activity	Activity Number and Description	Description as per Project Description
Listing Notice 1: GNR 327 of 7 April 2017		
11 (i)	The construction of facilities or infrastructure for the transmission and distribution of electricity – (i) Outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts;-	The proposed distribution line connecting Oasis Substation to the Taaipit Substation will be 132kV and lies outside an urban area.

[2] Chapter 3 of NEMA (Sections 11-16)

Listed Activity	Activity Number and Description	Description as per Project Description
12 (ii) (a)	The development of: (ii) infrastructure or structures with a physical footprint of 100 square metres or more; Where such development occurs (a) within a watercourse;	Several watercourses may be crossed along the powerline route, and as such pylons may be constructed within 32 metres of the watercourse.
19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock or more than 5 cubic metres from a watercourse but excluding where such infilling, depositing, dredging, excavation, removal or moving; (a) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or (b) Occurs behind the development setback line.	Several watercourses may be crossed along the powerline route, and as such pylons may be constructed within the watercourse.

It must be noted that activities requiring a Basic Assessment process are triggered by the proposed project and as such this proposed project's application will require a Basic Assessment process to be undertaken.

The aforementioned listed activities are deemed to include activities that could potentially have a detrimental impact on the social and biophysical state of an area and as such, are required to undergo a Basic Assessment process.

Application for Environmental Authorisation

The Application for Environmental Authorisation, in terms of NEMA, 1998 (Act No. 107 of 1998) and the EIA Regulations of 2014 (as amended) was submitted to the DEA on **11 December 2017**. In a letter dated **13 December 2017**, the DEA acknowledged receipt of the Application for Environmental Authorisation and issued the project with reference number **14/12/16/3/3/1/1866**.

This report constitutes the Final Basic Assessment Report (BAR) and sets out the findings of the Environmental Impact Study undertaken to identify, describe and assess the identified environmental impacts associated with all aspects of the proposed project.

2.1.3 National Heritage Resources Act (Act No. 25 of 1999)

The National Heritage Resources Act (NHRA) aims to introduce an integrated system for the management of South Africa's heritage resources. Further, the Act empowers civil society to nurture and conserve their heritage resources so that they can be passed on to future generations. The Act provides a framework for the management of heritage resources in South Africa and to protect heritage resources of national significance. In order to meet these objectives, the Act introduces an integrated system that can allow for the identification, assessment and management of heritage resources.

According to Section 38 (1) of NHRA:
Subject to the provisions of Subsections (7), (8) and (9) of the same section, any person who intends to undertake a development categorised as:

- The construction of a road, wall, power line, pipeline, canal or other similar form of linear development, or barrier exceeding 300m in length;

must at the very earliest stages of initiating such a development, notify the responsible Heritage Resources Authority (HRA) and furnish it with details regarding the location, nature and extent of the proposed development.

As such a Heritage Impact Assessment has been undertaken for the project in conformance with the South African Heritage Resources Agency (SAHRA) and will be submitted to SAHRA and Northern Cape Provincial Heritage Authority for comment and decision making.

2.1.4 National Environmental Management: Biodiversity Act (Act No. 10 of 2004)

The National Environmental Management: Biodiversity Act (NEM: BA) has as an objective to provide for the management and conservation of biological diversity within the Republic and of the components of such biological diversity. The focus of this legislation is on the preservation of species and ecosystems irrespective of whether or not they are situated in protected areas.

Chapter 4 of the NEM: BA is particularly relevant and provides for:

- The protection of threatened or protected ecosystems, with particular emphasis on critically endangered, endangered, vulnerable and protected ecosystems. – List of Threatened Ecosystems (Notice 1002 of Government Gazette 34808 dated 9 December 2011).
- Listing of species that are threatened or in need of protection to ensure their survival in the wild, while regulating the activities, including trade, which may involve such listed threatened or protected species and activities which may have a potential impact on

their long-term survival. - Threatened or Protected Species Regulations (Regulation 152 of 2007).
- The protection of natural systems from invasive species.

Chapter 5 of the Act specifically deals with species and organisms posing potential threats to biodiversity. To summarise, the purpose of Chapter 5 is to:

- Prevent the unauthorised introduction and spread of alien species and invasive species to ecosystems and habitats where they do not naturally occur;
- To manage and control alien species and invasive species to prevent or minimise harm to the environment and to biodiversity in particular; and
- To eradicate alien species and invasive species from ecosystems and habitats where they may harm such ecosystems or habitats.

Furthermore Section 73 (2) states that a person who is the owner of land on which a listed invasive species occurs must:

- Notify any relevant CA, in writing, of the listed invasive species occurring on that land;
- Take steps to control and eradicate the listed invasive species and to prevent it from spreading; and
- Take all the required steps to prevent or minimise negative impacts on biodiversity.

2.1.5 National Water Act, 1998 (Act No 36 of 1998)

The National Water Act, 1998 (Act No. 36 of 1998) (NWA) aims to provide management of the national water resources to achieve sustainable use of water for the benefit of all water users. This requires that the quality of water resources is protected as well as integrated management of water resources with the delegation of powers to institutions at the regional or catchment level. The purpose of the Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in responsible ways.

Of specific importance to this application is Section 19 of the NWA, which states that an owner of land, a person in control of land or a person who occupies or uses the land which thereby causes, has caused or is likely to cause pollution of a water resource must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring and must therefore comply with any prescribed waste standard or management practices.

Due to the nature of powerline type projects, various water uses in terms of the National Water Act, 1998 (Act No. 36 of 1998) are triggered as follows:

(c) Impeding or diverting the flow of water in a watercourse; and
(i) Altering the bed, banks, course or characteristics of a watercourse.

Accordingly, the proposed activities mentioned above requires a Water Use Licence (WUL), which is administered by the Department of Water and Sanitation (DWS).

2.1.6 Other Legal Requirements

The section below highlights other relevant policies, legislation, guidelines and standards that must be considered in the implementation of the project.

Table 2-2: Brief review of other relevant policies, legislation, guidelines and standards applicable to the BAR

Applicable Legislation/ guideline/ standard	Details/Applicable Sections
National Legislation	
The Promotion of Administrative Justice Act, 2000 (Act No. 3 of 2000)	• Definitions (Section 1). • Procedural Fairness (Section 3, 4 and 6). • Right to Reasons for Decisions (Section 5). • Judicial Review (Section 6 and 8).
Promotion of Access to Information Act, 2000 (Act No. 2 of 2000)	• The purpose of the Promotion of Access to Information Act ("PAIA") is to give effect to 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.
Environmental Conservation Act, 1989 (Act No. 73 of 1989)	• Waste disposal practices (Section 20). • National Noise control Regulations (GN R154 dated 10 January 1999).
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	• Prohibition of the spreading of weeds (Section 5). • Classification of categories of weeds and invader plants (Regulation 15 of GN R1048) and restrictions in terms of where these species may occur. • Requirement and methods to implement control measures for alien and invasive plant species (Regulation 15E of GN R1048).
National Environmental Management: Waste Act, 2008 (Act No 59 0f 2008)	• Waste Management Measures.
National Forests Act, 1998 (Act No. 84 of 1998)	• Protected trees. • Forests.
National Environmental Management Act (Act No. 107 of 1998) Public Participation Guideline (GN.R807 of 2012)	• In 2014, the Minister gazetted a new set of regulations on the requirements for conducting EIAs in terms of Chapter 5 of NEMA. In order to assist potential Applicants, interested and affected parties and environmental assessment practitioners

Applicable Legislation/ guideline/ standard	Details/Applicable Sections
	to understand their role, the DEA has produced a series of guidelines. These guidelines must be read in line with NEMA and the EIA Regulations of 2014 as they do not substitute primary legislation. The guideline updates and revises the draft integrated environmental management guideline which was developed in 2005. The public participation guideline provides for inter alia: the minimum legal requirements for public participation processes (PPP); the steps of a PPP; guidelines for planning a PPP; and a description of the roles and responsibilities of the various role players.
Municipal By-laws	
This chapter, which considers the potentially relevant national and provincial environmental legislative dimension of the project, does not include discussion on relevant municipal by-laws. However, it is possible that certain municipal bylaws will be relevant to the project and these will be discussed further during the impact assessment phase of the BA process were relevant.	

3 CHAPTER 3: PROJECT ALTERNATIVES

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3 Alternatives

The term "alternatives" as per Government Notice No. 326 of the NEMA EIA Regulations 2014 as amended is defined as follows:

"…in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to the -

a) Property on which or location where the activity is proposed to be undertaken;
b) Type of activity to be undertaken;
c) Design or layout of the activity;
d) Technology to be used in the activity; or
e) Operational aspects of the activity;

and includes the option of not implementing the activity;

All alternatives identified, have been assessed in detail during the BAR phase with specific reference to their environmental acceptability as well as socio-economic feasibility. Advantages and disadvantages of the various alternatives have also been provided where relevant.

3.1 No Go Alternative

The No-go alternative in the context of this project implies that the deviation to the powerline not be constructed. If the project does not proceed, the potential negative impacts related to the risk of collisions of birds, clearing of vegetation, soil erosion and wetland degradation would be avoided. The surrounding area will however, will be negatively affected due to the lack of a constant and reliable electricity supply. Eskom will not be able to actively inspect and maintain the existing powerline. The impacts to the surrounding environment can be proactively mitigated to acceptable levels.

The No-Go Alternative is therefore not recommended.

3.2 Route Alternatives

3.2.1 Alternative Deviation Routes

There are 2 route alternatives for deviation between the Oasis and Taaipit substations (see Figure 3-1 below).

Alternative 1:

Alternative 1 is approximately 1 020m in length and is made up of the proposed deviation to the existing 132Kv Oasis-Taaipit Powerline. The deviation will turn off from the existing route and travel for approximately 700m in a West North West direction before turning South West and traveling the remaining 320 meters to join in with the existing powerline.

Deviation Alternative 1 GPS Co-ordinates:

Point	Latitude	Longitude
Start	28°44' 13.98" S	20°40' 19.23" E
Middle	28°44' 09.50" S	20°39' 54.03" E
End	28°44' 15.78" S	20°39' 44.62" E

Alternative 2 (Preferred alternative):

Alternative 2 (preferred) is approximately 700m in length and is made up of the proposed deviation to the existing 132Kv Oasis-Taaipit Powerline. The deviation is located along the powerline near Lutzburg and is approximately 700 meters in length. The deviation will turn off from the existing route and travel for approximately 377m in a West North West direction before turning South West and traveling the remaining 323 meters to join in with the existing powerline.

Deviation Alternative 2 (Preferred) GPS Co-ordinates:

Point	Latitude	Longitude
Start	28°44' 13.98" S	20°40' 19.23" E
Middle	28°44' 12.86" S	20°40' 6.78" E
End	28°44' 18.54" S	20°39' 58.19" E

Please note that there will be a realignment of the powerline at the Oasis substation to enhance the arrangement at the substation.

Route realignment at Oasis substation GPS Co-ordinates:

Point	Latitude	Longitude
Start	28°41' 24.28" S	20°58' 37.55" E
Middle	28°41' 31.68" S	20°58' 42.50" E
End	28°41' 35.52" S	20°58' 45.92" E

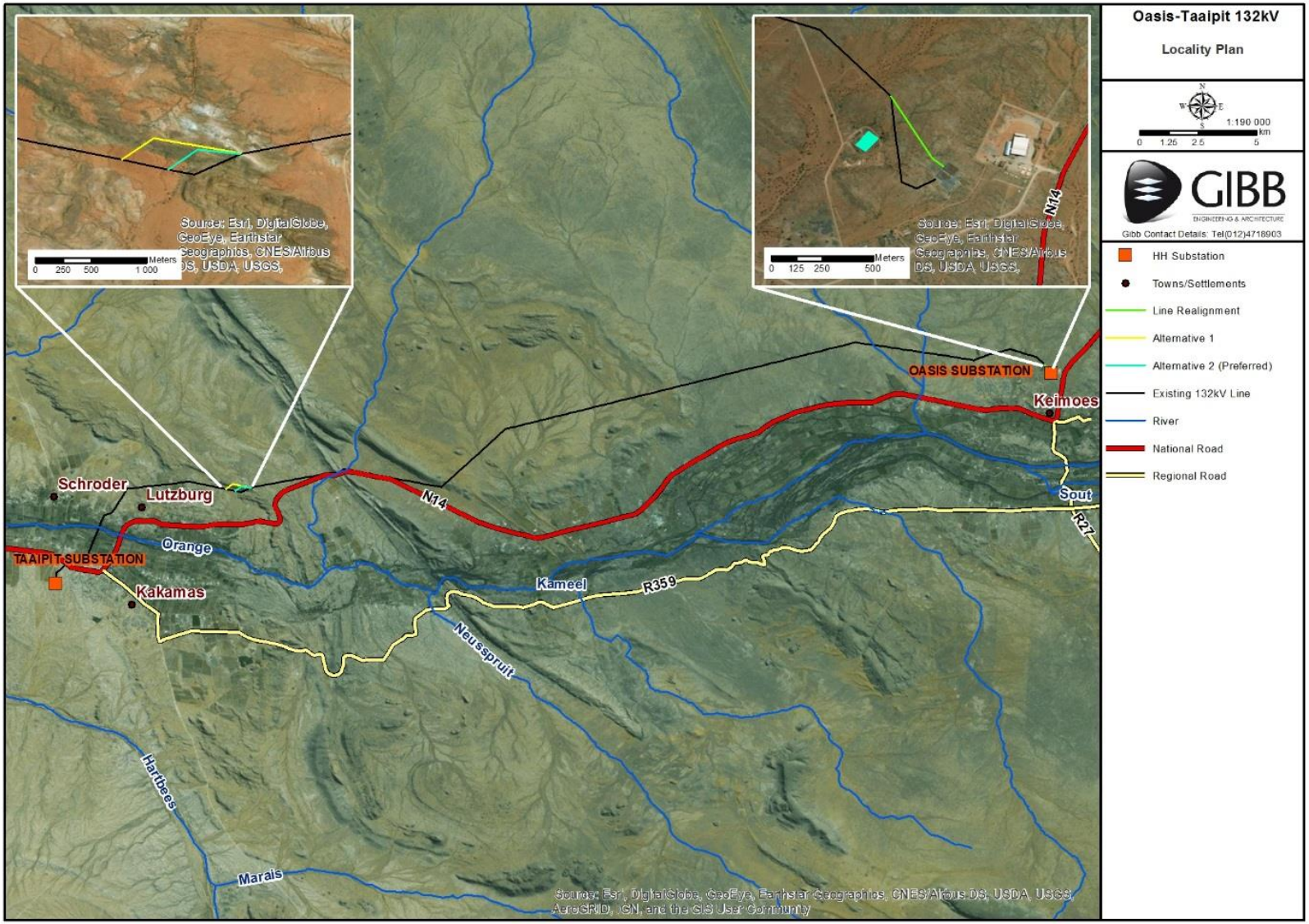

Figure 3-1: Proposed Route Deviation alternatives

3.3 Design/Layout Alternatives

Layout alternatives are not applicable to the construction of the proposed Oasis-Taaipit 132kV powerline.

3.4 Technology Alternative

Alternative technologies have not been considered as the technology to be used is already considered as the most appropriate technology and in some cases has been specifically designed for the existing environmental conditions and terrain, as specified by standard Eskom specifications and international best practice. The pylons under consideration for this project are the most appropriate based on the terrain and design integrity as well as for the purpose for which the powerline is to be constructed.

CHAPTER 4: BAR PROCESS

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4 BAR Process

A Basic Assessment (BA) process for the proposed refurbishment and Deviation of the Eskom Oasis-Taaipit 132Kv Powerline project is being undertaken in terms of the EIA Regulations of 2014, as amended, under the National Environmental Management Act, 1998 (Act No. 107 of 1998).

A BA process for the project is used to:

- Identify potential environmental impacts;
- Examine the significance of environmental implications;
- Assess whether impacts can be mitigated;
- Recommend preventive and corrective mitigating measures;
- Inform the decision maker and I&APs about the environmental implications; and
- Provide the decision maker with the necessary independent environmental and socio-economic information to determine whether the development should go ahead.

This chapter briefly describes the process that was followed, with emphasis on the results of the determination of the terms of reference of the specialist studies, the findings of which are the basis of the remainder of the report. **Figure 4-1** below illustrates the Basic Assessment process.

