

**MARULA CLUSTER – GRID
CONNECTION EXTENSION
PROJECT – 29 SOLAR (PTY) LTD.**

October 2022

DRAFT BASIC ASSESSMENT REPORT

Ref Nr: 14/12/16/3/3/1/2620



Details of Role Players

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EXECUTIVE SUMMARY

INTRODUCTION

29 Solar (Pty) Ltd. (hereunder referred to as 29 Solar) has appointed BioBlue Environmental Sustainability (Pty) Ltd. as an independent Environmental Assessment Practitioner (EAP) to undertake the required Basic Environmental Impact Assessment (BAR) in terms of the National Environmental Management Act 1998 (Act. No. 107 of 1998) EIA Regulation 2014 as amended; for the establishment of proposed twin 132kV conductor line extension from their authorized collector substation to the newly authorized Artemis MTS (Main Transmission Station) to be able to connect to authorized Marula Cluster Solar PV developments that is comprised of Indlovu (240Mw), Ngonyama (240Mw) and Amagama (125Mw) to the grid. This application triggers Listing Notice 1, Activity 11.

SITE LOCATION

The proposed project site is located on the Farms Cornelia, Modderpan, Leliehoek and Klipfontein situated approximately 3.8 km North-west of the town of Dealesville. Access can be gained via the R64 road driving from Dealesville to Boshof. The proposed site is located Within the Tokologo Local Municipality, Free State Province.

BRIEF PROJECT DESCRIPTION

29 Solar (Pty) Ltd. proposes to establish a twin 132kV conductor line to be able to connect the Marula Cluster Solar PV developments to the new Artemis MTS. The line will extend to an authorized collector sub within the Solar PV development area to the new Artemis Main Transmission substation.

The proposed conductor line will be located within one of the Strategic Transmission Corridors as gazetted within Government Gazette 41445, Notice Number 113 of 16 February 2018, and will ultimately be constructed for Eskom. The line is approximately 5.28 km in extent and crosses five different farm portions and the exact route of the line will be determined by the inputs from specialists.

LEGISLATIVE REQUIREMENTS

The application is done in terms of the National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA) and the Environmental Impact Assessment Regulations of December 2014, as amended in April 2017 (Government Notice Nr. 326). Environmental Authorization is requested for the following activities:

Listing Notice No.	Activity Description
Activity 11: The development of facilities or infrastructure for the transmission and distribution of electricity – (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 Kilovolts. (ii) Inside urban areas or industrial complexes with a capacity of 275 kilovolts or more. Excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is – (a) Temporarily required to allow for maintenance of existing infrastructure (b) 2 kilometres or shorter in length (c) Within an existing transmission line servitude; and (d) Will be removed within 18 months of the commencement of development	The new proposed twin 132kV Conductor line is more than 33 kilovolts, but less than 275 kilovolts and it falls outside urban areas and industrial complexes.

The National Heritage Resources Act (Act 25 of 1999)

The proposed project falls within the scope of Section 38 of the National Heritage Resources Act and the applicable activities are:

- Linear developments of 300m or longer.

The SA Heritage Resources Agency is the Competent Authority in this regard and their comment will be included and addressed in the Final BAR.

DFFE Screening Tool

The DFFE Screening Tool was compiled and site verification was conducted by BioBlue Environmental as well as the appointed specialist consultants. The proposed project entails the establishment of twin 132kV conductor lines from a substation within the Marula Cluster Solar PV development to the newly authorised Artemis MTS the following specialist assessments will be conducted, as guided by the web-based screening tool:

- Terrestrial Biodiversity Assessment
- Wetland Assessment
- Heritage Impact Assessment
- Agricultural Impact Assessment
- Paleontological Assessment

It is the opinion of the EAP that a Visual Assessment is not required as the proposed conductor line will be situated in an area that is comprised of numerous Eskom powerlines and substations and the proposed line will not impact on the visual aspects in the region.

ALTERNATIVES

The word “alternatives”, as described in Chapter 1, Regulation 1, Sub-regulation (1) of the EIA Regulations of 2014 (GN No. R. 326), in relation to a proposed activity, means different ways of meeting the general purpose and requirements of the activity which may include alternatives to the-

Property on which or location where the activity is proposed to be undertaken;

- Type of activity to be undertaken;
- Design or layout of the activity;
- Technology to be used in the activity; or
- Operational aspects of the activity; and
- Includes the option of not implementing the activity.

Alternative site layouts are not considered as the proposed twin Tern of twin Bersfort conductor overhead lines will be constructed within the corridors to be secured by Eskom or for Eskom by IPPs (servitude options are required to be in favour of Eskom). Collector Stations, such as the proposed 132kV Collector Stations 1 and 2 of the Marula Cluster, will eventually also belong to Eskom following their construction by IPPs under Self-Build Agreements.

However, small adjustments to associated “infrastructure” such as maintenance roads and servitudes will be considered due to the location of the wetlands within the corridors.

PUBLIC PARTICIPATION

The Public Participation process was initiated on the 8th of September 2022.

- Site Notices were placed on two locations – One next to the site and one at the entrance to Dealesville town driving from Boshof on the R64.
- An advert was placed in the Bloemnuus newspaper.

- Background Information Documents were submitted to the Dealesville Police Station and via email to relevant departments and I&APs.

All documents will be available on the BioBlue Environmental website and via Onedrive link.

SPECIALIST ASSESSMENTS

The proposed project entails the establishment of twin 132kV conductor lines from a substation within the Marula Cluster Solar PV development to the newly authorised Artemis MTS the following specialist assessments will be conducted, as guided by the web-based screening tool:

- Terrestrial Biodiversity Assessment
- Wetland Assessment
- Heritage Impact Assessment
- Agricultural Impact Assessment
- Paleontological Assessment

It is the opinion of the EAP that a Visual Assessment is not required as the proposed conductor line will be situated in an area that is comprised of numerous Eskom powerlines and substations and the proposed line will not impact on the visual aspects in the region.

IMPACT STATEMENT

The proposed project entails the establishment of a twin 132kV Conductor line to enable the Marula Cluster Solar PV developments to connect to the new Artemis MTS. The conductor lines will extend from an authorized collector sub within the Solar PV development area to the new Artemis Main Transmission Substation. The line will be approximately 5.28km in extent and will be located within farm portions that are mainly utilized for livestock farming. Due to the various substations located in the Dealesville area, there are numerous existing Eskom powerlines in the vicinity of the site.

Taking the above into account, the main impacts during the construction and operational phases, on the proposed site and surrounding environment could be the following:

- Pollution of soil and surface water resources
- Erosion and degradation of wetland systems
- Loss of habitat for resident (Fauna and Avi-fauna) species
- Long-term or permanent degradation and modification of the receiving environment resulting in the loss of important habitats

- Spreading of invasive alien species
- Electrocution and Collisions with powerline infrastructure

Most of the impacts will occur within the construction or establishment phase, such as the clearance of vegetation, possible pollution incidents and displacement of resident fauna species. The most significant possible impact associated with the project could occur during the operational phase with Avi-fauna species being susceptible to collision and electrocution with the powerline infrastructure.

However, the assessed impacts can be mitigated by implementing the proposed mitigation measures such as the following:

- Planning of layouts to minimise the project footprint required near wetland buffer zones
- Clearly demarcate wetland areas and their associated buffer zones as no-go areas.
- Maintain construction vehicles and equipment in sound working order and the crews must have spill kits on site to deal with any possible spill effectively.
- Minimise the construction footprint and reserve indigenous vegetation wherever possible.
- Avoid construction during the breeding season (summer) if possible and construct the development in the shortest timeframe.
- Implement an effective alien and invasive management plan throughout the different phases of the project.
- It is recommended that the standard Eskom Bird Perch be fitted to all pole tops to further provide safe perching space well above dangerous infrastructure.
- Demarcate sections requiring the installation of deterrents / flappers on all required sections of power line or directly adjacent to the site.

CONCLUSION AND RECOMMENDATIONS

The EAP is of the opinion that the development can be granted Environmental Authorization based on the assessment above as the negative impacts can be mitigated to a satisfactory level. The following mitigation measures must be included in the Environmental Authorization:

- An Environmental Control Officer must be appointed prior to the commencement of construction
- The authorized area to be cleared must be clearly demarcated
- All reports including monitoring reports must always be available on site.
- A complaints register must be drafted and kept up to date, with responses on any complaints recorded with each complaint.

- The applicant, site manager, staff and any contractor must adhere to all mitigation measures in the EMPr. The EMPr is a legally binding document to all parties involved in the construction of the activity.
- An Alien and Invasive monitoring and eradication programme must be compiled and implemented throughout the construction and operational phases.
- Vehicles and Equipment have to be maintained throughout the operations and drip trays and spill kits need to be available on site.
- It is recommended that the standard Eskom Bird Perch be fitted to all pole tops to further provide safe perching space well above dangerous infrastructure.
- Demarcate sections requiring the installation of deterrents / flappers on all required sections of power line or directly adjacent to the site.

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GLOSSARY OF TERMS

- "Activity" means an activity identified in Government Notice Number R718 of 2009, and GNR. 324, R. 325, and R. 327, of 2017 as a listed activity.
- "Alternatives", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to property, activity, design or technology.
- "Applicant" means a person who has submitted or intends to submit an application. "Application" means an application for Environmental Authorization in terms of the EIA regulations, 2014 (as amended).
- "Associated Infrastructure," means any building or infrastructure that is necessary for the functioning of a facility or activity or that is used for an ancillary service or use from the facility.
- "Biodiversity" The variety of life occurring in an area, including the number of different species, the genetic wealth within each species, and the natural habitat where they are found.
- "Borehole" Includes a well, excavation or any artificially constructed or improved underground cavity that can be used for the purpose of:
 - intercepting, collecting or storing water in or removing water from an aquifer;
 - observing and collecting data and information on water in an aquifer; or
 - re-charging an aquifer.
- "Cultural significance" This means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.
- "Cumulative impact" in relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.
- "Environment" The environment has been defined as "The external circumstances, conditions and objects that affect the existence and development of an individual, organism or group". These circumstances include biophysical, social, economic, historical, cultural and political aspects.
- "Environmental Assessment Practitioner" Person or company, independent of the applicant (developer), that manages the environmental assessment process of a proposed project on behalf of the applicant.

- "Environmental Management Programme" means a programme presenting management and mitigation measures in relation to identified or specified activities envisaged in Chapter 5 of the National Environmental Management Act and described in regulation 34.
- "Heritage resources" This means any place or object of cultural significance. It also includes archaeological resources.
- "Interested and Affected Party" means an interested and affected party contemplated in section 24(4) (d) of the Act, and which in terms of that section includes - (a) Any person, group of persons or organization interested in or affected by an activity; and (b) Any organ of state that may have jurisdiction over any aspect of the activity.
- "Public Participation Process" means a process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to, specific matters;
- "Registered Interested and Affected Party", in relation to an application, means an interested and affected party whose name is recorded in the register opened for that application in terms of regulation 42.
- "Species of Conservation Concern" All those species included in the categories of endangered, vulnerable or rare, as defined by the International Union for the Conservation of Nature and Natural Resources.
- "Significant impact" means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.
- "The Act" means the National Environmental Management: Waste Act, 1998 (Act No.59 of 2008).

DECLARATION OF INDEPENDENCE

The independent Practitioner

I, **Zander Liebenberg** declare that I –

- act as the independent Environmental Practitioner for the Basic Assessment Report;
- this report covers the Environmental Impact Assessment aspects only and no other scope of work was requested for this study and the information should be interpreted with caution
- do not have and will not have financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2010;
- have no and will have any vested interest in the proposed activity proceeding;
- undertake to disclose, to the competent authority any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the Environmental Impact Assessment Regulations, 2010;
- BioBlue accepts no responsibility for the accuracy of any third-party data used in the production of this report.



Signature of Author – Zander Liebenberg Pri.Sci. Nat (*Reg.No. 117291*) – *EAPASA Registered*



Signature of Marinus du Preez Pri.Sci.Nat

Date – 2022-10-31

1 CONTENT OF THE BASIC ASSESSMENT REPORT

According to NEMA 2014 Regulations (as amended in April 2017), Appendix 1, Section 3, the Basic Assessment Report must contain the information that is necessary for the competent authority to consider and come to a decision on the application. The items listed below with appropriate reference to the relevant Chapters in the BAR.

Table 1: Document Map

REQUIREMENTS	SECTION IN REPORT
a) details of— i. the EAP who prepared the report; and ii. the expertise of the EAP, including a curriculum vitae;	Section 3.2 , Appendix F for Declaration and Curriculum Vitae
b) the location of the development footprint of the activity on the approved site as contemplated in the accepted scoping report, including— i. the 21 digit Surveyor General code of each cadastral land parcel; ii. where available, the physical address and farm name; iii. where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Section 2.2
c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is— i. (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or ii. on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Section 2.2 and 2.3 for description and coordinates, Appendix A for A3 plans.
d) a description of the scope of the proposed activity, including— i. all listed and specified activities triggered; ii. a description of the activities to be undertaken, including associated structures and infrastructure;	Section 2.1 for project description and 2.2 - 2.3 for the layout, Appendix A Layouts, Section 4.1- 4.2 for listed activities.
e) a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;	Section 4.1 – 4.3
f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section 2.4

REQUIREMENTS	SECTION IN REPORT
g) a motivation for the preferred development footprint within the approved site	Section 2.3 and Figure 2
h) a full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including— i. details of all the alternatives considered; ii. details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; iii. a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; iv. the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; v. the impacts and risks identified 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; vi. the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks; vii. positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; viii. the possible mitigation measures that could be applied and level of residual risk; ix. if no alternative development footprints for the activity were investigated, the motivation for not considering such; and x. a concluding statement indicating the location of the preferred alternative development footprint within the approved site	Figure 3 – Alternative layout. Section 5 (Alternatives) Section 6 – Receiving Environment and Specialist studies Section 7 and Appendix E (Public Consultation) Section 8 (Impact Assessment) and Section 10 (Impact Statement)
i) 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 as contemplated in the accepted scoping report 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 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;	Section 6 – Receiving Environment and Specialist studies Section 8 (Impact Assessment) and Section 10 (Impact Statement)

REQUIREMENTS	SECTION IN REPORT
j) an assessment of each identified potentially significant impact and risk, including— i. cumulative impacts; ii. the nature, significance and consequences of the impact and risk; iii. the extent and duration of the impact and risk; iv. the probability of the impact and risk occurring; v. the degree to which the impact and risk can be reversed; vi. the degree to which the impact and risk may cause irreplaceable loss of resources; and vii. the degree to which the impact and risk can be mitigated;	Section 8 (Impact Assessment) and Section 10 (Impact Statement)
k) 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;	Section 6 – Receiving Environment and Specialist studies
l) an environmental impact statement which contains— i. a summary of the key findings of the environmental impact assessment; ii. a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint on the approved site iii. a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Section 10
m) 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;.	Section 11
n) the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;	Section 6, 10 and 11 And Figure 2
o) 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	Section 6, 8, 10 and 11
p) a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed	Section 9
q) 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 10 and 11
r) 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 finalised	Not Applicable
s) an undertaking under oath or affirmation by the EAP in relation to— i. the correctness of the information provided in the reports;	Appendix F

REQUIREMENTS	SECTION IN REPORT
ii. the inclusion of comments and inputs from stakeholders and I&APs; iii. the inclusion of inputs and recommendations from the specialist reports where relevant; and iv. any information provided by the EAP to interested and affected parties and any v. responses by the EAP to comments or inputs made by interested or affected parties;	
t) where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	Not Applicable
u) an indication of any deviation including the plan of study, including— i. any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and ii. a motivation for the deviation	Not Applicable
v) any specific information that may be required by the competent authority.	Not Applicable
w) any other matters required in terms of section 24(4)(a) and (b) of the Act.	Not Applicable

2 INTRODUCTION

29 Solar (Pty) Ltd. (hereunder referred to as 29 Solar) has appointed BioBlue Environmental Sustainability (Pty) Ltd. as an independent Environmental Assessment Practitioner (EAP) to undertake the required Basic Environmental Impact Assessment (BAR) in terms of the National Environmental Management Act 1998 (Act. No. 107 of 1998) EIA Regulation 2014 as amended; for the establishment of proposed twin 132kV conductor line extension from their authorized collector substation to the newly authorized Artemis MTS (Main Transmission Station) to be able to connect to authorized Marula Cluster Solar PV developments that is comprised of Indlovu (240Mw), Ngonyama (240Mw) and Amagama (125Mw) to the grid. This application triggers Listing Notice 1, Activity 11.

The Marula Cluster Solar PV developments have been submitted within BID Window 6 and if granted preferred bidder status this new proposed conductor line will connect the Solar PV development to the National Grid.

Strategic Transmission Corridors and Adoption of Standard in terms of GN 2313

Government Gazette 41445, Notice Number 113 of 16 February 2018 identifies Strategic Transmission Corridors (STCs) within which a Basic Assessment Process, instead of a full Scoping and EIA process, needs to be undertaken for electrical transmission infrastructure.

Adoption of the Standard for the development and expansion of power lines and substations within identified geographical areas and the exclusion of this infrastructure from the requirement to obtain an Environmental Authorization.

- The procedures stipulated within GN 2313 were followed during the application phase of this project and it indicated that a Basic Environmental Impact Assessment process must be followed.

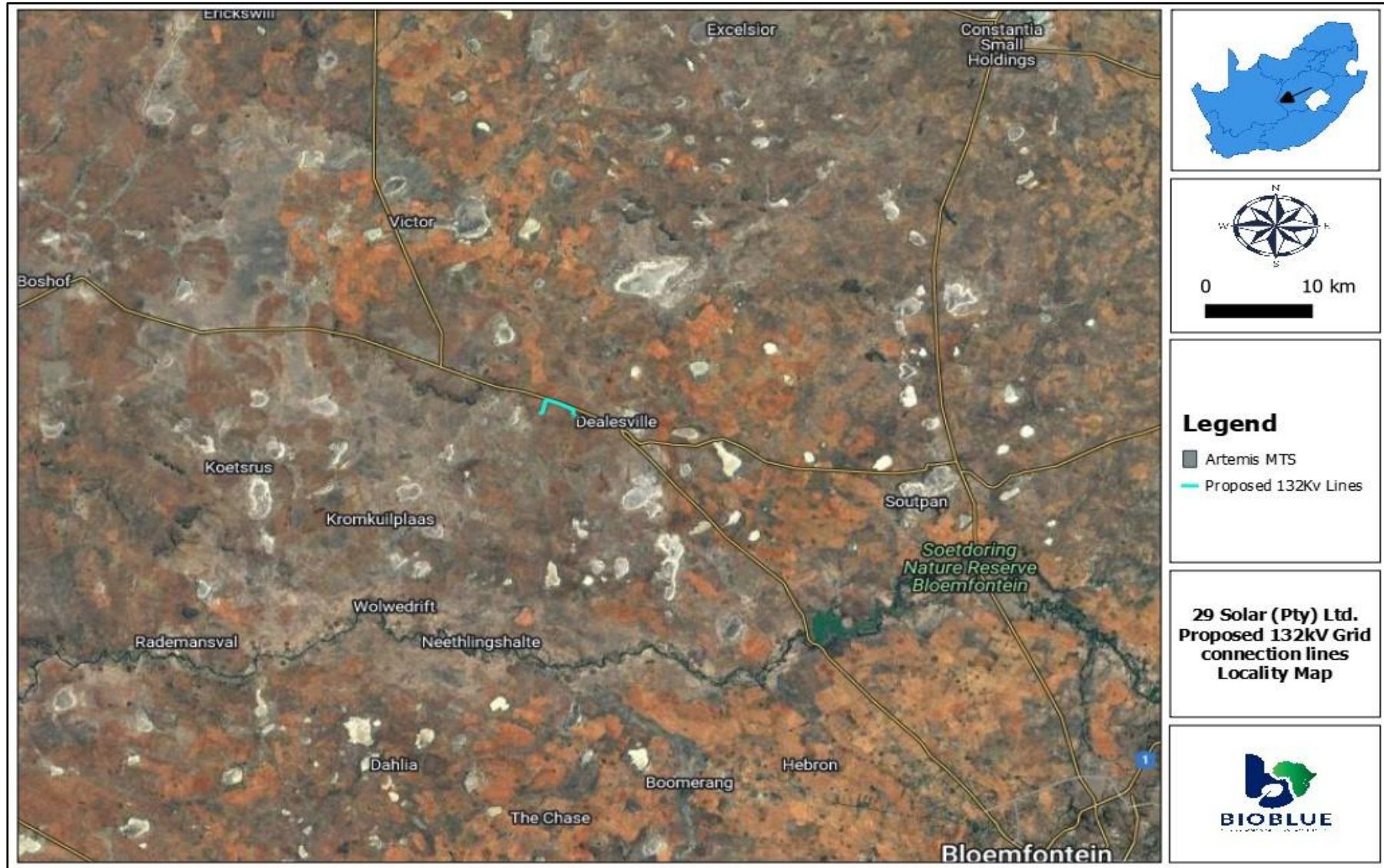


Figure 1: Locality Map

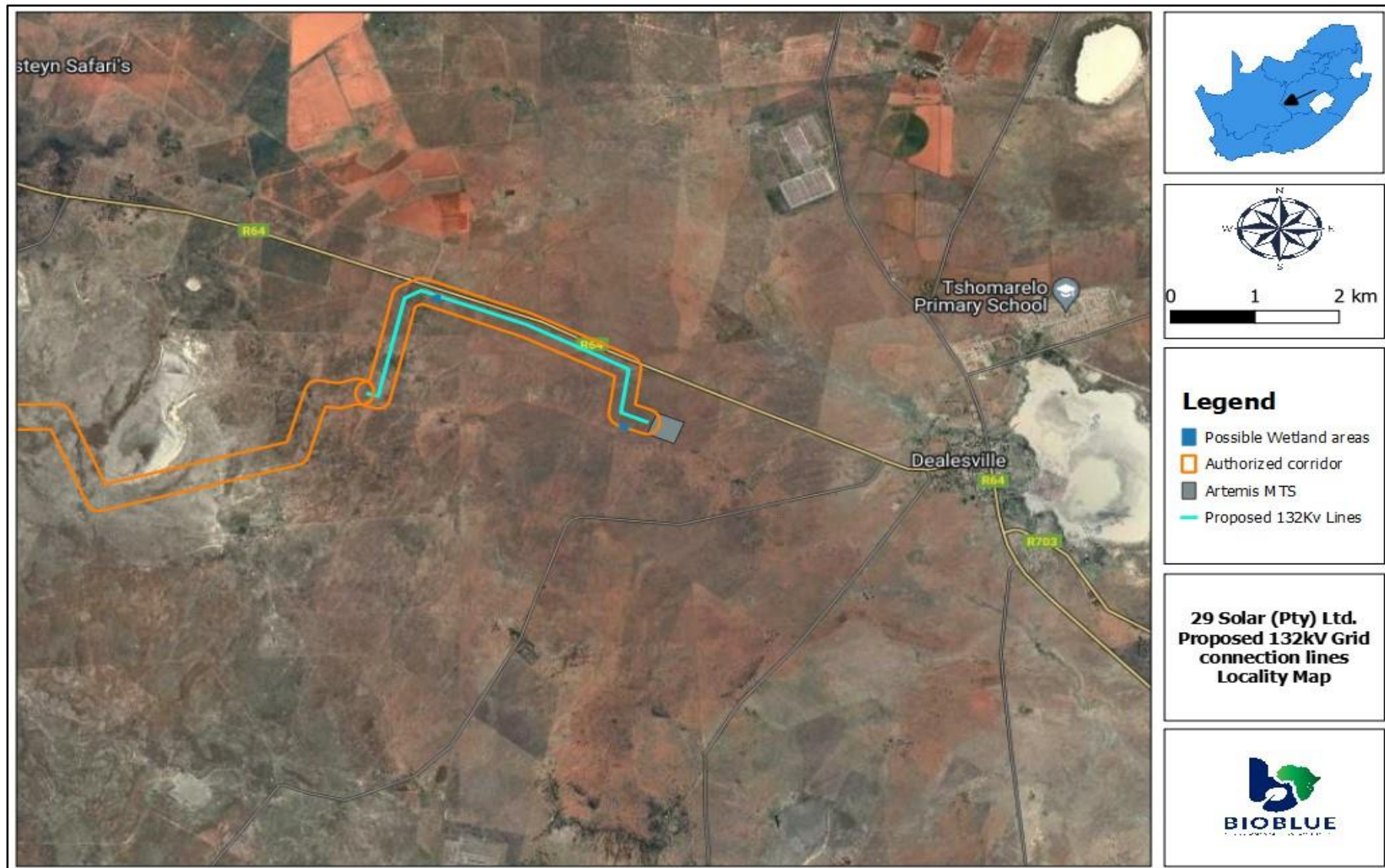


Figure 2: Locality Map 2

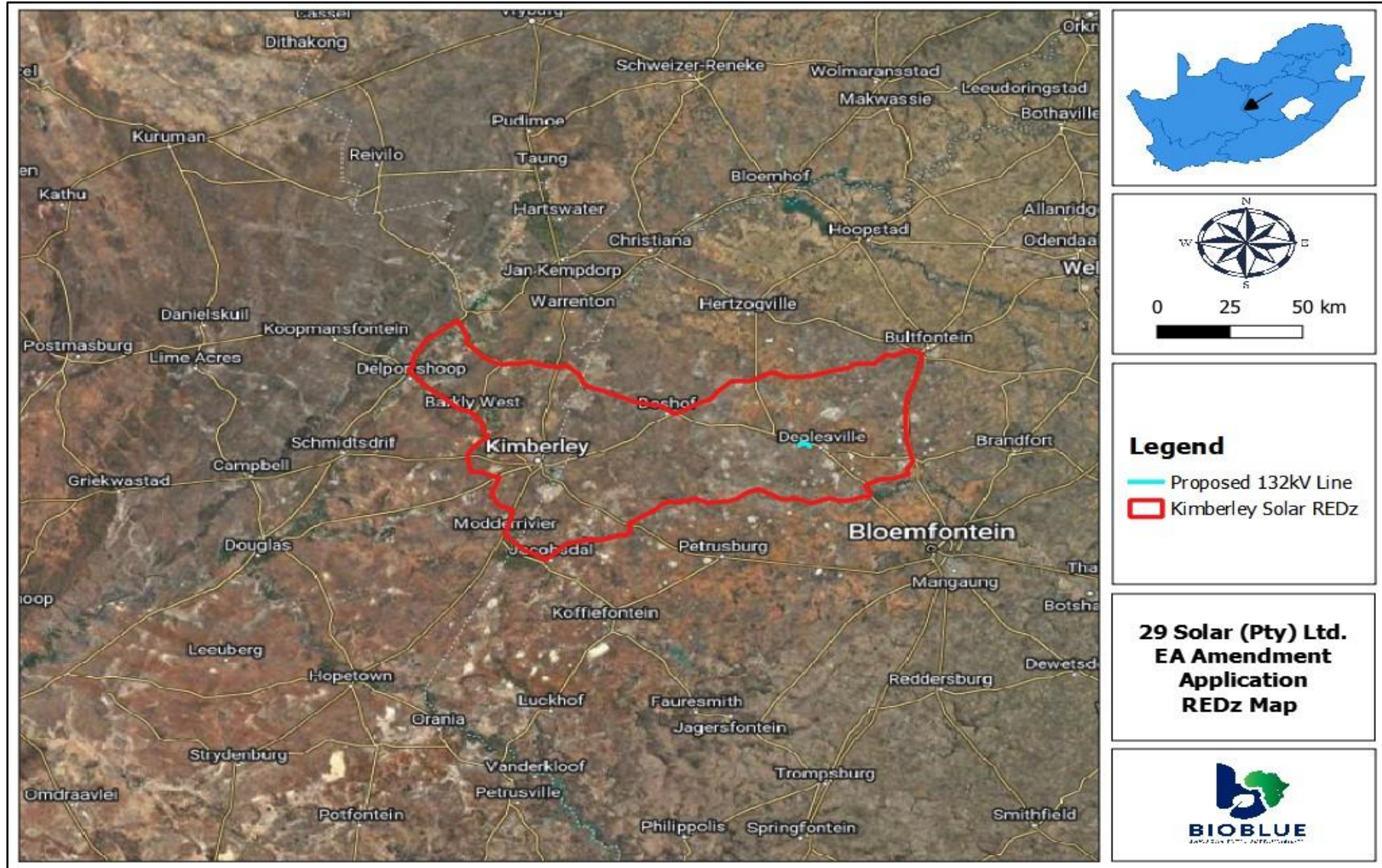


Figure 3: Site location within the Kimberley Renewable Energy Development Zone

2.1 PROJECT DESCRIPTION

The application for the proposed establishment of twin Tern 132kV conductor lines is being applied for to ensure that the Marula Cluster Solar PV developments can be connected to the newly authorised Artemis MTS.

