



Terrestrial Ecological and Avifaunal Statement Proposed Amendment to Bloemsmond 3 PV Between Keimoes and Upington Northern Cape Province

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APPLICANT

Bloemsmond Solar 3 (Pty) Ltd

ENVIRONMENTAL ASSESSMENT PRACTITIONER

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1 INTRODUCTION

1.1 PROJECT DETAILS AND BACKGROUND

Enviro-Insight CC was commissioned by Bloemsmond Solar 3 (Pty) Ltd to review the proposed amendment against the terrestrial ecology assessment done for Bloemsmond 3 project located near Keimoes in the Northern Cape Province, South Africa. The previous environmental authorisation excluded a Battery Energy Storage System (BESS) adjacent to the on-site sub-station within the approved site.

The applicant intends to include a provision for a 500 Megawatt Hour (MW/h) on approximately 4.9 hectares on each of the authorised footprints as shown in Figure 1-1.



Figure 1-1: Approved layout for Bloemsmond 3, showing the location of the proposed BESS (Blue Polygon) within the authorised footprint.





1.2 LIMITATIONS

- The letter should be read in conjunction which the former impact assessment (of which the project was approved). The purpose of this letter is to indicate possible changes in the context of the authorised project. Should impacts increase significantly or any new impacts result from the inclusion of the BESS, then these need to be assessed quantitatively;
- No site visit was done for verification purposes of the BESS impacts on flora and fauna. Previous tracks did not
 include the proposed site of the BESS as explained in the previous report. As with the initial assessment, data had to
 be extrapolated to inform the BESS impacts on SCC. It should however be noted that this does not represent a fatal
 flaw as the conditions in the EMPr and environmental authorisation will be adhered to;
- The BESS will have an Impact Analysis that is not comprehensively representative (in their Scale, Magnitude and overall Severity) of the Cumulative Impact Assessment that may be applied to the study area. In other words, the individual impacts identified per site will be lower compared to cumulative impacts of all three sites and considering surrounding developments.

2 RESULTS

It should be stated that reference will be made to international literature and standards due to the absence of policies and scientific literature within the South African context regarding BESS for renewable energy projects.

2.1 IMPACT ASSESSMENT

Several impacts previously identified and assessed remained MEDIUM after mitigation, including:

- Loss of existing habitat due to loss of vegetation;
- Direct loss of flora species of conservation concern and flora species endemic to the region;
- Direct mortality of fauna: Loss of species of conservation concern;
- Introduction of alien flora affecting native faunal assemblages;
- Increase in erosion reduces habitat quality: Roads and hardened surfaces.

In addition to the previous current ecological impacts identified for the study area, the following impacts are included and discussed (it should be noted that these impacts cannot be quantitatively assessed considering the current limitations of this statement, but the low significance of these impacts can be justified with medium confidence):

- Additional habitat loss even though the overall loss of vegetation accounts for less than 10% of the proposed development, the additional loss is not considered significant considering that the entire footprint is approximately 315 ha and BESS less than 5ha;
- Additional increased stormwater runoff during the construction phase and from impermeable foundation during the
 operational phase. Increased stormwater runoff could increase soil erosion, vegetation removal and overall habitat
 destruction. Considering the size of the BESS with regards to the overall development, this increase is not
 considered significant;





- Additional fences causing direct mortalities of fauna and inhibiting free movement of fauna. The fences are already
 encompassed in other fences within the greater development area; accordingly movement of species is already
 hindered. The primary concern is collision by avifauna, even though it is regarded as negligible compared to the
 overall development;
- Additional hydrocarbon spills, animal collisions and dust impacts due to increased vehicle activity (during construction and operational phase). These impacts are not considered significant and can be mitigated optimally;
- Increased fire risk due to malfunction of BESS (overheating, spillage etc.), even though the probability of this occurring is considered low, the necessary precaution and safety measures need to be in place;
- Contamination due to accidents or failure of the thermal management system (resulting in leakage of battery components). This can be optimally managed and the impact reduced by incorporating the necessary measures.

Flora Impacts

The impacts regarding ground preparation for construction, including vegetation clearing are considered minimal within the larger context of the development. The addition of the BESS will not significantly increase habitat loss, even though vegetation will not be re-established due to the impermeable foundation of the BESS. As the study area does not fall within a threatened ecosystem or vegetation type, the loss of vegetation will not necessarily hinder from meeting conservation targets. The concern is therefore on a species level where endemic species, provincially protected species, floral SCC and protected trees will be removed. Accordingly the habitat loss is not regarded as a significant impact; however, the necessary permit applications for the relocation of floral species should be applied for prior to the commencement of construction (this is not a new condition, but rather an important one that is stressed, especially where vegetation will be stripped completely from the study area – as is the case with the BESS).

The additional impact on the introduction and spreading of alien invasive flora species will remain unchanged and can be optimally mitigated and managed during and after construction, as well as during the operational phase of the project. Alien invasive species control should be managed as stipulated in the Environmental Management Programme (EMPr). No additional action is required.

Increased hard surfaces during the construction phase and impermeable surfaces during the operational phase could increase surface water runoff and increase erosion and removal of vegetation. This could reduce habitat quality (including functional quality). As the increase in hard surfaces are considered non-significant, the mitigation measures as stipulated in the Stormwater management plan should be followed to ensure that the onsite activities do not impact on the surrounding environment. The impact remains unchanged and can be optimally mitigated and managed during and after construction as well as during the operational phase of the project.