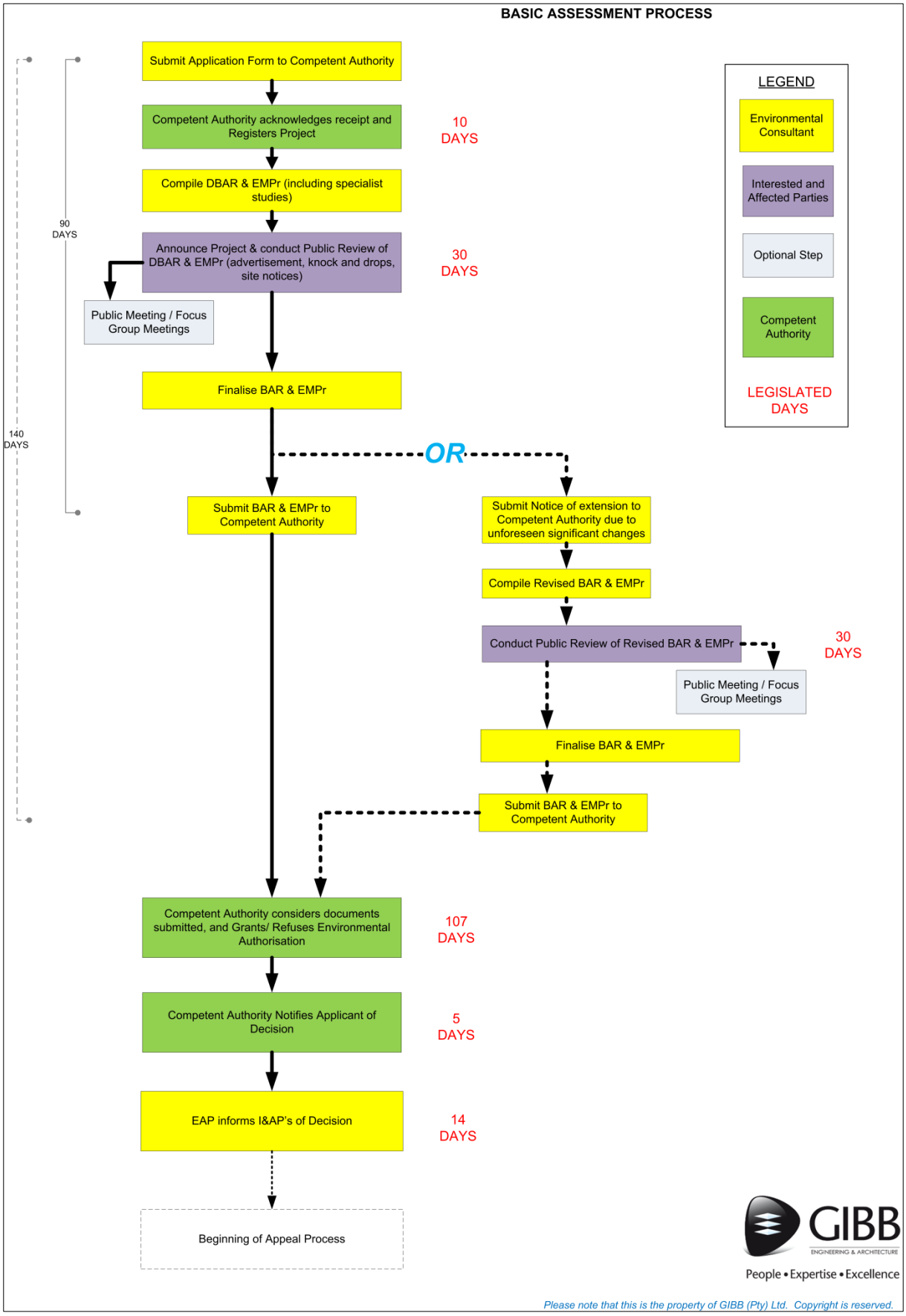

Figure 4-1: Basic Assessment Process

4.1 Basic Assessment Reporting Phase

The content of the BAR is prescribed in Section 23 and Appendix 3 of Government Notice No. 326 of 2014 (as amended 2017).

The Basic Assessment Reporting phase is being undertaken in accordance with the requirements of sections 24 and 24(d) of NEMA, as read with Government Notices R 326 (Section 23 and Appendix 3), 327, 325 and 324 of the EIA Regulations (2014), as amended.

The information collated during the specialist studies was compiled into the Draft Basic Assessment Report (BAR). The Draft BAR was made available for a thirty (30) day commenting period in suitable public places (e.g. libraries) to allow for I&APs to review and comment on the document. The comments arising from this review have been incorporated into the Comments and Response Report (CRR) and used to finalise the BAR. The Final BAR will be submitted to the Nation Department of Environmental Affairs (DEA) for a decision (positive or negative).

A significance rating matrix has been applied in order to rate the significance of the environmental impact(s) that the project will have on the receiving environment. This methodology followed has been prepared in accordance with the NEMA EIA Regulations of 2014 (as amended 2017) and the associated guideline documents. This method has also been integrated into the terms of reference for all specialist studies, ensuring uniformity and continuity.

The impact assessment has covered the following project phases:

- Pre-construction and design phase;
- Construction phase; and
- Operational phase.

4.1.1 Consultation with Authorities

The relevant authorities have and will continue to be, consulted throughout the BAR process. For the proposed project, the DEA is the Competent Authority (CA) for this project.

After the public review period for the Draft BAR lapsed, all comments received were adequately captured and addressed. The Final BAR will be submitted to the CA for their decision making.

4.1.2 Consultation with other Relevant Authorities

Please refer to **Section 4.1.4** for the information with regards to other relevant authorities which have been involved in the project and kept up to date with the progress on the BAR process to date.

A full list of key stakeholders consulted to date is included in the I&AP database attached in **Appendix D**. Authority and I&AP consultation will continue throughout the remainder of the BAR process and the database will be updated accordingly.

4.1.3 Identification of Potentially Significant Environmental Impacts

Both positive and negative direct and indirect environmental impacts associated with the proposed project have been fully investigated and assessed forming part of the Impact Assessment phase.

The following specialist studies have been conducted for the project and incorporated into this Final BAR:

Table 4-1: Specialist Studies

Specialist Study	Specialist Name/Company
Wetland Assessment	Sativa Travel and Environmental Consultants (Pty) Ltd
Heritage Assessment	Sativa Travel and Environmental Consultants (Pty) Ltd
Avifauna Assessment	Sativa Travel and Environmental Consultants (Pty) Ltd
Ecological Assessment	Sativa Travel and Environmental Consultants (Pty) Ltd
Visual Assessment	GIBB (Pty) Ltd

Further details of the proposed studies are provided in **Chapter 5.** The results of the specialist studies have been incorporated to form part of this Basic Assessment Report (BAR) in the detailed Impact Assessment phase of the BA process.

4.1.4 Draft Basic Assessment Report (BAR)

The Draft BAR comprised a detailed assessment of all the potential impacts (including findings from specialist studies) associated with the proposed development. These impacts have been fully assessed in **Chapter 6** and rated against one another in order to determine their nature, significance, extent, duration, severity, reversibility as well as their impact on irreplaceable resources. The proposed alternatives identified have been assessed in a comparative manner in order to establish which one is the preferred option from an environmental perspective. Effective and appropriate mitigation measures have also been incorporated into the Draft EMPr. These mitigation measures will ensure the minimisation of the severity of negative impacts and the optimisation of effects from positive impacts associated with the proposed development.

The Draft BAR was made available for public review for a period of 30 days during which time all registered I&APs were given adequate opportunity to review the Draft BAR and provide

their comments on the content thereof. All correspondence received during the Draft BAR public review period were updated into the Comments and Response Report, which contains adequate responses to all comments received on the project to date.

The Draft BAR was made available for public review for a period of 30 days from **Thursday, 18 January 2018 to Friday, 16 February 2018 (inclusive).**

4.1.5 Final Basic Assessment Report (BAR)

All comments made on the Draft BAR during public review were captured and adequately responded to in the updated Comments and Response Report. The BAR has now been finalised, and will be submitted to the DEA for decision making.

4.2 Public Participation Process

A comprehensive Public Participation Process (PPP) has been implemented as part of the BAR process (*in line with Chapter 6 of the Regulations and Appendix 3 for Environmental Impact Assessment Reports*).

The PPP aims to:

- Ensure all relevant key stakeholders and I&APs have been identified and invited to engage in the BA;
- Raise awareness, educate and increase understanding of stakeholders about the proposed project, the affected environment and the environmental process being undertaken;
- Create open channels of communication between key stakeholders and I&APs and the project team;
- Provide opportunities for key stakeholders and I&APs to identify issues or concerns and propose suggestions for enhancing potential benefits and to prevent or mitigate impacts; and
- Accurately document all opinions, concerns and queries raised regarding the project.

4.2.1 Identification of Key Stakeholders and I&APs

The identification and registration of I&APs is an on-going activity during the course of the BAR process. GIBB will develop, maintain and constantly update an electronic I&AP database for the project (see **Appendix D** for the Preliminary I&AP database). As such, I&APs were identified using the following:

- Existing I&AP databases obtained from the Applicant;
- Placement of advertisements in local newspaper(Kalahari Bulletin) on Thursday, 18 January 2018;
- Placement of site notices at strategic locations near the site, as well as at libraries and other public places; and
- Discussions with community leaders and relevant ward councillors.

As indicated above a preliminary I&AP database is included in **Appendix D**. Interested and Affected Parties (I&APs) representing the following sectors of society have been identified:

- National, provincial and local government;
- Ward councillors and committees;
- Community Based Organisations;
- Non-Governmental Organisations;
- Business, Religious and Civic Organisations;
- Service Providers; and
- Research.

4.2.2 Notification and Advertisements

In accordance with the requirements of the EIA Regulations (2014 as amended), the I&AP registration period commenced with the advertisement of the project in the Kalahari Bulletin newspaper and placement of site notices. The purpose of the advertisements and site notices were to notify the public about the proposed project and to invite them to register as I&APs and comment on the Draft BAR and invite them to attend a public meeting. Please refer below to **Table 4-2** for the relevant advertisement dates.

Table 4-2: Media Advert and Site Notification

Method	Where			Placement Date
Advertisement	Kalahari Bulletin			2018/01/18
Site Notices	**Description**	**Latitude**	**Longitude**	2018/01/17
	Taaipit Substation (Notice 1)	28°46’24.65”S	20°35’49.12"E	
	Oasis Site Notice 2	28°44’36.77"S	20°40’52.59"E	
	Oasis Site Notice 3	28°42’26.59"S	20°57’23.71"E	
	Oasis Substation (Notice 4)	28°41’37.44”S	20°58’44.76”E	

The project and BAR process has been widely announced with an invitation to the general public to register as I&APs and to actively participate in the PPP (refer to **Appendix D** for the announcement documents). Proof of publication of the advertisements and site notices placement is included in **Appendix D** of this Draft Basic Assessment Report. Public announcement of the project, the invitation to comment on the Draft BAR and to register as I&APs, were announced as follows:

- Publication of media advertisement in English and Afrikaans in the **Kalahari Bulletin** (**18 January 2018**) (**Appendix D**);
- Distribution of notification letters, comment and registration sheet by fax/post/email to all organs of state, service providers, Non-Governmental Organizations, Ward Councillors and committees on **18 January 2018** (**see Appendix D**) for reference to the information package consisting of notification letters, details of availability of the Draft

BAR for public review and comment, locality map and registration and comment sheet); and

- Project site notices were strategically located at the site, and key strategic points on Wednesday, 17 January 2018 (**Appendix D**).

4.2.3 Public Meeting

A public meeting was held on Wednesday, 31 January 2018 to engage with I&APs, to explain to purpose of the project to them and to allow them to raise their concerns and objections. The meeting was held at the NG Church Kakamas, Cnr. 10th Avenue and Voortrekker Way, Kakamas, 8870 and the meeting took place from 16:00 to 18:00. All concerns raised at the meeting were recorded and responded to accordingly (**Appendix D**).

4.2.4 Public Review of the Draft and Final Basic Assessment Report

The Draft BAR was made available to the public for their review from **Thursday, 18 January 2018 to Friday, 16 February 2018 (inclusive)** for a period of 30 days at the venues listed in **Table 4-3** below. The Draft BAR was also made available to the public on the GIBB website.

The Final BAR will be made available to the Public at the following venues listed in **Table 4-3** below.

Table 4-3: Locations where BAR was placed for I&AP Review

Place	Address	Contact Person	Telephone
Kakamas Public Library	28 Voortrekker Street, Kakamas, 8870	The Librarian	054 431 6300
Keimoes Hospital	459 Main Road, Keimoes, 8860	Rejane Petersen	054 461 1004
The Final BAR will also be made available on the GIBB website at the following link: • **https://projects.gibb.co.za/Eskom_Oasis_Taaipit_132KV_Powerline_FBAR** • **A** CD copy is available upon request (Contact: Mr. Richard Myburgh: 012 471 8916)			

All comments received have been captured in a Comment and Repose Report (CRR), submitted to DEA as an appendix to the Final Basic Assessment Report (Final BAR). Correspondence will be sent to all I&APs registered on the I&AP database, informing them of the submission of the Final BAR to the DEA for decision.

4.2.5 Final Basic Assessment Report (Final BAR)

All comments received during the review period of the Draft BAR have been included in the Comments and Responses Report (CRR) of the Final BAR. The comments received have been taken into consideration. The Final BAR will be submitted to DEA for decision making.

4.3 Conclusion

This Chapter has discussed the various tasks that have been undertaken as part of the BAR process. Two of the main components include the Public Participation Process and the specialist studies that have been completed as part of the Basic Assessment phase. The Basic Assessment Reporting process is being undertaken in accordance with the requirements of sections 24 and 24(d) of NEMA, as read with Government Notices R 326 (Section 23 and Appendix 3), 327, 325 and 324 of the EIA Regulations (2014), as amended.

CHAPTER 5: BASELINE RECEIVING ENVIRONMENT

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5 Baseline Environment

This chapter provides a description of the biophysical and socio-economic environment of the study area, which may be affected by or could affect the proposed project. The chapter is summarised from information provided in the specialist studies as well as other readily available information for the study area.

5.1 Biophysical Environment

5.1.1 Climate

The study area is situated within the dry, low rainfall region of South Africa (0mm – 200mm per annum) (Figure 5-1). The Mean Annual Precipitation (MAP) for the region is very low at approximately 70 mm (Mucina & Rutherford, 2006). The study site is approximately 12km east of Kakamas and has the same climatic conditions. Kakamas normally receives about 62mm of rain per year, with most rainfall occurring during autumn (March and April). The areas lowest rainfall (0mm) is typically in June and the highest (19mm) in March. The average midday temperatures for Kakamas range from 20°C in July to 33°C in January. The region is the coldest during July when temperatures drop on average to 3.1°C during the night (www.saexplorer.com). Frost is common, but not frequent during the dry winter months.

