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20 July 2023

**Attention:**

**SAVANNAH ENVIRONMENTAL (Pty) Ltd**

Jo-Anne Thomas

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**To whom it may concern:**

**ECOLOGICAL SPECIALIST INPUT FOR THE AMENDMENT OF THE ENVIRONMENTAL AUTHORISATION (EA) FOR THE PROPOSED CONSTRUCTION OF THE SOLAR PV FACILITY OF 90MW AND ASSOCIATED GRID CONNECTION INFRASTRUCTURE ON THE GRASPAN FARM, LOCATED 23 KM NORTH EAST FROM WITPUTS NEAR THE N12 BETWEEN HOPETOWN AND RICHIE IN THE NORTHERN CAPE PROVINCE.**

**Background**

Engie Southern Africa is proposing to amend the Environmental Authorizations (EAs) for the Graspán Solar Project (Pty) Ltd and associated grid connection infrastructure, by extending the EA validity by an additional two (2) years. Extension of the validity of the EAs will ensure that the EAs remains valid for the undertaking of the authorised activities. The projects are preferred bidder projects under Round 5 of the REIPPPP and construction is planned to commence in the near future following financial and commercial close.

Savannah Environmental has been appointed as the Registered Environmental Assessment Practitioner (EAP) to prepare the Application. The EA Amendment will be completed in terms of Regulation 30(1)(a) of the Environmental Impact Assessment (EIA) Regulations, 2014, as amended, including additional specialist studies and public participation required by the DFFE.

The applicant, Engie Solar thus requests that the Competent Authority extends the validity of the original EA (DFFE Reference No.: 14/12/16/3/3/276; dated April 2013) by two (2) years.

It should be noted that the EA for the project has not been lying dormant for 10 years. All specialists undertook a re-assessment of the potential environmental impacts associated with the project in 2021, and the impacts have been reassessed as part of the "Part 1" Application for amendment of the EA processes.

The Biodiversity Company (TBC) was appointed to provide specialist inputs for this Part 1 Amendment Application. The Scope of Work for this report is as follows:

- i. The status (baseline) of the environment that was assessed during the initial assessment.
- ii. The current status of the assessed environment.
- iii. A description and an assessment of any changes to the environment (biophysical) that has occurred since the initial EA was issued.
- iv. A site verification report providing an indication of the status of the receiving environment

- v. An indication if there are any new assessments/guidelines which are now relevant to the authorised development which were not undertaken as part of the initial assessment, must be taken into consideration, and addressed in the report.
- vi. The report mentioned above, must indicate if the impact rating as provided in the initial assessment remains valid; if the mitigation measures provided in the initial assessment are still applicable; or if there are any new mitigation measures which need to be included into the EA.
- vii. A description and an assessment of the surrounding environment, in relation to new developments or changes in land use which might impact on the authorised project.

### **Results and Outcomes**

1. The following assessments were considered for this report:
  - Fauna and flora specialist report for the impact assessment for the proposed Graspan Solar Facility (Simon Todd, 2012);
  - Soil and agricultural assessment for the proposed Graspan PV Solar Power Facility (SiVest, 2012);
  - The biodiversity and wetland assessments for the proposed Graspan PV development within the additional footprint (TBC, 2021-1); and
  - Agricultural compliance statement for the proposed Graspan PV development (TBC, 2021-2).
2. The habitat within the proposed development site is described as open plain grassland vegetation with scattered trees and Karroo scrub.
  - i. The terrestrial status or baseline of the environment (biophysical) from the original assessments proposed that the ecological sensitivity of the Project Area of Influence (PAOI) was 'Medium' or 'Moderate' sensitivity. No red listed faunal or flora species were found to occur within or around the PAOI. As such it was suggested that the proposed PV site from a terrestrial perspective was "not viewed as being highly ecologically sensitive and that with standard mitigation measures in place, the risk of significant environmental impact or degradation as a result of the development is very low". In relation to the proposed development, it was concluded that the disturbance of the fauna would be temporary, and the loss of vegetation would not have a significant effect at the landscape scale given the overwhelming intact nature of the receiving environment. - (Simon Todd, 2012).
  - ii. The pedology status (soil, land use and agricultural characteristics) or baseline of the environment (biophysical) from the original assessments proposed that the PAOI was mostly unsuitable for sustainable crop production and is dominated by unimproved grazing land. Less than 14% of the total area was found to be suitable for dry land crop production. The agricultural potential of the site was therefore deemed to be 'Low' in terms of potential for crop production. From an agricultural perspective, if the suggested mitigation measures are correctly implemented there is no reason why the proposed development cannot be accommodated on the Graspan Site. - (SiVest, 2012)

