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28 March 2023

NALA ENVIRONMENTAL CONSULTING FIRM
Arlene Singh: arlene@veersgroup.com

To whom it may concern:

AVIFAUNA SPECIALIST INPUT FOR THE PART 2 AMENDMENT OF THE ENVIRONMENTAL AUTHORISATION (EA) FOR THE PROPOSED CONSTRUCTION OF THE 765 KV GAMMA SUBSTATION ON THE FARMS UIT VLUGT FONTEIN NO.265 AND SCHIETKUIL NO.3 IN THE PIXLEY KA SEMA AND CENTRAL KAROO DISTRICT MUNICIPALITIES; WESTERN CAPE PROVINCE AND NORTHERN CAPE PROVINCE (DFFE REF: 12/12/20/873).

The Biodiversity Company (TBC) has undertaken the Terrestrial and Avifaunal assessment for the Emoyeni Grid Connection Infrastructure (132kV overhead powerline, watercourse crossings and access tracks) as part of the Basic Assessment (BA) process in 2022 as authorised (DFFE Ref: DFFE Ref: 14/12/16/3/3/1/2626) dated 15 March 2023. The scope of the BA process included the Gamma Substation and the 400kV turn-in footprints. Therefore, the findings of the 2022 assessment and the site sensitivity verification remain valid and are applicable to this Part 2 Amendment Application and have been referenced below.

1 The 2007 Avifaunal Specialist Study, conducted by J Smallie of the Endangered Wildlife Trust as part of the Environmental Impact Assessment (EIA) (Arcus, 2007) for the proposed Construction of the 765 KV Gamma Substation on the farms Uit Vlugt Fontein and Schietkuil in the Western Cape and Northern Cape (DEA REF. No. 12/12/20/873), refers.

2 The abovementioned study, as part of the Environmental Authorisation (EA) process (DEA REF. NO. 12/12/20/873), has been reviewed by The Biodiversity Company (TBC) who conducted a site assessment in April 2022, followed by a Sensitivity Verification in October 2022. Associated site visits were conducted in March 2022, April 2022 and August 2022.

3 It is understood that the next phase of the authorised Gamma substation (including a new 400/132kV substation yard and 400kV OHL turn-ins) is now planned for implementation in order to support the connection of the authorised Emoyeni Wind Farms.

4 The construction date for the additional infrastructure for the Gamma Substation is not yet finalised. However, to optimise the proposed project, the following amendments are applied for in terms of the EIA Regulations, 2012:

4.1. Addition of Conditions to the EA regarding the Updated Layout (April 2023);

4.2. Amendment to the project description on Page 3 of the Environmental authorisation related to the updated layout and co-ordinates of the 765 kV Gamma Substation;

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4.3. Amendment to the Title of the Environmental Authorisation; and

4.4. Change the name of the contact person and contact details for the Holder of the Environmental Authorisation.

5 This change in layout, although within the scope of the current EA, requires that the respective specialist studies hitherto undertaken as part of the original EA process must be reviewed by respective specialists in order to ascertain whether conditions on site have changed since the original EIA (ACER, 2007). This letter serves this purpose. Nala Environmental has requested confirmation regarding the assessed impacts in terms of the following:

- An assessment of all impacts (including cumulative impacts) related to the proposed changes
- Discussion on the change in impact or any new impacts, if any
- Additional mitigation measures, if any
- Any disadvantages and advantages that may result due to the amendment.

6 Impact Assessment from the 2007 Avifaunal Specialist Study report included the following:

6.1. Impact Assessment

Impact	Rating after mitigation
Habitat destruction	Low
Disturbance	Low
Electrocution of birds on substation infrastructure	Low
Collision of birds with communication tower	Low
Impact on quality of supply	Low

6.2. Cumulative impacts were not assessed in the 2007 Avifaunal Study (ACER, 2007)

7 Conclusions from the 2007 Avifaunal Specialist report included the following:

7.1. Impacts are of low significance overall.

7.2. Monitoring must take place once the substation is operational.

7.3. No mitigation measures are recommended as all impacts are low prior to mitigation.

8 In 2022 the Biodiversity Company (TBC) undertook a terrestrial biodiversity and avifaunal assessment for the grid connection infrastructure required to connect the authorised Emoyeni Wind Farm projects to the Gamma substation. The assessment area included the footprint of the proposed Gamma infrastructure. The resultant Impact Assessment Report from the 2022 Terrestrial Biodiversity and Avifauna Assessment Report (L de Wet, L Steyn, J Jacobs and A Husted, TBC, 2022) included impact assessment tables for the full grid line, associated access roads, switching stations and the Gamma Substation footprint (including the proposed Gamma substation yard footprint and the 400kV turn-in infrastructure footprint). N.B. The full Emoyeni Grid infrastructure as assessed in 2022 has been authorised as per the Department of Forestry, Fisheries and Environment (DFFE Ref: 14/12/16/3/3/1/2626) dated 15 March 2023.

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8.1. Impact tables are summarised below (TBC, 2022):

Impact	Rating after mitigation
Construction Phase	
Loss of Vegetation within the development footprint	Medium
Displacement of faunal (including avifaunal) communities due to habitat loss, direct mortalities, and disturbance	Low
Collection of eggs, nest destruction and poaching	Low
Operational Phase	
Continued fragmentation and degradation of habitats and ecosystems	Low
Ongoing displacement and direct mortalities of faunal community (including SCC) due to disturbance (road collisions, collisions with infrastructure, noise, light, dust, vibration)	Low
Collisions with powerlines and connection lines	High
Electrocution by powerlines	Low

8.2. Cumulative impacts are assessed in context of the extent of the proposed project area; other developments in the area; and general habitat loss and transformation resulting from other activities in the area (all activities, as required for assessment of cumulative impacts including surrounding wind energy facilities, powerlines, and associated infrastructure in the region). Cumulative impacts for the Emoyeni grid infrastructure, inclusive of the Gamma footprint were assessed as Low for the project considered in isolation and High for the project considered as a cumulative impact with surrounding grid infrastructure developments. The impact table is reproduced below.

Table 1 Cumulative Impacts to biodiversity associated with the proposed project.

The development of the proposed infrastructure will contribute to cumulative habitat loss, thereby impacting ecological processes in the region.		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Moderate (3)	Moderate (3)
Duration	Short term (2)	Long term (4)
Magnitude	Low (4)	Moderate (6)
Probability	Probable (3)	Definite (5)
Significance	**Low (27)**	**High (65)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	Moderate
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation:		
Should the vegetation be removed, the impact cannot be mitigated.		
Residual Impacts:		
Will result in the loss of: • **Less migratory species will be found in the area.** • **Road killings are still a possibility.**		

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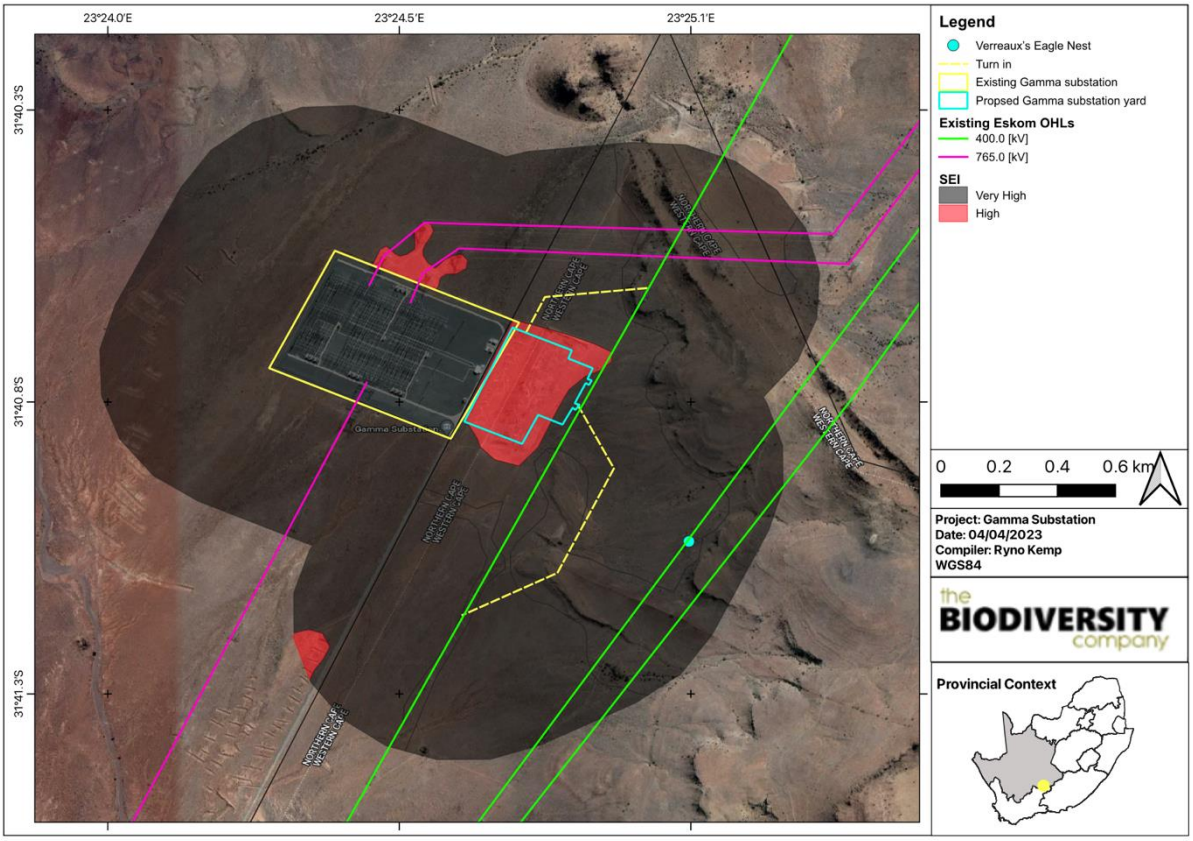
- **Migratory routes of fauna will change.**
- **Fauna and flora species composition may change.**
- **Avifauna SCCs will be influenced.**

