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Date: 03 September 2020
Ref: Sirius Solar PV Project Two Part 2
Amendment

Attention: Mr Reuben Maroga

Dear Sir,

ECOLOGICAL AND AVIFAUNAL COMMENTS: PROPOSED AMENDMENT TO THE AUTHORISED SIRIUS SOLAR PV PROJECT TWO ENERGY FACILITY (DEA REF 14/12/16/3/3/2/481) - INCREASE IN CONTRACTED CAPACITY AND THE CONSTRUCTION AND OPERATION OF A BATTERY ENERGY STORAGE SYSTEM (BESS).

The Sirius Solar PV Project Two facility is authorised for maximum electricity export capacity of 75MW and includes the following infrastructure.

- » Arrays of photovoltaic panels.
- » Mounting structure to support the PV panels.
- » Cabling between the project components, to be lain underground where practical.
- » A new on-site substation to evacuate power from the PV facility to the Eskom grid,
- » An overhead power line connecting the PV facility to the national grid.
- » Internal access roads and fencing.
- » Workshop area for maintenance, storage, and offices.

Sirius Solar PV Project Two RF (Pty) Ltd is now proposing the construction and operation of a Battery Energy Storage System (BESS) of up to 4.5GWh, as well as an increase of the contracted capacity of the authorised Sirius Solar PV Project Two by 75MW within the authorised footprint, on a site located 21km south-west of Upington in the Northern Cape Province. The project is located within the Upington Renewable Energy Development Zone (REDZ), within the Kai !Garib Local Municipality and the ZF Mgcau District Municipality in the Northern Cape Province. The proposed increase in the contracted capacity of the solar PV facility by 75MW is due to improvements in technology of solar PV panels since the original authorization of the project, as well as to ensure an adequate supply of electricity. The increase in the contracted capacity will not require an increase in the development footprint and the entire development will still be restricted to the authorised footprint. The general purpose and utilisation of a Battery Energy Storage System (BESS) is to save and store excess electrical output as it is generated, allowing for a timed release when the capacity is required. BESS systems therefore provide flexibility in the efficient operation of the electric grid through decoupling of the energy supply and demand.

The development area for the battery energy storage area is ~ 18ha and is proposed within the area assessed and approved for the solar PV facility. The extent of the development footprint of the battery energy storage will be up to 6.5ha and will be located within the development area. The development footprint, as well as the development area identified for the construction and operation of the BESS, is located adjacent to the authorised on-site facility substation of the solar PV facility. The following infrastructure is associated with the BESS:

- » Lithium-ion, Lithium Iron Phosphate, Sodium Sulphur, and Vanadium Redox batteries in a container with a footprint of 6.5ha and a maximum height of up to 2.8m; and
- » Multi-core, 33kV underground cables to connect the battery energy storage to the authorised on-site facility substation of Sirius Solar PV Project Two.

It is the Developer's intention to bid the solar PV facility and the battery energy storage under the Risk Mitigation Independent Power Producer (IPP) Procurement Programme of the Department of Mineral Resources and Energy. Ultimately, the development of the solar PV facility as well as the battery energy storage is intended to be part of the renewable energy projects portfolio for South Africa, as contemplated in the Integrated Resources Plan (IRP).

The original Ecological Assessment/Report was conducted by Ms Marianne Strohbach (PrSciNat.) in October 2013. The affected property was visited by myself in September 2015, for the compilation of a fauna and flora preconstruction walk-through assessment of the proposed development footprint. In September 2018 the same property (Farm Tungsten Lodge 638) was visited for the assessment of the Sirius Solar PV Project Three and Four developments (located adjacent to the approved Sirius Solar PV Projects One and Two). As such, thorough knowledge of the affected property's habitats and faunal/avifaunal and floral character have been obtained.

Ecological comments were requested from Nkurenkuru Ecology and Biodiversity by Savannah Environmental regarding the proposed amendments to the authorised Sirius Solar PV Project Two.

It should be noted that the increase in generating capacity (up to 75MW) is due to more effective PV panel technology and there will not be an increase in the authorised development footprint or the height of the PV panels.

Subsequently, the aim and terms of reference are to:

- » Determine whether the impacts assessed within the original Ecological Impact Assessment (2013) still ring true for the amended maximum generating capacity as well as the addition of a BESS;

- In the case where such impacts will change in any way due to the proposed amendments (in terms of duration, magnitude, significance etc.), a comparison should be provided of such impacts before the changes and after the proposed changes;
- » Whether there will be any additional impacts;
 - In the case where there will be additional impacts, such impacts should be assessed in-line with the methodology specified by Savannah Environmental.
- » Determine any potential advantages and/or disadvantages associated with the changes;
- » Provide measures to ensure avoidance, management and mitigation of impacts associated with such proposed changes, and any changes to the existing EMPr.