Collector Stations, such as the proposed 132kV Collector Stations 1 and 2 of the Marula Cluster, will eventually also belong to Eskom following their construction by IPPs under self-build agreements. The servitude between Marula Cluster Collector Station 1 and Artemis MTS has been secured for 132kV double circuit twin Tern or twin Bersfort conductor line according to Eskom specifications and in favour of Eskom, up to the municipal land that surrounds Artemis MTS.

The area is characterised by agricultural activities such as stock and game farming. There are numerous Eskom powerlines that are establishment within the area and also within certain areas on the farm portions that comprise this application. The numerous powerlines are due to the location of the Perseus and Beta substations.

2.2 LOCALITY

The proposed conductor line site is located approximately 3.8km west of the town of Dealesville and 3km south of the Perseus substation. The line will be approximately 5.4km in extent between the Marula Cluster collector substation and the new Artemis MTS.

Please refer to Figure 1.

2.2.1 Farm and portion number & SG 21 Digit Codes

Farm Name and Portion	Surveyor General 21 Digit Codes
Portion 0 of the Farm Cornelia 1550 Boshof RD	F0040000000015500000
Portion 0 of Farm Modderpan, 750 Boshof RD	F0040000000007500000
Portion 0 of Farm Leliehoek 748 Boshof RD	F0040000000007480000
Portion 0 of Farm Klipfontein 305 Boshof RD	F0040000000003050000

2.3 LAYOUT

The proposed establishment of the twin Tern 132kV conductor lines will be done within servitudes that have been secured for Eskom and the layout will remain fixed except for slight changes within the Strategic Transmission Corridor as required by the specialist assessments. Refer to Figure 2.

Preferred layout:

Table 2: Coordinates

List of Coordinates for Listing Notice 1: Activity 11	
132kV Line start	28°39'57.20"S 25°41'30.51"E
132kV Line Mid 1	28°39'12.66"S 25°41'53.22"E
132kV Line Mid 2	28°39'46.41"S 25°43'23.96"E
132kV Line Mid 3	28°40'5.73"S 25°43'20.73"E
132kV Line End	28°40'9.39"S 25°43'32.60"E

2.4 NEED AND DESIRABILITY

The power crisis in South Africa has worsened over the past few years, with loadshedding increasing on an annual basis. Coupled with the need to decarbonise due to the various climate strategies signed by world leaders, the development of renewable energy facilities such as Solar PV developments are of utmost importance not only to the economic security of our country but also to meet the requirements as set out in these global strategies.

29 Solar (Pty) Ltd. already have Environmental Authorization to construct their Marula Cluster Solar PV developments that are comprised of:

- Indlovu Solar (240Mw)
- Ngonyama Solar (240Mw)
- Amagama Solar (125Mw)

These solar facilities will contribute hugely to stabilising the electrical grid and also to develop new clean energy sources within South Africa. As the EA's have already been granted, the company requires this additional twin Tern 132kV conductor line to be authorised to be able to connect to the newly authorised Artemis MTS which will allow the Marula Cluster to be able to connect to the National Grid. This application will be an extension of their currently authorised grid infrastructure and is very important final step for the development project.

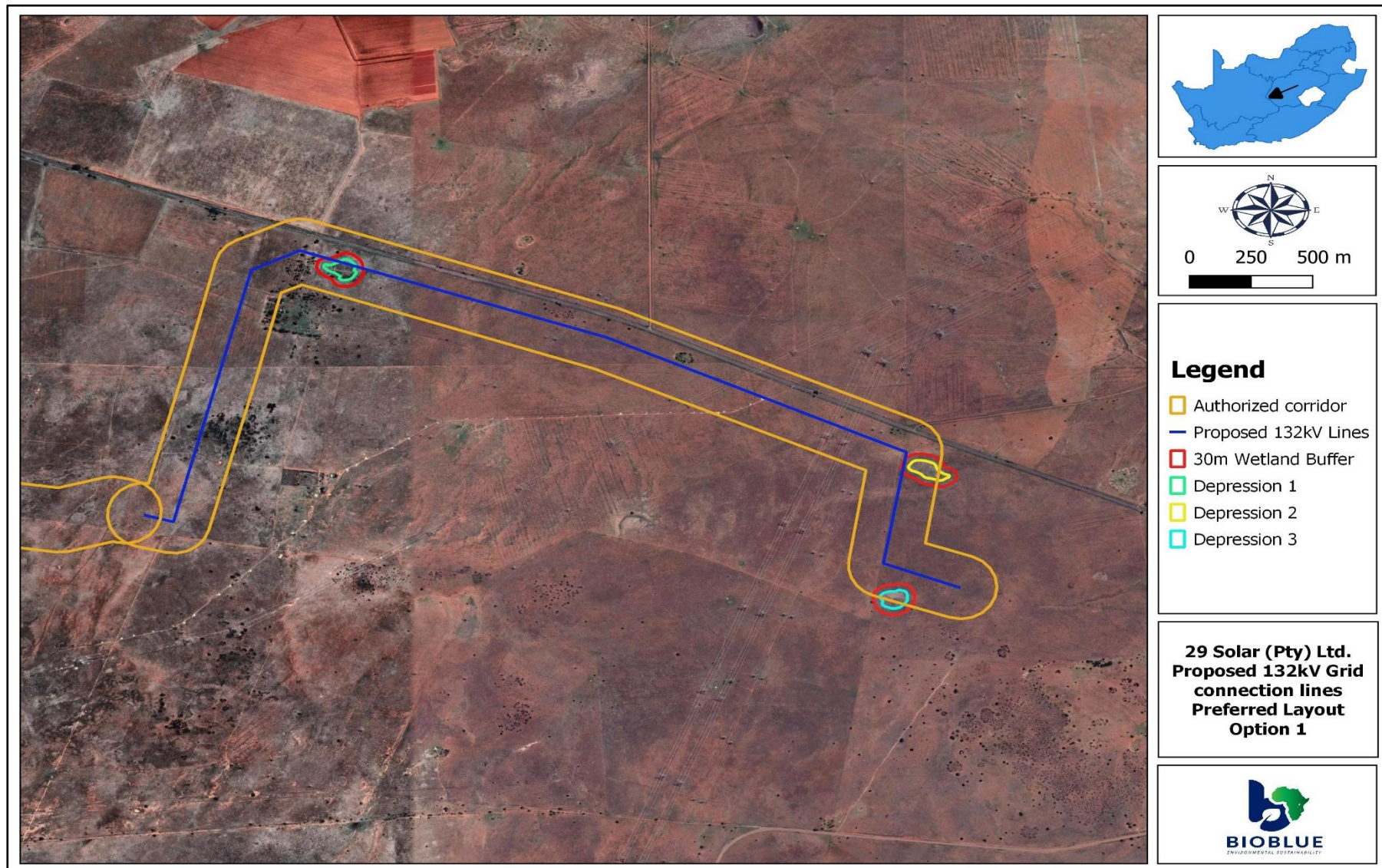


Figure 4: Preferred Option 1 – Layout Map

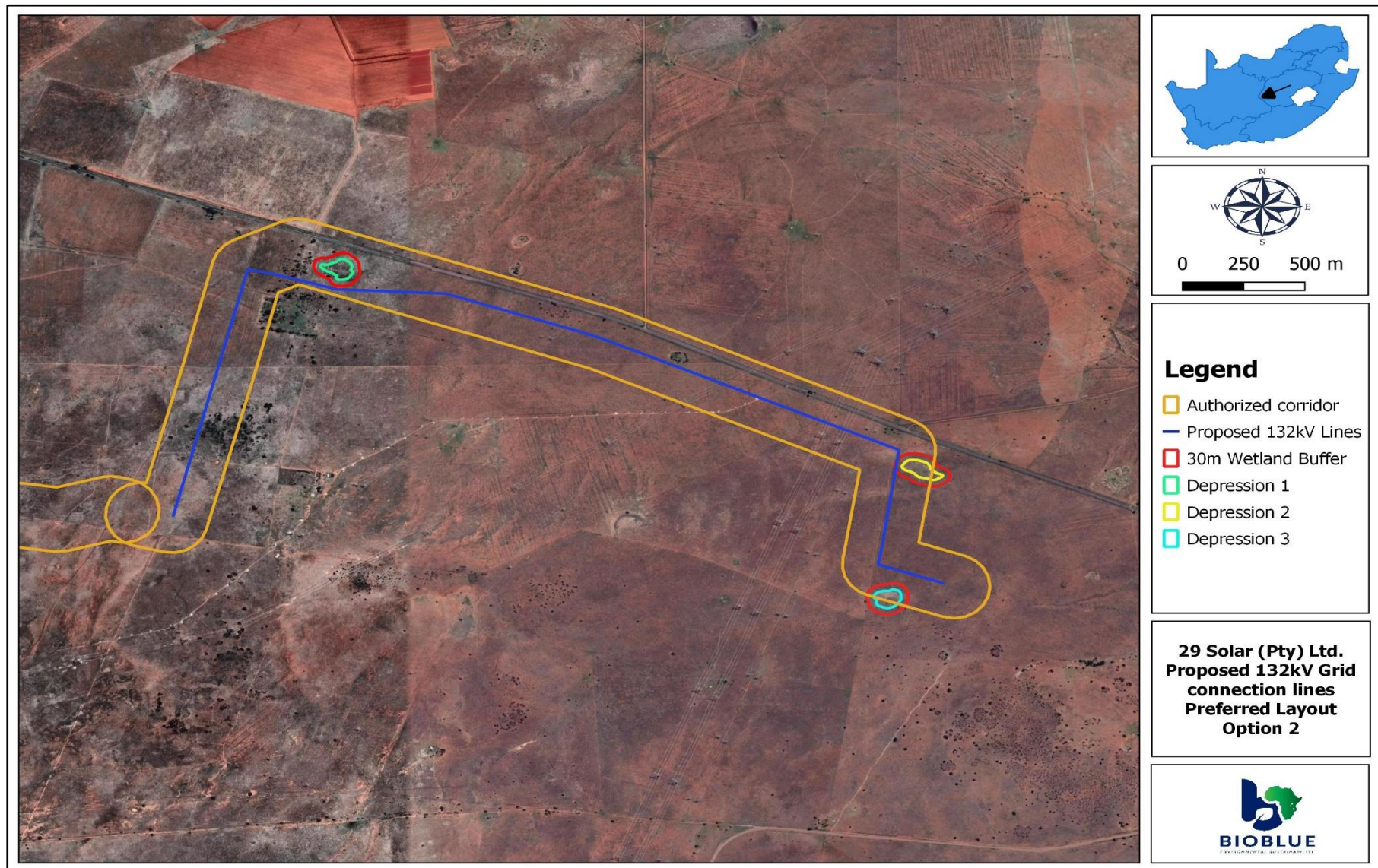


Figure 5: Preferred Layout Option 2

3 DETAILS OF THE ROLE PLAYERS

3.1 DETAILS OF THE APPLICANT

Please refer to page (ii).

3.2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

The EAP is Mr. Zander Liebenberg on behalf of BioBlue Environmental Sustainability (Pty) Ltd. Zander has a BSc. Hons. in Biological and Environmental Sciences from the North-West University, Potchefstroom Campus and has over 7 years of experience in the Environmental Management Field (refer to Annexure B for the EAP CV). The EAP has experience in conducted the following processes:

- Basic Assessment, Scoping and Environmental Impact Assessment
- Water Use License Applications
- Environmental Auditing and Monitoring
- Public Consultation and Stakeholder Engagement

The details of the EAP are stipulated on page (ii).

3.3 PROJECT PROGRAMME

1. The project's initial Public Participation process was initiated on the 7th of September 2022 with the aim to give all Interested and Affected Parties a chance to register until the 7th of October 2022 as required for the 30-day Public Participation period.
2. The Application form has been submitted on the 26th of September 2022.
3. The Specialist Assessments will be conducted from the 7th of September 2022 until the 7th of October 2022.
4. The aim will be to submit the Draft Basic Assessment Report between the 10th of October 2022 to the 17th of October 2022 for 30-day public comment.
5. The Final BAR will then be aimed to be submitted within 10 to 15 days of receiving comments from the Department and other I&APs. This will put the proposed timeline for submission between the 27th of November 2022 and the 5th of December 2022.
6. The Department then has 57 days to make a decision on the project as it falls within a Renewable Energy Development Zone.

4 LEGISLATIVE REQUIREMENTS

4.1 ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS OF 2014 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998)

This application will be conducted in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and the Environmental Impact Assessment Regulations of December 2014, as amended in April 2017 (Government Notice 326). Environmental Authorization is requested for the following listed activities:

Section 24(5) and 44 of NEMA asserts that the Minister or Member of the Executive Council (MEC) may make regulations pertaining to applications under NEMA. The Minister (of Environmental Affairs) has made such regulations and the latest were published on 04 December 2014, Amended in April 2017. The EIA Regulations focus primarily on creating a framework for co-operative environmental governance. NEMA provides for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by State Departments and to provide for matters connected therewith.

In terms of the EIA Regulations of 2014 and activities listed in Listing Notice 1, the following listed activities are deemed applicable to the proposed development based on the information provided by the project proponent and specialists.

Table 3: Triggered Activities in Terms of the EIA Regulations of 2014 as amended

Listing Notice No.	Activity Description
Listing Notice 1 R327, 07 April 2017, Activity No. 11: The development of facilities or infrastructure for the transmission and distribution of electricity – (i) Outside urban areas or industrial complexes with a capacity or more than 33 but less than 275 kilovolts; or (ii) Inside urban areas or industrial complexes with a capacity of 275 kilovolts or more;	The new proposed 132 kV twin tern line is more than 33 kilovolts but less than 275 kilovolts and it falls outside urban areas or industrial complexes.

Listing Notice No.	Activity Description
Excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is – (a) Temporarily required to allow for maintenance of existing infrastructure. (b) 2 kilometres in shorter in length (c) Within an existing transmission line servitude; and (d) Will be removed within 18 months of the commencement of development.	

The listed activities include activities that could potentially have a detrimental impact on the social and biophysical state of the prevailing environment and as such, the applicant is required to obtain an EA by way of a Basic Assessment process in order undertake the project.

This report constitutes the Draft Basic Assessment Report (DBAR) and assesses the possible impacts indicated during the consultation and planning phase of the project and presents the specialist findings as well as the proposed recommendations.

4.2 OTHER RELEVANT LEGISLATION

4.2.1 Constitution of the Republic of South Africa

The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) as amended has major implications for environmental management. The main effects are the protection of environmental and property rights, the change brought about by the sections dealing with administrative law, such as access to information, just administrative action and broadening of the locus standing of litigants. These aspects provide general and overarching support and are of major assistance in the effective implementation of the environmental management principles and structures of NEMA. Section 24 in the Bill of Rights of the Constitution asserts that: Everyone has the right -

- To an environment that is not harmful to their health or well-being; and
- To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that -
- Prevent pollution and ecological degradation;
- Promote conservation; and

- Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

4.2.2 National Heritage Resources Act, 1999 (Act No. 25 of 1999)

The proposed project falls within the scope of Section 38 of the National Heritage Resources Act and the applicable activities are:

- Linear developments of 300m or longer.

The SA Heritage Resources Agency is the Competent Authority in this regard and their comment will be included and addressed in the Final BAR.

4.2.3 Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)

The Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) as amended (CARA), is to provide for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and/or resources as well as the vegetation and the combating of weeds and invader plants; and for matters connected therewith. In terms of the amendments to the Regulations under the CARA, landowners are legally responsible for the control of alien species on their properties.

4.2.4 Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)

This Act is to provide for the health and safety of persons at work; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work; to establish an advisory council for occupational health and safety; and to provide for matters connected therewith.

4.2.5 Promotion of Access to Information Act, 2000 (Act No. 2 of 2000)

The Act recognises that everyone has a Constitutional right of access to any information held by the state and by another person when that information is required to exercise or protect any rights. The purpose of the Act is to foster a culture of transparency and accountability in public and private bodies and to promote a society in which people have access to information that enables them to exercise and protect their rights. In light of this Act, the Basic Assessment process includes PP which in essence is a platform for communities affected by the proposed development as well as any other persons with interest to be given access to

the information that forms part of this process so as to give comments and raise concerns about the proposed development. The Interested and Affected Parties (I&APs), State Departments and other stakeholders are afforded a period of 30 days, to comment on the content of that draft report. The comments received from I&APs, State Departments and other Stakeholders are incorporated into a CRR which forms part of the final report (FBAR). The final report inclusive of the CRR will be submitted to the DESTEA for decision making.

4.3 NATIONAL AND PROVINCIAL POLICIES AND/OR GUIDELINES

4.3.1 Integrated Environmental Management

Integrated Environmental Management (IEM) is a philosophy for ensuring that environmental considerations are fully integrated into all stages of the proposed development process. This philosophy aims to achieve a desirable balance between conservation and development (DEAT, 1992). The IEM guidelines intend to encourage a pro-active approach to sourcing, collating, and presenting information in a manner that can be interpreted at all levels.

The Department of Environmental Affairs (DEA) IEM Information Series guidelines will form part of the literature consulted during this Basic Assessment Process. Of particular relevance are the:

- Companion Guideline on the Implementation of the Environmental Impact Assessment Regulations (DEA, 2012); and
- Public Participation in the EIA Process (DEA, 2010).

Previous documents published by the DEA as part of the 2006 guideline series include:

- Guideline 3: General guide to the EIA Regulations;
- Guideline 4: Public participation; and
- Guideline 5: Assessment of alternatives and impacts.

4.3.2 Free State Biodiversity Plan

The purpose of the biodiversity plan is to unlock meaningful and lasting benefit for both the people of the province (i.e. enhancing human well-being and the environment by enhancing the integrity of the environment. The biodiversity plan's purpose was to create systems that would allow for all actions and tasks performed to be repeated accurately in future updates of the plan.

4.3.3 Tokologo IDP 2020-2021

The plan for the municipal service delivery and infrastructure planning. The IDP identifies areas of opportunity and improvement and lays out the plan to achieve the municipal mandate in terms of the Local Government Municipal Systems 2000 (Act 32 of 2000).

4.3.4 Independent Power Producer Procurement Programme

The Independent Power Producer Procurement Programme was launched to facilitate private sector investment into grid-connected renewable energy generation. Through the programme, Government intends to enhance its power generation capacity, reduce reliance on the combustion of fossil fuels for the generation of electricity, stimulate an indigenous renewable energy industry and contribute to socio-economic development and environmentally sustainable growth.

4.3.5 Renewable Energy Development Zones and Strategic Transmission Corridors

In 2015, the DFFE, through the Council for Scientific and Industrial Research (CSIR), embarked on a programme of Strategic Environmental Assessments (SEA's) for large-scale developments to support Strategic Integrated Projects (SIPs). The outcome of the programme led to the identification of eight Renewable Energy Development Zones (REDz) as well as the associated Strategic Transmission Corridors meant for the development of grid connection infrastructure.

The proposed grid infrastructure project is located within the Kimberley REDz and Central Strategic Transmission Corridor.

5 ALTERNATIVES

5.1 PROCESS FOLLOWED TO DETERMINE SITE ALTERNATIVES

To determine the various possible alternatives, the following process was followed:

1. Information was obtained from the applicant and assessed during a desktop and field assessment of the site.
2. The various specialists were appointed and conducted their field assessments.
3. The information and recommendations received from the specialists as well as comments from Interested, and Affected Parties were taken into consideration and the possible site alternatives established.

5.2 DETERMINING THE PREFERRED SITE ALTERNATIVES

There are two possible site alternatives, both within the Strategic Transmission Corridor and servitude.

1. Preferred Alternative – This alternative is the original site proposed by the client. Proper spacing of the grid line and pylons will need to be planned to ensure that the infrastructure is situated outside of the buffer zones of the wetlands.
2. Alternative 2 – This alternative shifts slightly to the south of Depression wetland 1 and grid conductor lines will not span over the depression wetland. It will also assist in ensuring that the maintenance servitude and access road will not impact the wetland area in any way.

5.3 NO-GO ALTERNATIVE

This option assumes that a conservative approach will be followed which would ensure that the environment is not impacted upon in anyway and the site remains in its current state. Should the Competent Authority decline the application, the 'No-Go' option will be followed, and the status quo of the site will remain. Should the CA consider the 'No-Go' option; the property will remain in its current state and will not add value to the area in terms of development and by providing employment to the locals. The Marula Cluster PV projects will then also require other grid connection options.

6 RECEIVING ENVIRONMENT AND SPECIALIST STUDIES

6.1 GENERAL DESCRIPTION OF THE STUDY AREA

The study site is characterised by natural vegetation mostly used for grazing livestock and game farming. There are numerous Eskom high-voltage lines situated within the area and crossing the site.

The study area falls primarily within the Western Free State Clay Grassland but also in the Vaal-Vet (Mucina and Rutherford, 2006). There is one Highveld Salt Pan (Ephemeral pans) located to the south-west of the site and three depression wetlands located within the servitude where the proposed conductor line will be established.

Vegetation was mostly comprised of *Themeda triandra* – *Rosenia humilis* mixed shrubland / grassland with some alien trees located within the western section of the site.

6.2 BIOPHYSICAL ENVIRONMENT

6.2.1 Terrestrial Biodiversity Assessment

6.2.1.1 Specialist Avifaunal Assessment

29 Solar (Pty) Ltd. plans to construct a new 132kV conductor line to connect the Marula Cluster PV Developments to the new Artemis MTS. The proposed construction is located approximately 3.8km North-west of the town of Dealesville in the Free State province.

No no-go areas are applicable to the project site from an avifaunal perspective. Should the proposed construction not proceed, due to other specialist studies, the site will remain unchanged and will continue to be used for farming purposes.

6.2.1.1.1 Avifaunal community

The overall avifaunal species occurring at the proposed powerline of the Artemis MTS mostly indicates a medium sensitivity. The area has a low diversity of avifaunal species and there is an availability of similar habitats in the broader area to reduce potential impacts on the current avifaunal species community.

6.2.1.1.2 Significance of avifaunal population

The DFFE screening tool was consulted using the feasibility region shown in the figure below which covers the proposed 132kV powerline development area. The DFFE screening tool outputs provided an avifaunal risk rating for the site as having Medium to High Environmental Sensitivity. The Medium to High Sensitivity is attributed to the presence of a critical habitat within

an area of 10km² from the construction site. There is a presence of waterbodies in the broader area represented on the feasibility map.

The environmental sensitivity rating is high where the authorised corridor is in proximity of the wetland. Wetland surveys were thoroughly conducted for this study and there were no observations of species of concern. From an avifaunal perspective, the site has a low species diversity and there are no objections for the proposed powerline development to continue.