- iii. The aquatic status at the Graspan site was found to be a limiting factor. The proposed development area does not contain, nor do they border a perennial river / freshwater impoundment which could be used as a source of irrigation water. Drinking water for the animals is sourced from groundwater resources. - (SiVest, 2012). Similarly, the TBC, 2021-1 report indicated no inland water sources or river lines were found within the project area and 500m regulatory area.
3. Based on the most recent available reports (TBC, 2021 - 1/2) the current status of the assessed environment (biophysical) was largely confirmatory of the original 2012 reports, suggesting that little to no change has occurred within the PAOI between 2012 to present.
- i. The POAI overlaps within 'Medium' sensitive habitats and other areas of medium biodiversity potential. Portions of the current layout as well as the expected access and service road of the development would not be considered to have a significant negative impact on the terrestrial ecology of the area. - (TBC, 2021-1)
- ii. No wetlands are located within a 500 m regulated area. - (TBC, 2021-1)
- iii. "Activities may proceed as have been planned without the concern of loss of high sensitivity land capabilities or agricultural productivity." - (TBC, 2021-2).
4. No changes to the environment (biophysical) since the initial EA was issued were detected or noted based on the available reports and information.
5. The Site Sensitivity Verification (TBC 2023) for the Graspan PV site, Part 1 Amendment, does not include a full impact assessment and associated tables due to its nature as a Site Sensitivity Verification.

**Table 1** *Impact assessment of construction and operational phase (SEI) for the proposed Solar Power Plant (SPP) Project Area*

<b>Impact</b>	<b>Rating after mitigation</b>
<b>Construction Phase</b>	
Loss of Vegetation within the development footprint	Medium
Long-term but temporary loss of vegetation in development footprint	Medium Negative
Displacement of faunal (including avifaunal) communities due to habitat loss, direct mortalities, and disturbance	Medium
Collection of eggs, nest destruction and poaching	Medium
Increase in roadkill	Low Negative
Barrier effect of internal roads and fencing	Low Negative
<b>Operational Phase</b>	
Continued fragmentation and degradation of habitats and ecosystems	Low-Medium
Ongoing displacement and direct mortalities of faunal community (including SCC) due to disturbance (road collisions, collisions with infrastructure, noise, light, dust, vibration)	Medium
Collisions with powerlines and connection lines	Low
Electrocution by powerlines	Medium-Low

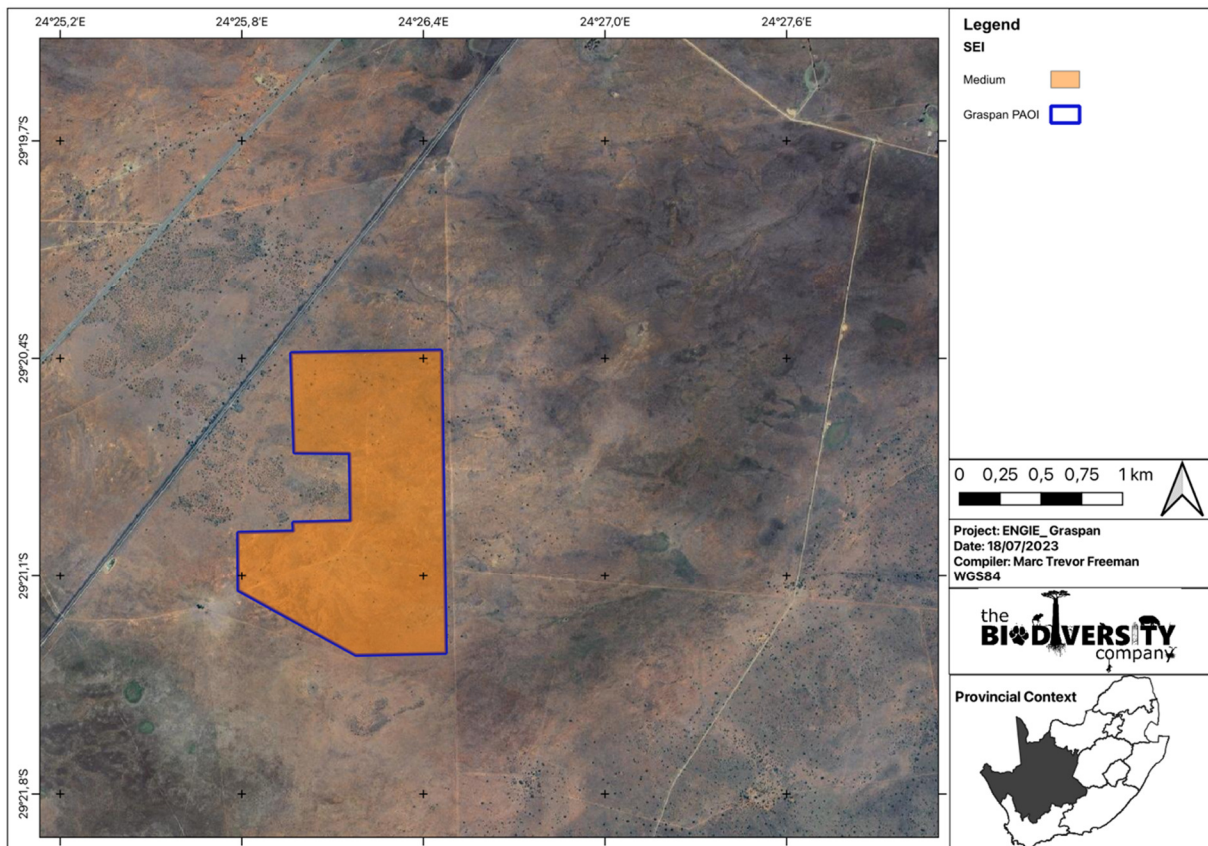
The conclusions of the Site Sensitivity Verification for the Graspan site is as follows:

- The Project Area was identified with the Environmental Screening Tool as possessing a mix of ‘Very High’ and ‘Low’ sensitivity within a Terrestrial Biodiversity Theme. The Very High sensitivity was due to overlap with Ecological Support Areas;
- The Project Area was identified with the Environmental Screening Tool as possessing a Medium sensitivity within the Animal Theme. The designation of a medium sensitivity was due to the presence of Ludwig’s Bustard *Neotis ludwigii*;
- The Project Area was identified with the Environmental Screening Tool as possessing a Medium sensitivity within the Agricultural Theme;
- The Project Area was identified with the Environmental Screening Tool as possessing a Low sensitivity within the Aquatic Biodiversity Theme; and
- The Project Area was identified with the Environmental Screening Tool as possessing a Low sensitivity within the Avian Sensitivity Theme.

**Table 2 Summary of the Screening Tool Sensitivity versus the Specialist assigned Site Ecological Importance (SEI) for the proposed Solar Power Plant (SPP) Project Area**

Screening Tool Theme	Screening Tool	Specialist	Tool Validated or Disputed by Specialist - Reasoning
<b>Animal Theme</b>	Medium	Medium	Validated – habitat is homogenous with little to no presence of SCC’s. This conclusion also aligns with that found in the original assessment done in 2012 by S. Todd.
<b>Aquatic theme</b>	Low	Low	Validated - No wetlands were detected within a 500 m regulated area of the PAOI.
<b>Avian Theme</b>	Low	Low	Validated – Low likelihood of SCC occurring within the PAOI
<b>Terrestrial Theme</b>	Very high	Medium	Disputed – Based on the findings of the Simon Todd, 2012 and TBC, 2021-2 reports, the POAI is a mosaic of ‘Very High’ and ‘Low’ sensitivity but following surveys and assessments overall deemed to be a ‘Medium’ sensitivity.
<b>Agricultural theme</b>	Medium	Low	Disputed - Only “Low” sensitivities were determined throughout previous reports. [(SiVest, 2012), (TBC, 2021-2)]

The Site Ecological Importance (SEI) as provided by the Species Environmental Assessment Guidelines (SANBI, 2020) was determined for the PAOI. This will provide the most appropriate and up to date sensitivity information. A multi-taxon approach was considered for the SEI determination.



**Figure 1** Map illustrating the Site Ecological Importance (SEI) for the proposed Project Area

Based on the layout design, there is overlap of infrastructure with 'Medium' SEI areas. Appropriate mitigation measures would be to minimise the footprints of these as much as possible and rehabilitation of degraded areas.

6. There are no new considerations or guidelines that need to be incorporated for this amendment process for the proposed Graspan PV development and associated grid connection infrastructure.
7. The initial impact ratings for terrestrial, pedology and aquatics sections of the project provided in the original reports remain valid. As such mitigation measures prescribed by each of the reviewed specialist reports remain applicable and must be adhered to.
8. An assessment of the surrounding environment, in relation to new developments or changes in land use which might impact on the authorised project was conducted through cumulative impacts. Cumulative impacts were assessed as part of the initial studies and are again assessed as part of the Sensitivity Verification Report. Impacts of the proposed layout are expected to be low overall and high when considered cumulatively.

Cumulative impacts are assessed within the context of the extent of the proposed PAOI other developments and activities in the area (existing and proposed) and general habitat loss and



disturbance resulting from any other anthropogenic activities in the area. The impacts of projects are often assessed by comparing the post-project situation to a pre-existing baseline. Where projects can be considered in isolation this provides a good method of assessing a project's impact. However, in areas where baselines have already been affected, or where future development will continue to add to the impacts in an area or region, it is appropriate to consider the cumulative effects of development or disturbance activities. This is similar to the concept of shifting baselines, which describes how the environmental baseline at a specific point in time may actually represent a significant change from the original state of the system. This section describes the potential cumulative impacts of the project on the local and regional avifauna community.