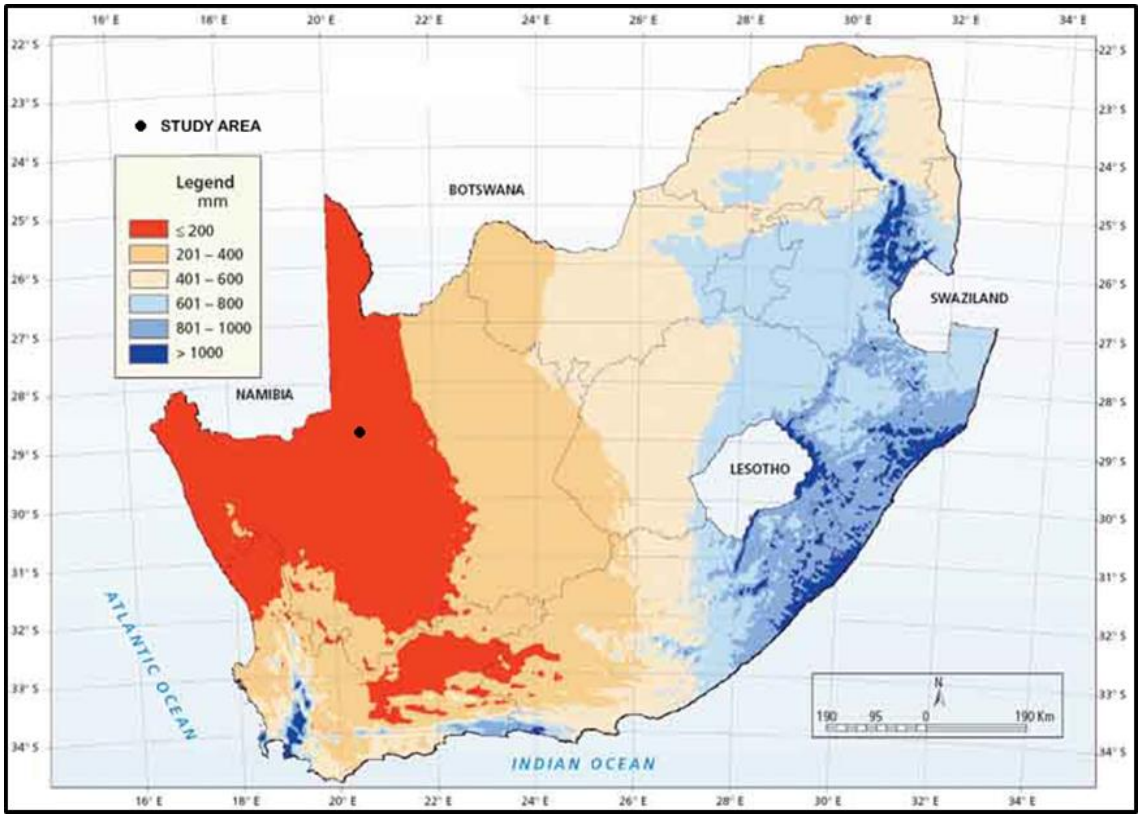

Figure 5-1: Rainfall zones for South Africa

5.1.2 Topography, Geology and Soils

The topography of the region is of hills and low mountains, slightly irregular plains and rugged, broken terrain. Numerous ridges and inselbergs are also present, with sparse vegetation dominated by low shrubs and dwarf shrubs. Grasses and herbaceous plants are mostly only present during the spring and summer months. Groups of widely scattered low trees such as Aloe dichotoma var. dichotoma and Acacia mellifera subsp. detinens occur on slopes of koppies, ridges and on sandy soils of foot slopes respectively.

The topography of the study area is typical of the region, and is situated along and down a ridgeline, with a sandy, broad valley bottom in which periodic / ephemeral drainage lines are present.

The region has a complicated geology, with the banded iron formation and amphibolites of the Asbestos Hills Subgroup being Vaalian and the carbonates and cherts of the Campbell Group being of the same Era. Metamorphic rocks of the Mokolian Erathem include quartzites and gneisses of the Korannaland Supergroup as well as the Riemvasmaak gneiss. Metamorphosed clastic sediments of the Uitdraai Formation are also Mokolian. Half of the area is composed of many other stratigraphies, metamorphosed sediments and outcrops of the ultrametamorphic rocks of the Namaqualand Metamorphic Complex. The soils are shallow and skeletal (dominant soil forms are Mispah and Glenrosa), typical mainly of Ib and Ic land types, and to a lesser extent also of the Fb land type (Mucina & Rutherford, 2006).

5.1.3 Regional Vegetation

The vegetation of the study area is characteristic of Lower Gariep Broken Veld, with stony ridges and sandy, dry valley bottomlands. The vegetation is sparse, low-density grassy level and scattered shrubs. The protected quiver tree (Aloe dichotoma var. dichotoma) is prominent on top of the ridge, with a few scattered thorntrees (Acacia mellifera) also present. The vegetation and veld is in good and fairly pristine condition for that region.

Quiver tree (*Aloe dichotoma var. dichotoma*) is a priority species present in numbers in the study area. Please refer to Figure 5-2 below which visually outlines the various vegetation groups with respect to the proposed development.

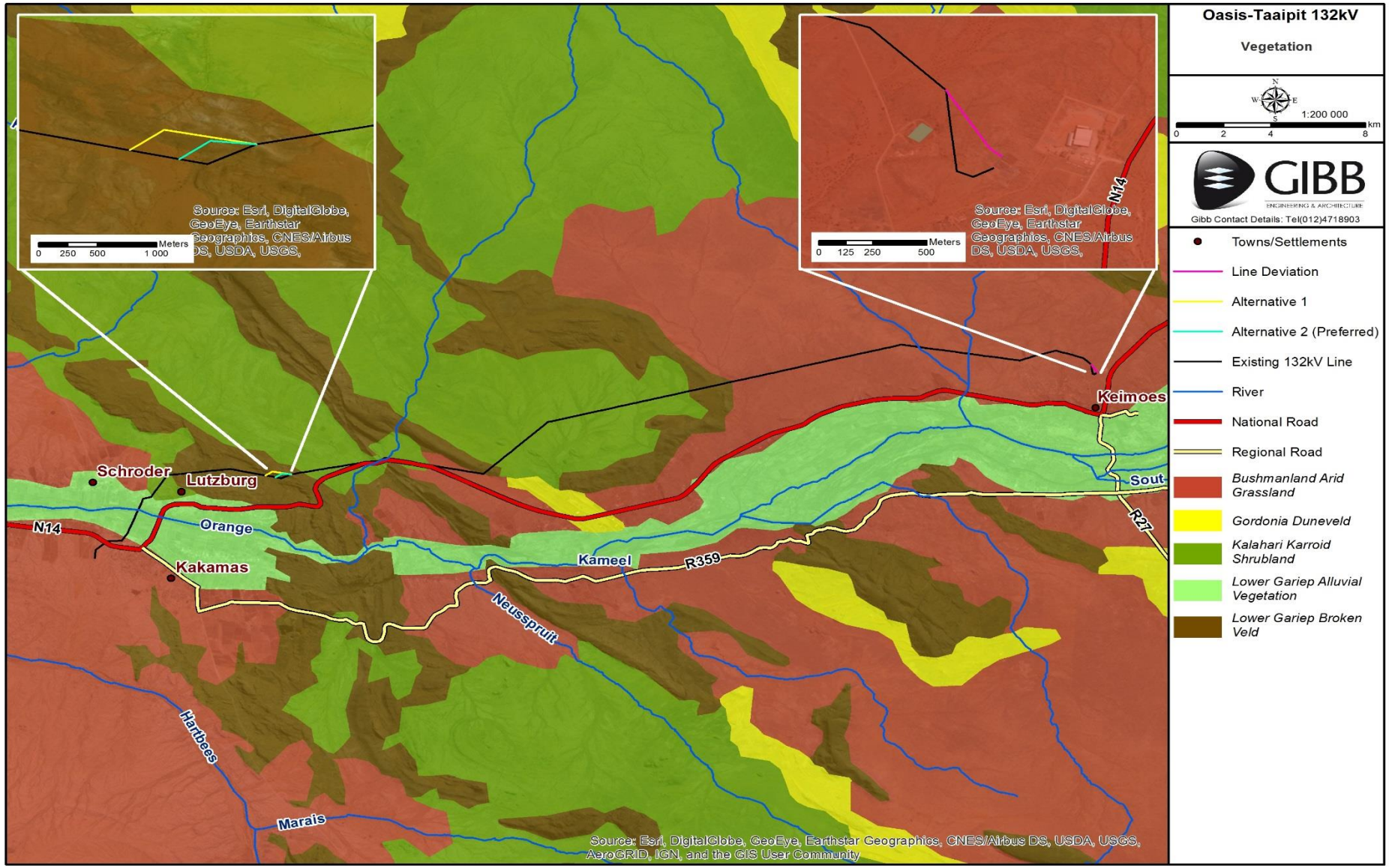

Figure 5-2: Vegetation of the study area

5.1.4 Biodiversity

(a) Vegetation

The vegetation of the study area is characteristic of Lower Gariep Broken Veld, with stony ridges and sandy, dry valley bottomlands. The vegetation is sparse, low-density grassy level and scattered shrubs. The protected quiver tree (Aloe dichotoma var. dichotoma) is prominent on top of the ridge, with a few scattered thorntrees (Acacia mellifera) also present. The vegetation and veld is in good and fairly pristine condition for that region.

The Red Data Species and protected quiver tree (*Aloe dichotoma*) is present in large numbers in the study area, especially on top of the stony ridge. According to the SANBI database only the only red data species to have been recorded in the study area is the quiver tree (with a status of Vulnerable). A summary of the priority floral species per grid reference previously identified for the study site, according to the SANBI database are tabled below (**Table 5-1**). *Bauhinia bowkeri* is a rare species that has been recorded in the larger area of QDS 2820DA, but was not observed during field investigations. Care should however, still be taken during the final route alignment of the powerline to ensure no shrubs are present at the pylon positions.

Table 5-1: Priority Floral Species per 1:50 000 Grid Reference

Grid reference & Priority Category	No. of species	Name of species
2820DA		
Critically endangered (CR)	0	-
Endangered (EN)	0	-
Vulnerable (VU)	1	*Aloe dichotoma*
Near threatened (NT)	1	*Bauhinia bowkeri*

Table 5-2: TOPS list of floral SCC for the Northern Cape

Family	Scientific Name	Habitat	Growth Form	Threat Status
Aizoaceae	*Cheiridopsis peculiaris*	Gravels and shale derived from metamorphic rocks of the Namaqualand Complex	Succulent	CR
Aizoaceae	*Conophytum herreanthus subsp. Herreanthus*	Quartz patches	Succulent	CR
Asphodelaceae	*Aloidendron pillansii*	Succulent Karoo shrubland on dry, rocky dolomite and gneiss hillsides.	Succulent, Tree	EN
Amaryllidaceae	*Haemanthus granitcus*	Namaqualand Klipkoppe Shrubland or Namaqualand Granite Renosterveld.	Geophyte	EN
Aizoaceae	*Lithops dorotheae*	Fine-grained, sheared, feldspathic quartzite	Succulent	EN
Asphodelaceae	*Aloidendron dichotomum*	On north-facing rocky slopes (particularly dolomite) in the south of its range. Any	Succulent, Tree	VU

		slopes and sandy flats in the central and northern parts of range.		
Amaryllidaceae	*Brunsvigia herrei*	Succulent Karoo Shrubland, granitic soils on flats and sometimes in deposits of fairly large stones.	Geophyte	VU
Aizoaceae	*Conophytum bachelorum*	Rocky outcrops	Succulent	VU
Aizoaceae	*Conophytum ratum*	Spongy quartz soil.	Succulent	VU
Amaryllidaceae	*Gethyllis grandiflora*	Sandy and or stony soils in arid karroid shrubland.	Geophyte	VU
Amaryllidaceae	*Gethyllis namaquensis*	Coastal dunes and gravelly mountain slopes in succulent Karoo shrubland.	Geophyte	VU
Amaryllidaceae	*Brunsvigia josephinae*	Heavy clay soils.	Geophyte	VU
Asphodelaceae	*Aloe krapohliana*	Occurs in the extremely arid northern regions of the Succulent Karoo, on clay, stony (mostly quarzitic) and sandy soils on flats and slopes.	Herb, Succulent	P
Amaryllidaceae	*Cyrtanthus herrei*	Deeply shaded rock ledges on south-facing rocky slopes.	Bulb	P
Aizoaceae	*Sceletium tortuosum*	Quartz patches and is usually found growing under shrubs in partial shade.	Succulent	P
Pedaliaceae	*Harpagophytum procumbens*	Well drained sandy habitats in open savanna and woodlands.	Herb	P

(b) Fauna

Field observations were limited to a few days, which always limits the observation and identification of fauna in the field. The study area is small, but is still connected to large, open surrounding areas. Although the immediate area is fairly pristine and undisturbed the dry to very dry conditions, lack of open water sources, lack of good quality vegetation, etc. will limit the species-richness and presence of wild faunal species in the study area. The Orange River is just over 2km south of the study site. Therefore, mobile faunal species would occur in the region and study area from time to time. The lack of ideal habitat for many species (such as permanent open water and trees for shelter) as well as the harshness of the existing environment (even though fairly pristine) will also drastically limit species-richness and numbers.

Birds

The presence of bird species is strongly linked to the availability of ideal habitats for foraging, breeding and nesting. There are few ideal bird habitats within the study area itself, even with the veld being in pristine condition. The most distinctive and important bird habitat is the cliff edges. The cliffs are not as high or as inaccessible as most cliff-dwelling species would prefer, but the pristine, open area for foraging can offset this. Other bird habitats are the 'less than ideal' dry drainage lines. This habitat is not of significant importance and will be

utilised mostly during the short-periods of sporadic rainfall and then for short periods only. The relatively close proximity of the large, Orange River still makes the cliffs and ridges fairly favourable as a bird habitat. Bird habitats within the study area can be categorised into ridges, drainage lines (valley lowlands) and open Nama-Karoo.

Priority species include red data species as well as other important species in terms of conservation. According to data obtained from the Southern African Bird Atlas Project, 112 bird species have been recorded for the Pentad (2840_2035) within the QDS (2820DA), in which the study area is situated.

No priority species were sighted during field investigations. By this time all migratory birds (summer visitors) would have left the region. Secondly, the site investigations were limited to a short period, which further limits the ability to fully assess and list all birds frequenting the area. Only a few common bird species were observed, including laughing dove (Streptopelia senegalensis), and cape turtle dove (Streptopelia capicola).

The study area is not situated in or nearby any Important Bird Areas (IBAs). The closest IBA is the Augrabies Falls National Park, which is approximately 33km northwest of the study site. The region will be frequented by numerous bird species, including a number of raptors, especially in the summertime when all migratory birds have returned to the region. A number of these species will include priority species. Priority species most likely to occur in the immediate region of the study area are, Ludwig's bustard, kori bustard, Martial eagle, Verreaux's (Black) eagle and Sclater's lark. The statuses of Ludwig's bustard (Neotis ludwigii) and Kori bustard (Ardeotis kori) are Endangered (EN) and Protected (P), respectively. It is unlikely that the two bustard species will be commonly present in the study area, due to unfavourable habitat. Sclater's lark (Spizocorys sclateri), which is listed as Near Threatened, is most likely to occur in the study area. The lark is an uncommon resident and partial nomad in arid Nama-Karoo habitat and favours stony plains. Sclater's lark is also strongly associated with kalkgras (Enneapogon desvauxii), which is found in the study area. Other priority species that should be noted in terms of their likely presence in the general region are martial eagle (Polemaetus bellicosus), black harrier (Circus maurus), pale chanting goshawk (Melierax canorus), booted eagle (Aquila pennatus), Verreaux's (Black) eagle (Aquila verreauxii) and lanner falcon (Falco biarmicus).

Mammals

No large- or medium-sized mammals were observed during field investigations. Some droppings of medium to small sized mammal species such as mice and mongoose were observed in the study area. These would include yellow mongoose (Cynictis penicillata) and possibly slender mongoose (Galerella sanguinea). These are fortunately not red data species, however, care should still be taken to avoid contact with, or disturbance of, wild animals during the construction phase.

The fauna of the Nama-Karoo is relatively species-poor (Vernon, 1999). There are few real endemics, as most animals' distribution areas are into adjacent biomes. One species of small mammal is strictly endemic to the Bioregion of the Nama-Karoo, Visagie's golden mole

(Chrysochloris visagiei, CR). Five other small mammals are near-endemic, Grant's rock mouse (Aethomys granti), Shortridge's rat (Thallomys shortridgei, LR), the riverine rabbit (Bunolagus monticularis, EN), Gerbillurus vallinus and Petromyscus monticularis, LR (Hilton-Taylor 2000). The most vulnerable of the Nama-Karoo's vertebrates is the riverine rabbit (Bunolagus monticularis), classified as "Endangered" in the South African Red Data Book, because of habitat destruction by agriculture. The quagga, (Equus quagga) a Nama Karoo near-endemic, was hunted to extinction in the 19th Century (Skinner and Smithers 1990).

Reptiles & Amphibians

No reptiles were observed during field investigations. The study area is situated within the QDS quadrant that is not a known hotspot for either snakes or lizards. Lizards tend to prefer rocky habitats and it is more than likely that a few species of lizards will be present in the ridges and cliffs of the study area. It is highly unlikely that any priority snake species are present on the site or the immediate adjacent areas.

The following are Snake Species of Conservation Concern (SCC) that are found in the Northern Cape:

Bitis caudalis (Horned adder), Bitis schneideri (Namaqua dwarf adder), Bitis xeropaga (Desert mountain adder) and Lamprophis fiski (Fisk's house snake). All four are protected species. It is highly likely that horned adder and desert mountain adder are present in the study area and surrounding areas, but not Namaqua dwarf adder. Fisk's house snake is extremely rare and unknown, and is difficult to say whether it might occur in the general region of the study area or not.