However, it is important to delineate sensitive avian habitats within the project site in order to ensure the development does not have a long-term negative impact on these habitats. Important avian habitats play an integral role in their persistence within a landscape providing nesting, foraging and reproductive benefits. It is also recommended that the sensitive habitats are used as a guide for sensitive areas during the construction and operational phase.

All the ecological features of the study area were considered, and sensitive areas were assessed. Based on the area sensitivity conducted during the specialist assessment, 60ha of land provide an important habitat for medium to large, bodied birds.

6.2.1.1.3 Norms, Guidelines and Standards

BirdLife South Africa compiled the Best Practice Guidelines on Birds and Solar Energy to guide the assessment and monitoring of the impact of solar generating facilities on birds in South Africa. This guideline has been followed as far as possible in the compilation of this report.

6.2.1.1.4 Baseline Description of the Avifaunal Community SABAP2 data

The Second South African Bird Atlas Project 2 (SABAP2), a continuous initiative of the Animal Demography Unit of the University of Cape Town, was consulted for data collected on the pentads in which the site is situated. SABAP2 is the second bird atlas project that was initiated in July 2007. SABAP2 was designed to run indefinitely with the aim to create valuable long-term dataset for southern Africa. The objective of the SABAP2 project is to accurately provide specified information on bird distributions, taken over a period of years. The site of the proposed site for the 132kV conductor lines is located in three pentads, namely, 2840_2540, 2840_2535 and 2845_2540 (Figure 6). Each pentad occupies approximately 7,700 Ha. The total area of the pentads is 23 100 Ha, whereas the total EIA footprint for the proposed construction is approximately 347 Ha as previously shown in Figure 4. The pentads cover a greater avian diversity and comprises priority habitats including waterbodies. The inclusion of aquatic habitats in the pentads will substantially increase the species counts. These species counts should not be expected for the proposed construction site. (Refer to Figure 5 below).

According to the SABAP2 species list in Table 1 (Refer to complete list on page 22 of the specialist assessment), it is estimated that a total of 123 birds species occur in the broader area of the proposed area of development. Of the 123 bird species 11 out of 14 bird species were observed during the transect surveys. Of the observed species, three species, the Cape Weaver, Dark-capped Bulbul, and the Red-knobbed Coot, were not previously recorded on site according to the SABAP2 species list for pentads 2840_2540, 2840_2535 and 2845_2540. This may be attributed the seasonal movement patterns of birds. There are many long-distance migrant species that will only be recorded during early to mid-summer and also some regional migrants and nomadic species that are more likely to occur in winter. Alternatively, this can be attributed to shorter survey timeframes and a vastly smaller assessment area (approximately 347 Ha) with a lower habitat diversity.

6.2.1.1.5 General Species Description

According to the results from the surveys, the overall avifaunal species occurring at the proposed development site are dominantly represented by species of Least Concern. As shown in the table below, species of Least Concern have been evaluated and classified as a widespread and abundant taxa. No Red Data species were encountered during surveys on all sampled habitats. On a broader scale, the SABAP2 species list indicates the likelihood of the following Red Data species to occur on site.

Table 4: Red Data Species occurring in the broader area of the proposed area of development

No.	Species	IUCN red-list conservation criteria
1	Secretarybird	Vulnerable
2	Black Harrier	Endangered
3	Blue Korhaan	Near Threatened

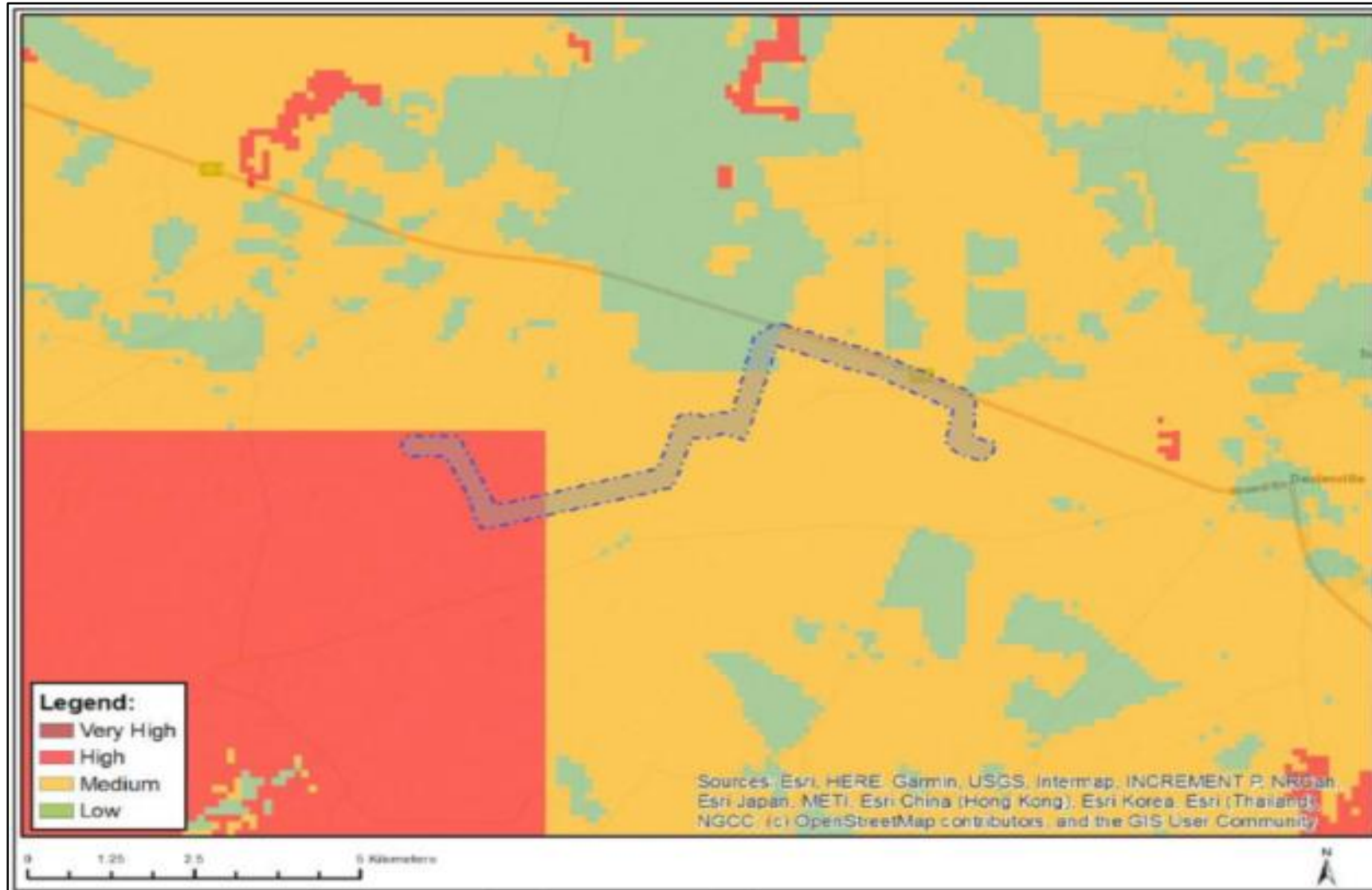


Figure 6: DFFE screening tool outputs of avifaunal sensitivity for the proposed 132kV powerline.



Figure 7: Location and extent of SABAP2 2840_2540, 2840_2535 and 2845_2540 pentads relative to the 132kV conductor lines construction site

6.2.1.1.6 Methodology

Prior to conducting field assessments, a comprehensive literature review of available published and unpublished literature pertaining to bird interactions with powerlines, linking station and onsite substation infrastructure was undertaken. The aim of the desktop study was to summarise various issues involved specifically for the new proposed 132kV conductor lines to connect the Marula Cluster PV Development to the new Artemis MTS development in the Free State Province. Additionally, a list of previously recorded birds was obtained from Southern African Bird Atlas Project 2 (SABAP 2), and Google Earth was also used to determine potential habitats for birds. The field methodology was thereafter conducted for assessing the impact of the proposed development on the extant avifaunal population. All habitat types were covered during assessments, and all attempts were made to ensure a representative spread of sampling localities and survey effort that reflected overall habitat composition.

6.2.1.1.7 Results of Avifaunal Population Assessment

Species richness, species evenness, and species abundance

The overall species richness of the site is considered low (3,06) as indicated in the Table below. Species evenness reflected that the site was highly even as a value of 0 indicates complete unevenness and a value of 1 indicates complete evenness. A diversity index score of below 1.5 is considered poor, between 1.5 and 2.5 is moderate, between 2.5 and 3.5 is high, and greater than 3.5 is extreme. The site can be concluded to have a moderately low diversity according to Shannon's and Simpson's Diversity indices.

Table 5: Avifaunal species richness, evenness and diversity recorded during transect surveys

Total Species	Total No. of individuals	Margalef's richness	Evenness	Shannon D	Simpson D
S	N	d	J'	H'(loge)	1-Lambda'
14	70	3,06	0,8843	2,334	0,8928

6.2.1.1.8 Impacts of Powerlines on Avifaunal Population

BirdLife, a dedicated bird-conservation organisation in South Africa takes a strong position on the impact of solar energy generation and distribution/transmission on birds, but not withstanding the countries technological advancements and developments. BirdLife's primary concern is the movement and removal of globally or nationally threatened birds, endemic or range-restricted species, or rare species from critical habitats. They are mostly concerned with the following impacts imposed by the development of powerlines:

1. The displacement of threatened species from important habitats;
2. Loss of habitat for resident species, especially where cumulative impacts exist;
3. The disturbance of resident species throughout construction, operation and maintenance;
4. Collisions with photovoltaic panels;
5. Reflective surfaces of panels creating a mirror affect and possibly attracting waterbirds;
6. Electrocution and collision at power line infrastructure;
7. New power line construction.

BirdLife suggests the following actions in terms of mitigating the impacts on birds:

- Undertaking sufficient pre-construction monitoring to determine the presence of threatened, rare, endemic or range-restricted species. SABAP2 data is recommended to supplement adequate field surveys.
- Constructing PV plants close to existing power lines and, if new lines are required, motivate the need for lines to be adequately marked with anti-collision devices and bird-friendly designs to prevent electrocution.
- Not constructing PV plants in formally or informally protected areas or Important Bird Areas (IBAs), but in areas of low relevance for nature conservation.
- Constructing PV plants in already degraded areas.
- Avoiding construction near drainage lines with trees where birds will be concentrated (e.g., in Karoo where most PV plant are likely to be constructed).
- Avoiding construction near large trees (e.g., in the Karoo) which serve as nesting and roosting sites for raptors and vultures.
- Building solar arrays outside known waterbird flight paths.
- Not using chemicals/pesticides for the maintenance of land/vegetation and rather use mowing or grazing to retard vegetation growth.
- Constructing new power lines in such a way that they have minimal impact on birds (i.e., birdfriendly designs, appropriate wire marking devices).
- Deconstruction of the plant after the expected economic life span

6.2.1.1.9 Impact Assessment Ratings

The methodology for assessing the impact ratings is included as Appendix A: Method of Environmental Assessment at the end of this report. The rating rankings for assessing impacts significance are as shown in the Table below. The findings of the impact assessment ratings are shown in the tables below. The impacts matrix used for scoring environmental significance and Table 7 is a summary of impacts ratings for the proposed 132kV Artemis MTS Powerline development using Appendix A (Refer to the full specialist assessment report).

Table 6: Impact rating scoring used for the avifaunal impact assessment at the proposed powerline construction

Points	Impact significance rating	Description
6 to 28	Negative low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive medium impact	The anticipated impact will have moderate positive effects.
51 to 73	Negative high impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive high impact	The anticipated impact will have significant positive effects.
74 to 96	Negative very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive very high impact	The anticipated impact will have highly significant positive effects.

Table 7: Summary

	Average impact rating	Significance class	Average mitigated impact	Significance class
Overall avifaunal impacts of the powerline and associated infrastructure	42.92	Negative medium impact	20.50	Negative low impact

*Refer to specialist assessment for full impact assessment table.

6.2.1.1.10 Mitigation Requirements

Summary:

The majority of the mitigation measures for the powerline development involve minimising impact footprints during construction, limiting site access beyond direct disturbance zones, reducing noise pollution, constructing in winter (to avoid the breeding season), and using designated roads as much as possible. Implementing these mitigations reduces the significance by 50% which results in acceptable Negative low impact ratings.

No-Go Areas, Buffers and Alternatives:

No no-go areas are applicable to the project site from an avifaunal perspective. Should the proposed activity not proceed, due to other specialist studies, the site will remain unchanged and will continue to be used for agricultural purposes.

No other possible sites were identified or authorised on the affected properties for the powerline development. This site is referred to as the authorised corridor. Some limited sensitive features occur on the site. The size of the site makes provision for the exclusion of any sensitive environmental features that may arise through the Basic Assessment process to enable the appropriate placement of the infrastructure within the development footprint.

6.2.1.1.11 Conclusion and Recommendations

The proposed 132kV powerline is situated in an area of Medium to High sensitivity. Assessments for the present waterbodies were conducted and only species of Least Concern were encountered. As a result, from an avifaunal perspective, there is no objection to the development of the proposed powerline development and associated infrastructure, provided to the recommended mitigation measures are strictly followed. The overall impacts (including cumulative) for the project are considered to be Negative low should the mitigation recommendations be affectively implemented.

Specific conditions recommended for the EA from an avifaunal perspective:

1. Implement mitigation controls during the construction phase as specified in the mitigation requirements. Monitor and report on their effectiveness.
2. Implement mitigation controls during the operational phase as specified in the mitigation. Monitor and report on their effectiveness.
3. Monitoring of implementation of mitigation controls, along with reporting, should be undertaken at least quarterly throughout the construction phase, and bi-annually during the operational phase. Monitoring, at the minimum, should consist of a

quarterly monitoring of the powerline area for evidence of collisions and electrocution risks.

4. Preserve as much of the natural habitat as possible during construction and operation to lessen the operational impacts and to reduce the irreversibility of impacts.
5. Effective restoration of the natural habitats that were intact before the development should be implemented and reported on after decommissioning.

6.2.1.2 Specialist Fauna Assessment

The Fauna specialist study provides details of the animal species composition occurring on site and provides an assessment of the possible ecological impacts associated with the development of the 132kV powerline and associated grid connection.

No no-go areas are applicable to the project site from a fauna perspective. Should the proposed construction not proceed, due to other specialist studies, the site will remain unchanged and will continue to be used for agricultural purposes.

The following tasks were undertaken by MORA ecological Services (Pty) Ltd. to achieve the assessment objective:

- Use of the Animal Demographic Unit (ADU) and the Second South African Bird Atlas Project 2 (SABAP2) database to identify fauna possible occurring on site.
- Determine the faunal species present within the site extent.
- Determine the presence of species of conservation concern.
- Determine the ecological state of the faunal diversity within the site extent.
- Compile a report with all findings. Including mapping of sensitive ecological areas for fauna species.

6.2.1.2.1 Site Sensitivity Assessment

The DFFE screening tool was consulted using the feasibility region which covers the proposed 132kV powerline development area. The DFFE screening tool outputs proved an animal species and relative aquatic biodiversity sensitivity ranking for the site as having Low to Very High Environmental Sensitivity. These sensitivities are attributed to the presence of critical habitat within an area of 10km² from the construction site. There is a presence of waterbodies in the broader area.

From a fauna specialist perspective, the site has a low species diversity and there are no objections for the proposed powerline development to continue. However, it is important to delineate sensitive fauna habitats within the project site in order to ensure the development

does not have a long-term negative impact on these habitats. It is also recommended that the sensitive habitats are used as a guide for sensitive areas during the construction and operational phase.

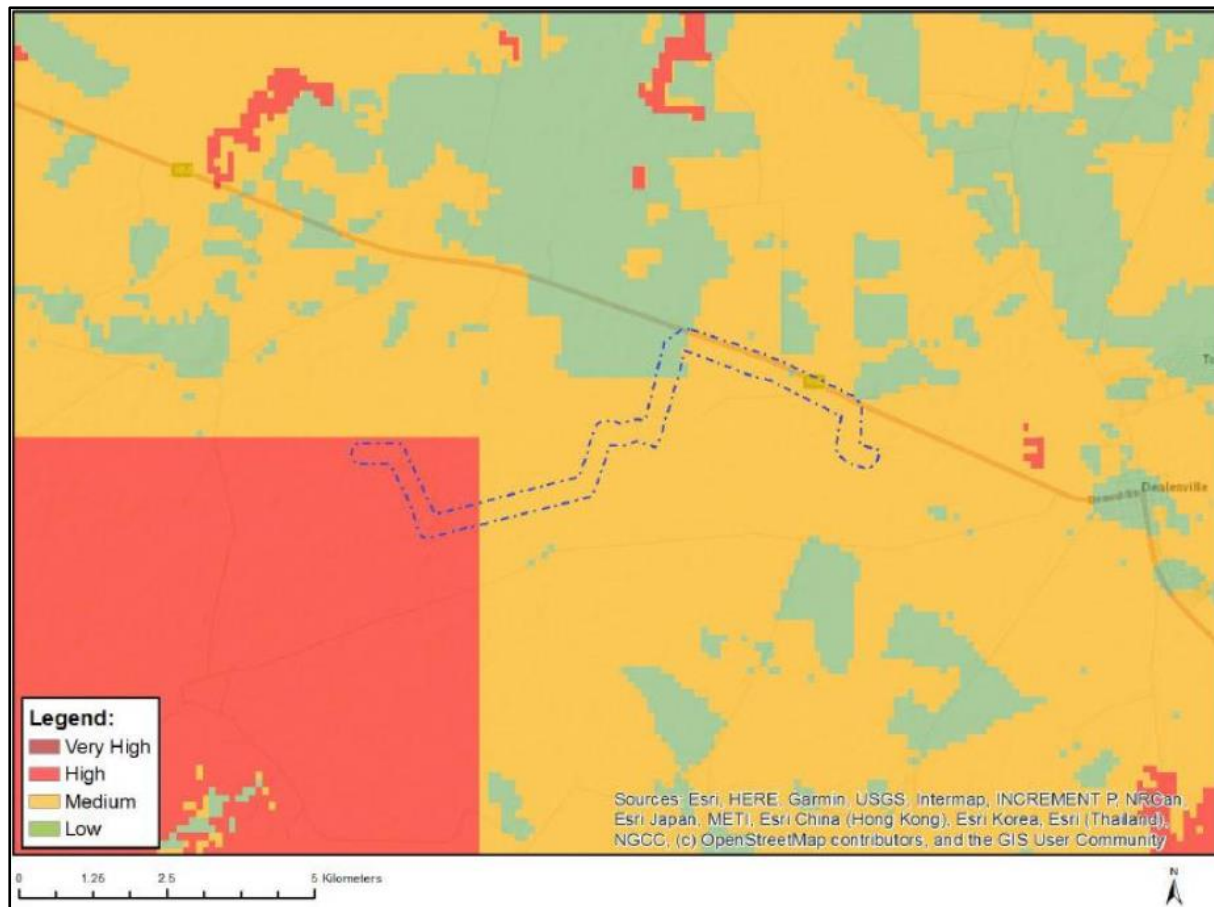


Figure 8: DFFE Screening tool outputs for relative animal species sensitivity for the proposed 132kV powerline.

All ecological features of the study area were considered, and sensitive areas were assessed. Based on the area sensitivity conducted during the specialist assessment, 60ha of land provide an important habitat for medium to large, bodied birds. Other animals potentially occurring in the area have Medium to Low sensitivity. Based on the desktop study and specialist surveys conducted, a majority of the species occurring in the area are of Least Concern according to the IUCN red-list conservation criteria.

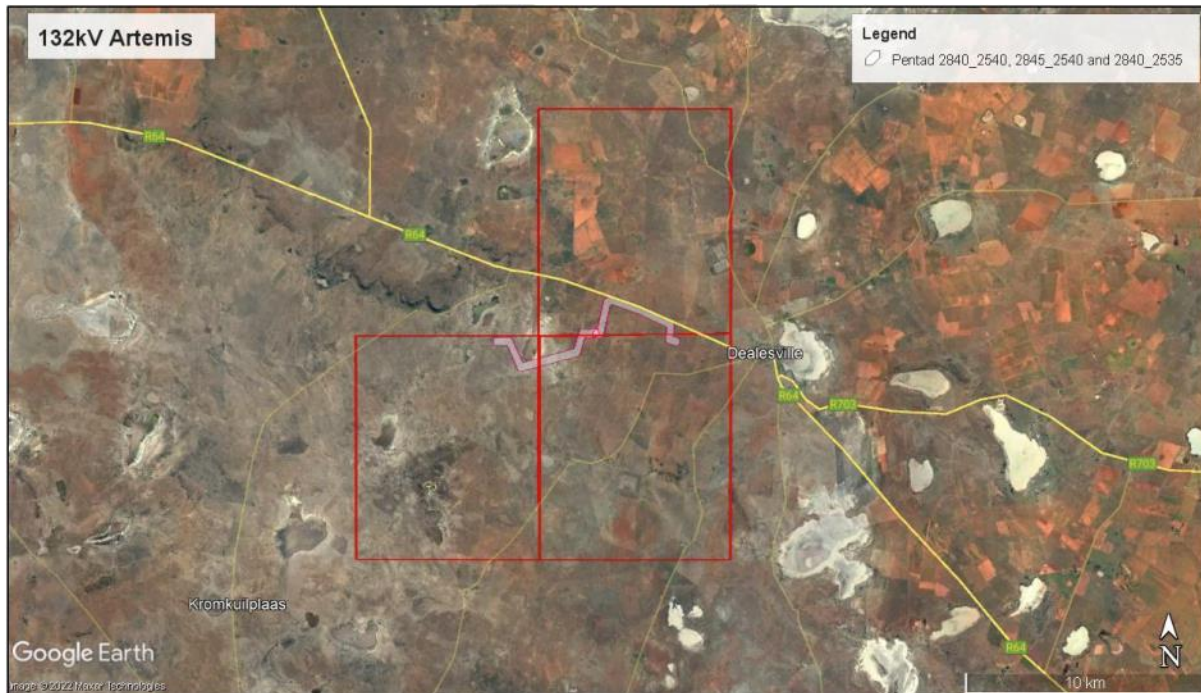


Figure 9: Location and extent of SABAP2 2840_2540, 2840_2535, 2845_2540 pentads relative to the 132kV conductor lines construction site.

6.2.1.2.2 Results from the Fauna Assessment

Of the pre-defined animal groups during the desktop study, no fauna species were observed onsite during the surveys. The faunal community results are historical species lists from the Animal Demographic Units (ADU) Virtual Museum and the Second South African Bird Atlas Project 2.

6.2.1.2.3 Faunal Communities

Mammals:

A record of 26 mammal species have been previously observed on site. Most of the species (23 out of 26) were categorized as Least Concern. Only 2 species i.e. *Hippotragus niger* (Vulnerable) and *Kobus leche* (Near Threatened) are of conservation concern.

Kobus leche was observed near the site area during the surveys conducted.