9 Conclusions from the 2022 Terrestrial Biodiversity and Avifauna Assessment[1] report (L de Wet, L Steyn, J Jacobs and A Husted, TBC, 2022) related to the Emoyeni Grid infrastructure with those applicable specifically to the Gamma Substation infrastructure extracted included the following:

9.1. The Gamma Substation is located mainly in an area of High Site Ecological Importance (SEI), with some infrastructure in an area of Very High SEI as shown below



9.2. Impact associated with collisions with powerlines are high due to the high number and density of avifauna Species of Conservation Concern (SCC) within the site (a Verreaux's

[1] This assessment was conducted in accordance with the amendments to the Environmental Impact Assessment Regulations. 2014 (GNR 326, 7 April 2017) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The approach has taken cognisance of the recently published Government Notices (GN) 320 (20 March 2020) and GN 1150 (30 October 2020): "Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation" (Reporting Criteria).

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Eagle nest, located on a 400kV pylon structure, is indicated with a blue dot on the above map).

9.3. The development (full grid line and associated infrastructure) in a previously authorised powerline route and the authorised 132kV Emoyeni Grid as assessed in 2022, therefore, is not regarded as a fatal flaw.

9.4. Provided all mitigation measures are adhered to, the development is supported.

10 The Terrestrial Ecology and Avifauna Site Sensitivity Verification (TBC 2022) for the authorised 132KV grid connection infrastructure, associated access tracks and water course crossings associated with the authorised Emoyeni wind energy facilities was undertaken as per the protocols (for the entire for grid connection footprint including the Gamma Substation yard and proposed turn-in footprint) and therefore does not include an impact assessment and associated tables due to its nature as a Site Sensitivity Verification. The impact assessment and tables had been included in the Terrestrial Ecology and Avifauna Impact Assessment report as part of the Basic Assessment process (DFFE Ref: . 14/12/16/3/3/1/2626).

11 The conclusions of the Site Sensitivity Verification (TBC 2022) for the authorised 132KV grid connection infrastructure, associated access tracks and water course crossings associated with the authorised Emoyeni wind energy facilities include the following and remain valid for the Part 2 Amendment Application as the proposed Gamma Substation yard and 400kV turn-in infrastructure being assessed falls within the previously assessed and authorised footprint of the Emoyeni Grid Infrastructure as per EA Ref: 14/12/16/3/3/1/2626 dated 15 March 2023 :

11.1. The assessment area was identified with the screening tool as possessing a High and Medium sensitivity within a Faunal context. The Gamma Substation occurs in an area with a high sensitivity. However, the implementation of specific mitigating measures proposed to be implemented will allow for the significance of impacts to be reduced and deemed acceptable for development.

11.2. Presently there are natural habitats within the assessment area that possess a High and Very High SEI. This is due to the numbers and density of avifaunal SCC i.e. the presence of a Verreaux Eagle nest within a pylon structure of an existing 400kV OHL to the east of the Gamma Substation.

11.3. The sensitivity of the Gamma substation and associated turn-ins was considered to be accurate at a High sensitivity with the surrounds a Very High sensitivity i.e. the presence of a Verreaux Eagle nest within a pylon structure of an existing 400kV OHL to the east of the Gamma Substation.

12 Mitigation measures prescribed by each of the reviewed specialist reports remain applicable and must be adhered to.

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13 In order to manage the impacts of the proposed Gamma infrastructure effectively, the following **additional** mitigation management should be included within the EMPrs be put into place for the general impacts associated with avifauna:

Management Outcome: Habitats				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
All development areas must be clearly demarcated. No development is to occur in areas possessing 'Very High' SEI wherever practicable. Only the 'High' SEI areas that have been authorised for development should be intruded into. Pylons may only be considered in "Very High SEI" areas where is it not feasible to span the area entirely. In such instances the minimum possible number of pylons with the smallest possible footprint must be utilised and the disturbance footprint must be strictly controlled. A service track (jeep track) is permissible in Very High SEI areas only to the extent required to establish and maintain the powerline, and only if no other access options are available in areas of lower sensitivity.	Life of operation	Project Manager	Infringement into these areas	Ongoing
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

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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 though 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
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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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. **Specific mitigation recommendations for the 400kV OHL:** • **Removal of earth wire or increase wire thickness to make it more visible;** • **Use 'Self Support' structures and avoid 'Cross Rope' structures;** • **Bands or stripes on Conductors (2 black, neoprene bands (35x35cm), crossed, with a bright strip, fixed every 10 m with plastic peg);** • **Static vibration damper, spirals, BFDs or 'pig-tails' (White polypropylene spirals, 1 m long, 30 cm diameter, stagged on two static wires to effect marking every 5 m);** • **All the parts of the infrastructure must be nest proofed and anti-perched devices placed on areas that can lead to electrocution;** • **All exposed parts must be covered (insulated) to reduce electrocution risk;** • **All conductor wires in the same horizontal plane.**	Planning and construction	Environmental Officer & Contractor, Engineer	Presence of bird collisions	During phase
All the parts of the infrastructure must be nest proofed and anti-perch devices placed on areas that can lead to electrocution	Planning and construction	Environmental Officer & Contractor, Engineer	Presence of electrocuted birds	During phase
Install anti-perch devices such as spikes to prevent Pied Crows from nesting/perching. This is especially important to impede excessive predation on *Psammobates* 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

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Ideally, construction within 500m of the existing Verreaux's Eagle nest should be conducted between January and April outside the breeding period of Verreaux's eagles (note that stringing of the 400kV turn-ins may extend into May). However, if this is not possible, the following mitigations need to be put in place for construction to continue within the 500m buffer: - **Construction of an artificial nesting platform as soon as April/May 2023 to encourage them to move their current breeding location. The construction of the artificial nesting platform and location of the platform must be undertaken in consultation with a suitably qualified Avifaunal Specialist.** - **Implementing a scientifically sound monitoring program to determine the level of disturbance during construction, only if eagles utilise their current nesting location in close proximity to the substation. A suitably qualified Avifaunal Specialist must be appointed to undertake the monitoring.**	Planning and construction	Environmental Officer & Contractor, Engineer Avifauna Specialist to monitor.	Presence of Verreaux's eagles making use of the nest.	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

14 The desktop terrestrial biodiversity theme sensitivity according to the screening tool for a portion of the site area is 'High' due to the presence of SCC. A baseline assessment (April 2022) determined the sensitivity of the habitat to be 'High' and 'Very High'.

15 Impacts assessed as part of the 2007 report: Avifaunal Specialist Study, conducted by J Smallie (EWT) as part of the Environmental Impact Assessment (EIA) for the proposed Construction of the 765 KV Gamma Substation on the farms Uit Vlugt Fontein and Schietkuil in the Western Cape and Northern Cape (DEA REF. No. 12/12/20/873) are considered to be relevant for the proposed new layout. Impacts identified and assessed as part of the Terrestrial Biodiversity and Avifauna Assessment Report (L de Wet, L Steyn, J Jacobs and A Husted, TBC, 2022) are also relevant, though assessed for the entire grid and associated infrastructure. No new impacts were identified in the most recent study, nor are any new impacts expected. It is considered that impacts so far identified and assessed are an accurate representation of the impacts associated with the proposed new layout of the Gamma substation.