5.2 Socio-economic Environment

5.2.1 Level of unemployment

Employment opportunities are an area of concern in the municipality. The total population size of this municipality is 68 929 and the unemployment rate is estimated at 10%. Amongst the working population (15–65 years) in the area, constituting of 70.5% of the total population, it is estimated that 10% are unemployed. One of the main reasons for the low levels of self-employment can be attributed to the low skills base in the municipality, especially skills related to entrepreneurship. Only 3.6% of the population aged 20+ partook in higher education enrolment.

The slow pace at which the largest sector (mining, agriculture, manufacturing, and business services) is growing also contributes to the growing unemployment of the area. Employment opportunities and average salary base are also somewhat limited in terms of the type of opportunities that exists. As a result, most individuals obtaining a higher education relocate to a different area or province where employment in a specific field of interest exists.

5.2.2 Economic Profile

The lack of energy resources within rural areas of South Africa is recognized as a major factor retarding socio-economic development.

The total population of the Kai !Garib Local Municipality is 68 929, and the key economic sectors contributing to the overall economy are made up of agriculture, manufacturing, and business services.

Agriculture is by far the largest economic sector contributing to employment opportunities in the area. Agriculture makes up for 51.8% of the main economic sectors in the Local Municipality, with community and government services catering for 15.9%.

5.2.3 Level of education

In 2016, an approximate 5.6% of the total population residing in the Kai !Garib Local Municipality had no form of schooling. Coupled with those individuals who only completed some form of primary education (a further 20.9%). As such approximately a quarter of the population had limited educational skills, which in turn would hinder their employability on the general employment market. It is statistically proven that an estimate 3.6% of the population obtained a higher education.

5.3 Cultural and Heritage

The literature review and field research confirmed that the project area is situated within a contemporary cultural landscape dotted with settlements with long local history. In terms of the archaeology and heritage with respect to the proposed Oasis-Taaipit 132kv powerline deviation alternative there are no obvious 'Fatal Flaws' or 'No-Go' areas.

The Heritage Impact study noted that the proposed powerline development route is located within a degraded area, and have reduced sensitivity for the presence of high significance physical cultural site remains, be they archaeological, historical or burial sites, due to previous disturbances resulting from mainly agriculture activities in the area. However, the absence of confirmable and significant archaeological cultural heritage sites is not evidence in itself that such sites did not exist in the proposed powerline route. There is potential of recovering significant archaeological remains beneath the surface. In addition, some sections were not easily accessible due to the steep nature of the project site. Significance of the sites of Interest is not limited to presence or absence of physical archaeological sites.

The study, did not find any permanent barriers to the proposed powerline upgrade. The following recommendations are based on the results of the AIA/HIA research, cultural heritage background review, site inspection and assessment of significance. The deviation Alternatives are all viable from an archaeological perspective, however **Alternative 2** for the Deviation on the ridge is the most preferred because it is shorter and less likely to cause any serious impacts to subsurface remains. All the potential impacts associated with the development site can be mitigated without serious design alterations. The project may be approved subject to the following recommendations:

- The proposed development may be approved to proceed as planned under observation that construction work does not extend beyond the surveyed site.

- Both deviation alternatives are viable from and archaeological and heritage perspective
- The foot print impact of the proposed development should be kept to minimal to limit the possibility of encountering chance finds within servitude.
- Location of the proposed development infrastructure should be restricted to minimum footprint impact especially where such infrastructure falls within bushy area. Such bushy sections have local ethno-botany significance as sources of traditional herbs and medicines. As such disruption and vegetation clearance should be minimal.
- Overall, impacts to heritage resources are not considered to be significant for the project receiving environment. It is thus concluded that the project may be cleared to proceed as planned subject to the Heritage Authority ensuring that a detailed heritage monitoring procedures are included in the project EMP for the construction phase, include chance archaeological finds mitigation procedure in the project EMP (See Appendix 1 of the Heritage Impact Report).
- The chance finds process will be implemented when necessary especially when archaeological materials and burials are encountered during subsurface construction activities.
- If archaeological materials are uncovered, work should cease immediately and the SAHRA be notified and activity should not resume until appropriate management provisions are in place.
- If during the construction or operations phases of this project, any person employed by the developer, any of its subsidiaries, contractors and subcontractors, or service provider, finds any artifacts of cultural significance, work must cease at the site of the find and this person must report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- The senior-site manager must then make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area before informing SAHRA/PHRA.
- If a human grave/burial is encountered, the remains must be left as undisturbed as possible before the local police and SAHRA or PHRA are informed. If the burial is deemed to be over 60 years old and no foul play is suspected, an emergency rescue permit may be issued by SAHRA for an archaeologist to exhume the remains.
- The Project Public Participation Process should ensure that any cultural heritage related matters for this project are given due attention whenever they arise and are communicated PHRA throughout the proposed project development. This form of extended community involvement would pre-empty any potential disruptions that may arise from previously unknown cultural heritage matter that may have escaped the attention of this study.
- The findings of this report, with approval of the PHRA/SAHRA, may be classified as accessible to any interested and affected parties within the limits of the laws.

All specialist studies are attached in Appendix F.

5.4 Ambient Noise

Noise control regulations and SANS 10103: 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 applicant must adhere to the relevant provincial noise control legislation (if any) as well as SANS 10103. Working hours should be restricted to 07h00 to 18h00 Monday to Friday excluding public holidays unless otherwise agreed with adjacent landowners.

5.5 Visual Assessment

A level 3 Visual Impact Assessment (VIA) was conducted for the project. From a visual impact perspective, it can be stated that the study area is of a moderate to high visual quality. To the north of the site there is a major ridge with surrounding open space. To the south there are the Orange River and wine vineyards surrounding the river and Kakamas. The cumulative visual impact of the proposed Alternative 1 and Alternative 2 (Preferred) powerline deviation is expected to be **Low-Negative**. It's expected that the proposed deviation will not increase the amount of visual receptors already experiencing visual exposure on the existing powerline other than small additional sections on the main roads. The change in exposure between the existing powerline and proposed deviation is expected to be minimal. For the deviation at Oasis substation, it's expected that the visual impact should reduce slightly as a result of the proximity of the deviation from the residential areas in the vicinity. One significant change will be the type of structures used for this existing powerline. The current structures consist of 5 pole wooden structures. The monopole steel structures will be used for the deviation and will also replace the wooden poles on the existing line. This will increase the level of visibility mainly in areas within 3km from the site as steel is not absorbed as easily into the landscape as wooden structures.

Even though the level of significance are very similar for both Alternative 1 and 2, after conducting the visual exposure and sensitive receptor maps, the results show that Alternative 1 will experience more visual exposure than Alternative 2. This is mostly due to Alternative 1 following a route on top of the ridge that is more than 358 meters longer than that of Alternative 2. This makes Alternative 1 more visible to visual receptors.

From a visual perspective, Alternative 2 will be the preferred route for this project. There are no fatal flaws from a visual perspective regarding the location of the realignment at Oasis substation, the deviation Alternative 2 north of Kakamas and refurbishments from 5 pole wooden structure to steel monopoles. It is recommended that the proposed project goes ahead, provided that recommended mitigation measures are implemented in a diligent manner.

Refer to Appendix F for the VIA report.

5.6 Wetland Assessment

The Study Site is located in the Orange Catchment in the quaternary drainage catchment D73F.

There are no wetlands (including salt pans) or dams in the area or located near the Site. There is, however, multiple channels or drainage lines in the valley within the Study Area, which are defined as watercourses. These watercourses are addressed as:

- unnamed watercourse(s), which do not have a riparian area or aquatic ecology. These watercourses can be defined as drainage lines;
- one watercourse which had a small riparian area (no aquatic ecology), because there seems to be a "constant" supply of water from a leaking water supply or sewage overflow from a township area,
- alternative routes crossing, and or
- Orange River (watercourse).

The identified watercourses are dry drainage lines, which only flow during rainstorm events. These watercourses do not have riparian areas, or banks and beds that can be identified separately from the surrounding terrestrial terrain. Except that the watercourses are defined by the channels that have formed because of a flow of water. Also, there are slightly higher numbers of terrestrial flora (plants and bushes) within or bordering these watercourses.

Another watercourse identified in the region was the Orange River. This watercourse was not investigated further because it is more than 2.5 km away from the Study Site.

It can be concluded that the impacts of the Alternative 1 or Alternative 2 routes will be very low. Most of the possible mitigating actions will be implemented if the basic recommendations as listed in this report are followed.

Construction and Maintenance Phase

- During refurbishing of the existing lines no new watercourse crossings in terms of access roads to be made. Only existing crossings and access roads in the area of watercourses to be used.
- Any existing pylons positioned directly within the main channel of any watercourses to be moved to outside of the main channel, where possible and with minimal of disturbance.
- In terms of the refurbishment of the existing crossing over the Orange River, great care needs be taken not to remove any additional riparian zone vegetation, if not totally necessary.
- The proposed position of the new pylon to located in the valley for the deviation route as described as Alternative 2 a be relocated at approximate 30 m further east away from the watercourse edge. This will give a 50 m buffer zone from the edge of

the watercourse and working radius for the construction of the pylon, reducing the potential impact on the watercourse where practical;

- Temporary facilities (including portable toilets) should preferably be positioned or setup within existing disturbed areas where possible.
- Only existing access roads to be used by vehicles during construction as far as possible.
- Disturbed surface areas arising during the construction phase to be rehabilitated. No open trenches to be left. No mounds of soils created during construction to be left.
- All construction material, equipment and any foreign objects brought into the area by contractors to be removed immediately after completion of the construction phase.
- Proper rubbish/waste bins to be provided. These to be emptied at least weekly and the waste to be removed to an official waste disposal site.
- Any erosion arising during the construction phase to be maintained during the construction phase and completely rehabilitated at the end of the construction phase.

Refer to Appendix F for the wetland assessment.

5.7 Avifauna Assessment

No priority species were sighted during field investigations. By this time all migratory birds (summer visitors) would have left the region. Secondly, the site investigations were limited to a single day, which further limits the ability to fully assess and list all birds frequenting the area. Only a few common bird species were observed, including laughing dove (*Streptopelia senegalensis*), cape turtle dove (*Streptopelia capicola*).

The study area is not situated in or nearby any Important Bird Areas (IBAs). The closest IBA is the Augrabies Falls National Park, which is approximately 33km northwest of the study site. The region will be frequented by numerous bird species, including a number of raptors, especially in the summertime when all migratory birds have returned to the region. A number of these species will include priority species. Priority species most likely to occur in the immediate region of the study area are, Ludwig's bustard, kori bustard, Martial eagle, Verreaux's (Black) eagle and Sclater's lark. The statuses of Ludwig's bustard (*Neotis ludwigii*) and Kori bustard (Ardeotis kori) are Endangered (EN) and Protected (P), respectively. It is unlikely that the two bustard species will be commonly present in the study area, due to unfavourable habitat. Sclater's lark (*Spizocorys sclateri*), which is listed as Near Threatened, is most likely to occur in the study area. The lark is an uncommon resident and partial nomad in arid Nama-Karoo habitat and favours stony plains. Sclater's lark is also strongly associated with kalkgras (Enneapogon desvauxii), which is found in the study area. Other priority species that should be noted in terms of their likely presence in the general region are martial eagle (*Polemaetus bellicosus*), black harrier (*Circus maurus*), pale chanting goshawk (*Melierax canorus*), booted eagle (*Aquila pennatus*), Verreaux's (Black) eagle (*Aquila verreauxii*) and lanner falcon (*Falco biarmicus*).

Table 5-3: Avifaunal Impact Assessment

Major Impacts:	Mitigation Measures:
Displacement of priority species due to habitat destruction and disturbance Displacement of priority species due to habitat destruction and disturbance Electrocution of Red Data species Collision of Red Data species	Taking all of the above into consideration the following mitigating measures during the construction phase are recommended: • Sections of line that will require the application of bird flight diverters (BFDs) are indicated on the accompanying sensitivity map. • The proposed BFD is the Double Loop Bird Flight Diverter. BFDs should be placed on the earth wires, staggered, alternating black and white, 10 metres apart. • No pylons to be erected within the main channel of a watercourse. • During construction, if any bird species are observed nesting or roosting in the vicinity (not necessary just within the power line servitude) then a bird specialist needs to be contacted immediately to do a site inspection and evaluation. • Nesting birds are not to be disturbed. • Preferably (if possible) to do the construction of the line across the Orange River during winter or early spring. This during a time period when there are less birds around and most birds are not nesting or breeding. The maintenance should have very little added impact on the physical environment in general and bird habitats in particular. The greatest risk is that of disturbance. Implementing the following mitigating measures will however further assist in reducing impacts and disturbances to the avifaunal component. o Only use existing roads and vehicle paths. o Do not drive through watercourses unless over an existing bridge. o Avoid areas where birds are nesting. o Ensure that all install BFDs are maintained and replaced if missing.

From an **Avifaunal point of view, Alternative 2 preferred** as it is shorter and passes over less of the ridges, which implies a lower potential for bird collisions and electrocutions. Refer to Appendix F for the avifaunal assessment.

5.8 Ecological Assessment

From an Ecological Impact Assessment point of view, there is very little difference between the two alternatives. The deviation routes are not only short, but the servitude is very linear and narrow, which drastically reduces the potential negative impacts. Furthermore, the nature of a powerline is such that the actual footprint on the ground is minimal. The biggest impact of the powerline is the potential impacts on birds in terms of collisions and to a lesser extent electrocutions. It must be kept in mind that the study site is sensitive overall due to the ridges and drainage lines, as the presence of quiver trees on top of the ridge.

The biggest difference between the two alternatives is that Alternative 1 runs on top of a ridge for double the distance than Alternative 2. Ridges are sensitive and this ridge has a number of quiver trees present. It is therefore, best for the powerline to get off the ridge in as short a distance as possible. **For this reason, Alternative 2 is the preferred ecological recommendation**.

Please refer to **Table 5-4** below for the Impacts and Mitigation measures identified in the Ecological Impact Assessment:

Table 5-4: Ecological Impact Assessment

Impacts:	Mitigation Measures:
Impacts on Plains & ridges	• Ridges are sensitive and are full of quiver trees, which is a protected tree. • Only a single vehicle track access road to be constructed on the ridge area. No area for a road to be scrapped or graded. • Erosion control to be put in place along access road and monitored after any rain downpours. (It is understood that the area is an arid area, but downpours could easily cause erosion on the steep, bare gradients). • Powerline poles (pylons) erected on the ridge to be kept to an absolute minimum to avoid and reduce impacts on the ridge. • The footprint around the poles (pylons) during the construction phase to be kept to a maximum of 20m radius around each pole. • No temporary storage facilities, lay-down areas, offices, etc. are allowed on top of the ridge at all. • A tree permit will be required to remove and transplant any quiver trees that may be impacted on. • All other succulents in the way of pole positions also to be lifted and replanted. • No wild animals may be captured or killed if encountered (including snakes). If snakes are encountered it must immediately be reported to the Supervisor and ECO. A

	professional must then capture and relocate the animal.
Impacts on Watercourses	• All watercourses (even dry drainage lines) need to be approached as sensitive. • Only a single vehicle track access road to be constructed in the valley lowlands in the area of the watercourses. No broad access roads to be graded. • Erosion control to be put in place along access road and monitored after any rain downpours. (It is understood that the area is an arid area, but downpours could easily cause erosion on the steep, bare gradients). • No poles to be erected within the main channels of any watercourses. • No poles to be erected within a 20m bufferzone of the edge of any watercourse were practical. • No temporary storage facilities, lay-down areas, offices, etc. are allowed within 100m of the edge of any watercourse. • No wild animals may be captured or killed if encountered (including snakes). If snakes are encountered it must immediately be reported to the Supervisor and ECO. A professional must then capture and relocate the animal.

From an Ecological point of view, Alternative 2 is preferred as it extends over shorter and less sensitive area.

Refer to Appendix F for the Ecological Assessment.

CHAPTER 6: IMPACT ASSESSMENT

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6 Potential Impacts and Impact Assessment

All key issues associated with this project, have been investigated in full during this BAR process by the specialist team and categorised in terms of their biophysical and socio-economic parameters (please refer to **Appendix F** for their reports). All the impacts have accordingly been assessed and their significance have been summarised in **Table 6-1**.