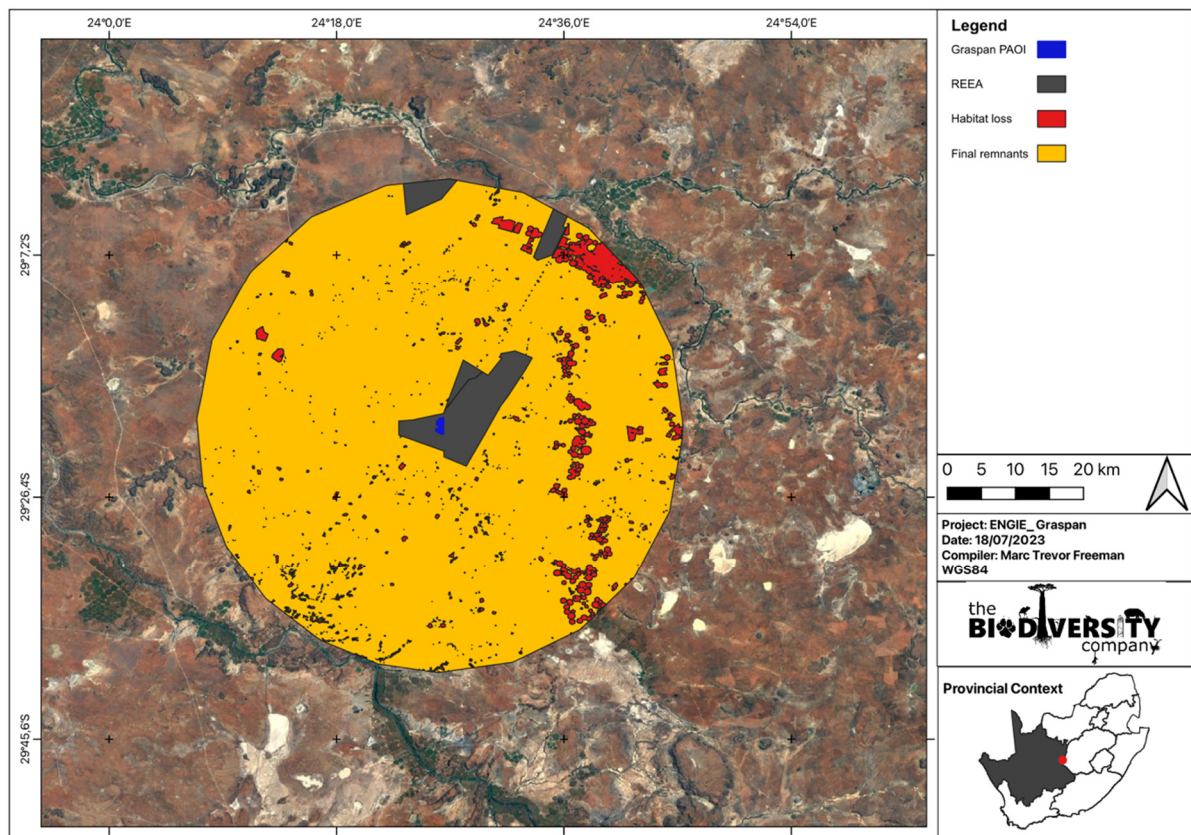
Localised cumulative impacts include those from operations that are close enough to potentially cause additive effects on the local environment or any sensitive receivers (such as nearby large road networks, other solar PV facilities, and power infrastructure). Relevant activities and impacts include dust deposition, noise and vibration, loss of corridors or habitat, disruption of waterways, groundwater drawdown, groundwater and surface water depletion, and transport activities. Long-term cumulative impacts associated with the site development activities can lead to the loss of endemic and threatened species, including natural habitat and vegetation types, and these impacts can even lead to the degradation of conserved areas such as the adjacent game parks and reserves.

The total area within the 30 km buffer around the project area amounts to 403,440 ha, but when considering the transformation (17,702 ha) that has taken place within this radius, 385,738 ha of intact habitat remains, according to the 2018 National Biodiversity Assessment. Therefore, the area within 30 km of the project has experienced approximately 4.39% loss in natural habitat. Considering this context, the project footprint for the proposed development (according to the provided layout), and similar projects that exist in the 30 km region measuring a maximum of 17,445 ha (as per the latest South African Renewable Energy EIA Application Database). This means that the total amount of remaining habitat lost as a result of solar projects in the region amounts to 4,52% (the sum of all related developments as a percentage of the total remaining habitat). Table outlines the calculation procedure for the spatial assessment of cumulative impacts.

The overall cumulative impact assessment is presented in **Error! Reference source not found.** and **Error! Reference source not found.** below. Approximately 4.39% of the habitat has already been lost, and as discussed above, the proposed solar developments will result in a further cumulative loss of approximately 4,52% from only similar developments (Solar, approved and in process) in the area, as such the cumulative impact from the proposed development is rated as medium (**Error! Reference source not found.**). This means that the careful spatial management and planning of the entire region must be a priority, and existing large infrastructure projects must be carefully monitored over the long term.