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16 Cumulative impacts were not assessed as part of the 2007 studies however, they are assessed as part of the 2022 studies for the authorised 132kV Emoyeni Grid Infrastructure and are considered accurate and applicable to the proposed layout change of the Gamma substation i.e., the inclusion of the Gamma Substation yard and the 400kV turn-in's associated with the existing 400kV Droer - Hydra 2 Overhead Powerline. Impacts of the proposed layout change in isolation are expected to be low overall and high when considered cumulatively with other proposed, existing and planned renewable energy facilities and grid connection infrastructure.

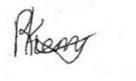
17 In terms of Avifauna, there are no advantages of the proposed updated layout. However, the proposed layout is not expected to result in an increase in impacts or their associated severities. Disadvantages include an increased risk of collisions with powerlines, as identified in the specialist studies.

18 All prescribed mitigation measures and supporting recommendations presented here will help to achieve an acceptable residual impact. These measures and recommendations will remain applicable for the Part 2 Amendment process. To this end, these measures have been included in the Generic EMPr's for this development as submitted with the Motivation report.

19 As such, should the measures described above, and as included in the Generic EMPr's for this development be implemented, it is the reasoned opinion of the specialist that the proposed layout changes i.e., the inclusion of the proposed substation yard within the authorised footprint of the existing Gamma Substation and the proposed turn-in's of the Droer-Hydra 2 400kV powerline be approved.

20 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,



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TERMS OF REFERENCE:

The report amendment report must reflect:

- An assessment of all impacts related to the proposed changes;
- Advantages and disadvantages associated with the changes;
- Comparative assessment of the impacts before the changes and after the changes; and
- Measures to ensure avoidance, management and mitigation of impacts associated with such proposed changes, and any changes to the EMPr.

The assessment must be clear on whether each of the proposed changes to the EA will:

- Increase the significance of impacts originally identified in the EIA report or lead to any additional impacts; or
- Have a zero or negligible effect on the significance of impacts identified in the EIA report; or
- Lead to a reduction in any of the identified impacts in the EIA report.

Please take note that should there be no change to impacts and their significance ratings as identified in the EIA process (as the corridor has already been assessed), no impact tables will be necessary to include. Should there be an increase or decrease in significance or additional impacts not identified within the EIA process, the Impact Assessment Methodology and table format should be used and additional mitigation measures, if any, should be included.

ENVIRONMENTAL IMPACT METHODOLOGY:

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:

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- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- 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

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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).		

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MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY

Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Aves-Neotis ludwigii
Medium	Mammalia-Bunolagus monticularis

Figure 1. Map of relative animal species theme for the proposed gamma substation yard as per the DFFE Screening Tool report

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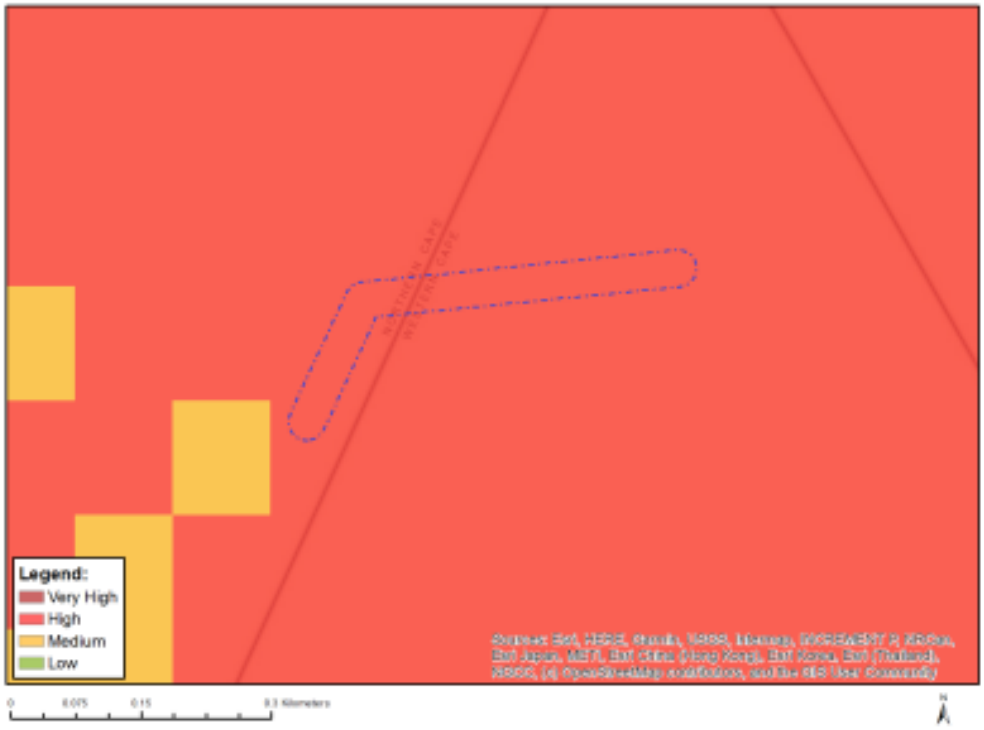
MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Aves-Neotis ludwigii
Medium	Mammalia-Bunolagus monticularis

Figure 2. Map of relative animal species theme for the proposed 400kV powerline turn in as per the DFFE Screening Tool report

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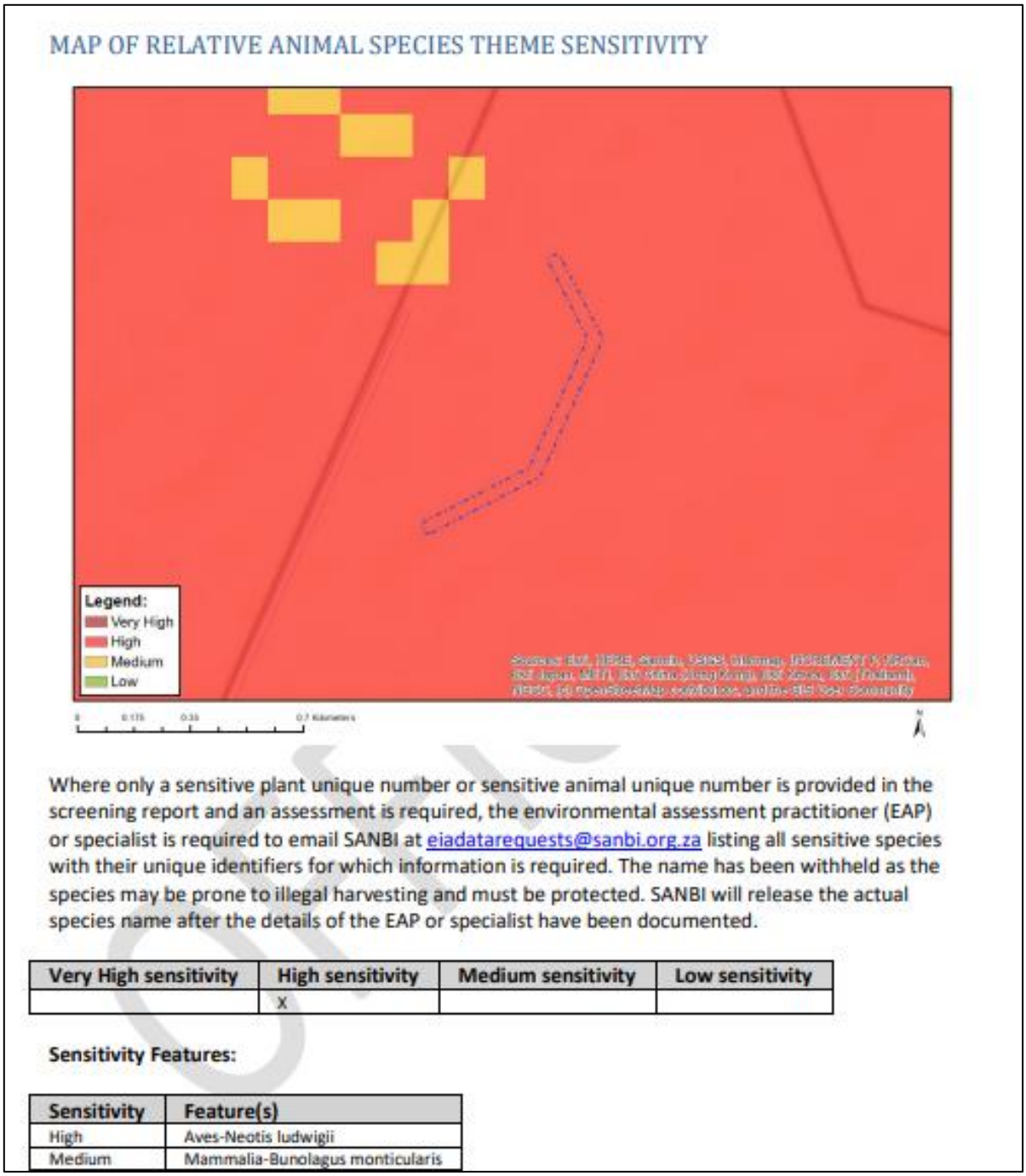

Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Aves-Neotis ludwigii
Medium	Mammalia-Bunolagus monticularis

Figure 3. Map of relative animal species theme for the proposed 400kV powerline turn in as per the DFFE Screening Tool report

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SITE SENSITIVITY VERIFICATION REPORT

AVIFAUNA: SITE SENSITIVITY VERIFICATION: GAMMA SUBSTATION

CONTENTS

1. INTRODUCTION

The construction of the Eskom Gamma Substation was authorised by the Department of Environmental Affairs in 2007. The approval was for constructing the complete Gamma substation. However, it was noted that individual components would be constructed in a phased approach as determined by the electricity demand over several years.

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As such, the first construction phase of the Gamma substation commenced during the original validity period of the EA and was completed in 2013 (**Figure 1**).

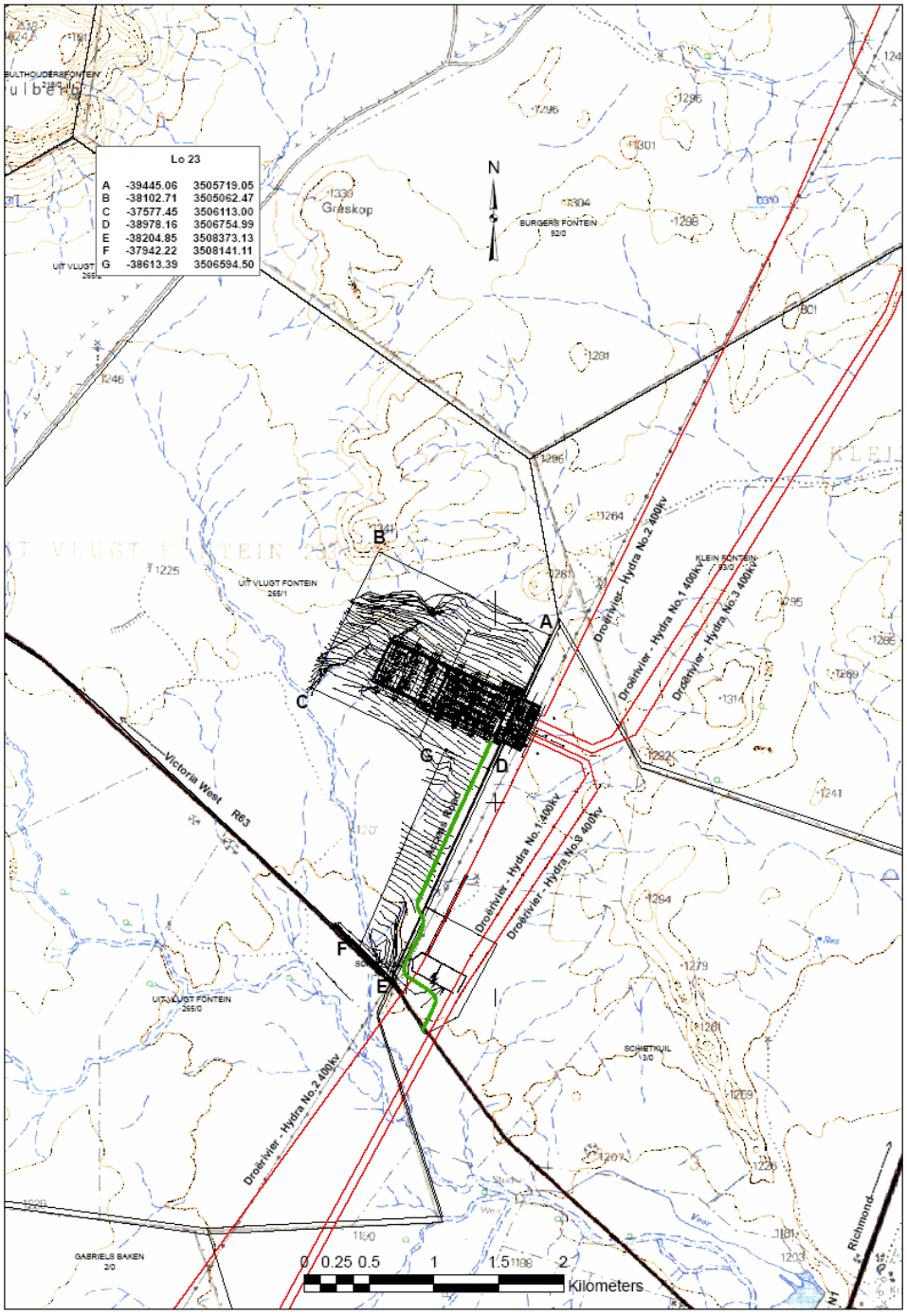

Figure 1 - As per the Final Environmental Impact Report (FEIR) (2007) indicating the layout of the 765kV Gamma Substation as authorised.

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Proposed Second Phase

The holder of the EA proposes to commence construction of the second phase of the authorised substation development, specifically the development of a 132/400kV yard at the existing MTS and OHL turn-in of the existing 400kV Droer-Hydra 2 Overhead Powerline into the substation yard, as provided for in the current EA.

The next phase of construction activities associated with the EA is directly linked to the increased demand for grid infrastructure which is linked to upcoming Renewable Energy projects in the Northern and Western Cape Provinces. Notably, the 132kV/400kV yard and 400kV OHL turn-ins are needed to enable the connection of the authorised Umsinde Emoyeni Wind Farm (DFFE Ref: 14/12/16/3/3/2/686) with has been registered as Strategic Integrated Project (SIP).

The proposed 132kV/400kV yard and 400kV OHL turn-ins fall within the scope of the current EA. However – based on further technical analysis and design – it has been identified that the layout of the authorised infrastructure will need to be updated to reflect the updated configuration proposed (i.e., the 132kV/400kV substation yard and 400kV turn-in) to be implemented. The updated layout falls within the scope and footprint of what was originally assessed in the original EIA process, however for the avoidance of doubt the holder wishes to have the updated layout approved by DFFE prior to implementation thereof.

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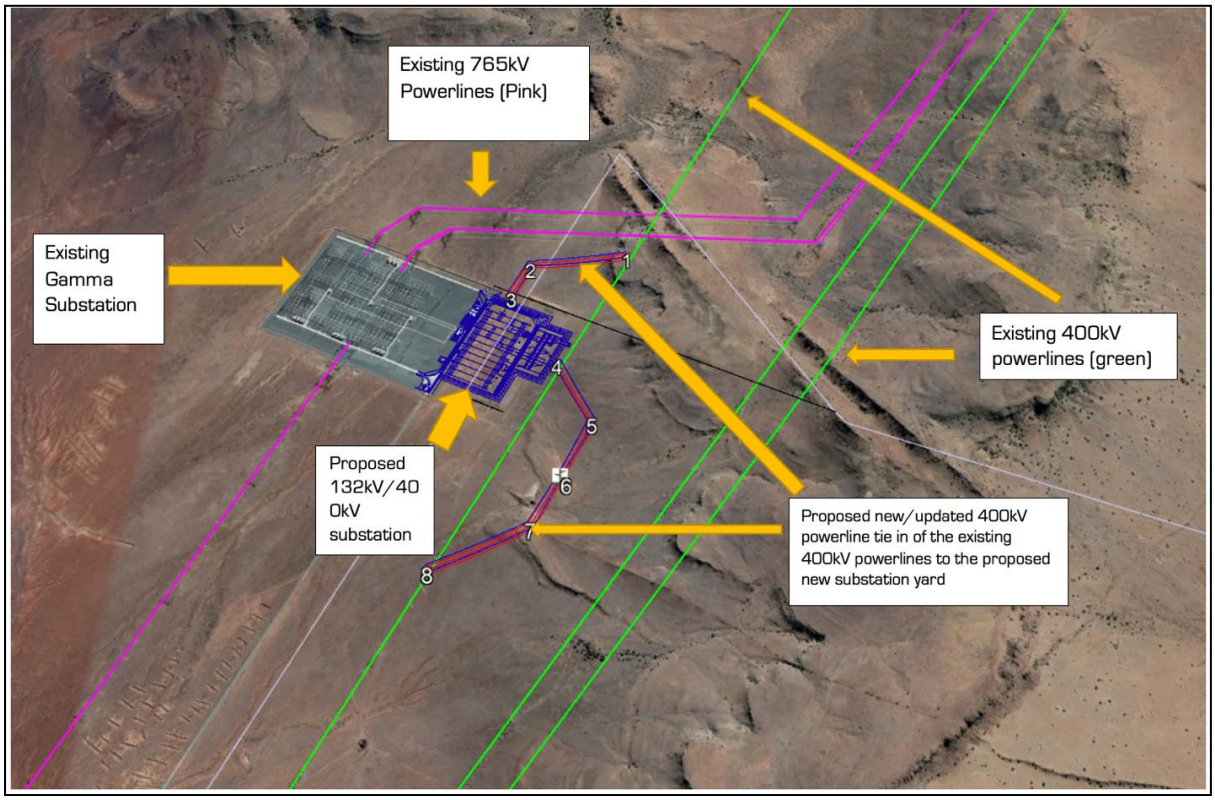