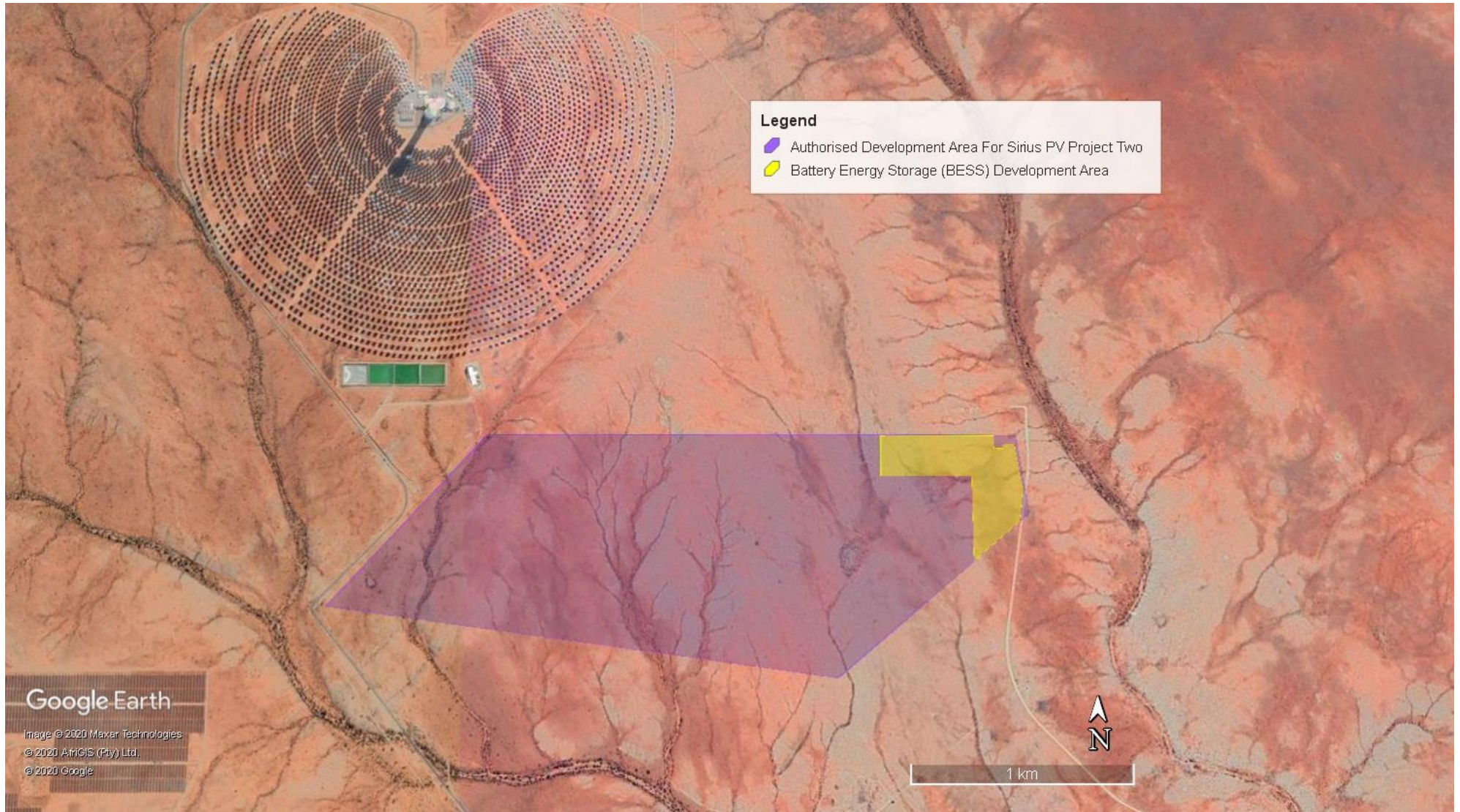


Figure 1: Google Image™ illustrating the proposed position of the BESS within the authorised development area for the Sirius Solar PV Project Two

1. GENERAL FINDINGS / NOTES ON THE AFFECTED ENVIRONMENT AND ASSESSED IMPACTS.

During the original ecological survey three vegetation associations were identified within the development area namely:

- » Association 1: *Ziziphus mucronata* – *Cenchrus ciliaris* riparian woodlands
- » Association 2: *Boscia foetida* – *Stipagrostis uniplumis* mixed open shrublands
- » Association 3: *Kleinia longiflora* – *Enneapogon scaber* dwarf shrublands

According to the distribution of these vegetation associations within the development area, the proposed BESS will be located within Associations 2 and 3 with the northern portion of the BESS footprint located primarily within Association 3 whilst the southern portion of the BESS footprint located within Association 2.

According to the sensitivity assessment, both of these vegetation associations have been classified as Medium Sensitivity (Figure 2). Both of these vegetation associates were regarded as acceptable for the proposed PV development and associated infrastructure (including access roads, grid connection infrastructure, substation, other electricity-related buildings, workshops, offices, guardhouses etc.). Furthermore, sensitive faunal and avifaunal habitats included large *Vachellia erioloba* trees and rocky/boulder outcrops, riparian woodlands and larger drainage systems. None of these faunal/avifaunal sensitive habitats is located within the proposed development area for the BESS.