**Table 3** Loss of habitat within a 30 km radius of the project

	Total Habitat (ha)	Total Loss (ha)	Tot. Remaining Habitat (ha) (Remnants)	Total Historical Loss (%)	Cumulative Projects (ha)	Tot. Remaining Habitat (ha)	Cumulative Habitat Lost (%)
Approximate Solar development cumulative effects (Spatial)	403,440	17702	385,738	4,39%	17,445	368,293	4,52%



**Figure 2** Cumulative effects within a 30km buffered area of the Graspan PAOI

<b>Impact Nature: Cumulative habitat loss within the region</b>		
The development of the proposed infrastructure will contribute to cumulative habitat loss and thereby impact the ecological processes in the region.		
	<b>Overall impact of the proposed development considered in isolation</b>	<b>Cumulative impact of the project and other projects in the area</b>
<b>Extent</b>	Very low (2)	Local area (3)
<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	Low (4)	Moderate (6)
<b>Probability</b>	Probable (3)	Definite (4)
<b>Significance</b>	<b>Medium (30)</b>	<b>Medium (52)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Moderate	Low
<b>Irreplaceable loss of resources?</b>	No	Yes
<b>Can impacts be mitigated</b>	To some extent, most of the impacts result from the construction and operation activities of the various facilities of which some can be well mitigated, while others pose greater challenges.	
<b>Mitigation:</b>		
<ul style="list-style-type: none"> <li>Establish set-aside and offset areas for associated projects.</li> <li>Development and implementation of Habitat Rehabilitation Plans.</li> </ul>		

- All prescribed mitigation measures and supporting recommendations presented will help to achieve an acceptable residual impact. These measures and recommendations will remain applicable for the requested extension of the EA;
- In order to manage the impacts effectively, the following additional mitigation management should be put into place for the general impacts associated with flora and fauna:

Management Outcome: Habitats				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
Areas of indigenous vegetation outside of the direct project footprint, should under no circumstances be fragmented or disturbed further.	Life of operation	Project Manager	Natural Areas (Karoo scrub, Rocky outcrops and Riparian thicket)	Ongoing
All activities must make use of existing roads and tracks as far as practically and feasibly possible.	Life of operation	Project Manager	Roads and paths used	Ongoing



All laydown areas, chemical toilets etc. should be restricted to existing transformed areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction phase has been concluded. Use of re-usable/recyclable materials are recommended.

Construction

Project Manager  
Foreman

Laydown areas  
and material  
storage &  
placement.

Ongoing

Progressive rehabilitation of areas that have been cleared of invasive plants will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank Any woody material removed can be shredded and used in conjunction with the topsoil to augment soil moisture and prevent further erosion.

Life of operation

Project Manager

Site footprint  
rehabilitation

Ongoing

Areas that have been disturbed but will not undergo development must be revegetated with indigenous vegetation.

Life of operation

Project Manager

Rehabilitated  
areas

Ongoing

A spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use.

Life of operation

Project Manager  
Contractors  
Foreman

Spill events,  
Vehicles  
dripping.

Ongoing

Eroded areas must be rehabilitated using the appropriate techniques and re-vegetated using indigenous flora.

Life of operation

Project Manager  
Contractor

Erosion area

Annually

<p>Clearing of vegetation should be minimized and avoided where possible. All activities must be restricted to flat areas as far as possible. It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon. All disturbed footprints to be rehabilitated and landscaped after construction is complete. Rehabilitation of the disturbed areas existing in the project area must be made a priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to the project area vegetation type.</p>	Life of operation	Project manager, Environmental Officer	Site footprint rehabilitation	Ongoing
<p>Existing servitudes, access routes, and especially roads must be made use of.</p>	Construction/Operational Phase	Environmental Officer & Design Engineer	Roads and paths used	Ongoing
<p>All laydown, chemical toilets etc. should be restricted to outside of the project area. No materials may not be stored within the project area, and all materials must be removed from the project area once the construction phase has been concluded. No permanent construction structures/formwork should be permitted. No storage of vehicles or equipment will be allowed outside of the designated project areas.</p>	Construction/Operational Phase	Environmental Officer & Design Engineer	Spill events, Vehicles dripping.	Ongoing
<p>Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood and wind events. This will also reduce the likelihood of encroachment by alien invasive plant species. All livestock should always be kept out of the project area, especially areas that have been recently re-planted.</p>	Operational phase	Environmental Officer & Contractor	Site footprint rehabilitation	Ongoing

