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14 October 2020

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Lichtenburg 1 PV Facility Part 2 Amendment, North West Province: Proposed Battery Energy Storage System (BESS)

1. Background

Pachnoda Consulting cc was requested by Savannah Environmental (Pty) Ltd on behalf of ABO Wind Lichtenburg 1 PV (Pty) Ltd ("Lichtenburg 1") to provide specialist consulting services concerning the avifauna for the construction and operation of a Battery Energy Storage System (BESS) as part of the authorised Lichtenburg 1 solar energy facility.

The Battery Energy Storage System (BESS) will store up to 500MW/500MWh within the authorised footprint of the Lichtenburg 1 solar PV facility on Portion 06 of the Farm Zamenkomst No 04 near Lichtenburg, North West Province.

The general purpose and utilisation of the BESS is to save and store excess electrical output as it is generated, allowing for a timed release when the capacity is required. The BESS system therefore provides flexibility in the efficient operation of the electricity grid through decoupling of the energy supply and demand. The BESS will be developed within the authorised laydown area, and with an extent of no more than 5ha. It is understood that the BESS may require the storage of dangerous goods for the operation and maintenance of the system, however this will be limited and will fall within the capacity of what was authorised for the solar energy facility. The following infrastructure is associated with the BESS:

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- Electrochemical battery energy storage systems with a maximum height of 3.5m; and
- Multi-core 33kV underground cables, to follow internal access roads of the PV facility, to connect the battery storage system to the on-site facility substation.

The proposed technology will be electrochemical batteries (including either Lead Acid and Advanced Lead Acid; Lithium ion, NiCd, NiMH-based batteries; High Temperature (NaS, Na-NiCl2, Mg/PB-Sb) batteries or Flow batteries (VRFB, Zn-Fe, Zn-Br)).

2. Locality

The PV facility is located on Portion 06 of the Farm Zamenkomst No 04, approximately 12 km north-north-west of Lichtenburg, in Ward 16 of the Ditsobotla Local Municipality, of Ngaka Modiri Molema District, North West Province (see Figure 1).

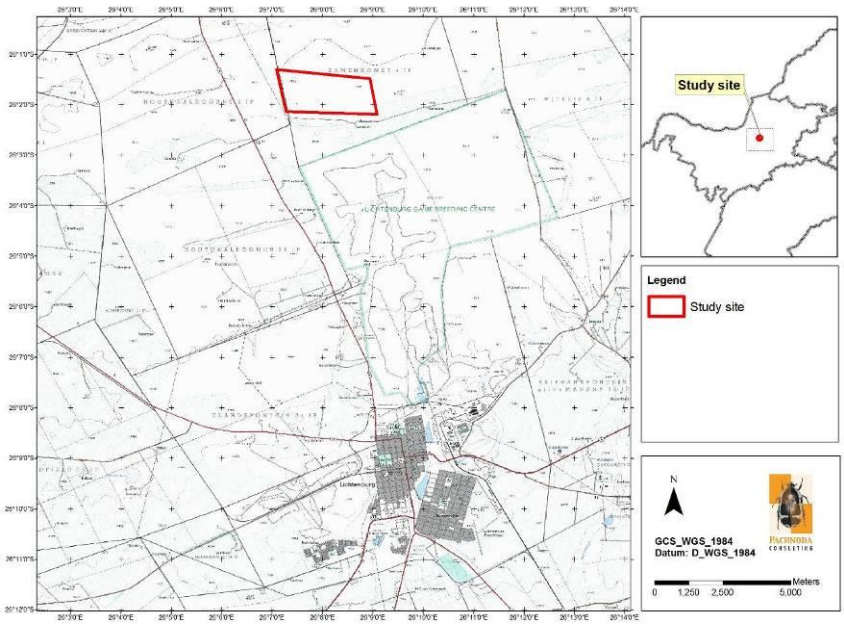

Figure 1: A topo-cadastral image illustrating the geographic position of Lichtenburg 1 PV Facility north of the town of Lichtenburg.

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The proposed BESS is located on the western part of the Lichtenburg 1 PV Facility near the existing powerline servitude. It corresponds to the open dolomite grassland and bush clump mosaic habitat unit, which is also a widespread habitat unit in the study area (Figure 2).