Table 6-1: Potential Impacts

Activity	Impact summary	Significance	Proposed mitigation
Alternative 1			
Construction Phase			
Increased soil erosion due to the removal of vegetation along servitude route	***Direct Impact*** *Soil erosion and degradation*	Very low	• Undertake vegetation clearing during the dry season; • Only clear vegetation where absolutely necessary; and • Stockpile areas will be decided and approved by the Project Manager and appointed ECO before construction commences on site and should not be located within drainage lines.
Floral destruction due to vegetation clearance activities taking place along the proposed powerline routes	***Direct impact*** *Loss of flora due to construction activities*	Very low	• Construction impacts must be contained within the footprint of the pylon structures and / or the servitude routes of the powerline; • Use existing access roads as far as possible; • Avoid strip clearing; • Vegetation should be removed only where construction is to take place; • During construction phase, existing access roads should be used where possible especially in the wooded habitats where a lot of vegetation will have to be removed if there is no access; • Clearing of the servitude should be as narrow as possible to prevent major destruction of habitats; • No trees may be affected in the grassland habitats where sufficient space is available for the tweaking of pylon positions;

Activity	Impact summary	Significance	Proposed mitigation
			• A road management plan should be compiled, showing allocated access points and roads, to prevent tracks all over the landscape; and • The removal of large sections of woodland in densely wooded areas should be avoided.
Faunal displacement due to vegetation clearance activities taking place along the proposed powerline routes	***Direct impact*** *Loss of fauna due to construction activities*	Very low	• Construction impacts must be contained within the footprint of the pylon structures and / or the servitude routes of the powerline; • Use existing access roads as far as possible; • Vegetation clearance should be conducted systematically from the start to the end of the route to allow fauna to move away; • Sequential construction should occur in order to allow faunal species to move away from the area of disturbance; • Construction activities should be restricted to daylight hours when the majority of faunal species are inactive; • No animals may be snared, captured or wilfully damaged or killed; • Clearing of the servitude should be as narrow as possible to prevent major destruction of habitats;
Increase in traffic volumes and associated congestion due to the transportation and construction vehicles travelling to and from the construction site	***Direct impact*** *Increase in traffic congestion due to the construction vehicles*	Very low	• Limit construction vehicle movement during peak periods; and • Use existing access roads as far as possible
Change in visual aesthetics due to	***Direct impact*** *Adjacent residents may be*	Very low	• Construction vehicles should be kept in demarcated areas only so as to reduce the visual intrusion of the construction activities;

Activity	Impact summary	Significance	Proposed mitigation
construction activities, placement of construction equipment and disposal of construction waste material	*visually impacted on the unsightliness of the construction camp (depending on the location of the camp).*		• During construction, all materials and stockpiles will be covered with tarps to prevent erosion, as well as dust arising from it, and to mitigate the visibility thereof (where required and as directed by the ECO); • Construction workers must ensure and implement good housekeeping practises to minimise the visual impact of waste and discarded materials; and • Construction activities to be kept to normal daytime working hours as far as possible to prevent the impact of floodlights and other sights during resting hours.
Soil contamination due to spillage of hazardous substances, oil and fuel leaks at the construction site from the transportation and construction vehicles as well as accidental spillages	***Direct impact*** *Degradation of the soil due to spillages*	Very low	• Store fuels and chemicals in an impermeable bunded area; • Provide staff with hazardous materials training; • Chemical toilets to be used on site, grey water should be disposed of off-site at a licensed waste treatment works; • No storage of fuel on site, vehicles to be fuelled off-site; • No mixing of cement/concrete should take place within 30m of aquatic features or in natural vegetation; • No servicing or repair of vehicles on site (unless absolutely necessary); • No concrete mixing on site unless on a mortar board; • Water used to clean concrete off of machinery should be treated as grey water and disposed of at a licensed water treatment works; • Construction vehicles should be maintained on a regular basis so as to prevent oil spills/leaks; • Drip trays should be places under vehicles when not in use; and • If a hydrocarbon spillage occurs, it must be cleaned up immediately and disposed of at an appropriate registered landfill site.
Increased risk of alien invasion for vegetation species due to	***Direct impact*** *Increase in alien invasive species due to vegetation*	Very low	• An alien management plan must be implemented as directed by the ECO. The plan should limit vegetation clearing to the servitude of the powerline and no more. This plan must be developed prior to construction.

Activity	Impact summary	Significance	Proposed mitigation
unmanaged vegetation clearing activities taking place on site	*clearing activities*		
Loss of avifauna and roosting sites due to the clearance of vegetation for the powerline servitude	***Direct impact*** *Loss of avifaunal species and roosting sites*	Very low	• The construction corridor of the selected alignment should be closely inspected before the start of construction in order to locate any active nests; • Reduce the construction time where possible and schedule construction activities around avian breeding schedules where practical; • Lower the levels of associated noise; and • Restrict the construction activities to the footprint area. Do not allow any access to the remainder of the properties. Make maximum use of existing roads.
Impacts on the archaeological resources due to construction activities associated with the pylon structures	***Direct impact*** *Loss of archaeological resources such as rock art, stone tools etc.*	Very low	• Any known sites (any graves and/or archaeological sites) should be avoided by both the pylons and any access roads that may need to be constructed; • Excavation of archaeological sites could be conducted if impacts to the site cannot be avoided;
Impacts on the palaeontological resources due to the construction activities associated with the pylon structures	***Direct impact*** *Loss of palaeontological resources due to construction activities.*	Very low	• If any palaeontological materials (such as dense bone accumulations) are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.
Temporary job creation during the construction of	***Direct impact*** *Unskilled labour force may*	Very low positive	• The development should proceed and should employ local labour as far as possible.

Activity	Impact summary	Significance	Proposed mitigation
the proposed powerline and associated infrastructure	*be required for construction activities*		
Potential increase in HIV/ AIDS in the area due to construction workers (migrant labour) associated with the proposed development	***Indirect impact*** *Due to the increase in workforce within the town, there may potentially be an increase in sexually transmitted diseases*	Very low	• HIV & AIDS awareness talks should be given to the workers on a regular basis by the relevant personnel.
Impacts on agriculture potential and expansion due to the placement of the pylon structures in existing potential farm lands resulting in the minor loss of arable land or potential expansion of farming activities.	***Indirect impact*** *Due to the location of pylon structures and the servitude restrictions, farming activities may be compromised*	Very low	• Locate pylon structures within natural fire breaks within the currently farmed areas (where possible). • Compensate farmers for the loss of arable land / servitude restrictions.
Operational Phase			
Economic growth and development in the surrounding area due to the strengthening of the existing electricity network to a point where	***Direct impact*** *Due to the powerline stabling the electricity grid and allowing for future development- economic benefits will be realised*	Moderate positive	• Continue with the proposed development and ensure that the line is maintained.

Activity	Impact summary	Significance	Proposed mitigation
it is stable and reliable and allowing future development and expansion of operations in the area			
Increased risk of alien invasion for vegetation species due to the disturbance in the landscape during operational and maintenance activities	***Direct impact*** *Increase in alien invasive species*	Low	• Areas disturbed due to maintenance activities should be rehabilitated as quickly as possible; • Soil stockpiles should not be trans-located from areas with alien plants into the site; • Within the site, alien plants on stockpiles must be controlled so as to avoid the development of a solid seed bank of alien plants within the stock-piled soil; • Any alien plants must be immediately controlled to avoid establishment of a soil seed bank; and • Create an integrated alien invasive management programme to be implemented during maintenance activities.
Increased collision and electrocution of avifauna and resulting mortality of these large terrestrial bird species due to building nests on pylon structures	***Direct impact*** *Loss of avifauna due to electrocution and collisions*	Very low	• Informed selection of low impact alignments for new powerlines relative to movements and concentrations of high risk species; • Use of either static or dynamic marking devices to make the lines and the earthwires more conspicuous; • Ensure that all new lines are marked with bird flight diverters along their entire length using industry standard markers and marker fitting protocols; • Identified high risk sections of the powerline needs to be installed with a suitable anti-bird collision marking device approved by Eskom, and as per the Eskom standards; • Fit bird perching bracket to the top of the pole;

Activity	Impact summary	Significance	Proposed mitigation
Floral destruction and faunal displacement due to clearing or trimming of natural vegetation located within the servitude of the powerline as part of routine maintenance operations	***Direct impact*** *Maintenance activities resulting in the loss of flora and fauna*	Very low	• Maintenance impacts must be contained within the footprint of the pylon structures and / or the servitude routes of the powerline; • Ensure that unnecessary impacts on natural vegetation do not occur; • Vegetation clearance should be conducted systematically from the start to the end of the route to allow fauna to move away; • Avoid strip clearing; • Maintenance activities should be restricted to daylight hours when the majority of faunal species are inactive; and • No animals may be snared, captured or wilfully damaged or killed.
Degradation of the cultural landscape and scenic qualities of the environment due to the proposed powerline extending across such landscape	***Direct impact*** *Visual intrusion of the powerline*	Very low	• Align the power line as close as possible to existing powerlines so as to keep visual impacts clustered.
Increased soil erosion due to the deterioration of access roads to the powerline servitude for operation and routine maintenance activities	***Indirect impact*** *Soil erosion due to maintenance activities*	Very low	• Apply the appropriate erosion protection measures where erosion is identified; • Regular maintenance of the identified access roads as and when required; • Improve the access of the identified access roads to ensure suitable passage for equipment, erosion control and maintenance of proper drainage; and • Maintenance staff to stay on the designated access roads at all times.

Activity	Impact summary	Significance	Proposed mitigation
Stimulation and growth of the local economy due to the provision of a stable electricity supply which will lead to the steady growth and economic development of the surrounding regions	***Cumulative impact*** *Taking into consideration the future infrastructural upgrades that will occur, the local economy will increase*	High positive	• Infrastructure maintenance should be prioritised to ensure that the provision of stable electricity is not interrupted and future upgrades along this corridor should be encouraged.
Decommissioning Phase			
Please note that due to the nature of the project and the fact that the project is an infrastructural project, decommissioning is not envisaged. However should decommissioning occur, the following impacts may be applicable:			
Waste generation in the forms of generating metal and concrete waste during decommissioning activities	***Direct impact*** *Solid waste generation due to decommissioning activities.*	Very low	• Waste generation must be managed according to Eskom's guidelines and standards; and • All materials that can be recycled must be recycled where possible. The rest of the rubble must be disposed of at an appropriate landfill site.
Soil contamination due to hydrocarbon spills which may occur from vehicles to be used to carry out various decommissioning activities	***Direct impact*** *Soil degradation due to decommissioning activities*	Very low	• Contaminated soil must be removed and disposed of at an appropriate registered landfill site; • Heavy vehicles must be service and maintained regularly.
Alternative 2			
Construction Phase			
Impacts same as Alternative 1			

Activity	Impact summary	Significance	Proposed mitigation
Operational Phase			
Impacts same as Alternative 1 with the exception of:			
Increased risk of alien invasion for vegetation species due to the disturbance in the landscape during operational and maintenance activities	***Direct impact*** *Increase in alien invasive species*	Very low	• Areas disturbed due to maintenance activities should be rehabilitated as quickly as possible; • Soil stockpiles should not be trans-located from areas with alien plants into the site; • Within the site, alien plants on stockpiles must be controlled so as to avoid the development of a solid seed bank of alien plants within the stock-piled soil; • Any alien plants must be immediately controlled to avoid establishment of a soil seed bank; and • Create an integrated alien invasive management programme to be implemented during maintenance activities.
Decommissioning Phase			
Impacts same as Alternative 1			
No-Go Option			
No additional job creation	***Direct impacts:*** No additional jobs will be created if the construction of the powerline does not commence	High negative	• Commence with the proposed powerline construction

Activity	Impact summary	Significance	Proposed mitigation
Inhibition of economic growth and development	***Direct impacts:*** If the powerline is not constructed, inhibition of the economic growth and development of the surrounding regions will occur.	High negative	• Commence with the proposed powerline construction

6.1 Impact Assessment Methodology

The objective of the assessment of impacts is to identify and assess all the significant impacts that may arise as a result of the proposed development.

For each of the main project phases the existing and potential future impacts and benefits (associated only with the proposed development) were described using the criteria listed in below. This was done in accordance with Government Notice R.543, promulgated in terms of Section 24 of the NEMA and the criteria drawn from the IEM Guidelines Series, Guideline 5: Assessment of Alternatives and Impacts, published by the DEAT (April 1998).The assignment of ratings has been undertaken based on past experience of the EIA team, as well as through research. Subsequently, mitigation measures have been identified and considered for each impact and the assessment repeated in order to determine the significance of the residual impacts (the impact remaining after the mitigation measure has been implemented).

Table 6-2: Proposed Criteria and rating Scales which were used in the Assessment of the Potential Impacts

Criteria	Rating Scales	Notes
Nature	Positive	An evaluation of the effect of the impact related to the proposed development.
	Negative	
Extent	Footprint	The impact only affects the area in which the proposed activity will occur.
	Site	The impact will affect only the development area.
	Local	The impact affects the development area and adjacent properties.
	Regional	The effect of the impact extends beyond municipal boundaries.
	National	The effect of the impact extends beyond more than 2 regional/ provincial boundaries.
	International	The effect of the impact extends beyond country borders.

Criteria	Rating Scales	Notes
Duration	Temporary	The duration of the activity associated with the impact will last 0-6 months.
	Short term	The duration of the activity associated with the impact will last 6-18 months.
	Medium term	The duration of the activity associated with the impact will last 18 months-5 years.
	Long term	The duration of the activity associated with the impact will last more than 5 years.
Severity	High negative	The severity of the impact is rated as High negative as the natural, cultural or social functions and processes are altered to the extent that the natural process will temporarily or permanently cease; and valued, important, sensitive or vulnerable systems or communities are substantially affected.
	Moderate negative	The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected
	Low negative	The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected
	Low positive	The severity of the impact is rated as Low positive as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally improved
	Moderate positive	The severity of the impact is rated as Moderate positive as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important,

Criteria	Rating Scales	Notes
		sensitive or vulnerable systems or communities are positively affected
	High positive	The severity of the impact is rated as High positive as the natural, cultural or social functions and processes are altered to the extent that valued, important, sensitive or vulnerable systems or communities are substantially positively affected.
Potential for impact on irreplaceable resources	No	No irreplaceable resources will be impacted.
	Yes	Irreplaceable resources will be impacted.
Consequence	Extremely detrimental	A combination of extent, duration, intensity and the potential for impact on irreplaceable resources.
	Highly detrimental	
	Moderately detrimental	
	Slightly detrimental	
	Negligible	
	Slightly beneficial	
	Moderately beneficial	
	Highly beneficial	
	Extremely beneficial	
Probability (the likelihood of the impact occurring)	Unlikely	It is highly unlikely or less than 50 % likely that an impact will occur.
	Likely	It is between 50 and 75 % certain that the impact will occur.
	Definite	It is more than 75 % certain that the impact will occur or it is definite that the impact will occur.
Significance	Very high - negative	A function of Consequence and Probability.
	High - negative	
	Moderate - negative	
	Low - negative	
	Very low	
	Low - positive	
	Moderate - positive	
	High - positive	
	Very high - positive	

Table 6-3: Explanation of Assessment Criteria

Criteria	Explanation
Nature	This is an evaluation of the type of effect the construction, operation and management of the proposed development would have on the affected environment. Will the impact change in the environment be positive, negative or neutral?
Extent or Scale	This refers to the spatial scale at which the impact will occur. Extent of the impact is described as: footprint (affecting only the footprint of the development), site (limited to the site) and regional (limited to the immediate surroundings and closest towns to the site). Extent or scale refers to the actual physical footprint of the impact, not to the spatial significance. It is acknowledged that some impacts, even though they may be of small extent, are of very high importance, e.g. impacts on species of very restricted range. In order to avoid "double counting, specialists have been requested to indicate spatial significance under "intensity" or "impact on irreplaceable resources" but not under "extent" as well.
Duration	The lifespan of the impact is indicated as temporary, short, medium and long term.
Severity	This is a relative evaluation within the context of all the activities and the other impacts within the framework of the project. Does the activity destroy the impacted environment, alter its functioning, or render it slightly altered?
Impact on irreplaceable resources	This refers to the potential for an environmental resource to be replaced, should it be impacted. A resource could possibly be replaced by natural processes (e.g. by natural colonisation from surrounding areas), through artificial means (e.g. by reseeding disturbed areas or replanting rescued species) or by providing a substitute resource, in certain cases. In natural systems, providing substitute resources is usually not possible, but in social systems substitutes are often possible (e.g. by constructing new social facilities for those that are lost). Should it not be possible to replace a resource, the resource is essentially irreplaceable e.g. red data species that are restricted to a particular site or habitat of very limited extent.
Consequence	The consequence of the potential impacts is a summation of above criteria, namely the extent, duration, intensity and impact on irreplaceable resources.
Probability of occurrence	The probability of the impact actually occurring based on professional experience of the specialist with environments of a similar nature to the site and/or with similar projects. It is important to distinguish between probability of the impact

Criteria	Explanation
	occurring and probability that the activity causing a potential impact will occur. Probability is defined as the probability of the impact occurring, not as the probability of the activities that may result in the impact.
Significance	Impact significance is defined to be a combination of the consequence (as described below) and probability of the impact occurring. The relationship between consequence and probability highlights that the risk (or impact significance) must be evaluated in terms of the seriousness (consequence) of the impact, weighted by the probability of the impact actually occurring. In simple terms, if the consequence and probability of an impact is high, then the impact will have a high significance. The significance defines the level to which the impact will influence the proposed development and/or environment. It determines whether mitigation measures need to be identified and implemented and whether the impact is important for decision-making.
Degree of confidence in predictions	Specialists and the EIA team were required to provide an indication of the degree of confidence (low, medium or high) that there is in the predictions made for each impact, based on the available information and their level of knowledge and expertise. Degree of confidence is not taken into account in the determination of consequence or probability.
Mitigation measures	Mitigation measures are designed to reduce the consequence or probability of an impact, or to reduce both consequence and probability. The significance of impacts has been assessed both with mitigation and without mitigation.