It should be made an offence for any staff to take/ bring any plant species into/out of any portion of the project area. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants.	Life of operation	Project manager, Environmental Officer	Site footprint rehabilitation, invasion avoidance	Ongoing
A fire management plan needs to be compiled and implemented to restrict the impact that fire might have on the surrounding areas.	Life of operation	Environmental Officer & Contractor	Damage to flora and habitat loss	Ongoing
A qualified environmental control officer must be on site when construction begins. Should animals not move out of the area on their own relevant specialists must be contacted to advise on how the species can be relocated. Should any large nests be observed within the project area construction should stop immediately and a qualified specialist must be contacted.	Construction Phase	Environmental Officer, Contractor	Presence of any fauna	Ongoing
The areas to be developed must be specifically demarcated to prevent movement of staff or any individual into the surrounding environments: Signs must be put up to enforce this.	Construction/Operational Phase	Project manager, Environmental Officer	Conservation of surrounding areas	Ongoing
All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must still be enforced to ensure that road killings, dust and erosion is limited. The speed limits should be restricted to a maximum of 30 km/h within the project area.	Life of operation	Health and Safety Officer	Vehicles and site preservation	Ongoing

Outside lighting should be designed and limited to minimize impacts on fauna. All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (green/red) lights should be used wherever possible.	Construction/Operational Phase	Project manager, Environmental Officer & Design Engineer	Fauna and flora impacts	Ongoing
Any holes/deep excavations must be dug and planted in a progressive manner and should not be left open overnight: Should the holes remain open overnight they must be covered temporarily to ensure no small fauna species fall in.	Planning and Construction	Environmental Officer & Contractor, Engineer	Fauna and flora impacts	Ongoing
Ensure that cables and connections are insulated successfully and adequately to reduce electrocution risk.	Life of project	Environmental Officer & Contractor, Engineer	Safety, fire avoidance and site preservation	Ongoing
Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests from entering the site	Life of operation	Environmental Officer & Health and Safety Officer	Waste management	Ongoing
Waste management must be a priority and all waste must be collected and stored effectively.	Life of operation	Environmental Officer & Contractor	Spill events, waste management	Ongoing
Litter, spills, fuels, chemical and human waste in and around the project area must be cleared and safely/appropriately stored immediately.	Construction/Operation/Closure Phase	Environmental Officer & Health and Safety Officer	Spill events, waste management	Ongoing
Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area and provided in the ratio as stipulated in the Health and Safety Act.	Life of operation	Environmental Officer & Health and Safety Officer	Spill events, waste management	Ongoing
The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility.	Life of operation	Environmental Officer & Health and Safety Officer	Spill events, waste management	Ongoing

Where a registered disposal facility is not available close to the project area, the Contractor shall provide a method statement with regard to waste management. Under no circumstances may domestic waste be burned on site or stored in pits.

Life of operation

Environmental Officer, Contractor & Health and Safety Officer

Spill events, waste management

Ongoing

Refuse bins will be emptied and secured. Temporary storage of domestic waste shall be in covered waste skips. Maximum domestic waste storage period will be 10 days.

Life of operation

Environmental Officer, Contractor & Health and Safety Officer

Spill events, waste management

Ongoing

Management Outcome: Avifauna

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
A qualified ecologist or suitably experienced Environmental Officer must be on site when construction begins to identify avifauna species that will be directly disturbed. The area must be walked through prior to construction to ensure no avifaunal species remain in the habitat and get killed. Should animals not move out of the area on their own relevant specialists must be contacted to advise on how the species can be relocated.	Construction	Project Manager Contractor	Presence of any fauna	Ongoing
Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances nocturnal avifauna.	Construction	Project Manager Contractor Foreman	Noise levels	Ongoing
No trapping, killing, or poisoning of any avifauna is to be allowed	Life of operation	Project Manager Contractor	Evidence of trapping or carcasses	Ongoing
The duration of the construction should be minimized to as short term as possible, to reduce the period of disturbance on avifauna	Construction Phase	Project Manager Contractor	Construction	Ongoing
The design of the grid lines must be of a type or similar structure as endorsed by the Eskom-EWT Strategic Partnership on Birds and Energy, considering the mitigation guidelines recommended by Birdlife South Africa (Jenkins et al., 2015).	Planning and construction	Environmental Officer & Contractor, Engineer	Presence of electrocuted birds or bird strikes	During Phase



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Infrastructure should be consolidated where possible in order to minimise the amount of ground and air space used.