Table 8: List of Mammal species from ADU Virtual Museum records using the 2825DA Quarter Degree Square

No.	Scientific name	Common name	Red list category
1	<i>Aepyceros melampus</i>	Impala	Least Concern
2	<i>Alcelaphus buselaphus</i>	Hartebeest	-
3	<i>Antidorcas marsupialis</i>	Springbok	Least Concern
4	<i>Connochaetes gnou</i>	Black Wildebeest	Least Concern
5	<i>Connochaetes taurinus taurinus</i>	-	Least Concern
6	<i>Damaliscus pygargus phillipsi</i>	Blesbok	Least Concern
7	<i>Hippotragus niger</i>	-	Vulnerable
8	<i>Kobus ellipsiprymnus ellipsiprymnus</i>	-	Least Concern
9	<i>Kobus leche</i>	Lechwe	Near Threatened
10	<i>Oryx gazella</i>	Gemsbok	Least Concern
11	<i>Raphicerus campestris</i>	Steenbok	Least Concern
12	<i>Redunca arundinum</i>	Southern Reedbuck	Least Concern
13	<i>Redunca fulvorufula</i>	Mountain Reedbuck	Least Concern
14	<i>Sylvicapra grimmia</i>	Bush Duiker	Least Concern
15	<i>Taurotragus oryx</i>	Common Eland	Least Concern
16	<i>Tragelaphus angasii</i>	Nyala	Least Concern
17	<i>Tragelaphus strepsiceros</i>	Greater Kudu	Least Concern
18	<i>Canis mesomelas</i>	Black-backed Jackal	Least Concern
19	<i>Vulpes chama</i>	Cape Fox	Least Concern
20	<i>Giraffa giraffa giraffa</i>	South African Giraffe	Least Concern
21	<i>Cynictis penicillata</i>	Yellow Mongoose	Least Concern
22	<i>Herpestes sanguineus</i>	Slender Mongoose	Least Concern
23	<i>Suricata suricatta</i>	Meerkat	Least Concern
24	<i>Mus (Nannomys) minutoides</i>	Southern African Pygmy Mouse	Least Concern
25	<i>Phacochoerus africanus</i>	Common Warthog	Least Concern
26	<i>Genetta genetta</i>	Common Genet	Least Concern

Reptiles:

There was only a record of 4 reptile species previously observed within the 2825DA Quarter Degree Square. These species are:

- *Naja nivea*
- *Agama aculeata distant*
- *Trachylepis capensis*
- *Psammophylax tritaeniatus*

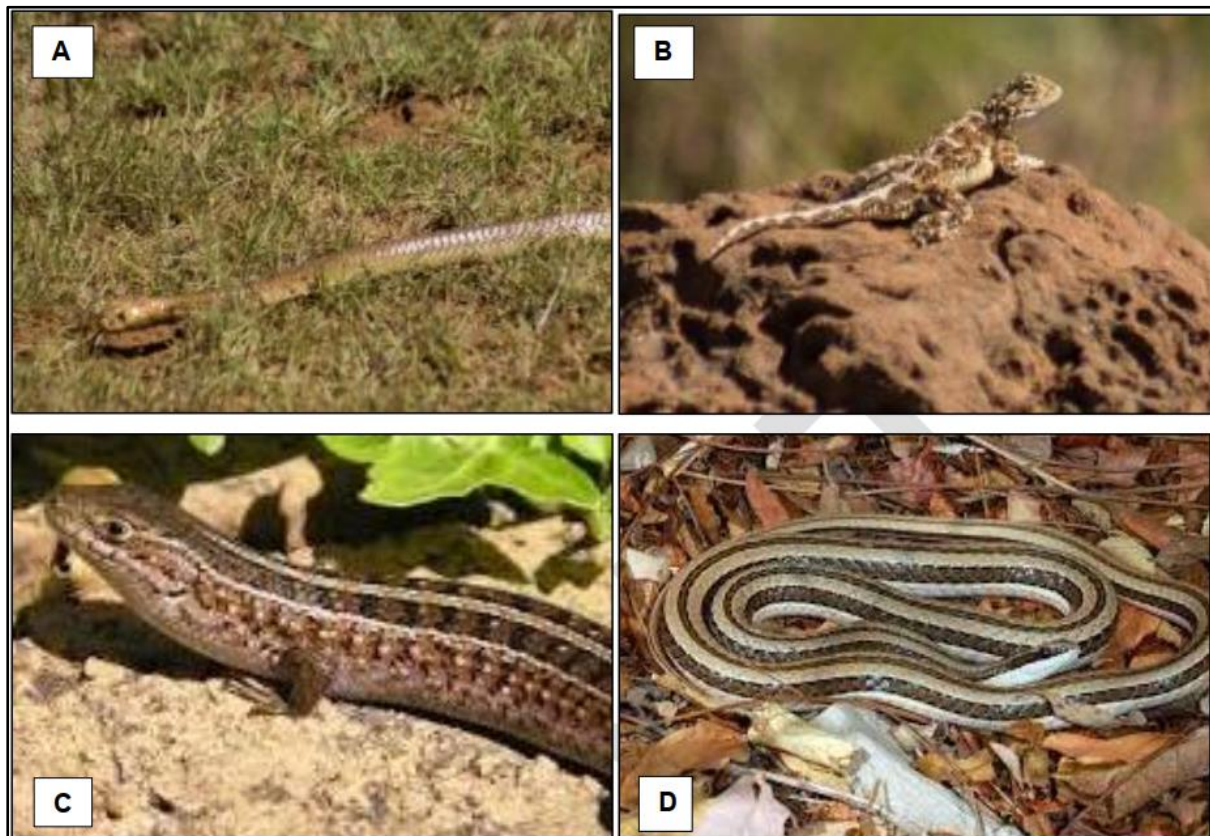


Figure 10: Photographic examples of the four reptiles

Birds:

Table 9: Species composition of encountered avifaunal community during assessments:

Species	Latitude	Longitude	Count
Ant-eating Chat	-28.65904	25.71685	5
Black-winged Kite	-28.66183	25.72364	1
Cape Weaver	-28.65806	25.7143	16
Dark-capped Bulbul	-28.65819	25.71439	7
Eastern Clapper Lark	-28.65804	25.71373	3
Laughing Dove	-28.65806	25.7143	2
Namaqua Dove	-28.65852	25.71433	1
Northern Black Korhaan	-28.66375	25.7231	1
Red-knobbed Coot	-28.6581	25.71432	4
Ring-necked Dove	-28.65292	25.6992	9
Scaly-feathered Weaver	-28.65166	25.69513	10
Southern Masked Weaver	-28.65265	25.69842	4
White-browed Sparrow-Weaver	-28.65454	25.69803	5
Yellow-billed Duck	-28.65854	25.71451	2

According to the SABAP2 species list in Appendix C, it is estimated that a total of 123 bird species occur in the broader area of the proposed development. Of the 123 bird species 11 out of 14 bird species were observed during the transect surveys. The endemic Northern Black Korhaan was encountered during the transect surveys.

6.2.1.2.4 Impact Assessment and Ratings

Refer to page 27 of the Specialist Fauna report for the full impact assessment tables.

6.2.1.2.5 Conclusion and Recommendations

Important recommendations for conservation of fauna species:

- The proponent must be committed to a conservation approach of practice and the actual footprint of disturbance must be kept to a minimum.
- Relocation of important species, identification and demarcation of specimens and sub habitats not to be disturbed will have to be done beforehand by a specialist.
- Important species (fauna) that will be threatened by the development must be relocated to safer habitats by suitable specialists.
- Preventative erosion control measures to be put in place.

6.2.1.3 Specialist Flora Assessment

The plant diversity information from the desktop study and that was collected as part of the investigations will be used to inform the Government's review during the application process of the proposed development in the Tokologo Local Municipality within the Lejweleputswa District Municipality.

No no-go areas are applicable to the project site from a flora perspective. Should the proposed construction not proceed, due to other specialist studies, the site will remain unchanged and will continue to be used for farming purposes.

The following tasks were undertaken to achieve the assessment objectives:

- A visual inspection of the study site area was done before surveys were conducted.
- During the process different homogenous vegetation units were identified and subsequently surveyed on foot and by vehicle in order to determine the floristic composition of each unit.
- A plotless sampling method was used to record data.
- Species identification was done following reputable checklists and field guides.
- Where necessary, plant material was collected and/or photographs taken of specimens for identification purposes.

6.2.1.3.1 Biome and bioregion

The geographic region of the proposed development falls on the Grassland Biome. Of the nine biomes in southern Africa, the Grassland biome is the second largest and it comprises 28% of the terrestrial surface. Mucina and Rutherford (2006) classified the approved site for the 132kV powerline corridor to lie on the Dry Highveld Grassland Bioregion of the broader Grassland biome.

The estimated total area of the Dry Highveld Grassland Bioregion is 117 753km², where only 1,52% is protected and 31,51% has already been transformed.

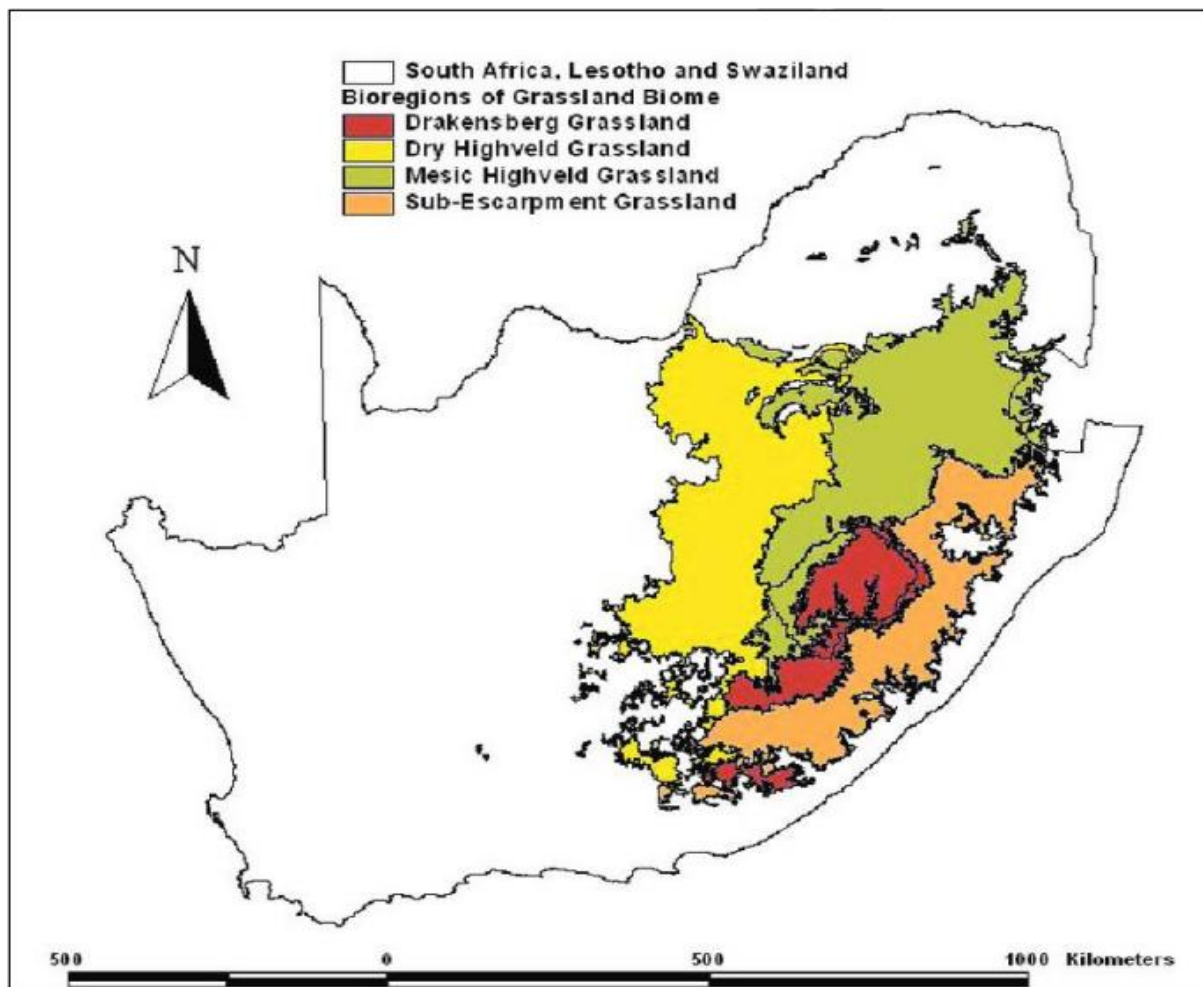


Figure 11: Location map of the Dry Highveld Grassland within South Africa (Carbutt et al. 2011)

6.2.1.3.2 Vegetation

Vegetation on the Dry Highveld Grassland largely consists of a semi-arid sweetveld due to low water supply and parent material giving rise to soils within a high base status. According to Mucina and Rutherford (2006), the local vegetation types are Western Free State Clay Grassland and Vaal-Vet Sandy Grassland. Plant species in this bioregion are mostly adapted to droughts and have proven to significantly reproduce by seeds even after droughts.

6.2.1.3.3 DFFE Screening Tool



Figure 12: DFFE screening tool outputs for relative plant species sensitivity for the proposed 132kV powerline

6.2.1.3.4 Results of the Vegetation Assessment

The area was established of 3 vegetation types on a local scale, i.e. transformed, wetland and a homogenous unit of vegetation. On a broader scale, the majority of the study area has undergone vegetation transformation as a result of current and historic gold mining and agriculture activities. The Dry Highveld Grassland has been modified through cultivation of crops and only a small, disconnected fragments of natural grassland remain. Also, mining and its associated infrastructure have resulted in irreversible modification of large areas of the Dry Highveld Grassland.



Figure 13: Photographic representation of the homogenous grassland habitat



Figure 14: The Sweet prickly pear invasive species observed on site – Invasive Alien plant species

6.2.1.3.5 Impact Assessment and Ratings

Refer to Flora Specialist assessment report for the full impact assessment.

Table 10: Summary of Flora impact ratings for the proposed 132kV powerline development

	Average impact rating	Significance class	Average mitigated impact	Significance class
Potential impact on the current vegetation structure before and after mitigation	40.64	Negative medium impact	18.00	Negative low impact

6.2.2 Wetland Specialist Assessment

29 Solar (Pty) Ltd. aims to establish a proposed 132kV powerline as part of a grid infrastructure extension. The proposed grid infrastructure extension will include a twin 132kV powerline and a servitude that will be utilised for maintenance purposes. The infrastructure will be located within a pre-determined corridor which is approximately 322m wide.

6.2.2.1 Wetland Delineation

The guidelines also state that locating the outer edge of the temporary zone, four specific indicators need to be employed namely:

- Terrain Unit Indicator (location in the landscape with highest likelihood of occurrence).
- Soil form Indicator (wetland soil forms which are associated with frequent and prolonged saturation).
- Vegetation Indicator (presence of hydrophytes); &
- Soil wetness Indicator (evidence of hydric conditions indicated by a wetness signature in the soil profile).

The wetland boundary is determined as the edge of the temporary zone of the wetland where the hydric indicators are encountered within the top 50cm of the soil surface. A Dutch soil auger was used to extract the soil samples to a depth of 50cm. All soil samples were evaluated in hand for soil composition, colour, number, and size of mottles as well as wetness. The soil wetness indicator and the vegetation indicator were the main indicators used with the other indicators fulfilling a confirmatory role. Soil samples were taken at regular intervals for the different wetlands of the study site. This was done by walking transects from the central part of the wetlands in an outward direction away from the wetland.

6.2.2.2 Results and Discussion

Based on current outputs of the NFEPA database, a NFEPA wetland was identified on the study site. It is the same wetland as which was identified during field survey as depression 1.

Table 11: The wetlands present on the study site with their corresponding NFEPA status

Wetlands on study site	NFEPA wetland status
Depression 1	Yes
Depression 2	No
Depression 3	No

The results from the National Screening Tool indicates that the study site has a Very High sensitivity with regards to wetlands. Two out of the three depressions are flagged by the National Screening Tool and both these wetlands have a Very High sensitivity rating.

Table 12: The wetlands on the study site with the corresponding Screening Tool status.

Wetlands on study site	NFEPA wetland status
Depression 1	Very High
Depression 2	Not flagged
Depression 3	Very High

6.2.2.3 Wetland's Bio-physical State & Delineations

The study consists of a corridor wherein the grid infrastructure is planned. The study site sprawls over grassland plains and has a very flat topographical nature. There are no rivers, streams or drainage lines in the immediate vicinity of the site. The wetlands on the study site are classified as depressions. These depressions present within the study area create habitat for various fauna and flora within the grassland habitat and thus increases the habitat heterogeneity of the landscape. The depressions also act as a water source for long periods of the year for birds, rodents, reptiles and small game such as steenbok and scrub hare.

Depression 1:

This wetland is classified as a depression HGM type. Although this depression stores water for long periods throughout the year due to its high clay content it is of an ephemeral nature. There isn't any signs of erosion or pollution present within the depression or its catchment. No alien invasive vegetation is present within the confines of the depression although there is a stand of Eucalyptus trees to the west of the depression.



Figure 15: Depression 1



Figure 16: Dark gleyed soils extracted within the first 50cm of the depression

Depression 2:

This wetland is classified as a depression HGM type. This wetland is the least distinct of the three depressions but is more easily discernible when employing aerial photography. The depression is utilised by livestock and game and although no signs of overgrazing were observed, trampling has taken place in sections, with bare soil patches present where water pools in the rainy season which is then trampled by cattle.



Figure 17: Bare areas within the depression were water pools and trampling occur.

Depression 3:

This wetland is classified as a depression HGM type (Figure 18). It is located approximately 800m south of the R64 road and partially within the grid infrastructure corridor, with the largest section of the wetland located within the boundaries of the grid infrastructure corridor. Depression 3 covers a land area of 0.82 ha.

Obligate wetland

species as well as facultative wetland species were recorded within the wetland. Moving from the wetland habitat to the terrestrial habitat there is a slight increase in elevation as well as change in species composition from wetland species to terrestrial species. The soil samples that were extracted from a depth of 50cm showed signs of wetness.



Figure 18: Depression wetland 3

Present Ecological State:

Table 13: Depression 1 PES

HGM Unit	ha	Extent (%)	Hydrology		Geomorphology		Vegetation		Overall Score
			Impact Score	Change Score	Impact Score	Change Score	Impact Score	Change Score	
1	0.85	100	1.7	0.1	1.5	0.1	1.4	0.2	1.5
Area weighted impact scores			1.7	0.1	1.5	0.1	1.4	0.2	
PES Category			B	→	B	→	B	→	B

Table 14: Depression 2 PES

HGM Unit	ha	Extent (%)	Hydrology		Geomorphology		Vegetation		Overall Score
			Impact Score	Change Score	Impact Score	Change Score	Impact Score	Change Score	
1	0.95	100	1.8	0.1	1.6	0	1.9	0	1.8
Area weighted impact scores			1.8	0.1	1.6	0	1.9	0	
PES Category			B	→	B	→	B	→	B

Table 15: Depression 3 PES

HGM Unit	Ha	Extent (%)	Hydrology		Geomorphology		Vegetation		Overall Score
			Impact Score	Change Score	Impact Score	Change Score	Impact Score	Change Score	
1	0.82	100	1.6	0.1	1.6	-0.1	1.4	0	1.5
Area weighted impact scores			1.6	0.1	1.6	-0.1	1.4	0	
PES Category			B	→	B	→	B	→	B

Refer to wetland assessment for full results and discussion as well as for the Mitigation measures proposed by the specialist.

6.2.2.4 Impact Statement

It is clear from the current proposed grid infrastructure layout (including adjacent servitude) that it will bisect the northern part of Depression 1. The proposed grid infrastructure will not cut through Depression 2, although it will cut through the buffer zone of Depression 2. Depression 3 including its buffer zone will not be impacted by the proposed grid infrastructure in its current layout. The impact of the current grid infrastructure layout will have a moderate to high impact on two out of the three depressions on the study site. The impacts can be lessened with the implementation of adequate mitigation measures. The impacts can also be completely eliminated if an alternative trajectory is planned for the grid infrastructure.

A 30m wide buffer zone is to be implemented around all three the depressions to protect the ecological integrity of the wetlands from detrimental edge effects associated with the proposed development during the construction and operational phases. It is imperative that

the mitigation measures and recommendations contained in this report must be adhered to and strictly implemented during the different phases of the project. If the mitigation measures and recommendations as prescribed in this report are followed the negative impacts of the proposed development on the aquatic ecosystems will be minimised or avoided all together depending on the final trajectory of the grid infrastructure decided upon.

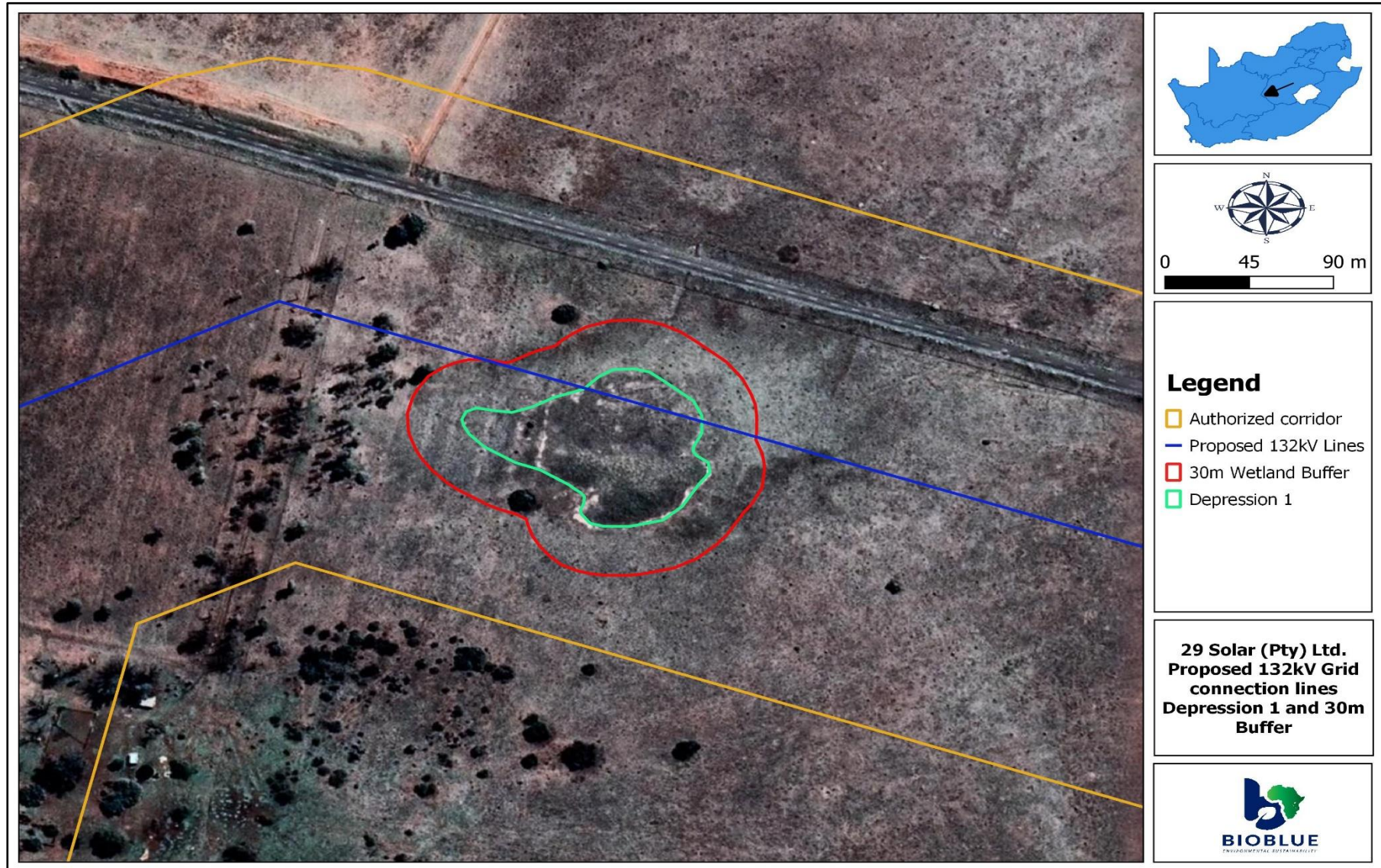


Figure 19: Delineation and Buffer zone map – Depression Wetland 1

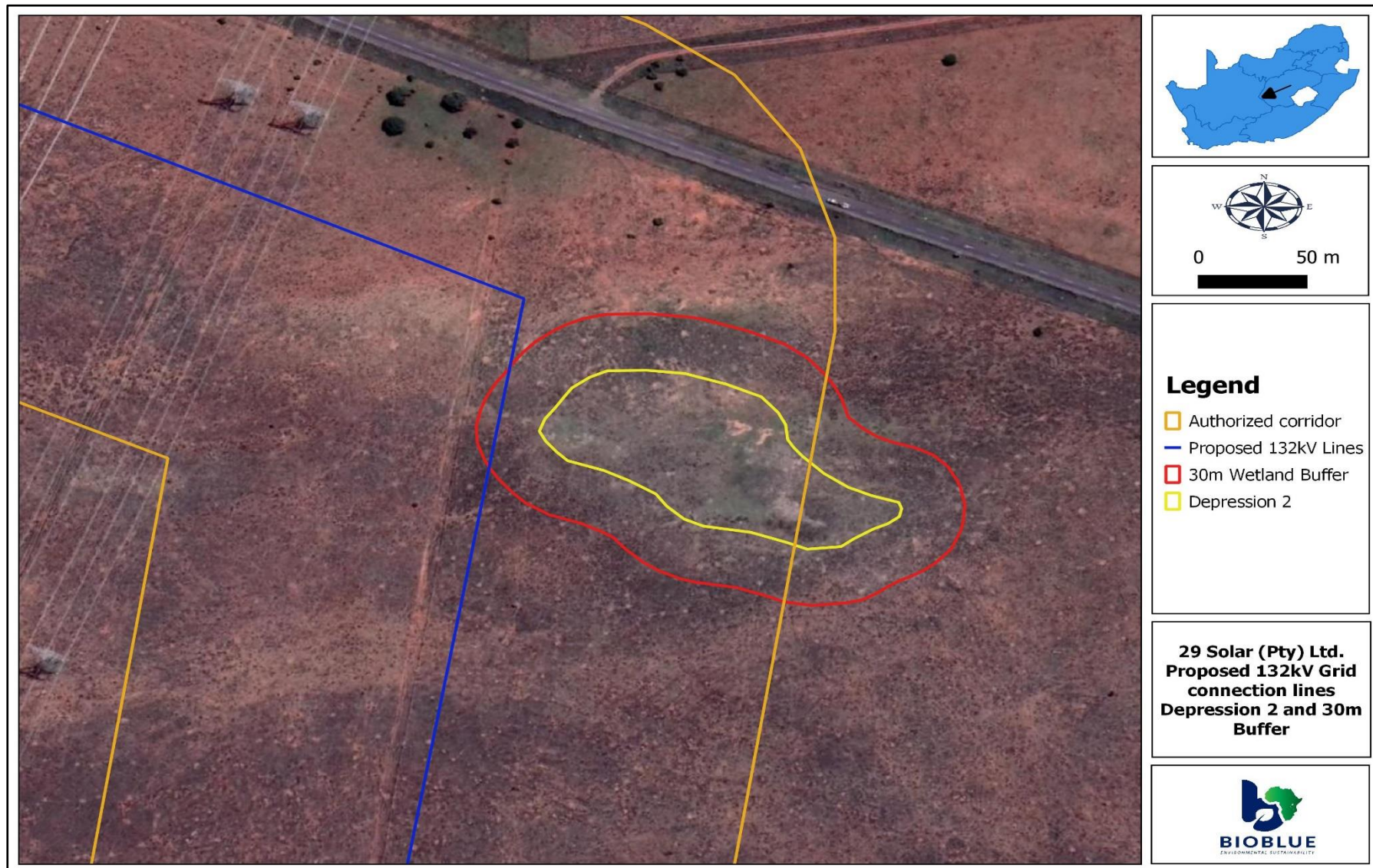


Figure 20: Delineation and Buffer zone map – Depression Wetland 2

6.2.3 Agricultural Impact Assessment

Digital Soils Africa (Pty) Ltd. (DSA) were tasked by BioBlue Environmental to undertake an Agricultural Compliance Statement for the Application of an Environmental Authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA).