Figure 2 - Proposed Updated Layout depicting the existing Gamma Substation with the next phase of the authorised development now proposed for implementation (new proposed 132kV/400kV Substation yard and new reconfigured turn-in and turn-out of the existing 400kV powerline).

A Part 2 amendment application is proposed to be undertaken for the proposed update to the layout to the existing 765kV Gamma Substation and associated powerline turn-in infrastructure. The next phase of the Gamma MTS development that will now be implemented will consist of:

1. A substation yard with a step-up voltage of 132kV/400kV on Farm Schietkuil 3 and Farm Uit Vlugt Fontein 265; and
2. In addition, the existing Eskom 400kV overhead powerline that currently bypasses the existing Gamma Substation (i.e. the "Droerivier- Hydra No. 2" 400kV OHL) will be reconfigured to turn-in and turn-out of the new substation yard

In terms of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) Environmental Impact Assessment (EIA) Regulations [4 December 2014, Government Notice (GN) R982, R983, R984 and R985, as amended], various aspects of the proposed development may have an impact on the environment and are considered to be listed activities. These activities require authorisation from the National Competent Authority

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(CA), namely the Department of Forestry, Fisheries and the Environment (DFFE), prior to the commencement thereof. Further to this as per GN R. 2313 : ***Adoptions of the standard for the development and expansion of powerlines and substation with identified geographical areas and the exclusion of this infrastructure from the requirements to obtain Environmental Authorisation*** , the Standard was adopted in terms of section 24(10)(a) of the Act for the purpose of excluding the activities contemplated in paragraph 5.1 and 5.2 of the Schedule from the requirement to obtain environmental authorisation prior to commencement. In terms of the procedural requirement set out in the standard, screening tool reports have been undertaken for the updated gamma substation layout and associated infrastructure and site sensitivity verifications have been undertaken by the relevant specialists in accordance with the sensitivity themes. As per 6.1. of the GNR .2313, "Where any part of the infrastructure occurs on an area for which the environmental sensitivity for any environmental theme is identified as being very high or high by the national web based environmental screening tool and confirmed to be such through the application of the procedures set out in the Standard", the site sensitivity verifications have been performed as per the procedural requirements set out.

In accordance with GN 320 and GN 1150 (20 March 2020)[2] of the NEMA EIA Regulations of 2014 (as amended), prior to commencing with a specialist assessment, a site sensitivity verification must be undertaken to confirm the current land use and environmental sensitivity of the proposed project areas as identified by the National Web-Based Environmental Screening Tool (i.e., Screening Tool). Leigh- Ann De Wet, Andrew Husted and Jan Jacobs, as terrestrial specialists, have been commissioned to verify the sensitivity of the project sites under these specialist protocols.

The scope of this report is for one (1) application, namely the Part 2 ammendment application for the proposed update top the layout to the exisiting 765kV Gamma Substation and associated powerline turn-in infrastructure. The next phase of the Gamma MTS development that will now be implemented will consist of:

1. A substation yard with a step-up voltage of 132kV/400kV on Farm Schietkuil 3 and Farm Uit Vlugt Fontein 265; and
2. In addition, the existing Eskom 400kV overhead powerline that currently bypasses the existing Gamma Substation (i.e. the "Droerivier- Hydra No. 2" 400kV OHL) will be reconfigured to turn-in and turn-out of the new substation yard

[2] GN 320 (20 March 2020): Procedures for The Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(A) and (H) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation

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2. SITE SENSITIVITY VERIFICATION METHODOLOGY

The following information sources were consulted to compile this report:

- National Biodiversity Assessment 2018 (Skowno *et al,* 2019) - The purpose of the National Biodiversity Assessment (NBA) is to assess the state of South Africa's biodiversity based on best available science, with a view to understanding trends over time and informing policy and decision-making across a range of sectors. The NBA deals with all three components of biodiversity: genes, species and ecosystems; and assesses biodiversity and ecosystems across terrestrial, freshwater, estuarine and marine environments. The two headline indicators assessed in the NBA are:
- Ecosystem Threat Status – indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition.
- Ecosystem Protection Level – indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. Not Protected, Poorly Protected or Moderately Protected ecosystem types are collectively referred to as under-protected ecosystems.
- Protected areas:
    - South Africa Protected Areas Database (SAPAD) and South Africa Conservation Areas Database (SACAD) (DEA, 2022) – The South African Protected Areas Database (SAPAD) and South Africa Conservation Areas Database (SACAD) contains spatial data for the conservation of South Africa. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. The database is updated on a continuous basis and forms the basis for the Register of Protected Areas which is a legislative requirement under the National Environmental Management: Protected Areas Act, Act 57 of 2003.
    - National Protected Areas Expansion Strategy (NPAES) (SANBI, 2018) – The National Protected Area Expansion Strategy (NPAES) provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus areas are large, intact and unfragmented and are therefore, of high importance for biodiversity, climate resilience and freshwater protection.
- Northern Cape Critical Biodiversity Areas (2016): The Northern Cape Department of Environment and Nature Conservation has developed the Northern Cape CBA Map which identifies biodiversity priority areas for the province, called Critical Biodiversity

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Areas (CBAs) and Ecological Support Areas (ESAs). These biodiversity priority areas, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species as well as the long-term ecological functioning of the landscape as a whole.

  - The identification of Critical Biodiversity Areas for the Northern Cape was undertaken using a Systematic Conservation Planning approach. Available data on biodiversity features (incorporating both pattern and process, and covering terrestrial and inland aquatic realms), their condition, current Protected Areas and Conservation Areas, and opportunities and constraints for effective conservation were collated.
  - The Northern Cape Critical Biodiversity Area (CBA) Map updates, revises and replaces all older systematic biodiversity plans and associated products for the province.

- Western Cape Biodiversity Spatial Plan (WCBSP): The WCBSP has been developed by CapeNature Scientific Services Land Use Team in order to identify the priority biodiversity areas and ecological infrastructure that must be conserved to meet the provincial biodiversity mandate (Pool-Stanvliet *et.al*. 2017). The plan includes land use guidelines along with biodiversity priority areas, covering terrestrial, freshwater, coastal and marine areas. The plan identified areas as Critical Biodiversity Areas (CBAs) which cannot be lost if conservation goals are to be met, and Ecological Support Areas (ESAs) (Table 5-1), which are required to support the functioning of ecosystems and CBAs (Pool-Stanvliet *et.al.* 2017).
- Important Bird and Biodiversity Areas (BirdLife South Africa, 2015) – Important Bird and Biodiversity Areas (IBAs) constitute a global network of over 13 500 sites, of which 112 sites are found in South Africa. IBAs are sites of global significance for bird conservation, identified through multi-stakeholder processes using globally standardised, quantitative and scientifically agreed criteria.

Desktop avifaunal Assessment

The avifaunal desktop assessment comprised of the following:

- Compiling an expected avifauna list from the Southern African Bird Atlas Project 2 (SABAP2) using the 3128CB, 3128DA, 3123DB, 3123DD and 2124CC quarter degree squares and their associated pentads**.**
- Confirmation of nearby Coordinated Avifaunal Road Count (CAR) route.
- Confirmation of nearby Coordinated Waterbird Count (CWAC) site.