Planning and construction

Environmental Officer & Contractor, Engineer

Presence of bird collisions

During phase

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<p>Powerlines must be fitted with industry standard bird flight diverters in order to make the lines as visible as possible to collision-susceptible species. Shaw et al (2021) demonstrated that large avifauna species mortality was reduced by 51% (95% CI: 23–68%). Recommended bird diverters such as flapping devices (dynamic device) and thickened wire spirals (static device) or similar diverters that increase the visibility of the lines should be fitted 5 m apart. The Inotec BFD88 bird diverter is highly recommended due to its visibility under low light conditions when most species move from roosting to feeding sites.</p> <p>Specific mitigation recommendations for the 400kV OHL:</p> <ul style="list-style-type: none"> <li>• Removal of earth wire or increase wire thickness to make it more visible;</li> <li>• Use 'Self Support' structures and avoid 'Cross Rope' structures;</li> <li>• Bands or stripes on Conductors (2 black, neoprene bands (35x35cm), crossed, with a bright strip, fixed every 10 m with plastic peg);</li> <li>• Static vibration damper, spirals, BFDs or 'pig-tails' (White polypropylene spirals, 1 m long, 30 cm diameter, staged on two static wires to effect marking every 5 m);</li> <li>• All the parts of the infrastructure must be nest proofed and anti-perched devices placed on</li> </ul>	<p>Planning and construction</p>	<p>Environmental Officer &amp; Contractor, Engineer</p>	<p>Presence of bird collisions</p>	<p>During phase</p>
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<p>areas that can lead to electrocution;</p> <ul style="list-style-type: none"> <li>All exposed parts must be covered (insulated) to reduce electrocution risk;</li> <li>All conductor wires in the same horizontal plane.</li> </ul>				
<p>All the parts of the infrastructure must be nest proofed and anti-perch devices placed on areas that can lead to electrocution</p>	Planning and construction	Environmental Officer & Contractor, Engineer	Presence of electrocuted birds	During phase
<p>Install anti-perch devices such as spikes to prevent Pied Crows from nesting/perching. This is especially important to impede excessive predation on <i>Psammobates</i> sp.</p>	Planning and construction	Environmental Officer & Contractor, Engineer	Over predation of tortoise	During phase
<p>Any exposed parts must be covered (insulated) to reduce electrocution risk</p>	Planning and construction	Environmental Officer & Contractor, Engineer	Presence of electrocuted birds	During phase
<b>Management Outcome: Environmental Awareness Training</b>				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
<p>All personnel to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the project area to inform contractors and site staff of the presence of species, their identification, conservation status and importance, biology, habitat requirements and management requirements within the Environmental Authorisation and the EMPr.</p>	Life of operation	Project Manager Health and Safety Officer Contractor Environmental Officer	Compliance to the training.	As needed
<b>Management Outcome: Habitats</b>				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
<p>Areas of indigenous vegetation outside of the direct project footprint, should under no circumstances be fragmented or disturbed further.</p>	Life of operation	Project Manager	Natural Areas (Karoo scrub, Rocky outcrops and Riparian thicket)	Ongoing

All activities must make use of existing roads and tracks as far as practically and feasibly possible.	Life of operation	Project Manager	Roads and paths used	Ongoing
All laydown areas, chemical toilets etc. should be restricted to existing transformed areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction phase has been concluded. Use of re-usable/recyclable materials are recommended.	Construction	Project Manager Foreman	Laydown areas and material storage & placement.	Ongoing
Progressive rehabilitation of areas that have been cleared of invasive plants will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank Any woody material removed can be shredded and used in conjunction with the topsoil to augment soil moisture and prevent further erosion.	Life of operation	Project Manager	Site footprint rehabilitation	Ongoing
Areas that have been disturbed but will not undergo development must be revegetated with indigenous vegetation.	Life of operation	Project Manager	Rehabilitated areas	Ongoing
A spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use.	Life of operation	Project Manager Contractors Foreman	Spill events, Vehicles dripping.	Ongoing
Eroded areas must be rehabilitated using the appropriate techniques and re-vegetated using indigenous flora.	Life of operation	Project Manager Contractor	Erosion area	Annually
<b>Management Outcome: Avifauna</b>				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
A qualified ecologist or suitably experienced Environmental Officer must be on site when construction begins to identify avifauna species that will be directly disturbed. The area must be walked through prior to construction to ensure no avifaunal species remain in the habitat and get killed. Should animals not move out of the area on their own relevant specialists must be contacted to advise on how the species can be relocated.	Construction	Project Manager Contractor	Presence of any fauna	Ongoing
Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances nocturnal avifauna.	Construction	Project Manager Contractor Foreman	Noise levels	Ongoing
No trapping, killing, or poisoning of any avifauna is to be allowed	Life of operation	Project Manager Contractor	Evidence of trapping or carcasses	Ongoing
The duration of the construction should be minimized to as short term as possible, to reduce the period of disturbance on avifauna	Construction Phase	Project Manager Contractor	Construction	Ongoing