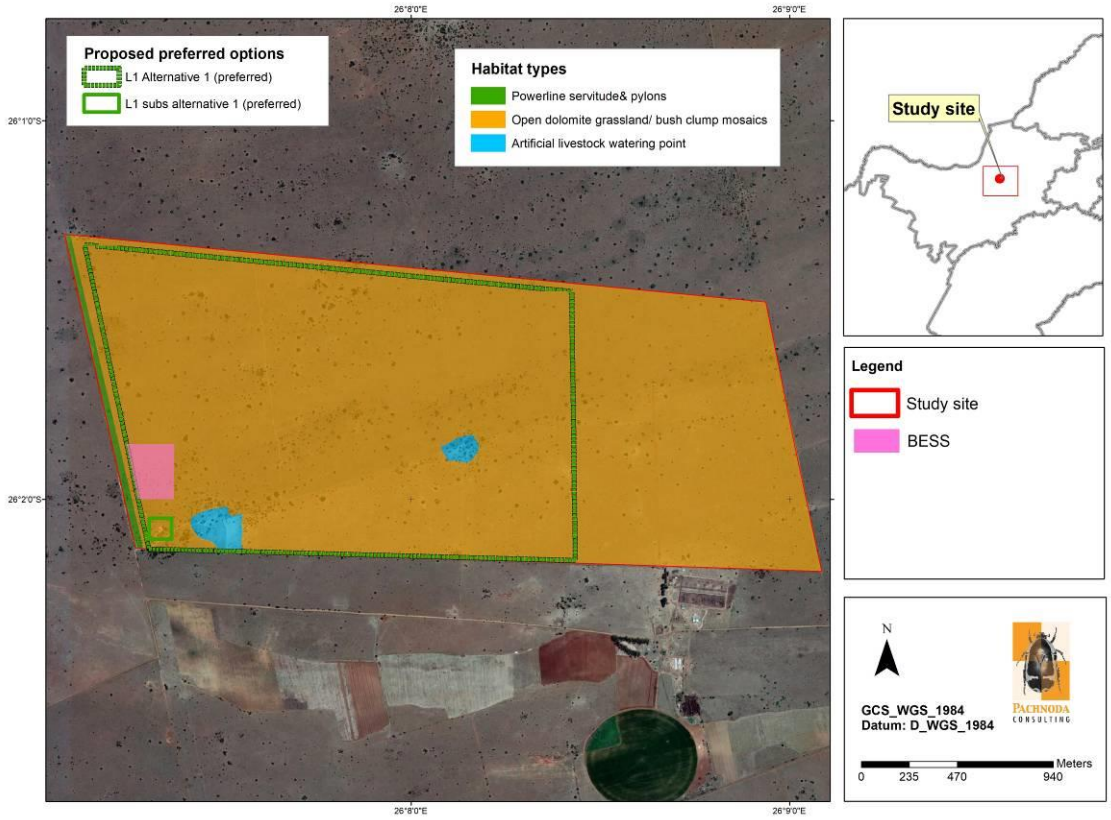

Figure 2: A habitat map of the Lichtenburg 1 PV Facility site, illustrating the locality of the proposed Battery Energy Storage System (BESS) within the authorised footprint of the PV facility.

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3. Avifaunal Sensitivity

Figure 3 illustrates the proposed locality of the BESS in terms of the avifaunal sensitivity in the area. It is evident from Figure 3 that the proposed footprint of the BESS coincides with habitat of medium avifaunal sensitivity. Habitat of medium avifaunal sensitivity represents extensive dolomite grassland and bush clump mosaics. These habitat types provide suitable foraging habitat for certain large terrestrial bird species (e.g. Northern Black Korhaan *Afrotis afraoides*) with the potential to interact (e.g. collide) with the proposed electrical infrastructure proposed for the PV facility. However, during the impact assessment it was concluded that reporting rates for threatened and near threatened bird species at the PV facility was relatively low, thereby suggesting a medium sensitivity rating instead of a high sensitivity even though the majority of the habitat is natural. In addition, the dolomite grassland and bush clump mosaics are widespread in the region and the proposed surface area of the BESS is small when compared to the surface area of natural grassland in the study area (for the entre Portion 06 of the Farm Zamenkomst No 04), thereby implying that the displacement of birds as a result of the development of the BESS is not regarded as a fatal flaw nor is the affected habitat unit considered to be a no-go area.