Fauna impacts

Several faunal impacts can be amplified due to the addition of the BESS, including:

- direct mortality (specifically for burrowing fauna) due to ground preparation for construction,
- fences (approximately 1.8 2.1 metres high) are relatively impenetrable to most fauna, resulting in habitat fragmentation in the surrounding natural area. Without adequate road servitude space (which allow escape or buffer





space for animals), large animals may run to avoid vehicles and collide with fences, resulting in death. In addition, these fence systems funnel slow moving fauna such as chelonians onto roads which concentrate on the open surfaces, often exacerbated by roadside water accumulations and green flush vegetation. Therefore, fence systems cause both direct mortality as well as indirect mortality due to the negative association with vehicles;

- increased vehicle collisions with animals resulting in direct mortality. Reptiles, amphibians, small mammals and especially avifauna and congregatory species are particularly vulnerable to collision;
- loss of suitable foraging and breeding habitat in the landscape;
- toxic effects of coolant or electrolyte leakages entering the environment owing to a lack of appropriate clean-up procedures and drains to intercept leaked chemicals.

None of the above impacts are expected to change from the initial MEDIUM to MEDIUM-HIGH or HIGH, and can be mitigated appropriately by referring to the approved EMP as well as suggestions made in this letter (where applicable). The collision of avifauna needs to be monitored and the appropriate recommendations need to be made to reduce this impact, if increases in collisions are recorded.

Greenhouse Gas Emissions and Waste generation

The impacts on Greenhouse Gas Emissions and Waste generation from the BESS impacts were not previously assessed and which are beyond the scope of this statement. Nonetheless, it is important to take note of.

Some recent reports that examine use phase impacts have suggested that "economic operation" of grid-connected electrochemical batteries can result in net increase in greenhouse gas (GHG) emissions, and changes in emissions of National Ambient Air Quality Standard criteria pollutants (e.g. particulate matter, NOx, and SO2) within the United States of America (Arciniegas & Hittinger 2018). The results from these studies (Arbabzadeh *et al.* 2017; Craig *et al.* 2018; Dehghani-Sanija *et al.* 2019; Pellow *et al.* 2020) highlight the importance of modeling the range of environmental impacts during the use phase of grid-scale BESS. They emphasize that the choice of operational profile can influence the sign and magnitude of their environmental/climate impact. These recent studies use a variety of different analytical approaches, scopes, and energy storage use cases. A careful review is warranted to clarify their general relevance for real world scenarios and to highlight best practices.

Currently, BESS owners and other stakeholders around the world have only limited real world experience with EOL pathways for grid-scale BESS, because most existing systems have been installed within the last five years and are still within their expected service lifetimes (typically 10 years). However, as these systems reach the end of service in coming years, the cost and environmental impacts associated with their decommissioning and disposal, recycling, or reuse will become an increasingly pressing concern for their owners (EPRI 2017; Pellow *et al.* 2020). Accordingly, the EMPr needs to include the end-of-life (EOL) for the BESS (possible waste generation) and ensure that the necessary measures are in place to address potential environmental impacts, where required.

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2.2 CUMULATIVE IMPACTS

As per the definition of cumulative impact (*in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities*) the BESS in itself may not indicate significant impacts, but as it is associated with other activities, the impacts in itself associated with BESS may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities) the BESS may become significant when added to the existing and reasonably foreseeable impacts in itself associated with BESS may become significant when added to the existing and reasonably foreseeable impacts eventuating from already approved activities from this facility as well as impacts from surrounding facilities.

3 CONCLUSION AND PROFESSIONAL OPINION

The addition of BESS to Bloemsmond 3 does not indicate significant additional impacts to the environment which changes existing impacts from MEDIUM to MEDIUM-HIGH or HIGH. This statement is however made considering current the limitations, but the confidence level is considered medium in the absence of quantitative information and the size of the proposed activities in relation to the greater development. The necessary recommendations and mitigation measures as stipulated in the EMPr needs to be implemented and monitored. Where necessary, the EOL of the BESS needs to be appropriately addressed in order to ensure that impacts to the environment (including flora and fauna) are minimal and/or easily mitigated, i.e. the recycling of batteries and associated components. This requires the existing EMPr to be updated (Closure and Decommissioning of facilities) to indicate how these components will be disposed of, recycled or reused.

The previous impact assessment indicated that not all impacts can be mitigated to acceptable levels - medium significance post-mitigation should be interpreted that more can be done to avoid this impact (as is the case for the impacts discussed within this statement). This is mainly because the impacts of BESS related to renewable energy projects are poorly understood (Pellow *et al.* 2020). Accordingly, the inclusion of BESS for the project should be done taking the necessary precautionary measures into account, and implementing the EMP.

All provincially protected species recorded on the study area that will be affected by the proposed BESS development are subjected to the Northern Cape Nature Conservation Act (Act No 9 of 2009) which require a permit from the competent authority for the removal and relocation of these species. The removal of *Aloidendron dichotomum* is not supported and this species and its habitat should be protected *in situ* if recorded within the BESS footprint. Furthermore, protected trees influenced by the proposed development including *Boscia albitrunca* and *Vachellia erioloba* will require permits from the competent authority for their removal according to the National Forest Act (Act No 84 of 1998).

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4 REFERENCES

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Disclaimer

I Corné Niemandt *Pr. Sci. Nat. (Ecological Science)* declare that the work presented above is my own and has not been influenced in any way by the client. At no point has the client asked me as a specialist to manipulate my results and the above methods has been carried out to the highest ecological standards.

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I Samuel Laurence *Pr. Sci. Nat. (Zoology and Ecological Science)* declare that the work presented above is my own and has not been influenced in any way by the client. At no point has the client asked me as a specialist to manipulate my results and the above methods has been carried out to the highest ecological standards.

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