<p>The design of the grid lines must be of a type or similar structure as endorsed by the Eskom-EWT Strategic Partnership on Birds and Energy, considering the mitigation guidelines recommended by Birdlife South Africa (Jenkins <i>et al.</i>, 2015).</p>	<p>Planning and construction</p>	<p>Environmental Officer &amp; Contractor, Engineer</p>	<p>Presence of electrocuted birds or bird strikes</p>	<p>During Phase</p>
<p>Infrastructure should be consolidated where possible in order to minimise the amount of ground and air space used.</p>	<p>Planning and construction</p>	<p>Environmental Officer &amp; Contractor, Engineer</p>	<p>Presence of bird collisions</p>	<p>During phase</p>
<p>Powerlines must be fitted with industry standard bird flight diverters in order to make the lines as visible as possible to collision-susceptible species. Shaw <i>et al</i> (2021) demonstrated that large avifauna species mortality was reduced by 51% (95% CI: 23–68%). Recommended bird diverters such as flapping devices (dynamic device) and thickened wire spirals (static device) or similar diverters that increase the visibility of the lines should be fitted 5 m apart. The Inotec BFD88 bird diverter is highly recommended due to its visibility under low light conditions when most species move from roosting to feeding sites.</p>				
<p>Specific mitigation recommendations for the 400kV OHL:</p>				
<ul style="list-style-type: none"> <li>• Removal of earth wire or increase wire thickness to make it more visible;</li> <li>• Use 'Self Support' structures and avoid 'Cross Rope' structures;</li> <li>• Bands or stripes on Conductors (2 black, neoprene bands (35x35cm), crossed, with a bright strip, fixed every 10 m with plastic peg);</li> <li>• Static vibration damper, spirals, BFDs or 'pig-tails' (White polypropylene spirals, 1 m long, 30 cm diameter, staggd on two static wires to effect marking every 5 m);</li> <li>• All the parts of the infrastructure must be nest proofed and anti-perched devices placed on areas that can lead to electrocution;</li> <li>• All exposed parts must be covered (insulated) to reduce electrocution risk;</li> <li>• All conductor wires in the same horizontal plane.</li> </ul>	<p>Planning and construction</p>	<p>Environmental Officer &amp; Contractor, Engineer</p>	<p>Presence of bird collisions</p>	<p>During phase</p>
<p>All the parts of the infrastructure must be nest proofed and anti-perch devices placed on areas that can lead to electrocution</p>	<p>Planning and construction</p>	<p>Environmental Officer &amp; Contractor, Engineer</p>	<p>Presence of electrocuted birds</p>	<p>During phase</p>



Install anti-perch devices such as spikes to prevent Pied Crows from nesting/perching. This is especially important to impede excessive predation on <i>Psammobates</i> sp.	Planning and construction	Environmental Officer & Contractor, Engineer	Over predation of tortoise	During phase
Any exposed parts must be covered (insulated) to reduce electrocution risk	Planning and construction	Environmental Officer & Contractor, Engineer	Presence of electrocuted birds	During phase

**Management Outcome: Environmental Awareness Training**

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
All personnel to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the project area to inform contractors and site staff of the presence of species, their identification, conservation status and importance, biology, habitat requirements and management requirements within the Environmental Authorisation and the EMPr.	Life of operation	Project Manager Health and Safety Officer Contractor Environmental Officer	Compliance to the training.	As needed

It is the opinion of the specialist that based on the observations made from the desktop studies, available information and the findings of the previous reports that the ecological (terrestrial, pedology and aquatic) status of the site has not decreased or changed since the original report in 2012. In consideration that the project has been previously authorised the proposed development may proceed, under the condition that all mitigation measures provided in this report and previous reports are adhered to.

We trust you find the above in order. If there are any uncertainties or additional information required, please feel free to contact the undersigned.

Kind regards



Marc Trevor Freeman  
The Biodiversity Company



Andrew Husted (Pr Sci Nat 400213/11)  
The Biodiversity Company

## ENVIRONMENTAL IMPACT METHOD

The impact significance rating methodology, as provided by Nala, is guided by the requirements of the NEMA EIA Regulations 2014 (as amended).

Direct, indirect and cumulative impacts associated with the projects must be assessed in terms of the following criteria:

- » The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- » The **duration**, wherein it will be indicated whether:
  - \* the lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
  - \* the lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
  - \* medium-term (5–15 years) – assigned a score of 3;
  - \* long term (> 15 years) - assigned a score of 4; or
  - \* permanent - assigned a score of 5;
- » The **magnitude**, quantified on a scale from 0-10, where 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- » The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1–5, where 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
- » the **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
- » the **status**, which will be described as either positive, negative or neutral.
- » the degree to which the impact can be reversed.
- » the degree to which the impact may cause irreplaceable loss of resources.
- » the *degree* to which the impact can be *mitigated*.

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

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

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

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

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

**Example of Impact table summarising the significance of impacts (with and without mitigation)**

Nature: [Outline and describe fully the impact anticipated as per the assessment undertaken]		
	Without mitigation	With mitigation
Extent	High (3)	Low (1)
Duration	Medium-term (3)	Medium-term (3)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (36)	Low (24)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	
Mitigation: "Mitigation", means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible. Provide a description of how these mitigation measures will be undertaken keeping the above definition in mind		
Residual Impacts: "Residual Risk", means the risk that will remain after all the recommended measures have been undertaken to mitigate the impact associated with the activity (Green Leaves III, 2014).		