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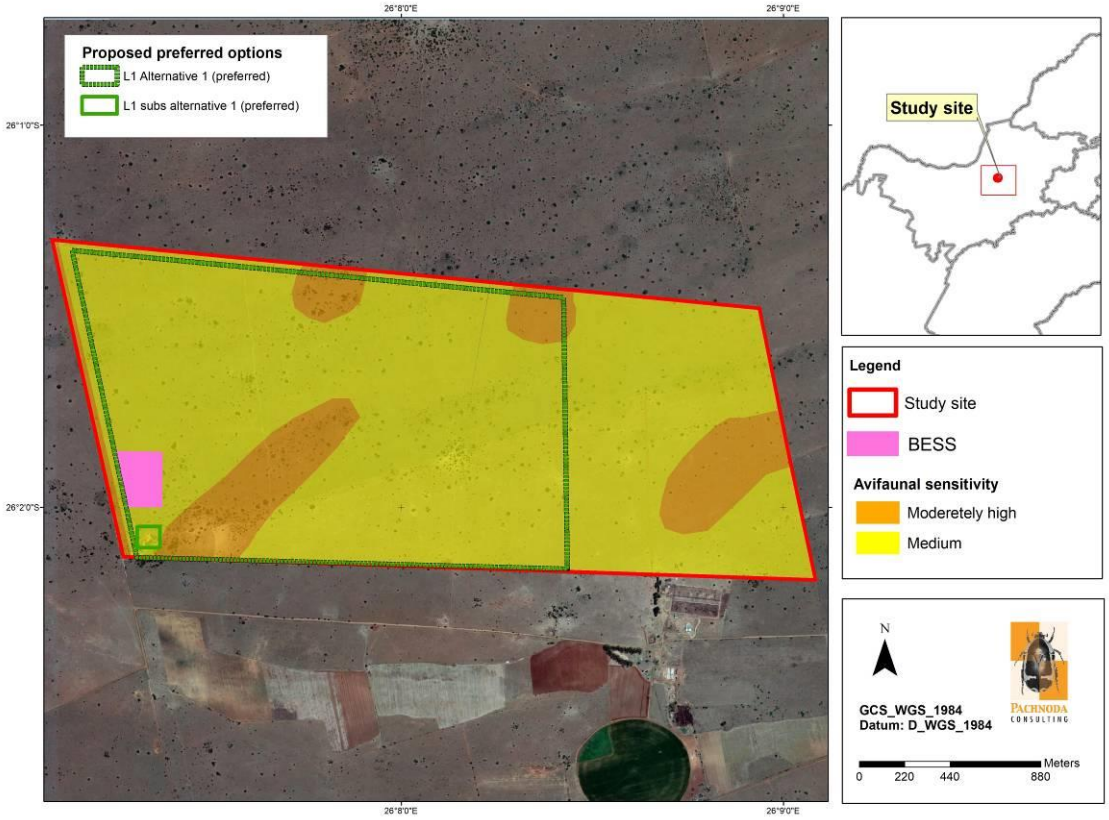

Figure 3: A sensitivity map of the Lichtenburg 1 PV Facility site, illustrating the locality of the proposed Battery Energy Storage System (BESS).

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4. Impact Statement and Conclusion

A previous evaluation of potential and likely avifaunal impacts (during the EIA phase) revealed that the impact significance was low to moderate after mitigation (depending on the type of impact), with the exception of the potential for birds to collide with the associated overhead power lines, which was high without mitigation (and moderate after mitigation). In addition, the PV facility was not located near any prominent wetland system or impoundment, and therefore the risk of waterbird collisions with the proposed infrastructure was considered to be low.

The addition of the BESS will not influence the outcome of the previous impact assessment and will not have any disadvantage to the project due to the small surface area of the BESS footprint (resulting in a low net loss of habitat) and the absence of any overhead cabling associated with the BESS structure (since all cables will be placed underground, resulting in a low to negligible risk of birds colliding with the infrastructure). Therefore, no fatal-flaws are identified with the proposed footprint or the operation of the BESS, and it is of the opinion that authorisation thereof will not have any negative bearing on the overall project. It is however recommended that the following mitigation measures be implemented in view of the occurrence and/or roosting of vultures on nearby pylon structures (along the nearby existing powerline):

- The electrochemical battery energy storage system should be contained or covered (to prevent access to the batteries); and
- Any above-ground cabling (if occurring) connecting to the BESS and/or any above-ground cabling (if occurring) connecting the BESS with the onsite substation should be covered with insulating material to prevent the risk of potential electrocutions should any large bird interact in any manner with the BESS (e.g. during perching).

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