The Compliance Statement Assessment is reported according to the protocol for the specialist assessment and minimum report content requirements for the environmental impacts on agricultural resources (GN320 of 2020).

The National Web-based Screening Tool classifies the areas as being high sensitivity for the Agricultural theme, although only a small portion of the study area has a high sensitivity (northern side of the study area). Most of the area has moderate sensitivity.

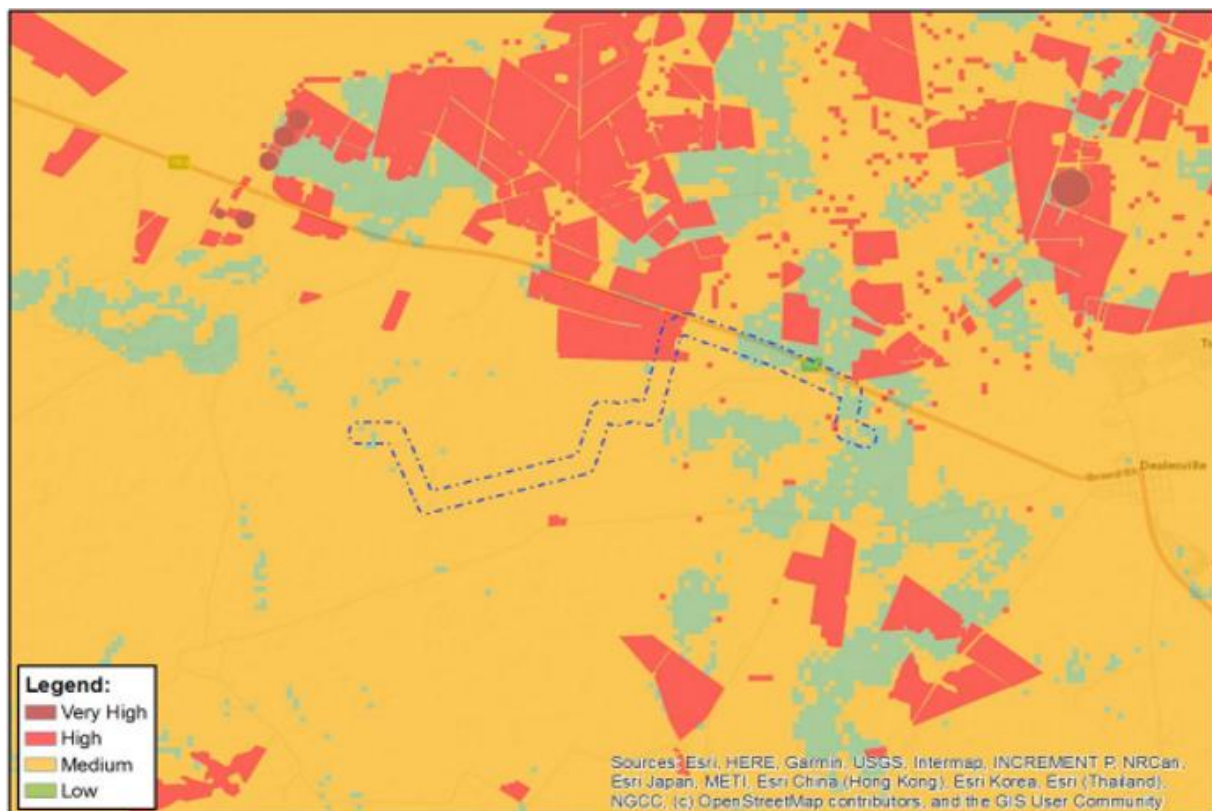


Figure 21: Map of relative Agricultural Theme Sensitivity

The field survey was conducted on the 2nd of September 2022. During the field survey visual observations and soil observations made with a hand auger were all logged using a GPS.

- The soils were described and classified according to the Soil Classification Working Group (2018).
- Visual observations of land degradation, crops and land-use were made. The data will be compared to the soils data from the land type survey and the agricultural capability, as well as the land-use map, will be refined.

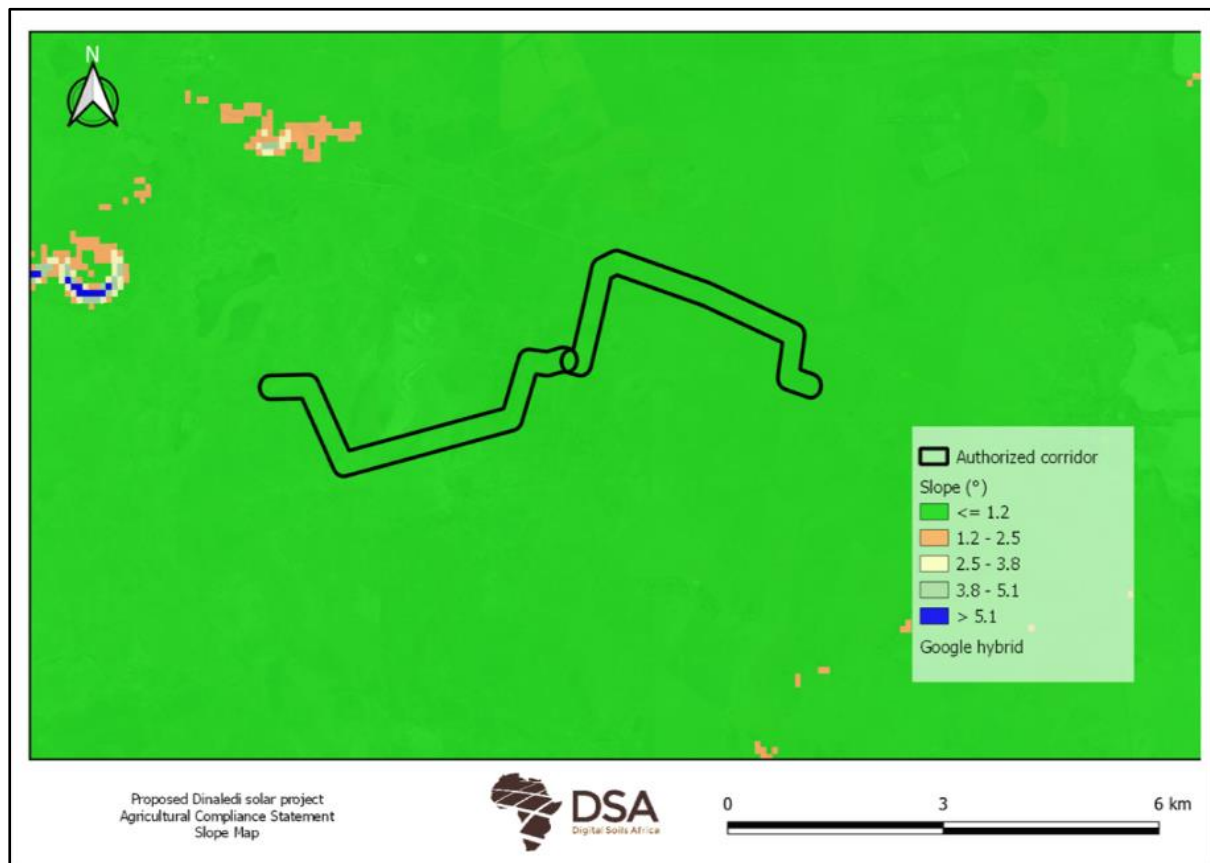


Figure 22: Slope of the survey area as degrees

6.2.3.1 Land Type Information

There are two land types occurring in the study area, namely, Ae46 and Db3. The criteria for an area to qualify for inclusion in the land types is given in the table below.

Table 16: Brief description of the Conductor line land types found in the study area.

Land Type	Description
Ae	The Ae land type refers to red, high-base status soil, of which the depth varies from 0.1 to 0.3m. The soil forms found are usually Hutton and Nkonkoni.
Db	Duplex soils (sandier topsoil abruptly overlying more clayey subsoil) comprise >50% of land type; <50% of duplex soils have non-red B horizons.

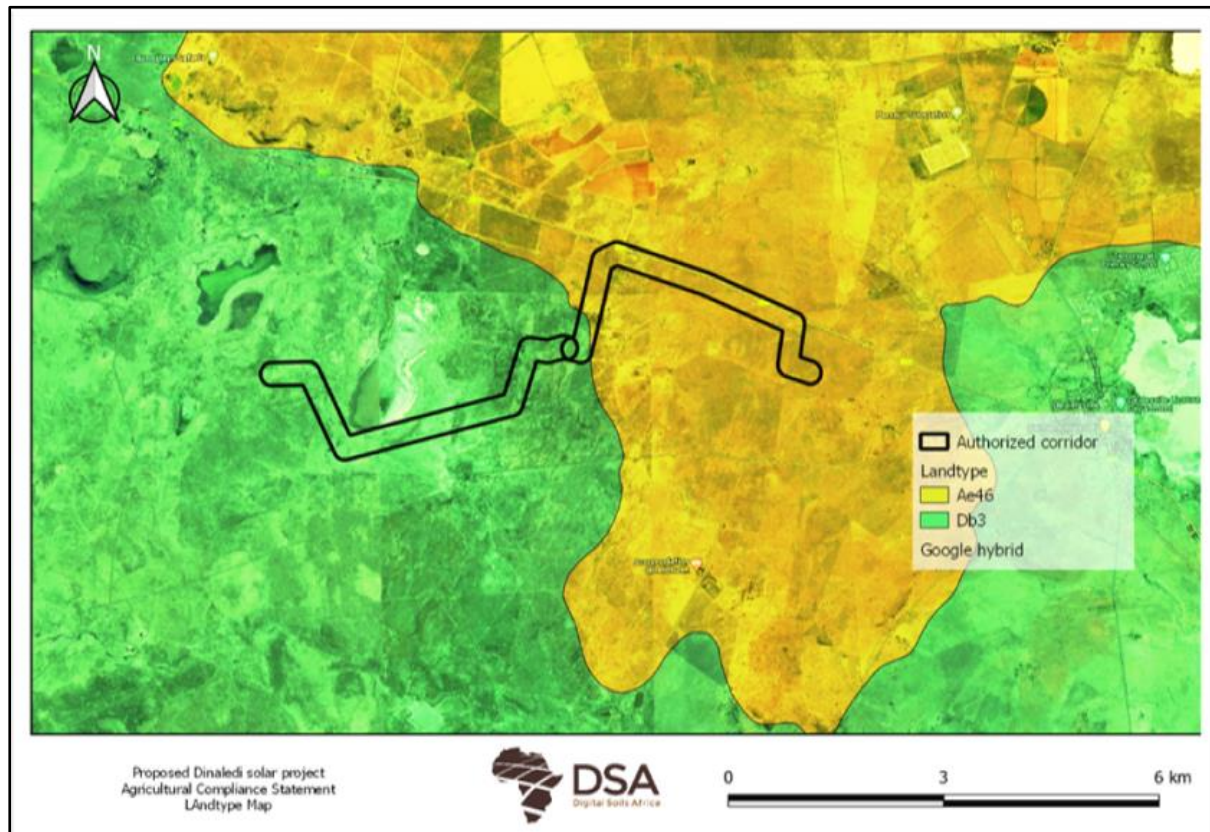


Figure 23: Land Types occurring in the study area (Land Type Survey Staff, 1972-2002)

The geology consists of the Karoo Dolerite and Volksrust Family (Fm), Eccca Group. Sandstone, mudstone and shale from the Volksrust Formation, Eccca Group lie beneath extensive areas of flat to undulating plains, interrupted by dolerite sills.

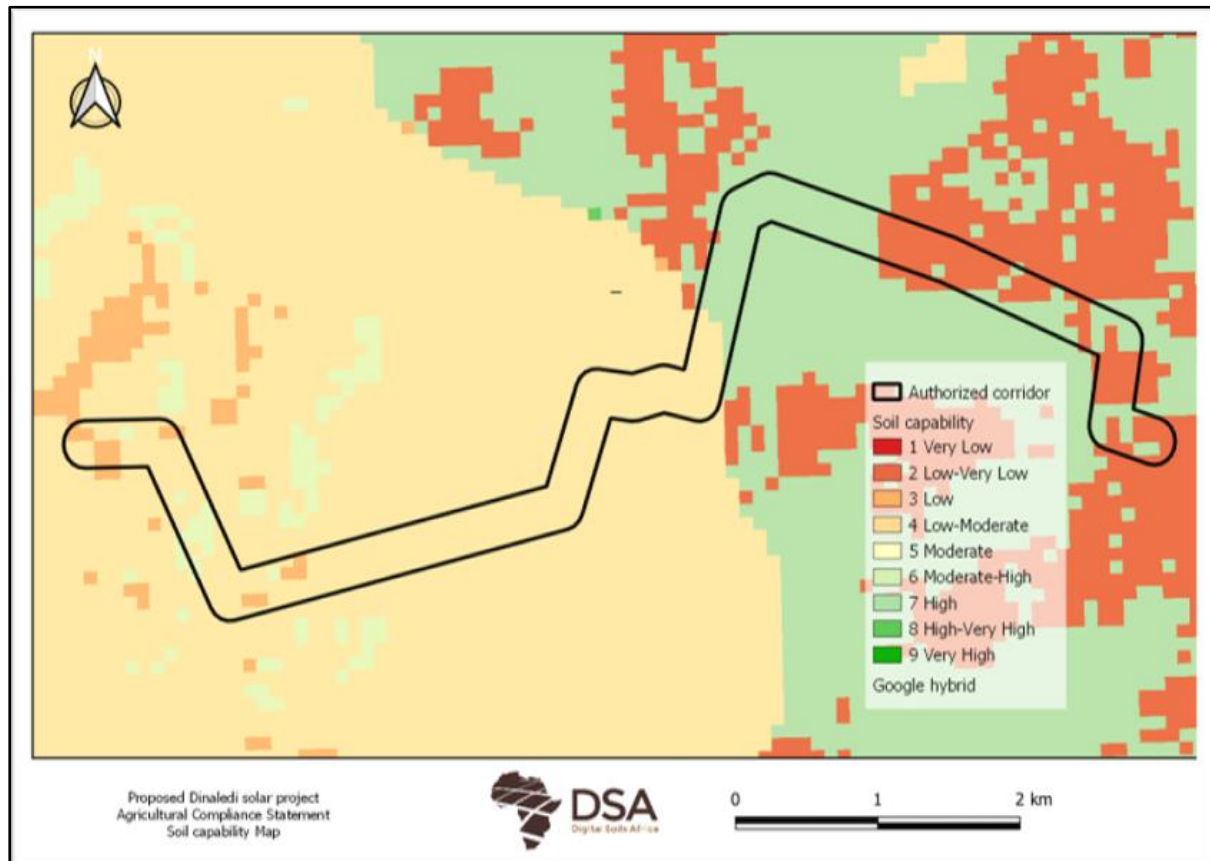


Figure 24: Soil Capability Class Map (Department of Agriculture, 2017)

6.2.3.2 Vegetation, Current Land-use, and Agricultural Activities

The study area consists of the Vaal Vet Sandy Grassland and the Western Free State Clay Grassland. The grazing capacity of the area varies with the western side having a grazing capacity of 10 LSU/ha and the eastern parts 8 LSU/ha.

6.2.3.3 Land Capability

As a first step, the land capability used to determine the agricultural sensitivity in the screening was analysed. The land capability of the area ranges from low (Land class 2) to high (Land class 10) (DAFF, 2016). The expected land capability according to the screening tool is moderate (7).

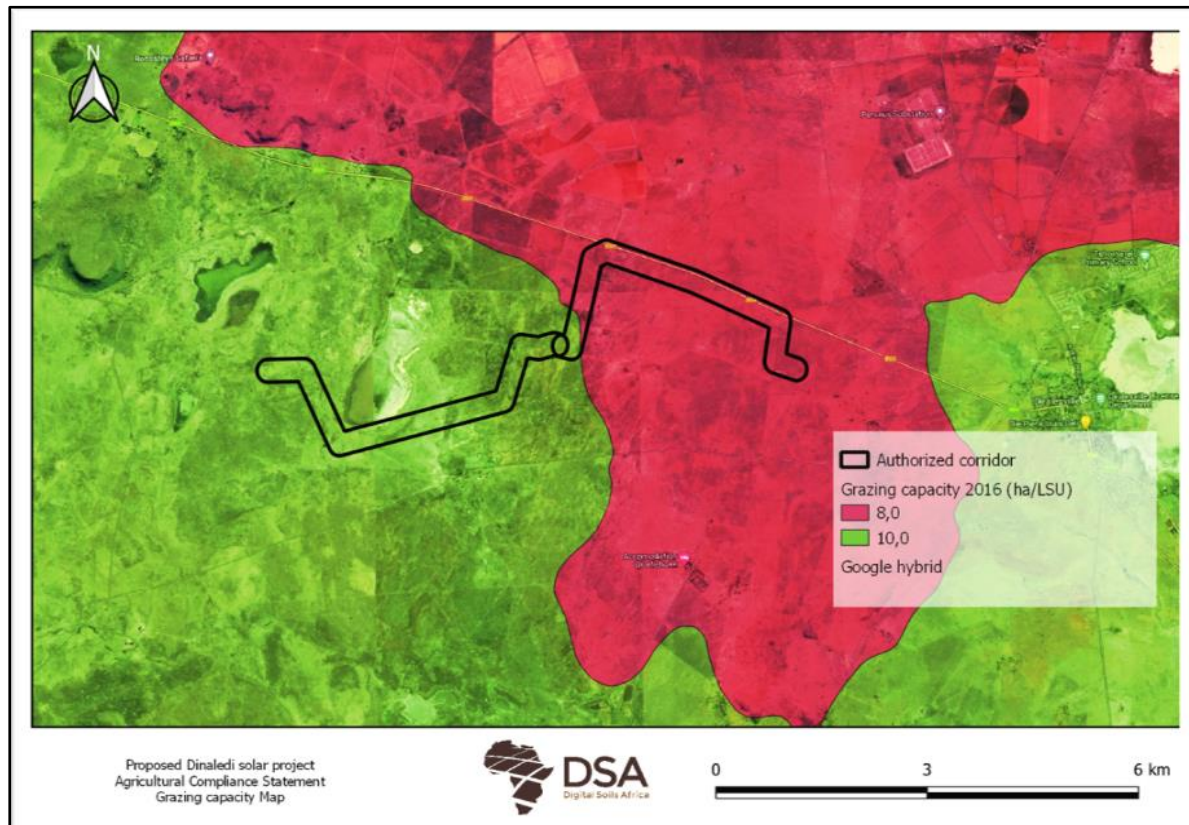


Figure 25: Long-term grazing capacity in ha/LSU (DAFF, 2016) of the site.

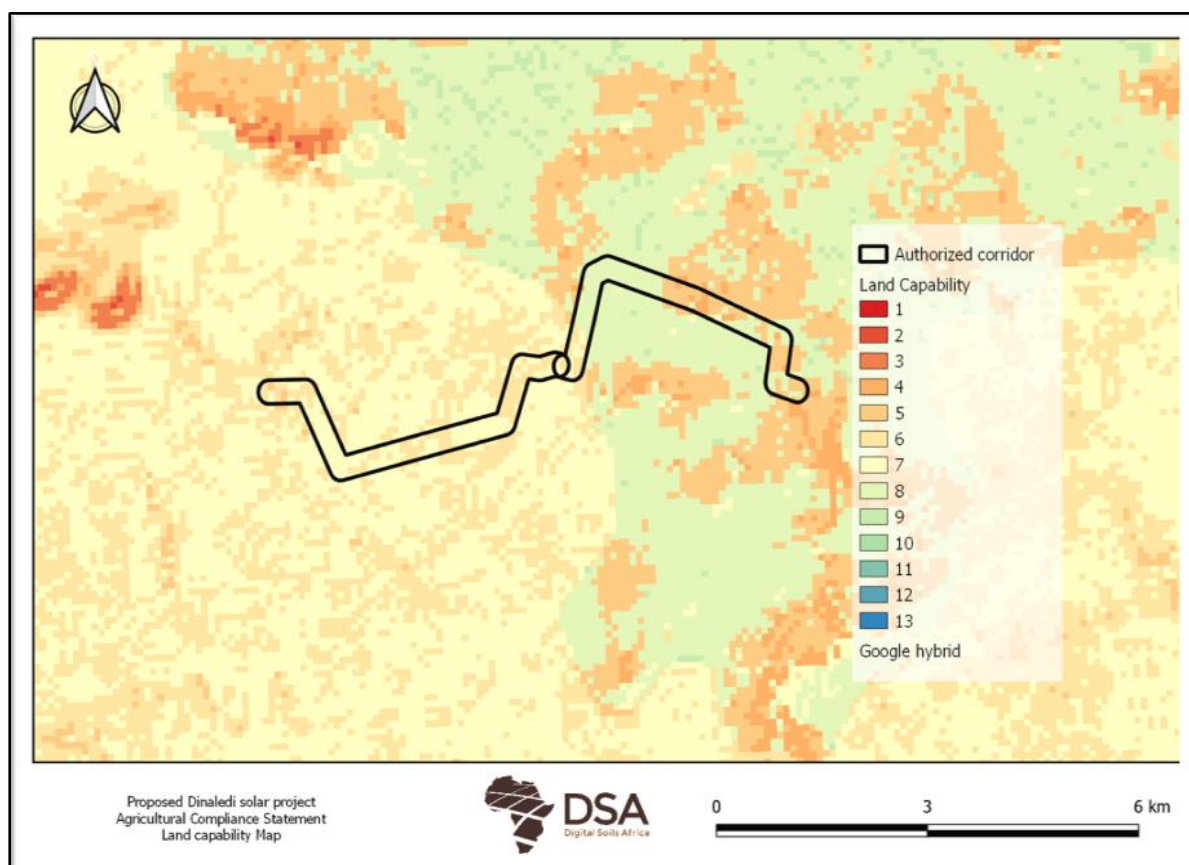


Figure 26: The land capability for the surrounding area (DAFF, 2016)

6.2.3.4 *Impact Assessment*

All areas where vegetation is removed from the soil surface in preparation for the power line construction, will result in exposed soil surfaces that will be prone to erosion. Both wind and water erosion are a risk. Once the soil particles are removed, vegetation will have difficulty establishing itself on the rock, lithic and hard carbonate material in the area.

During the construction phase, construction workers will access the different farm portions for the preparation of the terrain and the installation of the pylons. Both potential spills and leaks from construction vehicles and equipment as well as waste generation on site, can result in soil pollution.

Loss of agricultural land can unfortunately not be avoided during the lifetime of the corridor. The agricultural land lost in low as livestock grazing is the primary agricultural use.

Recommendations during construction:

- Restrict the proposed development to the smallest footprint possible and do not disturb/alter areas outside the development.
- Ensure that access conductor lines are kept clear, and the construction and operational activities do not interfere with agricultural activities.

It is the specialist's opinion that the proposed development site is generally of a low to moderate agricultural sensitivity, and that the development at the proposed site will not significantly impact agricultural activities.

6.3 CULTURAL / HISTORICAL ENVIRONMENT

6.3.1 *Heritage Impact Assessment*

APelser Archaeological Consulting was appointed to conduct a Phase 1 HIA for a new powerline related to the proposed Marula Cluster gridline project. The study and proposed development area is located near Dealesville in the Free State Province and on portions of the farms Leliehoek, Cornelia, Klipfontein & Modderdam.

Background research indicated that there are some cultural heritage sites and features in the larger geographical area within which the study area falls. There are no known cultural heritage resources in the specific study and proposed development area. During the field-based assessment some sites, features and material of cultural heritage origin & significance was identified and recorded in the area.

6.3.1.1 Discussion

The Stone Age is the period in human history when lithic (stone) material was mainly used to produce tools. In South Africa the Stone Age can be divided basically into three periods. It is however important to note that dates are relative and only provide a broad framework for interpretation.

Earlier Stone Age (ESA) up to 2 million – more than 200 000 years ago

Middle Stone Age (MSA) less than 300 000 – 20 000 years ago

Later Stone Age (LSA) 40 000 years ago – 2000 years ago

Several Stone Age sites are known from the larger geographical area, including those at the well-known Florisbad and Erfkroon. **No Stone Age sites, or material was identified in the study & development area during the field assessment.**

The Iron Age is the name given to the period of human history when metal mainly used to produce artifacts. In South Africa it can be divided in two separate phases (Bergh 1999). The archaeological footprint in the region is primarily dominated by Late Iron Age stone wall complexes. Stone enclosures found on and around dolerite koppies along the river valley between Winburg and Bethlehem, exhibit telltale signs of basic structural units including huts, large enclosures, pieces of walling and stone circles related to Late Iron Age settlements in the area. **No Iron Age sites are known to be present in the area, and none was identified during the current assessment as well.**

6.3.1.2 Results of the October 2022 field assessment

Four sites or areas with recent historical remains/features were identified in the general area during the October 2022 assessment. None of these sites will be directly impacted by the proposed Powerline development. However, these sites does carry some Cultural Heritage Significance and care should be taken to not impact on them during any possible future (other) developments.

Site 1 consists of a stone-packed kraal (Livestock enclosure), various structures (including a shed), corrugated iron farm dam and windmill ("windpomp"). These form part of the existing farming activities on Cornelia. It is uncertain what the age is of some of the structures, but it is possibly older than 60 years of age. It is however, not of High Significance and will not be negatively impact.



Figure 27: Stone kraal at Site 1.