Faunal Assessment

Sampling consisted of standardized point counts as well as random diurnal incidental surveys and vantage point surveys. Standardized point counts (following Buckland *et al.* 1993) were

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conducted to gather data on the species composition and relative abundance of species within the broad habitat types identified. Each point count was run over a 10 min period. The horizontal detection limit was set at 50 m. At each point the observer would document the date, start time, and end time, habitat, numbers of each species, detection method (seen or heard), behaviour (perched or flying) and general notes on habitat and nesting suitability for conservation important species. To supplement the species inventory with cryptic and illusive species that may not be detected during the rigid point count protocol, diurnal incidental searches were conducted. This involved the opportunistic sampling of species between point count periods, river scanning and road cruising.

Nests, feathers, individuals and signs were photographed and GSP coordinates were taken.

Relevant field guides and texts consulted for identification purposes included the following:

- Roberts Bird Guide; A comprehensive field guide to over 950 bird species in southern Africa 1st Edition (Chittenden, 2007); and
- Roberts Birds of Southern Africa mobile app.

Site Ecological Importance

The different habitat types within the assessment area were delineated and identified based on observations during the field assessment as well as available satellite imagery. These habitat types were assigned Ecological Importance (EI) categories based on their ecological integrity, conservation value, the presence of species of conservation concern and their ecosystem processes.

Site Ecological Importance (SEI) is a function of the Biodiversity Importance (BI) of the receptor (e.g., SCC, the vegetation/fauna community or habitat type present on the site) and Receptor Resilience (RR) (its resilience to impacts) as follows.

BI is a function of Conservation Importance (CI) and the Functional Integrity (FI) of the receptor as follows. The criteria for the CI and FI ratings are provided in Table 1.5 and Table 1.6 respectively.

Table 1.5. Summary of Conservation Importance criteria

Conservation Importance	Fulfilling Criteria
Very High	Confirmed or highly likely occurrence of CR, EN, VU or Extremely Rare or Critically Rare species that have a global EOO of < 10 km^2. Any area of natural habitat of a CR ecosystem type or large area (> 0.1% of the total ecosystem type extent) of natural habitat of an EN ecosystem type. Globally significant populations of congregatory species (> 10% of global population).
High	Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km^2. IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.

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Conservation Importance	Fulfilling Criteria
	If listed as threatened only under Criterion A, include if there are less than 10 locations or < 10 000 mature individuals remaining.
	Small area (> 0.01% but < 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type or large area (> 0.1%) of natural habitat of VU ecosystem type.
	Presence of Rare species.
	Globally significant populations of congregatory species (> 1% but < 10% of global population).
Medium	Confirmed or highly likely occurrence of populations of NT species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals.
	Any area of natural habitat of threatened ecosystem type with status of VU.
	Presence of range-restricted species.
	> 50% of receptor contains natural habitat with potential to support SCC.
Low	No confirmed or highly likely populations of SCC.
	No confirmed or highly likely populations of range-restricted species.
	< 50% of receptor contains natural habitat with limited potential to support SCC.
Very Low	No confirmed and highly unlikely populations of SCC.
	No confirmed and highly unlikely populations of range-restricted species.
	No natural habitat remaining.

Table 1.6 Summary of Functional Integrity criteria

Functional Integrity	Fulfilling Criteria
Very High	Very large (> 100 ha) intact area for any conservation status of ecosystem type or > 5 ha for CR ecosystem types.
	High habitat connectivity serving as functional ecological corridors, limited road network between intact habitat patches.
	No or minimal current negative ecological impacts with no signs of major past disturbance.
High	Large (> 20 ha but < 100 ha) intact area for any conservation status of ecosystem type or > 10 ha for EN
	ecosystem types.
	Good habitat connectivity with potentially functional ecological corridors and a regularly used road network between intact habitat patches.
	Only minor current negative ecological impacts with no signs of major past disturbance and good rehabilitation potential.

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Medium	Medium (> 5 ha but < 20 ha) semi-intact area for any conservation status of ecosystem type or > 20 ha for VU ecosystem types. Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches. Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.
Low	Small (> 1 ha but < 5 ha) area. Almost no habitat connectivity but migrations still possible across some modified or degraded natural habitat and a very busy used road network surrounds the area. Low rehabilitation potential. Several minor and major current negative ecological impacts.
Very Low	Very small (< 1 ha) area. No habitat connectivity except for flying species or flora with wind-dispersed seeds. Several major current negative ecological impacts.

BI can be derived from a simple matrix of CI and FI as provided in Table 1.7

Table 1.7 Matrix used to derive Biodiversity Importance from Functional Integrity and Conservation Importance

Biodiversity Importance (BI)		**Conservation Importance (CI)**				
		Very high	**High**	**Medium**	**Low**	**Very low**
Functional Integrity (FI)	**Very high**	Very high	Very high	High	Medium	Low
	High	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	Low	Medium	Medium	Low	Low	Very low
	Very low	Medium	Low	Very low	Very low	Very low

The fulfilling criteria to evaluate RR are based on the estimated recovery time required to restore an appreciable portion of functionality to the receptor as summarised in Table 1.8

Table 1.8 Summary of Resource Resilience criteria

Resilience	**Fulfilling Criteria**
Very High	Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of remaining at a

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	site even when a disturbance or impact is occurring, or species that have a very high likelihood of returning to a site once the disturbance or impact has been removed.
High	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.
Medium	Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a moderate likelihood of returning to a site once the disturbance or impact has been removed.
Low	Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a low likelihood of returning to a site once the disturbance or impact has been removed.
Very Low	Habitat that is unable to recover from major impacts, or species that are unlikely to remain at a site even when a disturbance or impact is occurring, or species that are unlikely to return to a site once the disturbance or impact has been removed.

Subsequent to the determination of the BI and RR, the SEI can be ascertained using the matrix as provided in Table 1.9

Table 1.9 Matrix used to derive Site Ecological Importance from Receptor Resilience and Biodiversity Importance

Site Ecological Importance		Biodiversity Importance				
		Very high	**High**	**Medium**	**Low**	**Very low**
Receptor Resilience (RR)	**Very Low**	Very high	Very high	High	Medium	Low
	Low	Very high	Very high	High	Medium	Very low
	Medium	Very high	High	Medium	Low	Very low
	High	High	Medium	Low	Very low	Very low
	Very High	Medium	Low	Very low	Very low	Very low

3. OUTCOME OF SITE SENSITIVITY VERIFICATION

The combined Fauna Theme Sensitivity for the assessment area was derived to be High as indicated in the National Environmental Screening Tool (Figures 2, 3 and 4)..