Table 6-4: Impact Assessment Criteria and Rating Scales

Duration		Extent		Irreplaceable Resources		Severity	Consequence = (Duration+Extent+Irr) x Severity		Likelihood		Significance		Confidence
1	Temporary	1	Footprint	1	Yes	-3	High - negative	-25 to -33	Extremely detrimental	1	Unlikely	-73 to -99	Very high - negative	Low
2	Short term	2	Site	0	No	-2	Moderate - negative	-19 to -24	Highly detrimental	2	Likely	-55 to -72	High - negative	Medium
3	Medium term	3	Local			-1	Low -negative	-13 to -18	Moderately detrimental	3	Definite	-37 to -54	Moderate - negative	High
4	Long term	4	Regional					-7 to -12	Slightly detrimental			-19 to -36	Low - negative	
		5	National			1	Low -positive	0 to -6	Negligible			0 to -18	Very low - negative	
		6	International			2	Moderate - positive							
						3	High - positive	0 to 6	Negligible			0 to 18	Very Low - positive	
								7 to 12	Slightly beneficial			19 to 36	Low - positive	
								13 to 18	Moderately beneficial			37 to 54	Moderate - positive	
								19 to 24	Highly beneficial			55 to 72	High - positive	
								25 to 33	Extremely beneficial			73 to 99	Very high - positive	

6.1.1 Ascribing Significance for Decision-Making

The best way of expressing the environmental costs/impacts and the inherent benefit implications for decision-making is to present them as risks. Risk is defined as the consequence (implication) of an event multiplied by the probability (likelihood)1 of that event. Many risks are accepted or tolerated on a daily basis because even if the consequence of the event is serious, the likelihood that the event will occur is low. A practical example is the consequence of a parachute not opening, is potentially death but the likelihood of such an event happening is so low that parachutists are prepared to take that risk and hurl themselves out of an airplane. The risk is low because the likelihood of the consequence is low even if the consequence is potentially severe.

It is also necessary to distinguish between the event itself (as the cause) and the consequence. Again using the parachute example, the consequence of concern in the event that the parachute does not open is serious injury or death, but it does not necessarily follow that if a parachute does not open that the parachutist will die.

Various contingencies are provided to minimise the likelihood of the consequence (serious injury or death) in the event of the parachute not opening, such as a reserve parachute. In risk terms this means distinguishing between the inherent risk (the risk that a parachutist will die if the parachute does not open) and the residual risk (the risk that the parachutist will die if the parachute does not open but with the contingency of a reserve parachute) i.e. the risk before and after mitigation.

6.1.2 Consequence

The ascription of significance for decision-making becomes then relatively simple. It requires the consequences to be ranked and likelihood to be defined of that consequence. In **Table 6-5** below a scoring system for consequence ranking is shown. Two important features should be noted in the table, namely that the scoring doubles as the risk increases and that there is no equivalent 'high' score in respect of benefits as there is for the costs. This high negative score serves to give expression to the potential for a fatal flaw where a fatal flaw would be defined as an impact that cannot be mitigated effectively and where the associated risk is accordingly untenable. Stated differently, the high score on the costs, which is not matched on the benefits side, highlights that such a fatal flaw cannot be 'traded off' by a benefit and would render the proposed project to be unacceptable.

Table 6-5: Ranking of Consequence

Environmental Cost	Inherent risk
Human health – morbidity / mortality, loss of species	High
Material reductions in faunal populations, loss of livelihoods, individual economic loss	Moderate – high
Material reductions in environmental quality – air, soil, water.	Moderate

[1] Because 'probability' has a specific mathematical/empirical connotation the term 'likelihood' is preferred in a qualitative application and is accordingly the term used in this document.

Loss of habitat, loss of heritage, amenity	
Nuisance	Moderate – low
Negative change – with no other consequences	Low
Environmental Benefits	**Inherent benefit**
Net improvement in human welfare	Moderate – high
Improved environmental quality – air, soil, water. Improved individual livelihoods	Moderate
Economic Development	Moderate – Low
Positive change – with no other consequences	Low

6.1.3 Likelihood

Although the principle is one of probability, the term 'likelihood' is used to give expression to a qualitative rather than quantitative assessment, because the term 'probability' tends to denote a mathematical/empirical expression. A set of likelihood descriptors that can be used to characterise the likelihood of the costs and benefits occurring, is presented in **Table 6-6.**

Table 6-6: Likelihood categories and definitions

Likelihood Descriptors	Definitions
Highly unlikely	The possibility of the consequence occurring is negligible
Unlikely but possible	The possibility of the consequence occurring is low but cannot be discounted entirely
Likely	The consequence may not occur but a balance of probability suggests it will
Highly likely	The consequence may still not occur but it is most likely that it will
Definite	The consequence will definitely occur

It is very important to recognise that the likelihood question is asked twice. The first time the question is asked is the likelihood of the cause and the second as to the likelihood of the consequence. In the tables that follow the likelihood is presented of the cause and then the likelihood of the consequence is presented. A high likelihood of a cause does not necessarily translate into a high likelihood of the consequence. As such the likelihood of the consequence is not a mathematical or statistical 'average' of the causes but rather a qualitative estimate in its own right.

6.1.4 Residual Risk

The residual risk is then determined by the consequence and the likelihood of that consequence. The residual risk categories are shown in **Table 6-7** where consequence scoring is shown in the rows and likelihood in the columns. The implications for decision-making of the different residual risk categories are shown in **Table 6-8.**

Table 6-7: Residual risk categories

		Residual risk				
Consequence	High	Moderate	High	High	Fatally flawed	
	Moderate – high	Low	Moderate	High	High	High
	Moderate	Low	Moderate	Moderate	Moderate	Moderate
	Moderate – low	Low	Low	Low	Low	Moderate
	Low	Low	Low	Low	Low	Low
		Highly unlikely	Unlikely but possible	Likely	Highly likely	Definite
		Likelihood				

Table 6-8: Implications for decision-making of the different residual risk categories

Rating	Nature of implication for Decision – Making
Low	Project can be authorised with low risk of environmental degradation
Moderate	Project can be authorised but with conditions and routine inspections
High	Project can be authorised but with strict conditions and high levels of compliance and enforcement
Fatally Flawed	The project cannot be authorised

6.2 Impact Assessment: Alternative 1

In comparison from a Heritage and Wetland Assessment view the impact of Alternatives 1 and 2 are very similar. However, from an ecological point of view the Alternative 1 is much longer than Alternative 2 as so would impact on a greater area. This also places a greater risk on Avifauna even though the significance ratings are the same, the EAP prefers Alternative 2.

Alternative 1 crosses on top of a ridge for double the length, as does Alternative 2. Ridges are sensitive and this ridge has a number of quiver trees present. It is therefore, best for the powerline to get off the ridge in as short a distance as possible.

Alternative 1 is not recommended as the preferred alternative.

Table 6-9: Alternative 1 Soil Erosion

SOIL EROSION				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT	*Increased soil erosion due to the removal of vegetation along servitude route.*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-12*	*3*
EXTENT	*2*	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	*-3*	*The severity of the impact is rated as High negative as the natural, cultural or social functions and processes are altered to the extent that the natural process will temporarily or permanently cease; and valued, important, sensitive or vulnerable systems or communities are substantially affected.*	***Slightly Detrimental***	***Definite***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-36***	***low - negative***		
PROPOSED MITIGATION MEASURES				
Undertake vegetation clearing during the dry season;				
Only clear vegetation where absolutely necessary; and				

Stockpile areas will be decided and approved by the Project Manager and appointed ECO before construction commences on site and should not be located within drainage lines.				
POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-6*	*2*
EXTENT	1	*The extent of the impact is rated as footprint as it only affects the area in which the proposed activity will occur*		
SEVERITY	-2	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Neglible***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-12**	**very low negative**		
CONFIDENCE LEVEL				
Medium				

Table 6-10: Alternative 1 Loss of Vegetation

LOSS OF VEGETATION				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT	*Floral destruction due to vegetation clearance activities taking place along the proposed powerline routes.*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-8*	*3*
EXTENT	*2*	*The extent of the impact is rated as site as it will affect only the development area*		

SEVERITY	*-2*	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly Detrimental***	***Definite***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-24***	***low - negative***		
PROPOSED MITIGATION MEASURES				
Construction impacts must be contained within the footprint of the pylon structures and / or the servitude routes of the powerline;				
Use existing access roads as far as possible;				
Vegetation should be removed only where construction is to take place;				
During construction phase, existing access roads should be used where possible especially in the wooded habitats where a lot of vegetation will have to be removed if there is no access;				
Clearing of the servitude should be as narrow as possible to prevent major destruction of habitats;				
No trees may be affected in the grassland habitats where sufficient space is available for the tweaking of pylon positions;				
A road management plan should be compiled, showing allocated access points and roads, to prevent tracks all over the landscape; and				
The removal of large sections of woodland in densely wooded areas should be avoided.				
POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-4*	*2*
EXTENT	2	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Neglible***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-8**	**very low negative**		
CONFIDENCE LEVEL				
High				

Table 6-11: Alternative 1 Loss of Fauna

LOSS OF FAUNA				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT	*Faunal displacement due to vegetation clearance activities taking place along the proposed powerline routes.*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-8*	*3*
EXTENT	*2*	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	*-2*	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly Detrimental***	***Definite***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-24***	***low - negative***		
PROPOSED MITIGATION MEASURES				
Construction impacts must be contained within the footprint of the pylon structures and / or the servitude routes of the powerline;				
Use existing access roads as far as possible;				
Vegetation clearance should be conducted systematically from the start to the end of the route to allow fauna to move away;				
Sequential construction should occur in order to allow faunal species to move away from the area of disturbance;				
Construction activities should be restricted to daylight hours when the majority of faunal species are inactive;				
No animals may be snared, captured or wilfully damaged or killed;				
Clearing of the servitude should be as narrow as possible to prevent major destruction of habitats;				
POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-4*	*2*

EXTENT	2	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Neglible***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-8**	**very low negative**		
CONFIDENCE LEVEL				
High				

Table 6-12: Alternative 1 Increased Traffic Congestion

INCREASED TRAFFIC CONGESTION				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT	*Increased traffic congestion due to construction vehicles*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-5*	*2*
EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	*-1*	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Neglible***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-10***	***very low negative***		
PROPOSED MITIGATION MEASURES				
Limit construction vehicle movement during peak periods; and				
Use existing access roads as far as possible				

POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-4*	*1*
EXTENT	2	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Neglible***	***Unlikley***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-4**	**very low negative**		
CONFIDENCE LEVEL				
High				

Table 6-13: Alternative 1 Changes in Visual Aesthetics

CHANGE IN VISUAL AESTHETICS				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT	*Change in visual aesthetics due to construction activities, placement of construction equipment and disposal of construction waste material*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-4*	*2*
EXTENT	*2*	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	*-1*	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Neglible***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		

SIGNIFICANCE	***-8***	***very low negative***		
PROPOSED MITIGATION MEASURES				
Construction vehicles should be kept in demarcated areas only so as to reduce the visual intrusion of the construction activities;				
During construction, all materials and stockpiles will be covered with tarps to prevent erosion, as well as dust arising from it, and to mitigate the visibility thereof (where required and as directed by the ECO);				
Construction workers must ensure and implement good housekeeping practices to minimise the visual impact of waste and discarded materials; and				
Construction activities to be kept to normal daytime working hours as far as possible to prevent the impact of floodlights and other sights during resting hours.				
POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-4*	*1*
EXTENT	2	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Neglible***	***Unlikley***
IMPACT ON IRREPLACEABLE RESOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-4**	**very low negative**		
CONFIDENCE LEVEL				
High				

Table 6-14: Alternative 1 Soil Degradation

SOIL DEGRADATION				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT	*Soil degradation due to spillages*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-4*	*2*

EXTENT	*2*	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	*-1*	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Neglible***	***Likely***
IMPACT ON IRREPLACEABLE RESOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-8***	***very low negative***		
PROPOSED MITIGATION MEASURES				
Store fuels and chemicals in an impermeable bunded area;				
Provide staff with hazardous materials training;				
Chemical toilets to be used on site, grey water should be disposed of off-site at a licensed waste treatment works;				
No storage of fuel on site, vehicles to be fuelled off-site;				
No mixing of cement/concrete should take place within 30m of aquatic features or in natural vegetation;				
No servicing or repair of vehicles on site (unless absolutely necessary);				
No concrete mixing on site unless on a mortar board;				
Water used to clean concrete off of machinery should be treated as grey water and disposed of at a licensed water treatment works;				
Construction vehicles should be maintained on a regular basis so as to prevent oil spills/ leaks;				
Drip trays should be places under vehicles when not in use; and				
If a hydrocarbon spillage occurs, it must be cleaned up immediately and disposed of at an appropriate registered landfill site.				
POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-4*	*1*
EXTENT	2	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Neglible***	***Unlikley***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		

SIGNIFICANCE	**-4**	**very low negative**
CONFIDENCE LEVEL		
High		

Table 6-15: Alternative 1 Increase in Alien Invasive Species

INCREASE IN ALIEN INVASIVE SPECIES				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT	*Increase in alien invasive species due to vegetation clearance activities*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-12*	*2*
EXTENT	*2*	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	*-3*	*The severity of the impact is rated as High negative as the natural, cultural or social functions and processes are altered to the extent that the natural process will temporarily or permanently cease; and valued, important, sensitive or vulnerable systems or communities are substantially affected.*	***Slightly Detrimental***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-24***	***low - negative***		
PROPOSED MITIGATION MEASURES				
An alien management plan must be implemented as directed by the ECO. The plan should limit vegetation clearing to the servitude of the powerline and no more. This plan must be developed prior to construction or as instructed by the ECO.				
POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-8*	*2*
EXTENT	2	*The extent of the impact is rated as site as it will affect only the development area*		

SEVERITY	-2	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly Detrimental***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-16**	**very low negative**		
CONFIDENCE LEVEL				
Medium				

Table 6-16: Alternative 1 Avifaunal Habitat Destruction

AVIFAUNAL HABITAT DESTRUCTION				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT	*Loss of Avifaunal species and roosting sites*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-8*	*2*
EXTENT	*2*	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	*-2*	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly Detrimental***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-16***	***very low negative***		
PROPOSED MITIGATION MEASURES				

The construction corridor of the selected alignment should be closely inspected before the start of construction in order to locate any active nests;				
Reduce the construction time where possible and schedule construction activities around avian breeding schedules where practical;				
Lower the levels of associated noise; and				
Restrict the construction activities to the footprint area. Do not allow any access to the remainder of the properties. Make maximum use of existing roads.				
POST-MITIGATION				
DURATION	1	*The duration of the activity associated with the impact will last 0-6 months and as such is rated as Temporary*	*-4*	*1*
EXTENT	1	*The extent of the impact is rated as footprint as it only affects the area in which the proposed activity will occur*		
SEVERITY	-2	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Neglible***	***Unlikley***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-4**	**very low negative**		
CONFIDENCE LEVEL				
High				

Table 6-17: Alternative 1 Loss of Archaeological Resources

LOSS OF ARCHAEOLOGICAL RESOURCES				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT	*Loss of archaeological resources due to construction activities.*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-8*	*1*

EXTENT	*2*	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	*-2*	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly Detrimental***	***Unlikley***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-8***	***very low negative***		
PROPOSED MITIGATION MEASURES				
Any known sites (any graves and/or archaeological sites) should be avoided by both the pylons and any access roads that may need to be constructed;				
Excavation of archaeological sites could be conducted if impacts to the site cannot be avoided;				
POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-8*	*1*
EXTENT	2	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	-2	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly Detrimental***	***Unlikley***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-8**	**very low negative**		
CONFIDENCE LEVEL				
High				

Table 6-18: Alternative 1 Loss of Palaeontological Resources

LOSS OF PALAEONTOLOGICAL RESOURCES				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT	*Loss of palaeontological resources due to construction activities.*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-8*	*1*
EXTENT	*2*	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	*-2*	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly Detrimental***	***Unlikley***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-8***	***very low negative***		
PROPOSED MITIGATION MEASURES				
If any palaeontological materials (such as dense bone accumulations) are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.				
POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-8*	*1*
EXTENT	2	*The extent of the impact is rated as site as it will affect only the development area*		

SEVERITY	-2	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly Detrimental***	***Unlikley***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-8**	**very low negative**		
CONFIDENCE LEVEL				
High				

Table 6-19: Alternative 1 Temporary employment

TEMPORARY EMPLOYMENT				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT	*Temporary job creation during construction phase.*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*5*	*2*
EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	*1*	*The severity of the impact is rated as Low positive as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally improved*	***Neglible***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***10***	***very low positive***		
PROPOSED MITIGATION MEASURES				
The development should proceed and should employ local labour as far as possible.				

POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*5*	*2*
EXTENT	3	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	1	*The severity of the impact is rated as Low positive as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally improved*	***Neglible***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**10**	**very low positive**		
CONFIDENCE LEVEL				
Medium				

Table 6-20: Alternative 1 Increase in HIV / AIDS

INCREASE IN HIV/ AIDS				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT				
INDIRECT IMPACT	*Potential increase in HIV/ AIDS in the area due to construction workers*			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-10*	*2*
EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	*-2*	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively*	***Slightly Detrimental***	***Likely***

		affected		
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-20***	***low - negative***		
PROPOSED MITIGATION MEASURES				
HIV & AIDS awareness talks should be given to the workers on a regular basis by the relevant personnel.				
POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-5*	*2*
EXTENT	3	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Neglible***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-10**	**very low negative**		
CONFIDENCE LEVEL				
Medium				

Table 6-21: Alternative 1 Loss of Agricultural Potential

LOSS OF AGRICULTURAL POTENTIAL				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT				
INDIRECT IMPACT	*Potential loss of agricultural land due to servitude restrictions*			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is*	*-8*	*2*

		rated as Short term		
EXTENT	*2*	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	*-2*	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly Detrimental***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-16***	***very low negative***		
PROPOSED MITIGATION MEASURES				
Locate pylon structures within natural fire breaks within the currently farmed areas (where possible).				
POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term*	*-4*	*2*
EXTENT	2	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Neglible***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-8**	**very low negative**		
CONFIDENCE LEVEL				
Medium				

Table 6-22: Alternative 1 Economic Growth and Development

ECONOMIC GROWTH AND DEVELOPMENT				
PROJECT PHASE	*Operational Phase*			
DIRECT IMPACT	*Economic growth and development in the surrounding area due to more reliable pylon structures*			
INDIRECT IMPACT				
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*4*	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*14*	*3*
EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	*2*	*The severity of the impact is rated as Moderate positive as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are positively affected*	***Moderately Beneficial***	***Definite***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***42***	***moderate positive***		
PROPOSED MITIGATION MEASURES				
Continue with the proposed development and ensure that the line is maintained.				
POST-MITIGATION				
DURATION	4	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*14*	*3*
EXTENT	3	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		

SEVERITY	2	*The severity of the impact is rated as Moderate positive as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are positively affected*	***Moderately Beneficial***	***Definite***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**42**	**moderate positive**		
CONFIDENCE LEVEL				
Medium				

Table 6-23: Alternative 1 Increase in Invasive Species

INCREASE IN ALIEN INVASIVE SPECIES				
PROJECT PHASE	*Operational Phase*			
DIRECT IMPACT	*Increase in alien invasive species due to vegetation clearance activities*			
INDIRECT IMPACT				
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*4*	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*-18*	*2*
EXTENT	*2*	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	*-3*	*The severity of the impact is rated as High negative as the natural, cultural or social functions and processes are altered to the extent that the natural process will temporarily or permanently cease; and valued, important, sensitive or vulnerable systems or communities are substantially affected.*	***Moderately Detrimental***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-36***	***low - negative***		

PROPOSED MITIGATION MEASURES				
Areas disturbed due to maintenance activities should be rehabilitated as quickly as possible;				
Soil stockpiles should not be trans-located from areas with alien plants into the site;				
Within the site, alien plants on stockpiles must be controlled so as to avoid the development of a solid seed bank of alien plants within the stock-piled soil;				
Any alien plants must be immediately controlled to avoid establishment of a soil seed bank; and				
Create an integrated alien invasive management Programme to be implemented during maintenance activities.				
POST-MITIGATION				
DURATION	4	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*-12*	*2*
EXTENT	2	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	-2	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly Detrimental***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-24**	**low - negative**		
CONFIDENCE LEVEL				
Medium				

Table 6-24: Alternative 1 Loss of Avifauna

LOSS OF AVIFAUNA				
PROJECT PHASE	*Operational Phase*			
DIRECT IMPACT	*Loss of avifauna due to electrocution and collisions*			
INDIRECT IMPACT				
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*4*	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*-18*	*2*
EXTENT	*2*	*The extent of the impact is rated as site as it will affect only*		

		the development area		
SEVERITY	*-3*	*The severity of the impact is rated as High negative as the natural, cultural or social functions and processes are altered to the extent that the natural process will temporarily or permanently cease; and valued, important, sensitive or vulnerable systems or communities are substantially affected.*	***Moderately Detrimental***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-36***	***low - negative***		
PROPOSED MITIGATION MEASURES				
Informed selection of low impact alignments for new powerlines relative to movements and concentrations of high risk species;				
Use of either static or dynamic marking devices to make the lines and the earthwires more conspicuous;				
Ensure that all new lines are marked with bird flight diverters along their entire length using industry standard markers and marker fitting protocols;				
Identified high risk sections of the powerline needs to be installed with a suitable anti-bird collision marking device approved by Eskom, and as per the Eskom standards; and				
Fit bird perching bracket to the top of the pole.				
POST-MITIGATION				
DURATION	4	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*-12*	*1*
EXTENT	2	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	-2	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly Detrimental***	***Unlikley***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-12**	**very low negative**		

CONFIDENCE LEVEL
High

Table 6-25: Alternative 1 Loss of Fauna and Flora

LOSS OF FAUNA AND FLORA				
PROJECT PHASE	*Operational Phase*			
DIRECT IMPACT	*Loss of fauna and flora due to maintenance activities*			
INDIRECT IMPACT				
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*4*	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*-12*	*2*
EXTENT	*2*	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	*-2*	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly Detrimental***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-24***	***low - negative***		
PROPOSED MITIGATION MEASURES				
Maintenance impacts must be contained within the footprint of the pylon structures and / or the servitude routes of the powerline;				
Ensure that unnecessary impacts on natural vegetation do not occur;				
Vegetation clearance should be conducted systematically from the start to the end of the route to allow fauna to move away;				
Avoid strip clearing;				
Maintenance activities should be restricted to daylight hours when the majority of faunal species are inactive; and				
No animals may be snared, captured or wilfully damaged or killed.				
POST-MITIGATION				

DURATION	4	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*-6*	*2*
EXTENT	2	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Neglible***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-12**	**very low negative**		
CONFIDENCE LEVEL				
Medium				

Table 6-26: Alternative 1: Aesthetic Degradation

AESTHETIC DEGRADATION				
PROJECT PHASE	*Operational Phase*			
DIRECT IMPACT	*Visual intrusion of the powerline*			
INDIRECT IMPACT				
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*4*	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*0*	*1*
EXTENT	*2*	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	*0*	*Neglible*	***Neglible***	***Unlikley***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***0***	***very low negative***		
PROPOSED MITIGATION MEASURES				
Align the power line as close as possible to existing powerline servitude so as to keep visual impacts clustered.				
POST-MITIGATION				

DURATION	4	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*0*	*1*
EXTENT	2	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	0	*Neglible*	***Neglible***	***Unlikley***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**0**	**very low negative**		
CONFIDENCE LEVEL				
Medium				

Table 6-27: Alternative 1 Soil Erosion

SOIL EROSION				
PROJECT PHASE	*Operational Phase*			
DIRECT IMPACT	*Soil erosion due to maintenance activities*			
INDIRECT IMPACT				
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*4*	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*-10*	*1*
EXTENT	*1*	*The extent of the impact is rated as footprint as it only affects the area in which the proposed activity will occur*		
SEVERITY	*-2*	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly Detrimental***	***Unlikley***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-10***	***very low negative***		
PROPOSED MITIGATION MEASURES				

Apply the appropriate erosion protection measures where erosion is identified;				
Regular maintenance of the identified access roads as and when required;				
Improve the access of the identified access roads to ensure suitable passage for equipment, erosion control and maintenance of proper drainage; and				
Maintenance staff to stay on the designated access roads at all times.				
POST-MITIGATION				
DURATION	4	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*-5*	*1*
EXTENT	1	*The extent of the impact is rated as footprint as it only affects the area in which the proposed activity will occur*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Neglible***	***Unlikley***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-5**	**very low negative**		
CONFIDENCE LEVEL				
Medium				

Table 6-28: Alternative 1 Increased Local Economic Development

INCREASED LOCAL ECONOMIC DEVELOPMENT				
PROJECT PHASE	*Operational Phase*			
DIRECT IMPACT				
INDIRECT IMPACT				
CUMULATIVE IMPACT	*Stimulation and growth of the local economy due to the provision of a stable electricity supply due to more reliable pylon structures.*			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*4*	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*21*	*3*
EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and*		

		adjacent properties		
SEVERITY	*3*	*The severity of the impact is rated as High positive as the natural, cultural or social functions and processes are altered to the extent that valued, important, sensitive or vulnerable systems or communities are substantially positively affected.*	***Highly Beneficial***	***Definite***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***63***	***high positive***		
PROPOSED MITIGATION MEASURES				
Infrastructure maintenance should be prioritized to ensure that the provision of stable electricity is not interrupted and future upgrades along this corridor should be encouraged.				
POST-MITIGATION				
DURATION	4	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*21*	*3*
EXTENT	3	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	3	*The severity of the impact is rated as High positive as the natural, cultural or social functions and processes are altered to the extent that valued, important, sensitive or vulnerable systems or communities are substantially positively affected.*	***Highly Beneficial***	***Definite***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**63**	**high positive**		
CONFIDENCE LEVEL				
High				

6.3 Impact Assessment: Alternative 2 (Preferred)

Environmental impacts associated with the deviation can be successfully mitigated to acceptable levels if the recommended mitigation measures in the EMPr are adhered to. The total length of the deviation, impacts associated on the area's Avifauna, and ecological resources have thus proven the most influential factor in concluding that this option is preferred.

The impacts associated with Alternative 2 is the same as that for alternative 1 however, based on the findings of the Specialist Impact Assessment Reports, it is the opinion of the EAP that **Alternative 2 be chosen as the preferred Route Deviation Alternative** for this project.

Table 6-29: Alternative 2 Increase in Invasive Species

INCREASE IN ALIEN INVASIVE SPECIES				
PROJECT PHASE	*Operational Phase*			
DIRECT IMPACT	*Increase in alien invasive species due to vegetation clearance activities*			
INDIRECT IMPACT				
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*4*	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*-12*	*2*
EXTENT	*2*	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	*-2*	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly Detrimental***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-24***	***low - negative***		
PROPOSED MITIGATION MEASURES				
Areas disturbed due to maintenance activities should be rehabilitated as quickly as possible;				
Soil stockpiles should not be trans-located from areas with alien plants into the site;				

Within the site, alien plants on stockpiles must be controlled so as to avoid the development of a solid seed bank of alien plants within the stock-piled soil;				
Any alien plants must be immediately controlled to avoid establishment of a soil seed bank; and				
Create an integrated alien invasive management programme to be implemented during maintenance activities.				
POST-MITIGATION				
DURATION	4	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*-12*	*1*
EXTENT	2	*The extent of the impact is rated as site as it will affect only the development area*		
SEVERITY	-2	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly Detrimental***	***Unlikley***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-12**	**very low negative**		
CONFIDENCE LEVEL				
Medium				

Table 6-30: Alternative 2 No-Go Option

NO JOB CREATION				
PROJECT PHASE	*No-Go Option*			
DIRECT IMPACT	*No additional job opportunities*			
INDIRECT IMPACT				
CUMULATIVE IMPACT				
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*4*	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*-21*	*3*

EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	*-3*	*The severity of the impact is rated as High negative as the natural, cultural or social functions and processes are altered to the extent that the natural process will temporarily or permanently cease; and valued, important, sensitive or vulnerable systems or communities are substantially affected.*	***Highly detrimental***	***Definite***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-63***	***high negative***		
PROPOSED MITIGATION MEASURES				
Commence with the proposed powerline construction				
POST-MITIGATION				
DURATION	4	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*-21*	*3*
EXTENT	3	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	-3	*The severity of the impact is rated as High negative as the natural, cultural or social functions and processes are altered to the extent that the natural process will temporarily or permanently cease; and valued, important, sensitive or vulnerable systems or communities are substantially affected.*	***Highly detrimental***	***Definite***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-63**	**high negative**		

CONFIDENCE LEVEL
High

ECONOMIC STAGNATION				
PROJECT PHASE	*No-Go Option*			
DIRECT IMPACT	*Inhibition of economic growth and development*			
INDIRECT IMPACT				
CUMULATIVE IMPACT				
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*4*	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*-21*	*3*
EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	*-3*	*The severity of the impact is rated as High negative as the natural, cultural or social functions and processes are altered to the extent that the natural process will temporarily or permanently cease; and valued, important, sensitive or vulnerable systems or communities are substantially affected.*	***Highly detrimental***	***Definite***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-63***	***high negative***		
PROPOSED MITIGATION MEASURES				
Commence with the proposed powerline construction				
POST-MITIGATION				
DURATION	4	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*-21*	*3*
EXTENT	3	*The extent of the impact is rated as Local as it affects the development*		

		area and adjacent properties		
SEVERITY	-3	*The severity of the impact is rated as High negative as the natural, cultural or social functions and processes are altered to the extent that the natural process will temporarily or permanently cease; and valued, important, sensitive or vulnerable systems or communities are substantially affected.*	***Highly detrimental***	***Definite***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-63**	**high negative**		
CONFIDENCE LEVEL				
High				

6.3.1 Defining the Implications of the Impacts for Decision-Making

In the specialist studies, impacts were defined as a potential change to the environment as a result of the construction or operation of the proposed Project.

In order to provide simplification, it is necessary to recognise that many of the impacts presented above, are in fact a series of changes that result in one overarching consequence.

As such the approach has been to interrogate the specialist studies and identify and describe the collective implications of all the impacts presented. In the process a distinction is then made between the collective implication of the various impacts and the causes of the implication. These implications have then been presented as either potential environmental costs (where the implications are negative) or as potential environmental benefits (where the implications are positive).