Sites 2-4 is more than likely part of a single site, containing the remains of various small structures such as homesteads and others related to a farmworker's settlement on the farm. Metal objects such as corrugated iron sheeting, tins/cans, pieces of glass and porcelain is also scattered around the area. Site 3 is related to this settlement and consists of two areas (rocks) with evidence of grinding activities taking place here. A Medium Cultural Heritage significance rating is also given to these features and the settlement site. Although they are allocated outside of the area of impact from the proposed development, it is however recommended that the sites be avoided by any possible future developments.

Finally, it can be concluded that the field assessment for the proposed new powerline related to the Marula Solar Facility Project was conducted successfully. From a Cultural Heritage perspective there should be no objection to approve the proposed development, taking into consideration the recommendations made in the report.



Figure 28: Map showing the location of the sites recorded in relation to the proposed powerline & solar development

6.3.2 Paleontological Impact Assessment

Alan Smith Consulting was appointed to conduct a Desk-top field assessment of the potential impacts to Palaeontology Resources that might occur through the activities of a gridline for the proposed Marula Cluster Project for 29 Solar, Dealesville, Tokologo District Municipality, Free state Province.

Section 38 of the National Resources Act No 25 of 1999 (Heritage Resources Management), requires a Palaeontological Impact Assessment (PIA) to assess any potential impacts to palaeontological heritage.

Scope and Purpose of the Report

A Palaeontological Impact Assessment (PIA) is a means of identifying any significant palaeontological material before development begins, so that these can be managed in such a way as to allow the development to proceed (if appropriate) without undue impacts to the fragile heritage of South Africa. This Desk-Top investigation fulfills the requirements of the heritage authorities (SAHRA), such that a comment can be issued by them for consideration by the competent authority, who will review the Basic Assessment (BA) and grant or refuse

73authorization. The PIA report will outline any management and/or mitigation requirements that will need to be complied with from a heritage point of view and that should be included in the conditions of 73authorization, should this be granted.

Geology

According to the Kimberley 2824 1: 250 000 geological map, the proposed gridline will overlie two lithologies. These are the Tierberg Formation and Karoo Dolerite (Figure 25).

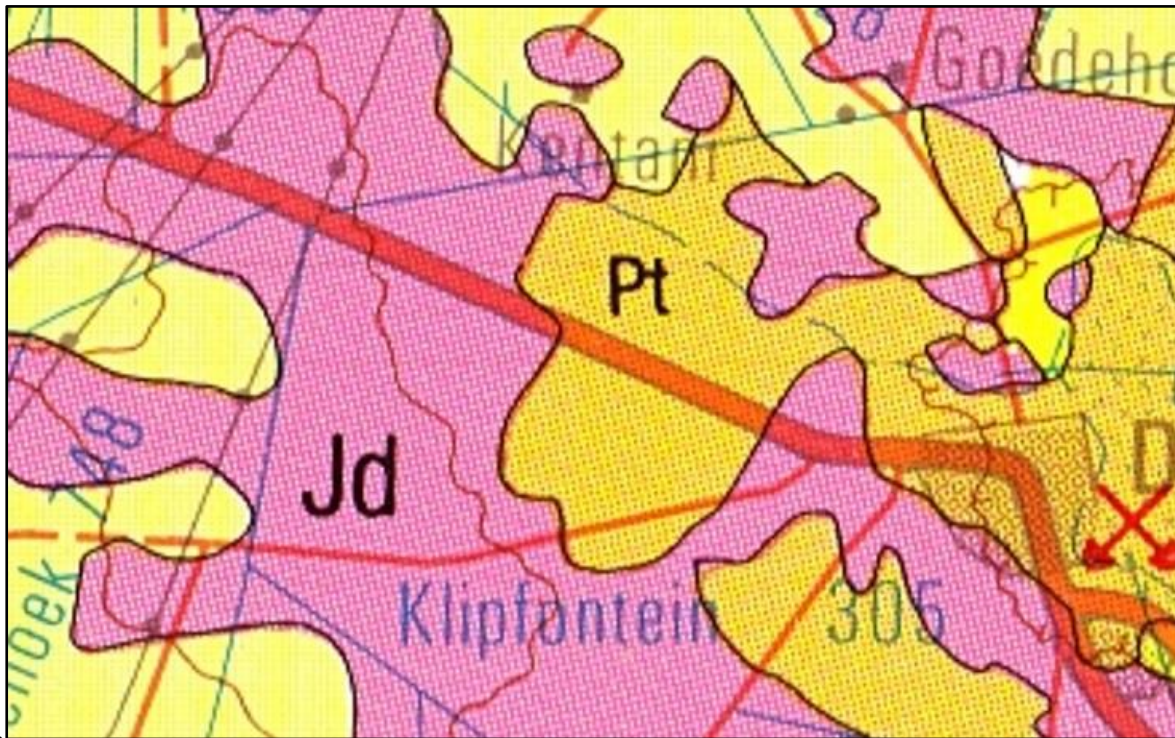


Figure 29: Approximate area of the proposed Marula Cluster Project – Grid Line. According to this map, this pylon line will intersect Karoo Dolerite (Pink) and The Karoo-aged Tierberg Formation (Yellow). Extract from the Kimberley (2824).

Tierberg Formation

The Tierberg Formation formed from sediment deposited below wave-base within a basin occupied by the Karoo Sea, located in the centre of the Gondwana Supercontinent. Tierberg Formation environments of deposition include basin plain, distal turbidite fans and distal prodelta setting (Viljoen 2005).

The Tierberg Formation is dark-coloured, usually grey or brown and, when fresh, laminated. It is carbonaceous with subordinate thin, fine-grained sandstones (Prinsloo 1989, Le Roux 1993, Viljoen 2005, Johnson et al., 2006).

The Tierberg Formation is usually associated with Karoo Dolerite sills and dykes (Prinsloo 1989). Bedding planes, on which fossils are usually found are very rare.

Karoo Dolerite

Karoo Dolerite is represented by dykes and sills. This lithology is part of the Karoo Large Igneous Province (LIP). The Karoo LIP is a sequence of lavas up to 4.5 km thick which was deposited about 184 Ma (million years ago). This igneous deposit was extruded via fissures as a “Continental Flood Basalt” during, a process that has never been witnessed by mankind. This event took place in a relatively short geological (>1Ma) time span and triggered the break-up of the Gondwana Supercontinent (Hastie et al., 2014).

Table 17: Summary of SAHRIS categories

Colour	Sensitivity	Required Action
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required



Figure 30: Palaeosensitivity of the Marula Pylon gridline. Extract from SAHRIS Palaeosensitivity Map.

Palaeontological Significance

Tierberg Formation trace fossils are relatively common and not paleontologically significant. The overall paleontological sensitivity of the Tierberg Formation is low. Although this unit is coded yellow, no further paleontological work is required unless the “Chance Find Protocol” (section 8) is triggered. The Karoo Dolerite contains no fossils.

Summary

The chance of fossils being found on this site is **Low**, but not **Zero**. **A field trip at this stage will not show anything as the surface rock is very weathered. Only when excavation begins will fresh rock be visible and even then will probably not be warranted.**

No further paleontological work is required, unless triggered by the “**Chance Find Protocol**” in which a suitably qualified paleontologist must be consulted. The “**Chance Find Protocol**” must form part of the Environmental Management Programme (EMPr) for the site.

6.4 SOCIO-ECONOMIC CONTEXT

The proposed grid infrastructure project falls within the Tokologo Local Municipality and the Lejweleputswa District Municipality in the Free State Province. The Local municipality is a Category B municipality and has an area that comprises 9 326km² which is equivalent to 29% of the District Municipality’s geographical area. Major towns present within the municipality include Boshof, Dealesville and Hertzogville.

6.4.1 Population

The table below indicates a slight increase in the population within the District and Local Municipalities. The trend over the last few years has been that younger people leave the smaller rural areas to move to the larger urban cities in search of employment opportunities. These renewable energy projects could provide the opportunity to attract younger people back to the rural areas and boost the local economy.

Table 18: Population growth

Area	Population in 2011	Population in 2016	Growth in population
Lejweleputswa	624 746	646 920	0.8
Tokologo	28 986	29 149	1.6

6.4.2 Employment Statistics

Unemployment is a major problem across South Africa and the country requires urgent investment into new infrastructure projects that can create much needed job opportunities, especially among the youth.

Unemployment in the Tokologo Municipality was estimated at approximately 27.5% in 2016 which is roughly the same as the 2011 rate.

7 PUBLIC PARTICIPATION PROCESS

The purpose of the Public Participation Process, as per Chapter 6, Regulation 40 of the EIA Regulations of 2014 as amended (GN No. R 326), is to provide access to all information that reasonably has or may have the potential to influence any decision with regard to an application unless access to that information is protected by law. This must include consultation with the DFFE (in this case), every state department that administers a law relating to a matter affecting the environment relevant to an application for an EA, all organs of state which have jurisdiction in respect of the activity to which the application relates, and all potential or registered (where relevant) I&APs.

The PP process is therefore undertaken in terms of the legislative requirements, *Chapter 6, Regulation 39 - 43 of the EIA Regulations of 2014, as amended, (GN No. R. 326)* as follows:

7.1 IDENTIFICATION OF KEY STAKEHOLDERS AND I&APs

The identification and registration of I&APs will be an ongoing activity during the course of the environmental impact assessment of the proposed development. BioBlue will develop, maintain and constantly update an electronic I&AP database for the application process. As such I&APs were identified using the following:

- Placement of advertisements in newspapers.
- Placement of site notices at the proposed development site and at entrance roads to Dealesville town; and
- Discussions with relevant Authorities and adjacent landowners

I&APs representing the following sectors of society have also been identified in terms of Chapter 6, Regulation 41, of the EIA Regulations):

- Provincial Authorities;
- Local Authorities;
- Parastatal/ Service Providers;
- Non-governmental Organisations;
- Local forums/ unions; and
- Adjacent Landowners.

Refer to Appendix E4 for the stakeholder database.

7.2 CONSULTATION WITH THE COMPETENT AUTHORITY

The DFFE is the Competent Authority for the project as it forms part of the national electricity grid infrastructure. Consultation with DFFE has commenced and will continue throughout the Basic Assessment Application process.

To date the authority consultation included the following:

- Submission of the pre-application meeting request to DFFE. Pre-application was not deemed necessary by the EAP and proof of acknowledgement was sent by the appointed Case Officer.
- The completed EA application form was submitted with all accompanying documents that were required by the Department.
- A Reference number was issued

7.3 CONSULTATION WITH OTHER RELEVANT AUTHORITIES

The Background regarding the proposed development was provided to other relevant Authorities, together with a registration and comment form, formally requesting the input into the Basic Assessment Process. The Authorities include inter alia:

Table 19: Other Relevant Authorities contacted as part of the BA process.

Name and Surname	Contact Details	Company/Organisation
Ms. Dimakatso Mokoena and Ms. Grace Mkhosana	mokoenad@destea.gov.za mkhosana@destea.gov.za	Free State Department: Economic, Small Business Development, Tourism and Environmental Affairs (DESTEa)
Mr. D. Seiphemo	seiphemod@dws.gov.za	Department of Water and Sanitation

Municipal Manager	info@lejwe.co.za 057 353 3094/5/8/9	Lejweleputswa District Municipality
Municipal Manager and other officials	info@tokologo-municipality.co.za kmogoasi@yahoo.com kelehilem@gmail.com	Tokologo Local Municipality (Municipal Manager)
		Free State Agriculture

7.4 NOTIFICATIONS AND ADVERTISEMENTS

The proposed development and Basic Assessment process will be widely announced with an invitation to the public to register as I&APs and to actively participate in the PP process. This will be achieved using:

- Print media advertisements in the local Bloemfontein Courant newspaper in English (8th September 2022).
- Identified key stakeholders who will be contacted telephonically or by email and informed of the proposed development and the Basic Assessment process;
- The identified I&APs will be invited to comment on the content of the Draft BAR through letters via Email; (Appendix E5)
- Posters/ site notices indicating where the Draft BAR will be made available and placed at public locations and around the site. (Refer to Appendix E for proof of advertisement)

In accordance with the requirements of the EIA Regulations of 2014, the I&AP registration period commenced with the advertisement of the proposed development in newspapers and the placement of site notices. As stated, the purpose of the advertisements and site notices is to notify the public of the proposed development and to invite the public to register as I&APs and comment on the Draft BAR.

7.5 PUBLIC REVIEW OF THE DRAFT BASIC ASSESSMENT REPORT

All registered I&APs have been notified of the Draft Basic Assessment Report and the Report has been made available in Hard Copy at the Dealesville Police Station as well as on the BioBlue website and via direct Onedrive link. The reports will be made available for the required 30-day public comment period.

Any comments received during the 30-day public comment period on the Draft BAR will be recorded, incorporated into the Basic Assessment Report where relevant, and appropriately responded to. This will all be included within the Comments and Response Report which will form part of the Appendices submitted to the Competent Authority for review and assessment.

8 IMPACT ASSESSMENT

The Impact Assessment is undertaken in line with the requirements of Appendix 3 of the EIA Regulations (2014) as amended.

8.1 IMPACT ASSESSMENT METHODOLOGY

The following assessment methodology has been used for the purpose of assessing impacts because of the construction / establishment and operational phases also including the assessment of the cumulative impacts of the proposed extension of the Twin tern 132kV conductor lines.

The impacts arising from the activities are included in the impact assessment tables. This is to identify activities that require certain environmental management actions to mitigate the impacts arising from them. The assessment of the impacts will be conducted according to a synthesis of criteria required by the integrated environmental management procedure (Table 19).

Table 20: Impact Assessment Table

Extent The physical and spatial scale of the impact.	Footprint	The impacted area extends only as far as the activity, such as footprint occurring within the total site area.
	Site	The impact could affect the whole, or a significant portion of the site.
	Regional	The impact could affect the area including the neighbouring farms, the transport routes and the adjoining towns.
	National	The impact could have an effect that expands throughout the country (South Africa).
	International	Where the impact has international ramifications that extend beyond the boundaries of South Africa.
Duration The lifetime of the impact, that is measured in relation to the lifetime of the proposed development.	Short Term	The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than that of the construction phase. Usually ≤ 1 to 5 years
	Medium Term	The impact will last up to the end of the development phases, where after it will be entirely negated. Usually 5 – 15 years .
	Long Term	The impact will continue or last for the entire operational lifetime of the development, but will be mitigated by direct human action or by natural processes thereafter.

	Permanent	This is the only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.
Intensity Is the impact destructive or benign, does it destroy the impacted environment, alters its functioning, or slightly alter the environment itself?	Low	The impact alters the affected environment in such a way that the natural processes or functions are not affected.
	Moderate	The affected environment is altered, but functions and processes continue, albeit in a modified way.
	High	Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.
Probability The likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time.		
	Improbable	The possibility of the impact occurring is very low, due either to the circumstances, design or experience. The chances of this impact occurring is defined as 25%.
	Probable	There is a possibility that the impact will occur to the extent that provisions must therefore be made. The chances of this impact occurring is defined as 50%.
	Highly Probable	It is most likely that the impacts will occur at some stage of the development. Plans must be drawn up before carrying out the activity. The chances of this impact occurring is defined as 75%.
	Definite	The impact will take place regardless of any prevention plans, and only mitigation actions or contingency plans to contain the effect can be relied on. The chance of this impact occurring is defined as 100%.

Table 21: Impact Significance Methodology

The Significance of Environmental Impacts is to be assessed by means of the following method: Significance = Probability x Severity. Probability describes the likelihood of the impact actually occurring, and is rated below:	
Improbable	Rating = 2
Probable	Rating = 3
Highly Probable	Rating = 4
Definite	Rating = 5
The Severity rating is calculated by multiplying Intensity with Duration. The Intensity factor is described below:	
Low Intensity	Factor 1

Moderate Intensity	Factor 2
High Intensity	Factor 3
The Duration factor is described below:	
Short term	Factor 2
Moderate term	Factor 3
Long term	Factor 4
Permanent	Factor 5
The Severity rating obtained from the above calculations are discussed below:	
Low severity (Rating 2)	Calculated values 2 to 4
Moderate severity (Rating 3)	Calculated values 5 to 8
High severity (Rating 4)	Calculated values 9 to 12
Very High severity (Rating 5)	Calculated values 13 to 16 or more
Severity factors below 3 indicate no impact	
A Significance Rating = Severity Rating x Probability Rating. The significance rating should influence the development project as described below:	
Low Significance (Rating 4 – 6)	Positive Impact and negative impacts of Low significance should have no influence on the proposed development project.
Moderate Significance (Rating 7 to 12)	Positive Impact – Should indicate that the proposed project should be approved. Negative impact – Should be mitigated or mitigation measures should be stipulated before the proposed project can be approved.
High Significance (Rating 13 – 18)	Negative Impact – Should weigh towards decision to terminate the proposed project if not mitigation measures can be implemented. Mitigation measures should be stipulated and performed to reduce the significance to at least low significance.
Very High Significance (Rating 19 – 25 and more)	

Mitigation – The impacts that are generated by the development can be minimised if measures are implemented to reduce the impacts. The mitigation measures ensure that the development considers the environment and the predicted impacts to minimise impacts and achieve sustainable development.

Determination of Significance – Without Mitigation – Significance is determined through a synthesis of impact characteristics as described in the above paragraphs. It provides an indication of the importance of the impact in terms of both tangible and intangible characteristics. The significance of the impact “without mitigation” is the prime determinant of the nature and degree of mitigation required. Where the impact is positive, significance is noted as “positive”. Significance will be rated on the following scale:

No significance: The impact is not substantial and does not require any mitigation action;

Low: The impact is of little importance, but may require limited mitigation;

Medium: The impact is of importance and is therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels; and

High: The impact is of major importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.

Determination of Significance – With Mitigation – Determination of significance refers to the foreseeable significance of the impact after the successful implementation of the necessary mitigation measures. Significance with mitigation will be rated on the following scale:

No significance: The impact will be mitigated to the point where it is regarded as insubstantial;

Low: The impact will be mitigated to the point where it is of limited importance;

Low to medium: The impact is of importance, however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels;

Medium: Notwithstanding the successful implementation of the mitigation measures, to reduce the negative impacts to acceptable levels, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw;

Medium to high: The impact is of major importance but through the implementation of the correct mitigation measures, the negative impacts will be reduced to acceptable levels; and

High: The impact is of major importance. Mitigation of the impact is not possible on a cost-effective basis. The impact is regarded as high importance and taken within the overall context of the project, is regarded as a fatal flaw. An impact regarded as high significance, after mitigation could render the entire development option or entire project proposal unacceptable.

Assessment Weighting – Each aspect within an impact description was assigned a series of quantitative criteria. Such criteria are likely to differ during the different stages of the project's life cycle. To establish a defined base upon which it becomes feasible to make an informed decision, it will be necessary to weigh and rank all the identified criteria.

Identifying the Potential Impacts Without Mitigation Measures (WOM) – Following the assignment of the necessary weights to the respective aspects, criteria are summed and multiplied by their assigned weightings, resulting in a value for each impact (prior to the implementation of mitigation measures).

$$\text{Calculation 1:} \quad \text{Significance Rating (WOM)} = (\text{Extent} + \text{Intensity} + \text{Duration} + \text{Probability}) \times \text{Weighting Factor}$$

Identifying the Potential Impacts with Mitigation Measures (WM) – In order to gain a comprehensive understanding of the overall significance of the impact, after implementation of the mitigation measures, it will be necessary to re-evaluate the impact.

Mitigation Efficiency (ME) – The most effective means of deriving a quantitative value of mitigated impacts is to assign each significance rating value (WOM) a mitigation effectiveness (ME) rating. The allocation of such a rating is a measure of the efficiency and effectiveness, as identified through professional experience and empirical evidence of how effectively the proposed mitigation measures will manage the impact.

Thus, the lower the assigned value the greater the effectiveness of the proposed mitigation measures and subsequently, the lower the impacts with mitigation.

$$\text{Calculation 2: Significance Rating (WM)} = \text{Significance Rating (WOM)} \times \text{Mitigation Efficiency}$$

$$\text{Or} \quad \text{WM} = \text{WOM} \times \text{ME}$$

Significance Following Mitigation (SFM) – The significance of the impact after the mitigation measures are taken into consideration. The efficiency of the mitigation measure determines the significance of the impact. The level of impact will, therefore, be seen in its entirety with all considerations considered.

Consideration will also be given to potential cumulative impacts as illustrated below, occur as a result from the combined effect of incremental changes caused by other activities together with the proposed project. In other words, several developments with insignificant impacts individually may, when viewed together, have a significant cumulative adverse impact on the environment.

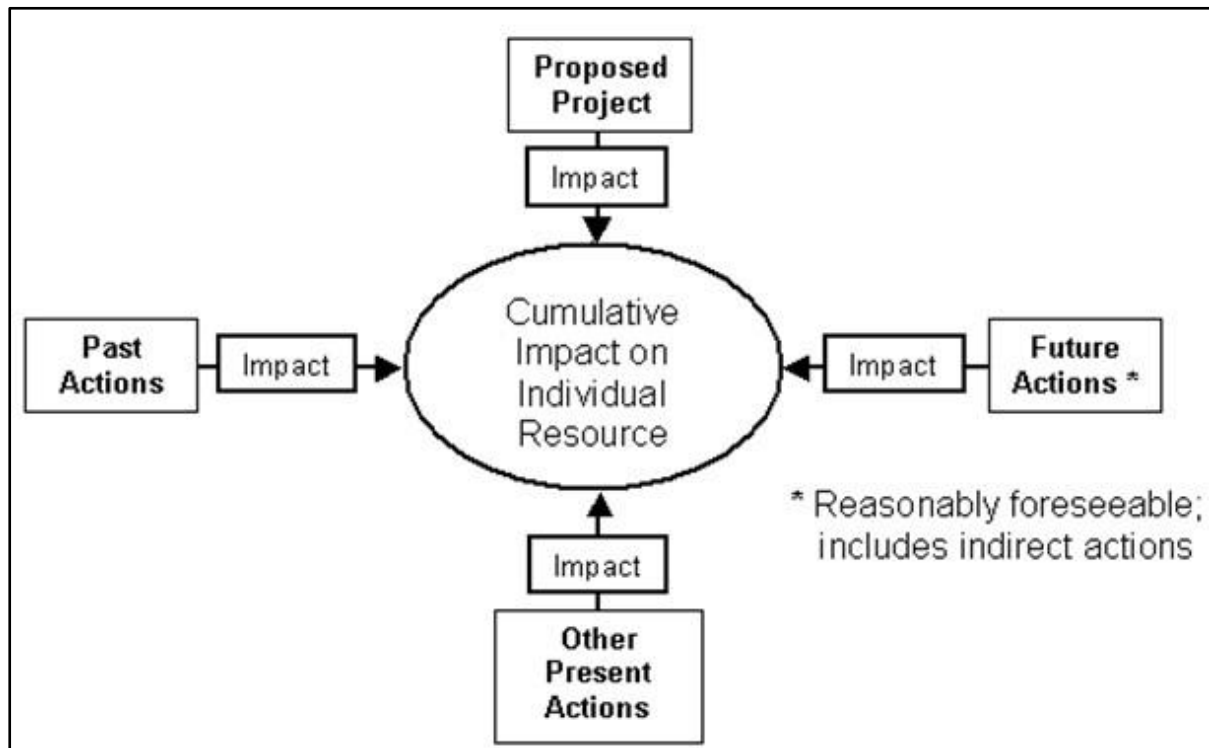


Figure 31: Cumulative impacts illustration
(<https://www.environment.fhwa.dot.gov/nepa/QAimpact.aspx>)

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 the specialist /. EAP's level of knowledge and expertise will also be reported. The Degree of confidence will however not be taken into account in the determination of consequence or probability.

This assessment is initially done for the scenario where no mitigation measures are implemented. Mitigation measures will then be 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) The results of the assessment of the significance of the residual impacts will then be linked to decision-making by Authorities.

8.2 IDENTIFIED POTENTIAL IMPACTS

The potential impacts associated with the proposed development have been identified through the Basic Assessment process and inputs from the various specialist assessments, and then categorized in terms of biophysical and socio-economic parameters. The identified potential impacts have been investigated in detail within the Impact Assessment phase of this process.

The identification of key issues and the assessment of the significance of impacts within the process are thus aimed at giving input in the planning phases of the proposed development and ensuring the most viable and least environmentally sensitive environment is utilized for the proposed development.