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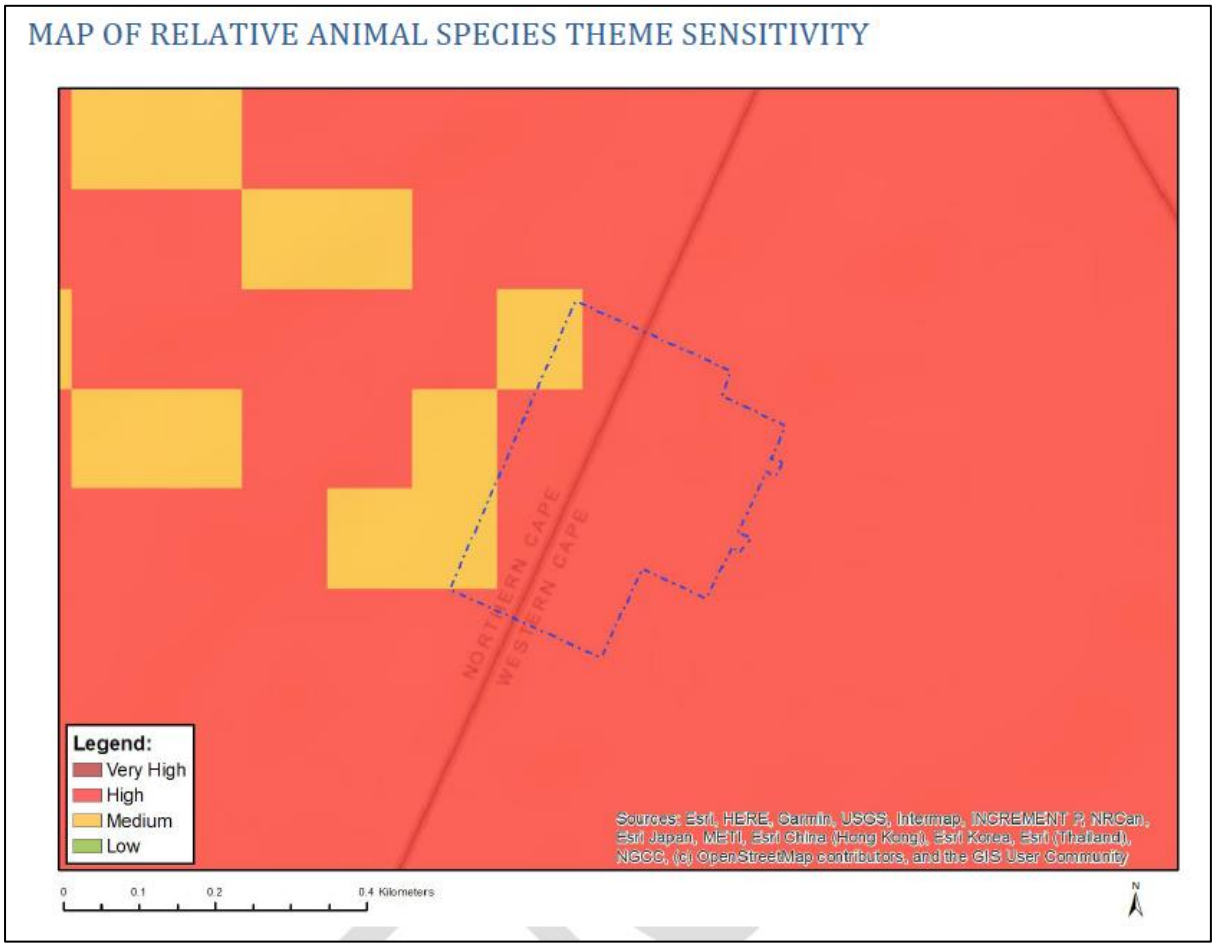

Figure 2: The classification of the study area in the DFFE online screening tool: Gamma Substation

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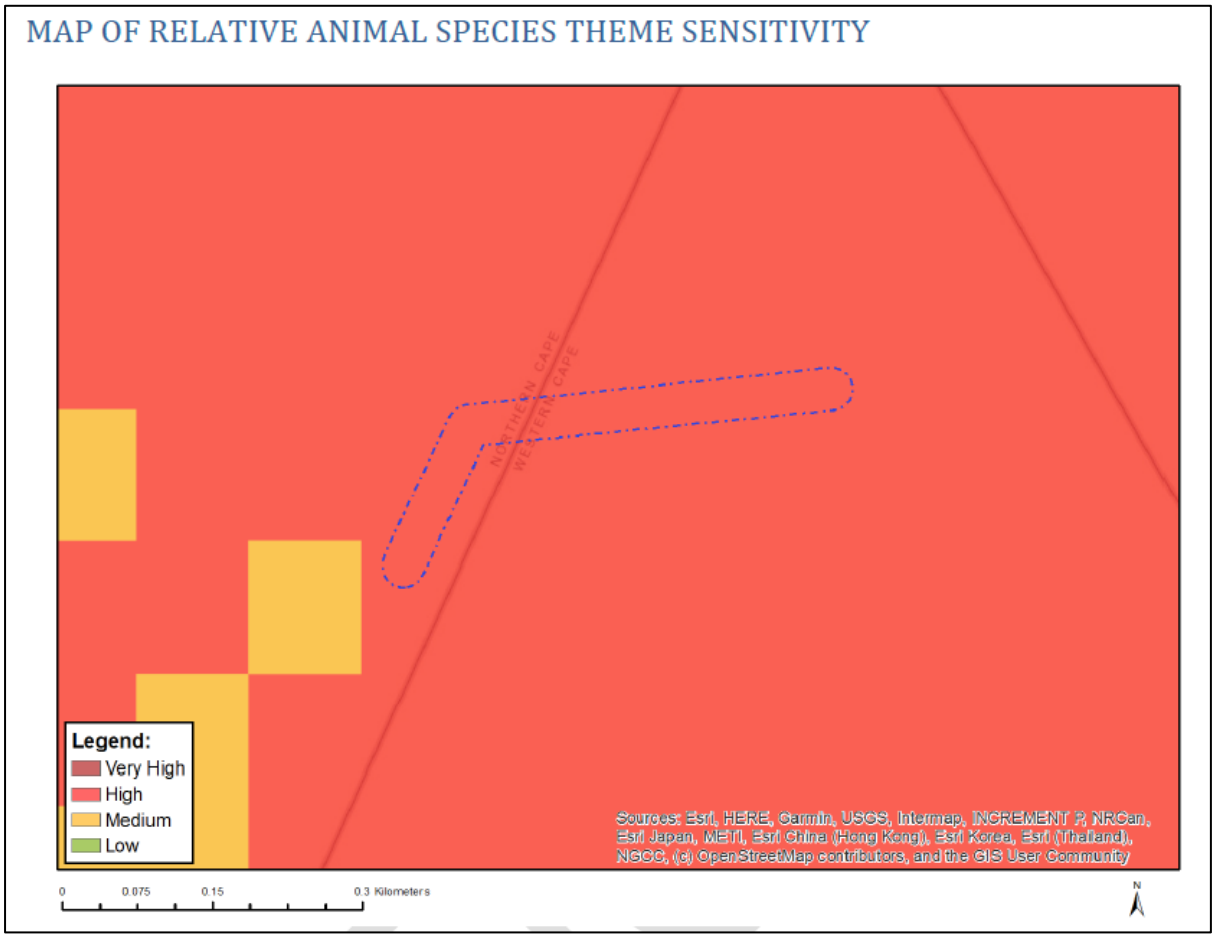

Figure 3: The classification of the study area in the DFFE online screening tool: Turn in points 1 - 3

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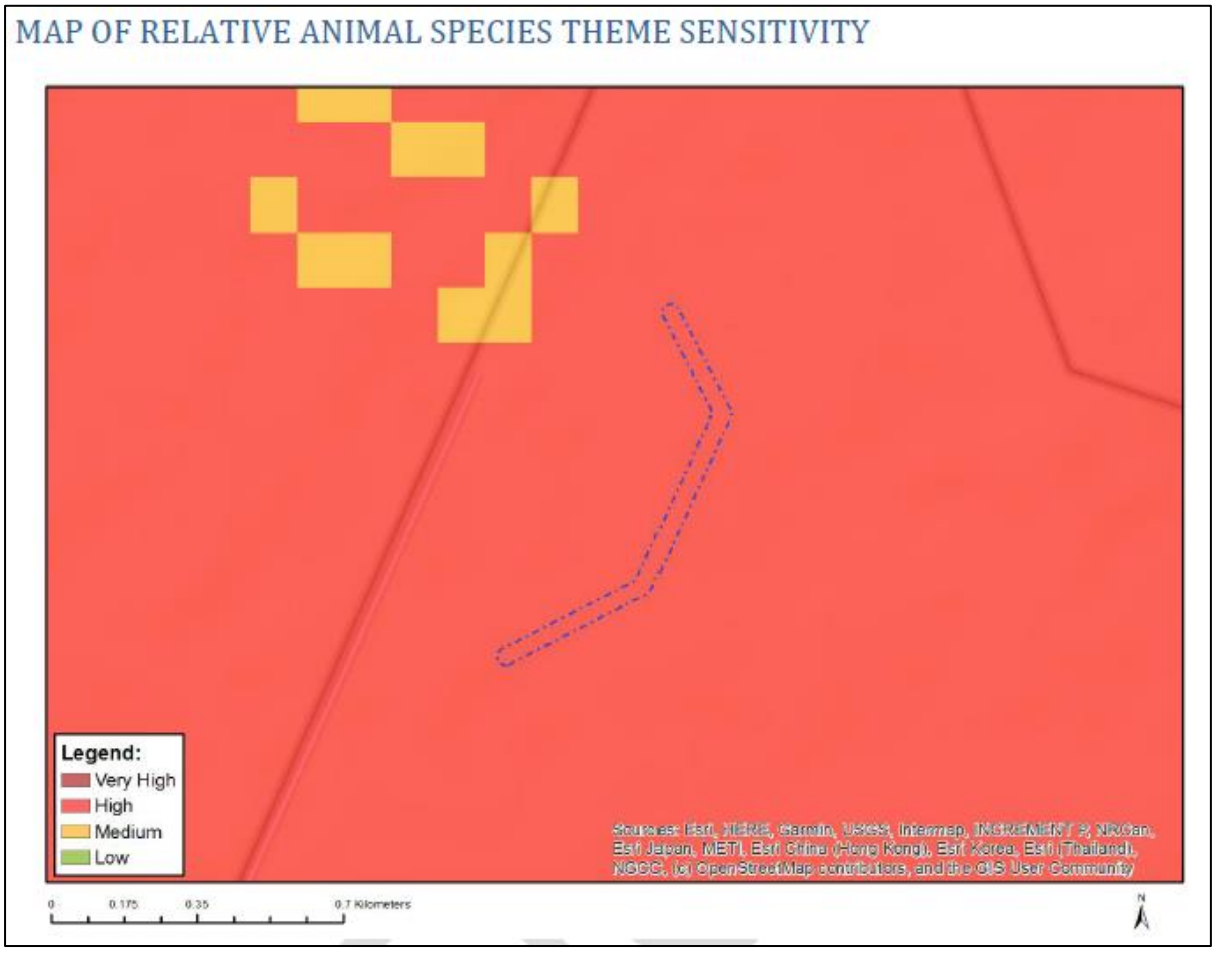