6.3.2 Potential Environmental Costs

The following potential environmental costs have been identified from the specialist studies that were conducted for the EIA on the proposed Eskom Oasis-Taaipit 132Kv Powerline Deviation Project:

- Social Reductions/deteriorations
    - Nuisance (Noise, Aesthetics etc.)
    - Loss of Heritage
    - Loss of Agricultural Potential

- Biophysical reductions deteriorations:
    - Displacement of Species
    - Material Reductions in Fauna, Avifauna and Flora

6.3.3 Potential Environmental Benefits

The following potential benefits have been identified from the specialist studies that were conducted for the EIA on the proposed Eskom Oasis-Taaipit 132Kv Powerline Deviation Project:

- Social Improvements:
    - Social Upliftment
    - Job creation
    - Economic Growth

6.3.4 Nuisance

Nuisance was determined to be a ***MODERATE LOW*** inherent risk. The most significant causes of irritation and nuisance to surrounding residents is listed as follows:

- Noise
- Aesthetics
- Environmental Pollution (odour, dust etc.)
- Unacceptable Social Behaviour
- Disturbance to landowners, and businesses

Based on all of the causes above, the likelihood of Nuisances occurring was determined to be Likely resulting in a Low residual risk.

Table 6-31: The residual risk of Nuisance due to risk sources associated with the proposed project

Potential Environmental Cost	Nuisance	
Inherent risk	**MODERATE-LOW**	
Causes of risk	**Likelihood of causes**	
	Alternative 1	**Alternative 2**
Visual	Unlikely but possible	Unlikely but possible
Traffic congestion	Unlikely but possible	Unlikely but possible
Waste Generation	Definite	Definite
Likelihood of consequence	**Unlikely but possible**	**Unlikely but possible**
Residual risk	**Low**	**Low**

6.3.5 Heritage Resources

The environmental cost of a loss of Heritage Resources is a ***Low*** inherent risk.

The likelihood of this consequence was considered to be **Highly Unlikely.**

Table 6-32: The residual risk of loss of heritage resources due to the various risk sources associated with the proposed project

Potential Heritage Costs	Heritage Impacts	
Inherent risk	**Low**	
Causes of risk	**Likelihood of causes**	
	Alternative 1	**Alternative 2**
Loss of Archaeological Resources	Highly Unlikely	Highly Unlikely
Loss of Palaeontological Resources	Highly Unlikely	Highly Unlikely
Likelihood of consequence	**Highly Unlikely**	**Highly Unlikely**
Residual risk	**Low**	**Low**

6.3.6 Loss of Agricultural Potential

Loss of Agricultural Potential was determined to be a ***MODERATE LOW*** inherent risk.

Table 6-33: The residual risk of loss of agricultural potential due to the various risk sources associated with the proposed project

Potential Environmental Cost	Loss of agricultural potential	
Inherent risk	**Moderate - Low**	
Causes of risk	**Likelihood of causes**	
	Alternative 1	**Alternative 2**
Loss of Agricultural Potential	Unlikely but possible	Unlikely but possible
Likelihood of consequence	**Unlikely but possible**	**Unlikely but possible**
Residual risk	**Low**	**Low**

6.3.7 Material Reductions in Fauna, Avifauna and Flora

Material reductions in Fauna, Avifauna and Flora is a ***Moderate High*** inherent risk.
The following causes of this risk may result in material reductions in threatened species

- Disturbance of species with conservational value
- Loss and disturbance of Habitat

Table 6-34: The residual risk of Biodiversity loss due to the various risk sources associated with the proposed project

Potential Environmental Cost	Biodiversity loss	
Inherent risk	**Moderate - high**	
Causes of risk	**Likelihood of causes**	
	Alternative 1	**Alternative 2**
Loss of Vegetation	Definite	Likely
Loss of Avifauna	Unlikely but possible	Unlikely but possible
Loss of Avifauna Habitat	Likely	Likely
Loss of Fauna	Highly likely	Likely
Increase in Alien Invasive Species	Highly likely	Highly likely
Likelihood of consequence	**Unlikely but possible**	**Unlikely but possible**
Residual risk	**Moderate**	**Moderate**

6.3.8 Soil Degradation

Soil degradation is rated as having a ***Moderate*** inherent risk.

Table 6-35: The residual risk of soil degradation due to the various risk sources associated with the proposed project

Potential Environmental Cost	Soil degradation	
Inherent risk	**MODERATE**	
Causes of risk	**Likelihood of causes**	
	Alternative 1	**Alternative 2**
Loss of Vegetation	Definite	Likely
Soil Contamination	Highly likely	Likely
Likelihood of consequence	**Definite**	**Likely**
Residual risk	**Moderate**	**Moderate**

6.3.9 Economic Growth

As with all projects, we can't ignore the benefits to society. Economic growth as benefit if rated as ***Moderate-High*** potential benefit.

Table 6-36: The inherent benefit of improved economic growth due to the various risk sources associated with the proposed project

Potential Economic Benefit	Economic growth	
Inherent risk	**Moderate - High**	
Causes of risk	**Likelihood of causes**	
	Alternative 1	**Alternative 2**
Temporary Employment	Highly Likely	Highly Likely
Local Economic development	Likely	Likely
Likelihood of consequence	**Highly Likely**	**Highly Likely**
Residual risk	**High Positive**	**High Positive**

6.3.10 Increase Morbidity due to HIV/ AIDS and STDs

The inherent risk of an increase in Morbidity is rated as **High**.

Table 6-37: The residual risk of increase in Morbidity associated with the proposed project

Potential Environmental Cost	Increased morbidity	
Inherent risk	**High**	
Causes of risk	**Likelihood of causes**	
	Alternative 1	**Alternative 2**
Increase in HIV/AIDS/STDs	Likely	Likely
Likelihood of consequence	**Likely**	**Likely**
Residual risk	**High**	**High**

6.4 Environmental Impact Summary

It has been illustrated that with the implementation of the mitigation measures and Environmental Management Programme, all the identified impacts can be mitigated to acceptable levels. As such, environmental impacts associated with all deviation alternatives can be successfully mitigated to acceptable levels if the recommended mitigation measures in the EMPr are adhered to. Through the identified consequences, we can see that the majority of them are Moderate to Moderate-Low with some falling under the High rating.

With a Moderate rating, the DEA must consider that the Project can be authorised but with conditions and routine inspections. With the High ratings, the Project can be authorised but with strict conditions and high levels of compliance and enforcement

In summary and based on this detailed assessment and the various specialist studies, it is the EAP's opinion that the proposed project with ***Alternative 2 (preferred)*** be authorised with strict conditions and routine inspections stipulated within the authorisation. This will ensure that all impacts are monitored efficiently.

6.4.1 No-Go Alternative

The No-go alternative in the context of this project implies that the deviation to the powerline not be constructed. Eskom will not be able to efficiently inspect and proactively maintain their pylons which may lead to longer periods of maintenance than if they powerline were diverted and upgraded.

The "no–go" alternative is therefore not considered to be the preferred alternative.

CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

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7 Conclusion and Recommendations

GIBB (Pty) Ltd (GIBB) has been appointed by Eskom Holdings SOC Ltd, Eskom Distribution – Northern Cape Operating Unit (Eskom) (via Trans-Africa Projects), to undertake an environmental authorisation process in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended (NEMA) and the Environmental Impact Assessment Regulations of 2014, as amended for the deviation and refurbishment of the existing 132kV powerline from the Oasis substation to the Taaipit substation, Northern Cape Province (refer to Figure 1). A 200m corridor was assessed along the existing 132 kV 42 km powerline route and each of the proposed deviation routes to determine the environmental impacts and significance of these impacts associated with the proposed development. Eskom has applied for environmental authorisation from the National Department of Environmental Affairs (DEA), Reference number: **14/12/16/3/3/1/1866.**

In terms of the EIA Regulations of 2014 (as amended), an application of this nature, based on the triggers identified, has to undergo a Basic Assessment Reporting process (BAR) prior to issuing an Environmental Decision. As such, GIBB has been commissioned to undertake the environmental assessment process.

This report thus represents the outcomes of the BAR process and also the tasks that have been undertaken as part of the BAR process thus far which included the following:

- Identification of stakeholders and/ or Interested and Affected Parties (I&APs); Notification of I&APs by means of newspaper advertisements and site notice erection;
- Specialist studies; and
- On-going consultation and engagement.

The Draft Basic Assessment Report was made available for public review and comment for a period of 30 calendar days (**Thursday, 18 January 2018 to Friday, 16 February 2018).** Concerns raised by I&APs and key stakeholders during the public participation process were captured in a Comments and Response Report which is included in the Final Basic Assessment Report that will be submitted to the Competent Authority.

7.1 EAP Recommendations

As outlined in Chapter 6 (Potential Impacts and Impact Assessment) of the Final BAR, all impacts associated with the proposed refurbishment and deviation to the Eskom Oasis-Taaipit 132Kv Powerline can be mitigated to acceptable levels. The majority of the project footprint will be contained within the existing Powerline route. There will also be little clearance of vegetation along the road reserve.

At a regional level, the study area lies within the Northern Cape Province and is situated within the Kai !Garib Local Municipality. The route for the proposed powerline deviation

extending from the Oasis substation to the Taaipit substation, is an approximate distance of 42.5km. The study site consists of two alternatives for the powerline route deviation. The deviation is located along the line near Lutzburg and has two alternatives. Alternative 1 is approximately 1 020m long and Alternative 2 (preferred) is approximately 700m long. The entire route, including the deviation is to be upgraded from the wooden 5-pole pylon structure to the steel monopole pylon structures and the re-alignment of the powerline at the Oasis substation to enhance the arrangement at the substation.

Direct impacts associated with the development on the receiving environment are therefore mitigated to a low – very low significance as shown in Chapter 6.

The EAP therefore recommends that the DEA grant a positive Environmental Authorisation (EA) for the proposed development of the Project **Alternative 2** as the preferred alternative. The following recommended conditions, should be considered for inclusion in the EA:

- Due to the envisaged construction period it is requested that the environmental authorisation is valid for a period of 5 years;
- The EMPr is a legally binding document and must be implemented;
- An independent ECO must be appointed to ensure compliance with the EMPr;
- General environmental compliance monitoring must be undertaken by a suitably qualified environmental control office on a monthly basis as a minimum to ensure that basic environmental best practices are followed and that conditions of the environmental authorisation are complied with. The presence of an on-site environmental officer is strongly recommended to monitor daily operations.

- Recommendations as provided in the specialist reports must be considered.

7.2 Specialist Recommendations

Recommendations and mitigation measures as provided in the Specialist Reports (**Appendix F**) have been incorporated into the EMPr which is a legally binding document. The key conclusions are provided in **Table 7-1** below:

Table 7-1: Specialist Recommendations/Conclusions

Specialist Study	Conclusions and Recommendations
Heritage	The project may be approved subject to the following recommendations: • The proposed development may be approved to proceed as planned under observation that construction work does not extend beyond the surveyed site. • Both deviation alternatives are viable from and archaeological and heritage perspective • The foot print impact of the proposed development should be kept

Specialist Study	Conclusions and Recommendations
	to minimal to limit the possibility of encountering chance finds within servitude. • Location of the proposed development infrastructure should be restricted to minimum footprint impact especially where such infrastructure falls within bushy area. Such bushy sections have local ethno-botany significance as sources of traditional herbs and medicines. As such disruption and vegetation clearance should be minimal. • Overall, impacts to heritage resources are not considered to be significant for the project receiving environment. It is thus concluded that the project may be cleared to proceed as planned subject to the Heritage Authority ensuring that a detailed heritage monitoring procedures are included in the project EMP for the construction phase, include chance archaeological finds mitigation procedure in the project EMP (See Appendix 1 of the Heritage Impact Report). • The chance finds process will be implemented when necessary especially when archaeological materials and burials are encountered during subsurface construction activities. • If archaeological materials are uncovered, work should cease immediately and the SAHRA be notified and activity should not resume until appropriate management provisions are in place. • If during the construction or operations phases of this project, any person employed by the developer, any of its subsidiaries, contractors and subcontractors, or service provider, finds any artifacts of cultural significance, work must cease at the site of the find and this person must report this find to their immediate supervisor, and through their supervisor to the senior on-site manager. • The senior-site manager must then make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area before informing SAHRA/PHRA. • If a human grave/burial is encountered, the remains must be left as undisturbed as possible before the local police and SAHRA or PHRA are informed. If the burial is deemed to be over 60 years old and no foul play is suspected, an emergency rescue permit may be issued by SAHRA for an archaeologist to exhume the remains. • The findings of this report, with approval of the PHRA/SAHRA, may be classified as accessible to any interested and affected parties within the limits of the laws.

Specialist Study	Conclusions and Recommendations
Wetland	The following conclusions from the study are: • A number of small, insignificant drainage lines are encountered throughout the study area. • A network of drainage lines where identified in the valley below the mountain ridge over which the existing powerline crosses into that valley and in the area of the proposed line deviation. • The identified watercourses (drainage lines or small dry streams) across most of the study site (with the exception of the Orange River) are dry, highly ephemeral, drainage lines, which only flow during heavy rainstorm events. Even during times of short, active flow from rare heavy storms, these drainage lines seldom flow along their full length. • These watercourses (drainage lines) do not have distinctive riparian areas, stream banks or streambeds that can be easily identified separately from the surrounding terrestrial terrain. Except that the shallow channels that have formed because of a flow of water over many years define the watercourses. There are also slightly higher numbers of common, terrestrial flora (plants and bushes) within or bordering these watercourse stream channels. There is a marked lack of distinctive aquatic flora within or along these watercourses (with the exception of the Orange River). • PES of the Orange River is a Category E (Seriously modified). • PES of the Unnamed Watercourses is a Category B (Largely natural). • EIS of the Orange River is a Category B (High). • EIS of the Unnamed Watercourses is a Category C (Moderate). • The potential impact on these watercourses will be very low to non-measurable, as long as the proposed recommendations are followed during the construction and maintenance phases. The biggest potential risk of negative impacts is during the construction / upgrade phase. • The proposed position of the new pylon to located in the valley for the deviation route as described as Alternative 2 be relocated at approximate 30 m further east away from the watercourse if possible. • There are **no 'fatal flaws'**, in terms of the water environment for the continuation of constructing, operating and maintaining a deviation for the Oasis – Taaipit 132 kV powerline.
Visual	There are certain mitigation measures that need to be implemented in order to reduce the significance of visual impact on the receiving

Specialist Study	Conclusions and Recommendations
	environment. These measures include: • Reduce the construction period through careful logistical planning and productive implementation of resources • Reduce construction activities to daylight hours where possible in order to reduce lighting impacts • Rehabilitate all disturbed areas immediately after construction. • Where possible, natural vegetation around the power line deviation and mono pole sites must be retained. • If vegetation is to be cleared on site, erosion control measures should be kept in place to ensure that excessive scarring of the landscape is reduced.
Ecological (Fauna and Flora)	The following conclusions and recommendations from the study are: • The natural vegetation and area of the study site is generally in a good condition, except for in the immediate areas around the towns of Keimoes and Kakamas, as well as in the area of the Orange River. • The study area is not situated within any priority areas, CBAs or ESAs, except where the line crosses over the Orange River. • The Orange River and floodplain are CBAs as well as NFEPA priority areas. • There are protected trees (quiver trees) in the study area. A tree permit will be required to relocate any of these trees (should they be affected by the proposed project). There are also a few Sherpherd's trees and Camelthorn trees, but none of these are within the powerline servitude. • Euphorbia plants are present in the area and most have a milky latex that is harmful to humans and can cause skin irritations if handled. Euphorbias need to be pointed out to contractors before the onset of the construction phase. • Due to the nature of the project the potential negative impacts on the environment will be low to negligible.
Avifauna	The following conclusions are drawn from the study: • There are no known records or power line collisions in the study area. • The study area is not viewed as an important or sensitive area in terms of bird collisions and electrocutions. • The study area itself is not a hotspot for the presence of priority birds, including red data species. • The area is not within or close to an Important Bird Area (IBA). • There is a lack of ideal bird habitats in much of the study area, which limits the presence of priority bird species, except in the

Specialist Study	Conclusions and Recommendations
	vicinity of the steeper cliffs and the Orange River basin. • The following priority bird species are commonly found in the region, namely, Martial eagle, Verreaux's (Black) eagle, Kori bustard and Ludwig's bustard. • Bird diverters are recommended across sensitive areas, which include the ridge, down the slope of the ridge and across the drainage lines (at the line deviation) and where the line crosses over the Orange River.
The recommended route from all the specialists is Alternative 2.	