Potential Impacts that are likely to occur in the:

8.2.1 Construction Phase

- The displacement of threatened bird species from important habitats (direct and indirect)
- Loss of habitat for resident species (Fauna and Avi-Fauna) throughout the construction, operations and maintenance phases (Direct and Cumulative)
- Long-term or permanent degradation and modification of the receiving environment resulting to the loss of important habitats for Fauna species (Direct, Indirect and Cumulative)
- Displacement of resident fauna species through increased disturbance (Direct and Cumulative)
- Vehicle movement and compaction of soil minimizing plant growth of indigenous flora (Direct and Cumulative)
- Spreading of invasive alien plants. The altered environment will also favor species that are better adapted to disturbed / transformed areas. (Direct and Cumulative)
- Compaction of wetland soils that could lead to establishment of preferential flow-paths (Direct and Cumulative)
- Loss of wetland vegetation during clearance / establishment (Direct and Cumulative)
- Pollution of soil and water resources (Direct, Indirect and Cumulative)

- Vegetation clearance will result in exposed soil surfaces that will be prone to erosion (Direct, Indirect and Cumulative)
- Potential impact on ambient air quality (dust generation);and (Direct, Indirect and Cumulative)
- Potential socio-economic impacts (both positive and negative). (Direct and Indirect)
- Potential cultural impacts if any items of cultural value is un-earthed during the construction phase (Direct)

8.2.2 Operational and Maintenance Phase

- Vehicle movement and compaction of the soil minimizing plant growth of indigenous flora (Direct and Cumulative)
- Alteration of the natural environment and loss of habitat (Direct, Indirect and Cumulative)
- Spreading of alien invasive plants (Direct and Cumulative)
- Long-term or permanent degradation and modification of the receiving environment resulting to the loss of important habitats for fauna species (Direct and Cumulative)
- Electrocution and Collisions with powerline infrastructure (Cumulative and Direct impacts)
- Potential pollution of soil and water resources (Direct and Indirect)
- Health and Safety;

8.2.3 Decommissioning

- Long-term or permanent degradation and modification of the receiving environment resulting to the loss of important habitats for all animal groups. (Direct, Indirect and Cumulative)
- Continuous proliferation of invasive alien plants (Direct and Cumulative)
- Erosion as a result of exposed disturbed areas that could impact on the wetland systems on site (Direct, Indirect and Cumulative)

Table 22: Construction Phase – Impact Table – Preferred Option 1

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
Pollution of soil and water due to spillages of hazardous materials such as Petroleum, oil and concrete	Direct: Pollution of soil and water resources Cumulative: Pollution of soil and water sources could impair the functioning of the surrounding wetland systems.	Probability = 4 Intensity = 3 Duration = 4 Severity = $3 \times 4 = 12$ (High Severity Rating) (Rating 4) Significance = $4 \times 4 = 16$ High Negative Significance	- Wetland areas and their associated buffer zones must be fenced off and zoned as no-go areas unless approved by the ECO. The contractor has the responsibility to inform all staff of the importance of the on-site wetlands. - Runoff from any new service roads must be managed - Construction vehicles and equipment are to be maintained in good working order, to reduce the probability of leakage of fuels and lubricants - Concrete to be mixed only on an impermeable surface such as a batching tray and not on exposed soil - All concrete and tar that is spilled outside these areas must be promptly removed by the Contractor according to the specified measures to be followed. - Clean-up of hydrocarbon spills should be done	Probability = 3 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $3 \times 2 = 6$ (Low Negative Significance)

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
			immediately, and soil tests must be done All construction materials liable to spillage / contamination are to be stored in appropriate structures with impermeable flooring and bund walls with sufficient capacity to contain a spill	
Loss of priority avian and Fauna species from important habitats	Direct: Construction activities and infrastructure could lead to species moving from the area Cumulative: With continuous increase in activities and certain species moving away from the area, it could result in more species moving from the area as they are reliant on other animals as food source	Probability = 4 Intensity = 2 Duration = 3 Severity = $2 \times 3 = 6$ (Moderate Severity Rating) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Negative Significance	- Minimise the construction footprint and reserve indigenous vegetation wherever possible. Avoid constructing during the breeding season (summer) and construct the development in the shortest timeframe - Staff must not be allowed to wander into the adjacent natural areas and disturb the wildlife unnecessarily - Control pollution on site in order to protect remaining natural habitat	Probability = 3 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $3 \times 2 = 6$ (Low Negative Significance)
Loss of resident fauna through increased disturbance	Direct: Construction activities and infrastructure could lead to resident species moving from the area	Probability = 4 Intensity = 2 Duration = 3 Severity = $2 \times 3 = 6$ (Moderate Severity Rating) (Rating 3)	Minimise the construction footprint and reserve indigenous vegetation wherever possible. Avoid construction during the breeding season (Summer)	Probability = 3 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2)

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
	Indirect: Staff wandering through adjacent natural areas (no-go areas) Cumulative: With continuous increase in activities and certain species moving away from the area, it could result in more species moving from the area as they are reliant on other animals as food source	Significance = $4 \times 3 = 12$ Moderate Negative Significance	if possible and construct the development in the shortest timeframe. - A group of Meerkats were seen near the site. Contractor must ensure that staff do not disturb their den area - Control pollution on site in order to protect remaining natural habitat	Significance = $3 \times 2 = 6$ (Low Negative Significance)
Potential Increase in invasive vegetation	Direct: Spreading of invasive alien plants as the altered environment will also favour species that are better adapted to disturbed areas Cumulative: Proliferation of the alien invasive species will hamper the long-term rehabilitation efforts and re-establishment of natural vegetation	Probability = 4 Intensity = 2 Duration = 4 Severity = $2 \times 4 = 8$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Negative Significance	- Invasive plant material should be disposed by incineration, or alternatively, composting to break down seeds. If seedbank persists, invasive alien plant management and eradication measures should be implemented. - Any proclaimed weed or alien species that germinates during the	Probability = 2 Intensity = 1 Duration = 2 Severity = $1 \times 2 = 2$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
			contract period shall be cleared by hand before flowering • All vehicles and equipment that enters the site must be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access on to the areas to be cleared. • Continuously monitor the emergence of alien invasive plant species on the site and remove such species as soon as they become apparent. • Limit the use of chemicals (pesticides and herbicides) and do not spray in windy conditions. Pesticides may impact on pollinators and lead to	

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
			a decline in species diversity and densities	
Long-term or permanent degradation and modification of the receiving environment resulting to the loss of important habitats	Direct: Loss of important habitat for avi-fauna and fauna species Cumulative: Loss of important habitat will impact on the species composition within the area and that could, in the long-term lead to impacts on other indigenous species.	Probability = 4 Intensity = 2 Duration = 4 Severity = $2 \times 4 = 8$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Negative Significance	- Only utilize designated roads to access the site. - Minimise the construction footprint and reserve indigenous vegetation wherever possible. - Construct the development in the shortest timeframe and control noise pollution - Rehabilitate the area with indigenous flora - Demarcate the wetland areas and associated buffer zones - The spanning of the powerlines across the depression wetlands on the study site should be prioritised if the alternative trajectory of the grid infrastructure is not feasible.	Probability = 2 Intensity = 2 Duration = 3 Severity = $2 \times 3 = 6$ (Moderate Severity) (Rating 3) Significance = $2 \times 3 = 6$ Low Significance
Vehicle movement and compaction of soil	Direct: Vehicle movement on site will lead to compaction of soil and will minimize plant growth and have a negative	Probability = 4 Intensity = 2 Duration = 4 Severity = $2 \times 4 = 8$ (Moderate Severity) (Rating 3)	- Vehicles should only use designated roadways to access the site - After construction has been finalized, the compacted soil areas	Probability = 2 Intensity = 2 Duration = 3 Severity = $2 \times 3 = 6$ (Moderate Severity) (Rating 3)

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
	effect on the re-establishment of indigenous flora By minimizing the re-establishment of indigenous flora, invasive species could establish in that area Cumulative: Compaction of soil around wetland areas could lead to erosion and loss of functionality of these systems Compaction of soil could also lead to obstruction of natural flow to wetland areas	Significance = $3 \times 4 = 12$ Moderate Negative Significance	must be loosened and monitored for revegetation - Vehicles should not be allowed to indiscriminately drive through wetland areas and any signs of erosion must be addressed immediately to avoid impacting the functionality of the wetland areas - The site area must be inspected after construction to identify the areas of concern. Compacted areas must be loosened, and exposed areas must be revegetated with indigenous flora. Monitoring must be done on a regular basis.	Significance = $2 \times 3 = 6$ Low Significance
Vegetation clearance will result in exposed soil surfaces	Direct: Exposed soil surfaces could be prone to erosion (water and wind) and this could lead to loss of valuable topsoil Cumulative: Exposed soil is prone to erosion and the continuous loss of topsoil can	Probability = 4 Intensity = 2 Duration = 4 Severity = $2 \times 4 = 8$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Negative Significance	- Land clearance must only be undertaken immediately prior to construction activities and only within the development footprint / servitude. - Unnecessary land clearance must be avoided	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Significance

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
	lead to habitat degradation		- Level any remaining soil from excavation pits that remained on the surface instead of allowing small stockpiles to remain - Where possible, conduct the construction activities outside of the rainy season - No random-access routes may be established to prevent the unnecessary trampling of vegetation	
Clearance of vegetation and construction activities near wetland areas	Direct: If construction activities encroaches on the wetland habitat, then wetland functioning and integrity can be degraded. Cumulative: If impacts on the wetland areas persist throughout the construction and operational phases of the project then the small impacts could lead to degradation of the wetland area over time.	Probability = 4 Intensity = 3 Duration = 4 Severity = $3 \times 4 = 12$ (High Severity) (Rating 4) Significance = $4 \times 4 = 16$ High Negative Significance	- The construction of the proposed infrastructure must preferably occur during the dry season in the months of May to August when the rainfall is minimal. - The spanning of the powerlines across the depression wetlands on the study site should be prioritised if the alternative trajectory of the grid infrastructure is not feasible. - During the construction phase the natural flow of water (hydrological inputs), which will be in the form of runoff from	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Significance

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
			rainfall events to the depressions on the study site should not be hampered or obstructed in any way or form. • The wetland areas and their associated buffer zones must be fenced off and zoned as no-go areas. No person should be allowed into the area unless approved by the ECO for official purposes. • Runoff from roads must be managed to avoid erosion and pollution problems. Where excessive loose sediment is created, attenuation swales and / or soils screens should be installed. • Concrete and tar must only be mixed on mixing trays and in areas which have been specially demarcated for this purpose. • Portable septic toilets must be located outside of the delineated wetland boundaries and buffer zones.	

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
Increased runoff from hardened surfaces	Direct: Increased runoff from hardened surfaces could lead to exposed areas susceptible to erosion. Cumulative: Hardened surfaces that are not loosened and re-vegetated could lead to increased runoff and in time that could lead to head-cut erosion within the wetland areas.	Probability = 4 Intensity = 2 Duration = 4 Severity = $2 \times 4 = 8$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Negative Significance	- Vegetation and soil must be retained in position for as long as possible and only removed immediately before construction activities commences. - Re-vegetation of disturbed areas must be undertaken with site indigenous species and in accordance with the instructions issued by the ECO. Areas where soil compaction or ruts developed must be rehabilitated. - Avoid construction activities in the wetlands through proper demarcation of the construction site. The Contractor has a responsibility to inform all staff of the need to be vigilant against any practice that will have a harmful effect on wetlands on and off the site.	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Significance
Employment Opportunities and land rental	Direct: The proposed project will create employment opportunities during	Probability = 4 Intensity = 2 Duration = 3	The proposed project will create a possible 10 job opportunities; however many more opportunities	Probability = 5 Intensity = 2 Duration = 4

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
	the construction and operational phases of the project and will also result in rent paid to the landowner. Cumulative: The project will create employment opportunities throughout as infrastructure maintenance needs to be conducted.	Severity = $2 \times 3 = 6$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Positive Significance	will be created by the larger Solar PV developments that will be connected to the grid through this line. Structures should be established to ensure appropriate development and transfer of skills to the local community.	Severity = $2 \times 4 = 8$ (Moderate Severity) (Rating 3) Significance = $5 \times 3 = 15$ High Positive Significance
Historical or Archaeological Impacts – Destruction of palaeontological or archaeological resources	Direct: Destruction of archaeological resources that may be damaged during the construction period when excavations are made for the pylons. Impacts also include the visual intrusion of the new electrical infrastructure into the rural cultural landscape.	Probability = 3 Intensity = 2 Duration = 5 Severity = $2 \times 5 = 10$ (High Severity) (Rating 4) Significance = $3 \times 4 = 12$ Moderate Negative Significance	- As the chances of encountering fossils are Low, but Not Zero, a "Chance Find Protocol" has been included in the EMPr. - It must be noted that a large amount of electrical infrastructure is already present in the landscape and visual intrusion will not have a major impact. - The specialist noted archaeological sites near the proposed grid line site, it is still recommended that these sites be recorded and marked as no-go areas by construction crews.	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
			- Minimise disturbance footprint. - Rehabilitated all areas not required during operation.	
Establishment of storage and construction camps and employees / contractors wandering off-site	Direct: Damage or loss of riparian systems and other sensitive features. Increase in littering around the construction camp site.	Probability = 3 Intensity = 3 Duration = 3 Severity = $3 \times 3 = 9$ (High Severity) (Rating 4) Significance = $3 \times 4 = 12$ Moderate Negative Significance	- The temporary construction camps must be located outside of the delineated wetland areas and associated buffer zones. Proper planning must be done during the final layout establishment. - All construction camps, wash bays and storage areas must be planned and submitted to the ECO for approval. - Domestic waste bins need to be situated strategically around the site and be emptied on a regular basis. Effective construction camp management must be implemented.	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance
Influx of workers and presence of new employees and facilities	Direct: Disturbance of fauna on site could lead to changing in behavioural patterns that could have a negative effect on the species in the long term	Probability = 4 Intensity = 3 Duration = 3 Severity = $3 \times 3 = 9$ (High Severity) (Rating 4) Significance = $4 \times 4 = 16$ High Negative Significance	- Construction teams may not feed wildlife and ensure that all food and food waste, is placed in sealed containers and not exposed on site. - Provide adequate waste removal skips to prevent	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
			attraction of rats and other alien scavenging species to the sites. No poisons are to be used on site for the control of vermin (insects, rodents, small scavenging carnivores), unless these are environmentally friendly and can be locally contained.	
Loss of Agricultural land	Direct: Loss of agricultural land can not be avoided during the lifetime of the corridor. The agricultural land lost is of low significance, as livestock grazing is the primary agricultural use.	Probability = 4 Intensity = 2 Duration = 4 Severity = $2 \times 4 = 8$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Negative Significance	- The required project footprint must be kept as small as possible. - Land clearance must only be undertaken immediately prior to construction activities and only within the development footprint/servitude. - If possible, conduct the construction activities outside of the rainy season. - Clean-up of hydrocarbons spills if it occurs. Test soil for contamination and perform best clean-up method.	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance

Table 23: Impacts Associated with the Operational Phase – Preferred Option 1

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
Pollution of soil and water due to spillages of hazardous materials such as Petroleum, oil and concrete	Direct: Pollution of soil and water resources Cumulative: Pollution and soil and water sources could impair the functionality of the surrounding wetland systems.	Probability = 4 Intensity = 3 Duration = 4 Severity = $3 \times 4 = 12$ (High Severity) (Rating 4) Significance = $4 \times 4 = 16$ High Negative Significance	- Before maintenance activities commence on the proposed grid line infrastructure, the contractors or maintenance crew must be supplied with a map of the delineated wetland and associated buffer zones as well as other sensitive areas within the site area as these areas must be avoided and disturbance minimized. - Vehicles and equipment are to be maintained in good working order, to reduce the probability of leakage of fuels and lubricants. - Clean-up of hydrocarbon spills should be done immediately, and soil tests must be done.	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance
Long-term or permanent degradation and modification of the receiving environment	Direct: Loss of important avi-fauna and fauna habitat	Probability = 4 Intensity = 2 Duration = 4	Only the required maintenance servitude must be disturbed during	Probability = 2 Intensity = 2 Duration = 2

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
resulting to the loss of important avian and fauna habitats	Cumulative: Loss of important habitat will impact on the species composition within the area and that could, in the long-term lead to impacts on other indigenous species.	Severity = $2 \times 4 = 8$ (Moderate Severity Rating) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Negative Significance	the operational phase of the proposed grid line. - During the rehabilitation and re-vegetation phase the area must be inspected for signs of erosion or proliferation of alien and invasive species that could impact on the remaining natural habitat. - Monitoring of the project area must continue during the operational phase.	Severity = $2 \times 2 = 4$ (Low Severity Rating) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance
Loss of resident avifauna and other fauna through increased disturbance	Direct: Prolonged maintenance activities could lead to resident species moving from the area. Indirect: Maintenance crews wandering through adjacent natural areas (no-go areas) Cumulative: With prolonged maintenance activities and increase in large teams on site, more	Probability = 4 Intensity = 2 Duration = 3 Severity = $2 \times 3 = 6$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Negative Significance	- Before maintenance activities are scheduled, proper planning should be done to ensure that the duration of the maintenance is kept as short as possible in order to keep disturbance on resident fauna as insignificant as possible. - Maintenance crews must remain within the designated maintenance corridor and not disturb	Probability = 3 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $3 \times 2 = 6$ Low Negative Significance

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
	species could move from the site as they are reliant on other animals as food source		the adjacent natural areas. Maintenance crews must have spill-kits on site to ensure that any pollution incident can be cleaned-up effectively.	
Collisions and electrocution risks with powerline infrastructure	Direct: Avi-fauna species colliding with proposed infrastructure, leading to injury or loss of avian life which decreases avifauna species diversity Cumulative: If the stipulated mitigation measures are not implemented, it could lead to substantially larger loss of avian life.	Probability = 4 Intensity = 3 Duration = 4 Severity = 3 x 4 = 12 (High Severity) (Rating 4) Significance = 4 x 4 = 16 High Negative Significance	- It is recommended that the standard Eskom Bird Perch be fitted to all pole tops to further provide safe perching space well above dangerous infrastructure. - Demarcate section requiring the installation of deterrents/flappers on all required sections of power line or directly adjacent to the site. - Conduct quarterly fatality monitoring assessments.	Probability = 3 Intensity = 2 Duration = 3 Severity = 2 x 3 = 6 (Moderate Severity) (Rating 3) Significance = 3 x 3 = 9 Moderate Negative Significance
Vehicle movement and compaction of soil minimising plant growth of indigenous flora	Direct: Vehicle movement through the delineated wetland areas could result in the compaction of the wetland soils that	Probability = 4 Intensity = 2 Duration = 4	Vehicles should only use designated maintenance corridors and roads to access the site.	Probability = 2 Intensity = 2 Duration = 3

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
	could impact on the functionality of the wetlands. Cumulative: Compaction of soil around the wetland areas could lead to loss of vegetation cover and also obstruction of flow to wetland areas.	Severity = $2 \times 4 = 8$ (Moderate Severity) (Rating 3) Significance = $3 \times 4 = 12$ Moderate Negative Significance	- The area must be regularly monitored for any signs of erosion to exposed surfaces on site. - Maintenance vehicles should be aware of the no-go areas and associated buffer zones and must not drive through the wetland areas indiscriminately.	Severity = $2 \times 3 = 6$ (Moderate Severity) (Rating 3) Significance = $2 \times 3 = 6$ Low Negative Significance
Alteration of natural environment and loss of habitat	Direct: Encroachment into natural habitat by maintenance activities could lead to alteration of these areas and impact on important habitats. Cumulative: Continuous encroachment during the operational/maintenance phase could result in loss of habitat and result in further species moving from the area.	Probability = 4 Intensity = 2 Duration = 3 Severity = $2 \times 3 = 6$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Negative Significance	- The maintenance corridor should be restricted to the approved (less sensitive) area. During maintenance activities only this corridor should be utilised as not to disturb any more natural habitat. - Proper planning should be done before maintenance activities are to take place and employees must be made aware of the stipulations within the EMPr.	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
Spreading of Alien invasive plants within the altered environment which would favour the species that are better adapted to disturbed / transformed areas.	Direct: The maintenance corridor could favour the establishment of alien and invasive vegetation as a result of poor management practices and disturbance within the area. Cumulative: If alien invasive species are not managed and eradicated, it could spread into adjacent natural habitats and result in degradation of these areas	Probability = 4 Intensity = 2 Duration = 4 Severity = $2 \times 4 = 8$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Negative Significance	- An alien and invasive management plan must be compiled for use during the operational period to ensure that any species can be controlled and eradicated from the site. - Any proclaimed weeds or alien species that germinates during the contract period shall be cleared by hand before flowering. - Limit the use of chemicals (pesticides and herbicides) and do not spray in windy conditions.	Probability = 2 Intensity = 1 Duration = 2 Severity = $1 \times 2 = 2$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance
Historical or Archaeological Impacts – Destruction of palaeontological or archaeological resources	Direct: If the maintenance crews move into the areas identified by the specialist it could lead to destruction of archaeological resources that may be damaged.	Probability = 3 Intensity = 2 Duration = 5 Severity = $2 \times 5 = 10$ (High Severity) (Rating 4) Significance = $3 \times 4 = 12$ Moderate Negative Significance	As the areas with identified archaeological resources fall outside of the proposed maintenance corridor it is imperative that maintenance crews remain within this approved area when	Probability = 2 Intensity = 1 Duration = 2 Severity = $1 \times 2 = 2$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
			conducting any activities on site. Crews must be made aware of the sensitive areas and stipulations within the approved EMPr.	
Employment Opportunities and land rental	Direct: The project will create job opportunities in the form of maintenance and service of the proposed grid lines and associated infrastructure Lease rental will be paid to the landowners for establishment of the project on the farm portions	Probability = 4 Intensity = 2 Duration = 3 Severity = $2 \times 3 = 6$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Positive Significance	No mitigation available to enhance the positivity of this aspect.	Probability = 4 Intensity = 2 Duration = 3 Severity = $2 \times 3 = 6$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Positive Significance

Table 24: Impacts Associated with the Construction Phase – Layout Option 2

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
Pollution of soil and water due to spillages of hazardous materials such as Petroleum, oil and concrete	Direct: Pollution of soil and water resources Cumulative: Pollution of soil and water sources could impair the functioning of the surrounding wetland systems.	Probability = 4 Intensity = 3 Duration = 4 Severity = $3 \times 4 = 12$ (Moderate Severity Rating) (Rating 4) Significance = $4 \times 4 = 16$ High Negative Significance	- Wetland areas and their associated buffer zones must be fenced off and zoned as no-go areas unless approved by the ECO. The contractor has the responsibility to inform all staff of the importance of the on-site wetlands. - Runoff from any new service roads must be managed - Construction vehicles and equipment are to be maintained in good working order, to reduce the probability of leakage of fuels and lubricants - Concrete to be mixed only on an impermeable surface such as a batching tray and not on exposed soil - All concrete and tar that is spilled outside these areas must be promptly removed by the Contractor according to the specified measures to be followed. - Clean-up of hydrocarbon spills should be done	Probability = 3 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $3 \times 2 = 6$ (Low Negative Significance)

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
			immediately, and soil tests must be done All construction materials liable to spillage / contamination are to be stored in appropriate structures with impermeable flooring and bund walls with sufficient capacity to contain a spill	
Loss of priority avian and Fauna species from important habitats	Direct: Construction activities and infrastructure could lead to species moving from the area Cumulative: With continuous increase in activities and certain species moving away from the area, it could result in more species moving from the area as they are reliant on other animals as food source	Probability = 4 Intensity = 2 Duration = 3 Severity = $2 \times 3 = 6$ (Moderate Severity Rating) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Negative Significance	- Minimise the construction footprint and reserve indigenous vegetation wherever possible. Avoid constructing during the breeding season (summer) and construct the development in the shortest timeframe - Staff must not be allowed to wander into the adjacent natural areas and disturb the wildlife unnecessarily - Control pollution on site in order to protect remaining natural habitat	Probability = 3 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $3 \times 2 = 6$ (Low Negative Significance)
Loss of resident fauna through increased disturbance	Direct: Construction activities and infrastructure could lead to resident species moving from the area	Probability = 4 Intensity = 2 Duration = 3 Severity = $2 \times 3 = 6$ (Moderate Severity Rating) (Rating 3)	Minimise the construction footprint and reserve indigenous vegetation wherever possible. Avoid construction during the breeding season (Summer)	Probability = 3 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2)

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
	Indirect: Staff wandering through adjacent natural areas (no-go areas) Cumulative: With continuous increase in activities and certain species moving away from the area, it could result in more species moving from the area as they are reliant on other animals as food source	Significance = $4 \times 3 = 12$ Moderate Negative Significance	if possible and construct the development in the shortest timeframe. - A group of Meerkats were seen near the site. Contractor must ensure that staff do not disturb their den area - Control pollution on site in order to protect remaining natural habitat	Significance = $3 \times 2 = 6$ (Low Negative Significance)
Potential Increase in invasive vegetation	Direct: Spreading of invasive alien plants as the altered environment will also favour species that are better adapted to disturbed areas Cumulative: Proliferation of the alien invasive species will hamper the long-term rehabilitation efforts and re-establishment of natural vegetation	Probability = 4 Intensity = 2 Duration = 4 Severity = $2 \times 4 = 8$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Negative Significance	- Invasive plant material should be disposed by incineration, or alternatively, composting to break down seeds. If seedbank persists, invasive alien plant management and eradication measures should be implemented. - Any proclaimed weed or alien species that germinates during the	Probability = 2 Intensity = 1 Duration = 2 Severity = $1 \times 2 = 2$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
			contract period shall be cleared by hand before flowering • All vehicles and equipment that enters the site must be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access on to the areas to be cleared. • Continuously monitor the emergence of alien invasive plant species on the site and remove such species as soon as they become apparent. • Limit the use of chemicals (pesticides and herbicides) and do not spray in windy conditions. Pesticides may impact on pollinators and lead to	

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
			a decline in species diversity and densities	
Long-term or permanent degradation and modification of the receiving environment resulting to the loss of important habitats	Direct: Loss of important habitat for avi-fauna and fauna species Cumulative: Loss of important habitat will impact on the species composition within the area and that could, in the long-term lead to impacts on other indigenous species.	Probability = 4 Intensity = 2 Duration = 4 Severity = $2 \times 4 = 8$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Negative Significance	- Only utilize designated roads to access the site. - Minimise the construction footprint and reserve indigenous vegetation wherever possible. - Construct the development in the shortest timeframe and control noise pollution - Rehabilitate the area with indigenous flora - Demarcate the wetland areas and associated buffer zones - The spanning of the powerlines across the depression wetlands on the study site should be prioritised if the alternative trajectory of the grid infrastructure is not feasible.	Probability = 2 Intensity = 2 Duration = 3 Severity = $2 \times 3 = 6$ (Moderate Severity) (Rating 3) Significance = $2 \times 3 = 6$ Low Negative Significance
Vehicle movement and compaction of soil	Direct: Vehicle movement on site will lead to compaction of soil and will minimize plant growth and have a negative	Probability = 4 Intensity = 2 Duration = 4 Severity = $2 \times 4 = 8$ (Moderate Severity) (Rating 3)	- Vehicles should only use designated roadways to access the site - After construction has been finalized, the compacted soil areas	Probability = 2 Intensity = 2 Duration = 3 Severity = $2 \times 3 = 6$ (Moderate Severity) (Rating 3)

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
	effect on the re-establishment of indigenous flora By minimizing the re-establishment of indigenous flora, invasive species could establish in that area Cumulative: Compaction of soil around wetland areas could lead to erosion and loss of functionality of these systems Compaction of soil could also lead to obstruction of natural flow to wetland areas	Significance = $3 \times 4 = 12$ Moderate Negative Significance	must be loosened and monitored for revegetation - Vehicles should not be allowed to indiscriminately drive through wetland areas and any signs of erosion must be addressed immediately to avoid impacting the functionality of the wetland areas - The site area must be inspected after construction to identify the areas of concern. Compacted areas must be loosened, and exposed areas must be revegetated with indigenous flora. Monitoring must be done on a regular basis.	Significance = $2 \times 3 = 6$ Low Significance
Vegetation clearance will result in exposed soil surfaces	Direct: Exposed soil surfaces could be prone to erosion (water and wind) and this could lead to loss of valuable topsoil Cumulative: Exposed soil is prone to erosion and the continuous loss of topsoil can	Probability = 4 Intensity = 2 Duration = 4 Severity = $2 \times 4 = 8$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Negative Significance	- Land clearance must only be undertaken immediately prior to construction activities and only within the development footprint / servitude. - Unnecessary land clearance must be avoided	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
	lead to habitat degradation		- Level any remaining soil from excavation pits that remained on the surface instead of allowing small stockpiles to remain - Where possible, conduct the construction activities outside of the rainy season - No random-access routes may be established to prevent the unnecessary trampling of vegetation	
Clearance of vegetation and construction activities near wetland areas	Direct: If construction activities encroaches on the wetland habitat, then wetland functioning and integrity can be degraded. Cumulative: If impacts on the wetland areas persist throughout the construction and operational phases of the project then the small impacts could lead to degradation of the wetland area over time.	Probability = 4 Intensity = 3 Duration = 4 Severity = $3 \times 4 = 12$ (High Severity) (Rating 4) Significance = $4 \times 4 = 16$ High Negative Significance	- The construction of the proposed infrastructure must preferably occur during the dry season in the months of May to August when the rainfall is minimal. - As the conductor lines will not be spanned over the depression wetland 1 and will move to the south of the proposed site, the maintenance corridor should be established outside of the buffer zone. - During the construction phase the natural flow of water (hydrological inputs), which will be in the form of runoff from	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Significance

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
			rainfall events to the depressions on the study site should not be hampered or obstructed in any way or form. • The wetland areas and their associated buffer zones must be fenced off and zoned as no-go areas. No person should be allowed into the area unless approved by the ECO for official purposes. • Runoff from roads must be managed to avoid erosion and pollution problems. Where excessive loose sediment is created, attenuation swales and / or soils screens should be installed. • Concrete and tar must only be mixed on mixing trays and in areas which have been specially demarcated for this purpose. • Portable septic toilets must be located outside of the delineated wetland boundaries and buffer zones.	