Figure 4: The classification of the study area in the DFFE online screening tool: Turn-in points 4-8

Four (4) different habitat types were delineated within the assessment area (Table 1.10). Based on the criteria provided in the species protocols for the site ecological sensitivity, all habitats within the assessment area of the proposed development were allocated a sensitivity category or SEI. The sensitivities of the habitat types delineated are illustrated in Figure 5.

The reason for the very high rating in the transformed area is based on the presence of the Verreaux's Eagle Nest on an existing powerline.

Table 1.10 Summary of habitat types delineated within the field assessment area of the proposed development

Habitat	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance
Transformed	High	Low	**Medium**	Low	**Very High**
Karoo scrub (flat)	Medium	High	**Medium**	Medium	**Medium**
Rocky outcrops	High	High	**High**	Low	**Very high**

Wash areas	**(wetland)**	High	High	**High**	Medium	**High**

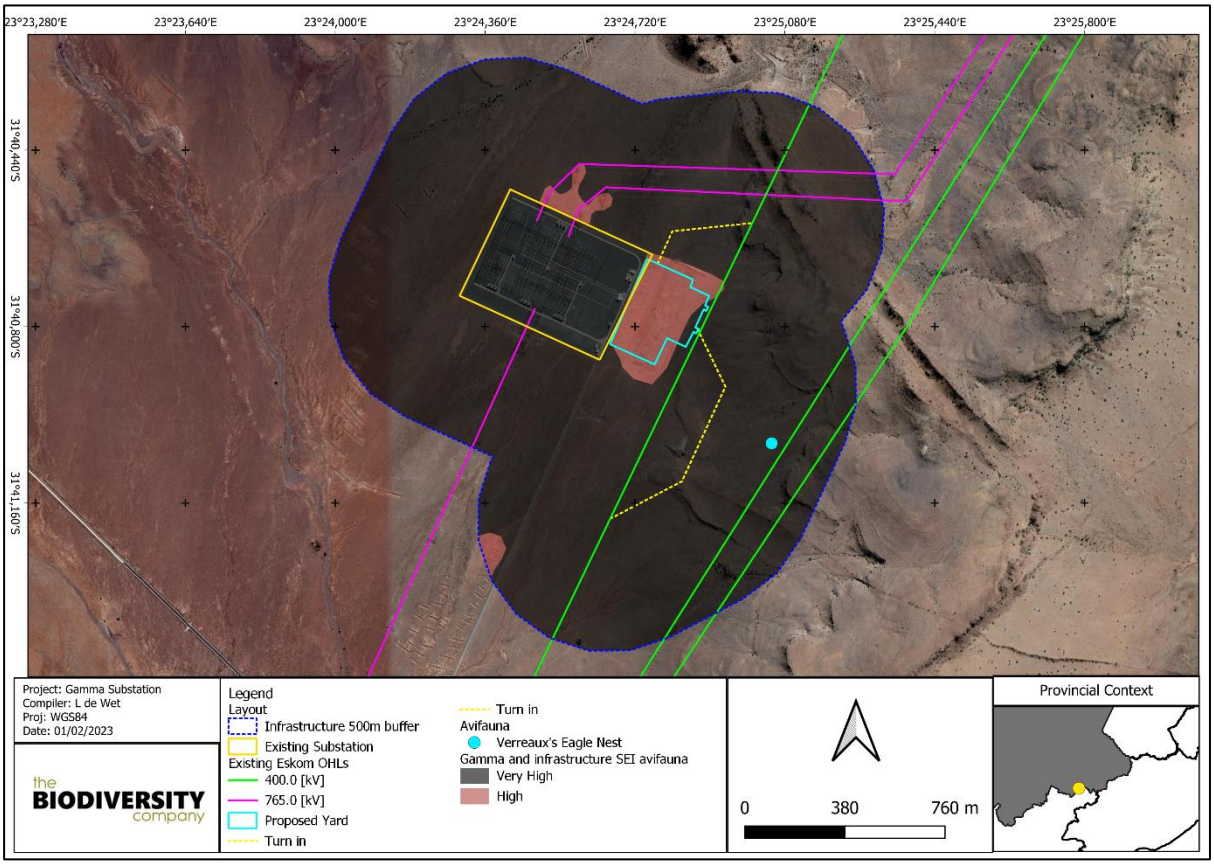

Figure 5 Map illustrating Site Ecological Importance (SEI) of the avifauna habitat types within the assessment area

4. CONCLUSION

During the field assessment 99 bird species were recorded of these eight of the species recorded were SCCs on a national or international scale. Blue Crane (*Grus paradisea*), Karoo Korhaan (*Eupodotis vigorsii*), Kori Bustard (*Ardeotis kori*), Ludwigs Bustard (*Neotis ludwigii*), Martial Eagle (*Polemaetus bellicosus*), Secretary bird (*Sagittarius serpentarius*), Verreauxs Eagle (*Aquila verreauxii*), and Lanner Falcon (*Falco biarmicus*) were the SCCs recorded. One nest of a Verreauxs Eagle was found close to the Gamma substation in an existing 400kV powerline, while an additional two nests' locations were provided by local farmers (these areas could not be accessed to confirm the nests). The high number of SCCs present increases the overall sensitivity of the area and is the reason for the powerline corridor mainly being made up of Very-High and High sensitivity areas.

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This classification of the screening tool was found to be too low for certain portions as far as the impact of the proposed substation and associated infrastructure is concerned, based on actual conditions recorded on the ground during the site visit of March 2022 and April 2022 the rating should be High for majority of the line.

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APRIL 2023 UPDATED LAYOUT

23°24'30"E 23°25'0"E 23°25'30"E 23°26'0"E

31°40'30"S 31°41'0"S 31°41'30"S

1/265 765kV 765kV RE/93 765kV RE/3

Northern Cape Western Cape Northern Cape Western Cape

Droërivier-Hydra No.2 (400kV) Droërivier-Hydra No.1 (400kV) Droërivier-Hydra No.3 (400kV)

1 start
2 middle
3 end
4 end
5
6 middle
7
8 start

Droërriver-Hydra 2 400kV (turn-in from the North)	Structure locations	Latitude	Longitude
Start	1	31° 40.592'S	23° 25.000'E
Middle	2	31° 40.609'S	23° 24.813'E
End	3	31° 40.673'S	23° 24.779'E
Droërriver-Hydra 2 400kV (turn-in from the South)			
End	4	31° 40.809'S	23° 24.871'E
	5	31° 40.923'S	23° 24.937'E
Middle	6	31° 41.022'S	23° 24.883'E
	7	31° 41.113'S	23° 24.834'E
Start	8	31° 41.188'S	23° 24.663'E

Legend

- Main roads
- Rivers
- Provincial boundaries

Land parcel no

- 1/265
- 1/3
- RE/3
- RE/93

Existing

- Existing Eskom 400kV powerlines
- Existing Eskom 765kV powerlines
- Existing Gamma substation

Proposed new/update

- Proposed new/updated 400kV powerline tie in of the existing 400kV powerlines to the proposed new substation yard
- Proposed 132kV/400kV substation yard
- Proposed structure locations

Prepared for:
Nala Environmental Consulting Firm

Prepared by:
Ecofluence Consulting

Gamma Substation:
Layout (400kV works Phase 1)

Layout map

Province	Municipality
Northern Cape	Ubuntu Local Municipality
Western Cape	Central Karoo District Municipality

N

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Scale: 1:10 000

Date: April 2023

0 300 600 1 200 m