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
Increased runoff from hardened surfaces	Direct: Increased runoff from hardened surfaces could lead to exposed areas susceptible to erosion. Cumulative: Hardened surfaces that are not loosened and re-vegetated could lead to increased runoff and in time that could lead to head-cut erosion within the wetland areas.	Probability = 4 Intensity = 2 Duration = 4 Severity = $2 \times 4 = 8$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Negative Significance	- Vegetation and soil must be retained in position for as long as possible and only removed immediately before construction activities commences. - Re-vegetation of disturbed areas must be undertaken with site indigenous species and in accordance with the instructions issued by the ECO. Areas where soil compaction or ruts developed must be rehabilitated. - Avoid construction activities in the wetlands through proper demarcation of the construction site. The Contractor has a responsibility to inform all staff of the need to be vigilant against any practice that will have a harmful effect on wetlands on and off the site.	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Significance
Employment Opportunities and land rental	Direct: The proposed project will create employment opportunities during	Probability = 4 Intensity = 2 Duration = 3	The proposed project will create a possible 10 job opportunities; however many more opportunities	Probability = 5 Intensity = 2 Duration = 4

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
	the construction and operational phases of the project and will also result in rent paid to the landowner. Cumulative: The project will create employment opportunities throughout as infrastructure maintenance needs to be conducted.	Severity = $2 \times 3 = 6$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Positive Significance	will be created by the larger Solar PV developments that will be connected to the grid through this line. Structures should be established to ensure appropriate development and transfer of skills to the local community.	Severity = $2 \times 4 = 8$ (Moderate Severity) (Rating 3) Significance = $5 \times 3 = 15$ High Positive Significance
Historical or Archaeological Impacts – Destruction of palaeontological or archaeological resources	Direct: Destruction of archaeological resources that may be damaged during the construction period when excavations are made for the pylons. Impacts also include the visual intrusion of the new electrical infrastructure into the rural cultural landscape.	Probability = 3 Intensity = 2 Duration = 5 Severity = $2 \times 5 = 10$ (High Severity) (Rating 4) Significance = $3 \times 4 = 12$ Moderate Negative Significance	- As the chances of encountering fossils are Low, but Not Zero, a "Chance Find Protocol" has been included in the EMPr. - It must be noted that a large amount of electrical infrastructure is already present in the landscape and visual intrusion will not have a major impact. - The specialist noted archaeological sites near the proposed grid line site, it is still recommended that these sites be recorded and marked as no-go areas by construction crews.	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
			- Minimise disturbance footprint. - Rehabilitated all areas not required during operation.	
Establishment of storage and construction camps and employees / contractors wandering off-site	Direct: Damage or loss of riparian systems and other sensitive features. Increase in littering around the construction camp site.	Probability = 3 Intensity = 3 Duration = 3 Severity = $3 \times 3 = 9$ (High Severity) (Rating 4) Significance = $3 \times 4 = 12$ Moderate Negative Significance	- The temporary construction camps must be located outside of the delineated wetland areas and associated buffer zones. Proper planning must be done during the final layout establishment. - All construction camps, wash bays and storage areas must be planned and submitted to the ECO for approval. - Domestic waste bins need to be situated strategically around the site and be emptied on a regular basis. Effective construction camp management must be implemented.	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance
Influx of workers and presence of new employees and facilities	Direct: Disturbance of fauna on site could lead to changing in behavioural patterns that could have a negative effect on the species in the long term	Probability = 4 Intensity = 3 Duration = 3 Severity = $3 \times 3 = 9$ (High Severity) (Rating 4) Significance = $4 \times 4 = 16$ High Negative Significance	- Construction teams may not feed wildlife and ensure that all food and food waste, is placed in sealed containers and not exposed on site. - Provide adequate waste removal skips to prevent	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
			attraction of rats and other alien scavenging species to the sites. No poisons are to be used on site for the control of vermin (insects, rodents, small scavenging carnivores), unless these are environmentally friendly and can be locally contained.	
Loss of Agricultural land	Direct: Loss of agricultural land can not be avoided during the lifetime of the corridor. The agricultural land lost is of low significance, as livestock grazing is the primary agricultural use.	Probability = 4 Intensity = 2 Duration = 4 Severity = $2 \times 4 = 8$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Negative Significance	- The required project footprint must be kept as small as possible. - Land clearance must only be undertaken immediately prior to construction activities and only within the development footprint/servitude. - If possible, conduct the construction activities outside of the rainy season. - Clean-up of hydrocarbons spills if it occurs. Test soil for contamination and perform best clean-up method.	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance

Table 25: Impacts Associated with the Operational Phase – Layout Option 2

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
Pollution of soil and water due to spillages of hazardous materials such as Petroleum, oil and concrete	Direct: Pollution of soil and water resources Cumulative: Pollution and soil and water sources could impair the functionality of the surrounding wetland systems.	Probability = 4 Intensity = 3 Duration = 4 Severity = $3 \times 4 = 12$ (High Severity) (Rating 4) Significance = $4 \times 4 = 16$ High Negative Significance	- Before maintenance activities commence on the proposed grid line infrastructure, the contractors or maintenance crew must be supplied with a map of the delineated wetland and associated buffer zones as well as other sensitive areas within the site area as these areas must be avoided and disturbance minimized. - Runoff from any new service roads must be managed. - Vehicles and equipment are to be maintained in good working order, to reduce the probability of leakage of fuels and lubricants. - Clean-up of hydrocarbon spills should be done immediately, and soil tests must be done.	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
Long-term or permanent degradation and modification of the receiving environment resulting to the loss of important avian and fauna habitats	Direct: Loss of important avi-fauna and fauna habitat Cumulative: Loss of important habitat will impact on the species composition within the area and that could, in the long-term lead to impacts on other indigenous species.	Probability = 4 Intensity = 2 Duration = 4 Severity = $2 \times 4 = 8$ (Moderate Severity Rating) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Negative Significance	- Only the required maintenance servitude must be disturbed during the operational phase of the proposed grid line. - During the rehabilitation and re-vegetation phase the area must be inspected for signs of erosion or proliferation of alien and invasive species that could impact on the remaining natural habitat. - Monitoring of the project area must continue during the operational phase.	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity Rating) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance
Loss of resident avifauna and other fauna through increased disturbance	Direct: Prolonged maintenance activities could lead to resident species moving from the area. Indirect: Maintenance crews wandering through adjacent natural areas (no-go areas) Cumulative:	Probability = 4 Intensity = 2 Duration = 3 Severity = $2 \times 3 = 6$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Negative Significance	Before maintenance activities are scheduled, proper planning should be done to ensure that the duration of the maintenance is kept as short as possible in order to keep disturbance on resident fauna as insignificant as possible.	Probability = 3 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $3 \times 2 = 6$ Low Negative Significance

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
	With prolonged maintenance activities and increase in large teams on site, more species could move from the site as they are reliant on other animals as food source		- Maintenance crews must remain within the designated maintenance corridor and not disturb the adjacent natural areas. - Maintenance crews must have spill-kits on site to ensure that any pollution incident can be cleaned-up effectively.	
Collisions and electrocution risks with powerline infrastructure	Direct: Avi-fauna species colliding with proposed infrastructure, leading to injury or loss of avian life which decreases avifauna species diversity Cumulative: If the stipulated mitigation measures are not implemented, it could lead to substantially larger loss of avian life.	Probability = 4 Intensity = 3 Duration = 4 Severity = $3 \times 4 = 12$ (High Severity) (Rating 4) Significance = $4 \times 4 = 16$ High Negative Significance	- It is recommended that the standard Eskom Bird Perch be fitted to all pole tops to further provide safe perching space well above dangerous infrastructure. - Demarcate section requiring the installation of deterrents/flappers on all required sections of power line or directly adjacent to the site. - Conduct quarterly fatality monitoring assessments.	Probability = 3 Intensity = 2 Duration = 3 Severity = $2 \times 3 = 6$ (Moderate Severity) (Rating 3) Significance = $3 \times 3 = 9$ Moderate Negative Significance

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
Vehicle movement and compaction of soil minimising plant growth of indigenous flora	Direct: Vehicle movement through the delineated wetland areas could result in the compaction of the wetland soils that could impact on the functionality of the wetlands. Cumulative: Compaction of soil around the wetland areas could lead to loss of vegetation cover and also obstruction of flow to wetland areas.	Probability = 4 Intensity = 2 Duration = 4 Severity = $2 \times 4 = 8$ (Moderate Severity) (Rating 3) Significance = $3 \times 4 = 12$ Moderate Negative Significance	- Vehicles should only use designated maintenance corridors and roads to access the site. - The area must be regularly monitored for any signs of erosion to exposed surfaces on site. - Maintenance vehicles should be aware of the no-go areas and associated buffer zones and must not drive through the wetland areas indiscriminately.	Probability = 2 Intensity = 2 Duration = 3 Severity = $2 \times 3 = 6$ (Moderate Severity) (Rating 3) Significance = $2 \times 3 = 6$ Low Negative Significance
Alteration of natural environment and loss of habitat	Direct: Encroachment into natural habitat by maintenance activities could lead to alteration of these areas and impact on important habitats. Cumulative: Continuous encroachment during the operational/maintenance phase could result in loss of habitat and result in further species moving from the area.	Probability = 4 Intensity = 2 Duration = 3 Severity = $2 \times 3 = 6$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Negative Significance	- The maintenance corridor should be restricted to the approved (less sensitive) area. During maintenance activities only this corridor should be utilised as not to disturb any more natural habitat. - Proper planning should be done before maintenance activities are to take place and	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
			employees must be made aware of the stipulations within the EMPr.	
Spreading of Alien invasive plants within the altered environment which would favour the species that are better adapted to disturbed / transformed areas.	Direct: The maintenance corridor could favour the establishment of alien and invasive vegetation as a result of poor management practices and disturbance within the area. Cumulative: If alien invasive species are not managed and eradicated, it could spread into adjacent natural habitats and result in degradation of these areas	Probability = 4 Intensity = 2 Duration = 4 Severity = $2 \times 4 = 8$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Negative Significance	- An alien and invasive management plan must be compiled for use during the operational period to ensure that any species can be controlled and eradicated from the site. - Any proclaimed weeds or alien species that germinates during the contract period shall be cleared by hand before flowering. - Limit the use of chemicals (pesticides and herbicides) and do not spray in windy conditions.	Probability = 2 Intensity = 1 Duration = 2 Severity = $1 \times 2 = 2$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance
Historical or Archaeological Impacts – Destruction of palaeontological or archaeological resources	Direct: If the maintenance crews move into the areas identified by the specialist it could lead to destruction of	Probability = 3 Intensity = 2 Duration = 5 Severity = $2 \times 5 = 10$ (High Severity) (Rating 4) Significance = $3 \times 4 = 12$	As the areas with identified archaeological resources fall outside of the proposed maintenance corridor it	Probability = 2 Intensity = 1 Duration = 2 Severity = $1 \times 2 = 2$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$

Potential Impacts	Type of Impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
	archaeological resources that may be damaged.	Moderate Negative Significance	is imperative that maintenance crews remain within this approved area when conducting any activities on site. Crews must be made aware of the sensitive areas and stipulations within the approved EMPr.	Low Negative Significance
Employment Opportunities and land rental	Direct: The project will create job opportunities in the form of maintenance and service of the proposed grid lines and associated infrastructure Lease rental will be paid to the landowners for establishment of the project on the farm portions	Probability = 4 Intensity = 2 Duration = 3 Severity = $2 \times 3 = 6$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Positive Significance	No mitigation available to enhance the positivity of this aspect.	Probability = 4 Intensity = 2 Duration = 3 Severity = $2 \times 3 = 6$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Positive Significance

Table 26: Impacts Associated with the Decommissioning Phase – Preferred Option 1 and Layout Option 2

Potential Impacts	Type of impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
Continuous proliferation of invasive alien plants	Direct: Alien and invasive plant species left to spread will degrade the natural habitat as they out compete certain indigenous species. Cumulative: Continuous proliferation of alien and invasive species on the project site could spread to adjacent natural areas and impact on important natural habitats.	Probability = 4 Intensity = 2 Duration = 4 Severity = $2 \times 4 = 8$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Negative Significance	Effective alien invasive plant management and eradication should be implemented on an ongoing basis.	Probability = 2 Intensity = 1 Duration = 2 Severity = $1 \times 2 = 2$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance

Potential Impacts	Type of impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
Exposed soil within the disturbed areas will impact on vegetation cover	Direct: Exposed surfaces could be susceptible to erosion Cumulative: Exposed surfaces susceptible to erosion could impact on natural flow to wetlands and impact on the natural functioning of these systems	Probability = 4 Intensity = 3 Duration = 4 Severity = $3 \times 4 = 12$ (High Severity) (Rating 4) Significance = $4 \times 4 = 16$ High Negative Significance	It is recommended that a rehabilitation plan be compiled a year before decommissioning of the project site and this plan must be implemented upon closure.	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance
Long-term or permanent degradation and modification of the receiving environment resulting to the loss of important avian and fauna habitats	Direct: Loss of important habitat for avi-fauna and fauna species Cumulative: Loss of important habitat will impact on the species composition within the	Probability = 3 Intensity = 3 Duration = 3 Severity = $3 \times 3 = 9$ (High Severity) (Rating 4) Significance = $3 \times 4 = 12$ Moderate Negative Significance	- A biodiversity protocol and rehabilitation plan must be established that will be implemented within the decommissioning and closure phase. - Keep habitat transformation to a	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance

Potential Impacts	Type of impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
	area and that could, in the long-term lead to impacts on other indigenous species.		minimum during the operational phase of the project and limit ongoing human activity. Rehabilitate the project site with indigenous vegetation and establish an effective monitoring programme to ensure the effectiveness of rehabilitation.	
Displacement of resident avi- and other fauna through increased disturbance	Direct: Displacement of avi- and other fauna species could have an effect on the over-all species composition of the area	Probability = 3 Intensity = 3 Duration = 3 Severity = $3 \times 3 = 9$ (High Severity) (Rating 4) Significance = $3 \times 4 = 12$ Moderate Negative Significance	A biodiversity protocol and rehabilitation plan must be established that will be implemented within the decommissioning and closure phase.	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance

Potential Impacts	Type of impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
Compaction of soils and wetland buffer zones	Direct: Compacted soils could be susceptible to erosion Cumulative: Areas not rehabilitated to effective standards could lead to erosion within the natural and wetland areas and result in the loss of valuable topsoil and degradation of the wetland systems	Probability = 3 Intensity = 3 Duration = 3 Severity = $3 \times 3 = 9$ (High Severity) (Rating 4) Significance = $3 \times 4 = 12$ Moderate Negative Significance	- All soils compacted during the decommissioning phase must be loosened to ensure effective re-establishment of vegetation within the corridor area. - Wetland buffer zones must be closely monitored for any signs of erosion that could impact on the functionality of the wetland systems.	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance
Loss of agricultural land	Direct: If the area is not rehabilitated to required standards it cannot be utilised for agricultural purposes	Probability = 4 Intensity = 2 Duration = 4 Severity = $2 \times 4 = 8$ (Moderate Severity) (Rating 3) Significance = $4 \times 3 = 12$ Moderate Negative Significance	Implement an effective rehabilitation plan with the aim to return the area to natural veld that can again be utilised for grazing.	Probability = 2 Intensity = 2 Duration = 2 Severity = $2 \times 2 = 4$ (Low Severity) (Rating 2) Significance = $2 \times 2 = 4$ Low Negative Significance

Potential Impacts	Type of impact	Significance Rating before mitigation	Proposed Mitigation	Significance Rating after mitigation
	Cumulative: Areas not rehabilitated according to required standards could lead to further degradation of the natural areas		Establish and effective monitoring programme for the management and eradication of weed and alien species.	

9 ASSUMPTIONS AND LIMITATIONS

9.1 ASSUMPTIONS

The scope of the EIA is limited to assessing the potential impacts associated with the proposed development, therefore the effect on the surrounding environment is based on the current land-use.

All information provided by the applicant is deemed valid and correct at the time it was provided.

9.2 LIMITATIONS / GAPS IN KNOWLEDGE

The study is limited by the amount of detailed information that could be provided at the time of modelling. No other limitations were observed.

10 IMPACT STATEMENT

The proposed project entails the establishment of a twin tern 132kV Conductor line to enable the Marula Cluster Solar PV developments to connect to the new Artemis MTS. The conductor lines will extend from an authorized collector sub within the Solar PV development area to the new Artemis Main Transmission Substation. The line will be approximately 5.28km in extent and will be located within farm portions that are mainly utilized for livestock farming. Due to the various substations located in the Dealesville area, there are numerous existing Eskom powerlines in the vicinity of the site.

Taking the above into account, the main impacts during the construction and operational phases, on the proposed site and surrounding environment could be the following:

- Pollution of soil and surface water resources
- Erosion and degradation of wetland systems
- Loss of habitat for resident (Fauna and Avi-fauna) species
- Long-term or permanent degradation and modification of the receiving environment resulting in the loss of important habitats
- Spreading of invasive alien species
- Electrocution and Collisions with powerline infrastructure

Most of the impacts will occur within the construction or establishment phase, such as the clearance of vegetation, possible pollution incidents and displacement of resident fauna

species. The most significant possible impact associated with the project could occur during the operational phase with Avi-fauna species being susceptible to collision and electrocution with the powerline infrastructure.

However, the assessed impacts can be mitigated by implementing the proposed mitigation measures such as the following:

- Planning of layouts to minimise the project footprint required near wetland buffer zones
- Clearly demarcate wetland areas and their associated buffer zones as no-go areas.
- Maintain construction vehicles and equipment in sound working order and the crews must have spill kits on site to deal with any possible spill effectively.
- Minimise the construction footprint and reserve indigenous vegetation wherever possible.
- Avoid construction during the breeding season (summer) if possible and construct the development in the shortest timeframe.
- Implement an effective alien and invasive management plan throughout the different phases of the project.
- It is recommended that the standard Eskom Bird Perch be fitted to all pole tops to further provide safe perching space well above dangerous infrastructure.
- Demarcate sections requiring the installation of deterrents / flappers on all required sections of power line or directly adjacent to the site.

The project is situated within an area characterised by agricultural activities, large quantity of Eskom grid infrastructure and numerous planned renewable energy developments. The project will be situated on farm portions utilised for grazing purposes and will cross under various Eskom high voltage pylons.

It is imperative that the adjacent natural areas and delineated wetland areas not be encroached upon, and that the area be managed throughout all the project phases.

The overall negative impacts of the site can be mitigated to low significance and therefore the development activities are not expected to impact on the surrounding areas in a detrimental manner due to the high concentration of existing Eskom pylons. The Applicant needs to continually update their Environmental Management Programmes on site as well as their Environmental Awareness training programmes to ensure that the operations remain sustainable in the long-term. By implementing the required mitigation measures, establishing effective management and monitoring systems, the project can be developed and operated in a sustainable manner.

11 CONCLUSION AND RECOMMENDATIONS

The process within this BAR demonstrated through the description of the activity and the assessment of the impacts that the proposed development does not have any fatal flaws. Most of the impacts will be limited to the footprint area of the proposed grid line establishment and can be limited with the implementation of the mitigation measures as recommended within this report as well as the associated specialist reports.

The overall negative impacts range from mostly low negative significance to moderate negative significance in nature after mitigation measures are applied. The medium negative significance is associated with the possible collision and electrocution of Avi-fauna species against the powerline infrastructure as the infrastructure will further add to the intrusion of the existing electrical infrastructure in the Dealesville area.

The 2014 EIA Regulations (as amended) require that the need and desirability are considered and evaluated against the principles of sustainability. Thus, the project was investigated from a social, economic and environmental perspective. Specialists were appointed to assist the EAP with the assessment of impacts and to investigate the viability of the proposed project.

As South Africa has been struggling with crippling power cuts over the past few years, numerous projects have been investigated and submitted into the IPP BID Windows for approval by Government. The location and function of the proposed grid line infrastructure will enable the Marula Cluster Solar PV developments to connect to the grid and assist in ensuring security of energy supply to society rapidly and significantly. The Marula Cluster Solar PV developments which total approximately 600Mw in generation capacity has been successfully submitted within Round 6 REIPPPP.

The EAP is of the opinion that the development can be granted Environmental Authorization based on the assessment above as the negative impacts can be mitigated to a satisfactory level. The following mitigation measures must be included in the Environmental Authorization:

- An Environmental Control Officer must be appointed prior to the commencement of construction
- The authorized area to be cleared must be clearly demarcated
- All reports including monitoring reports must always be available on site.
- A complaints register must be drafted and kept up to date, with responses on any complaints recorded with each complaint.

- The applicant, site manager, staff and any contractor must adhere to all mitigation measures in the EMP. The EMP is a legally binding document to all parties involved in the construction of the activity.
- An Alien and Invasive monitoring and eradication programme must be compiled and implemented throughout the construction and operational phases.
- Vehicles and Equipment have to be maintained throughout the operations and drip trays and spill kits need to be available on site.
- It is recommended that the standard Eskom Bird Perch be fitted to all pole tops to further provide safe perching space well above dangerous infrastructure.
- Demarcate sections requiring the installation of deterrents / flappers on all required sections of power line or directly adjacent to the site.

11.1 CONSTRUCTION TIMEFRAMES

Construction and implementation timeframes of the proposed grid infrastructure will depend on the success of the Marula Cluster Solar PV developments within the REIPPPP round and thus, it is requested that the Environmental Authorization for construction, if issued by the Competent Authority, be valid for a period of 10 years from the day of signature.

12 REFERENCES

- ✚ National Environmental Management Act 1998 (Act 107 of 1998) Environmental Impact Assessment Regulations, 2014 as amended.
- ✚ Collins, N.B. 2016. Free State Province Biodiversity Plan: Technical Report v1.0. Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs. Internal Report.
- ✚ Department of Agriculture, Forestry and Fisheries, 2002. National land type inventories data set. Pretoria.
- ✚ Proposed Artemis MTS 132kV Powerline outside Dealesville, in the Free State Province, MORa Ecological Services (Pty) Ltd., Fauna, Avi-Fauna and Vegetation Assessments
- ✚ Wetland Assessment Report, Marula Cluster Grid Infrastructure Extension, October 2022, BioBlue Environmental Sustainability (Pty) Ltd.
- ✚ Compliance Statement for the proposed Marula Cluster – Grid Line Connection, Digital Soils Africa (Pty) Ltd.
- ✚ Phase 1 HIA Report for the Powerline Assessment Related to the Marula Cluster Solar Development on Various Farms near Dealesville in the Free State Province, A.J. Pelser, October 2022.