During the Ecological Impact Assessment as well as the pre-construction walk-through, eleven species of conservation importance (Red List and Protected) were recorded within these two plant associations. During the pre-construction botanical walk-through, the entire development area, including the area proposed for the construction of the BESS was surveyed, and all species occurring within this area were recorded. Both assessments indicated that the transformation of the proposed authorised footprint for the PV facility will not have a significant impact on the conservation status of these identified species.

Subsequently, the increase in generating capacity as well as the addition of a BESS will not impact any additional areas of natural and/or sensitive vegetation, as well as sensitive faunal species or sensitive faunal/avifaunal habitats. As such the sensitivity rating of Medium (60) without mitigation and Medium (40) with mitigation, as assessed and described within the original Ecological Impact Assessment remain relevant. Also, no additional mitigation measures are recommended as the mitigation measures within the original ecological report are deemed as adequate.

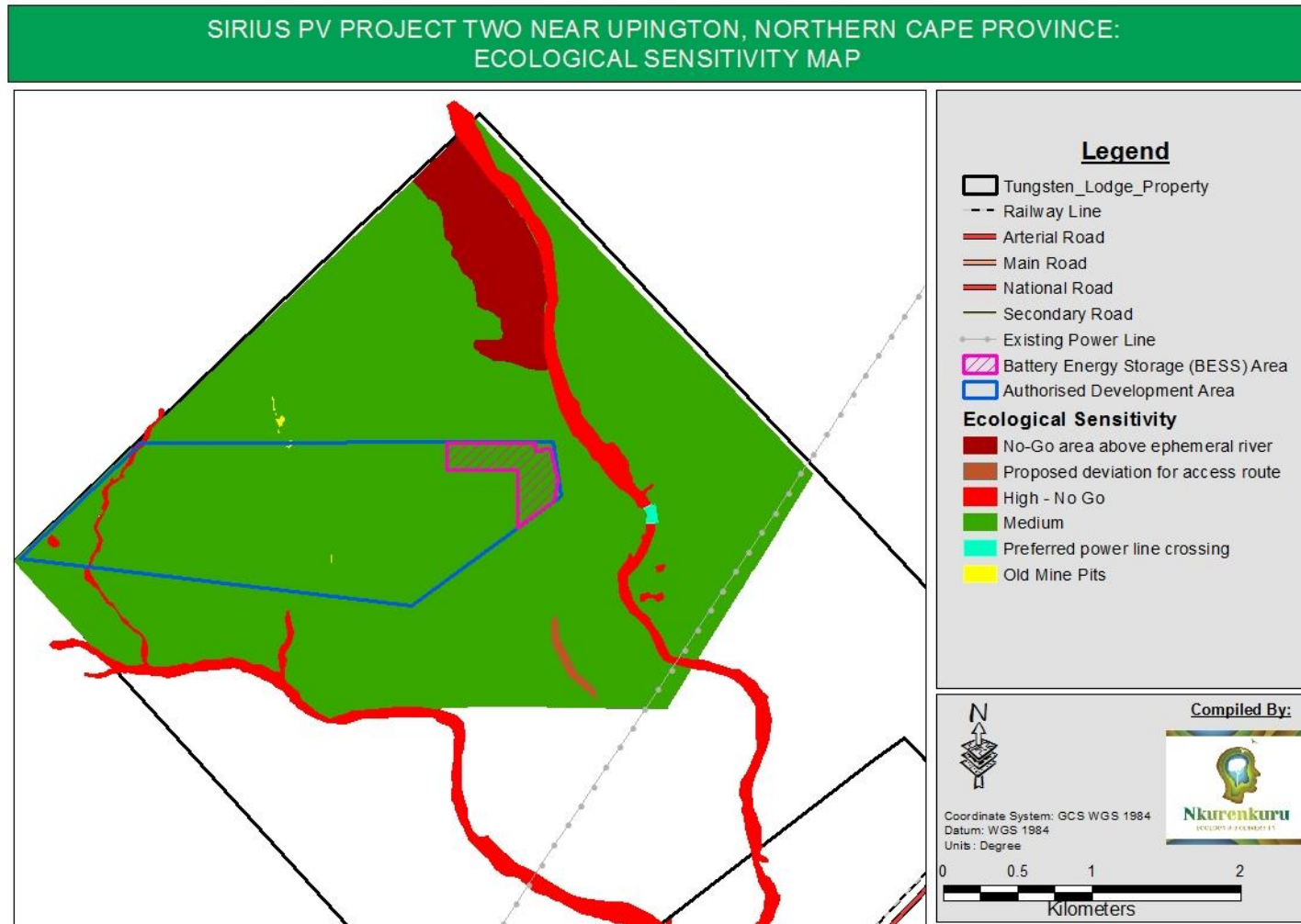


Figure 2: Ecological Sensitivity Map of the authorised development area, illustrating the location of the BESS development area (purple).

In terms of cumulative impacts due to this renewable energy development and other renewable energy projects within the area, the cumulative impacts on the keystone species, *Vachellia erioloba* and *Boscia albitrunca*, within the region, as well as the potential cumulative impact associated with excessive clearing of vegetation on runoff and stormwater flow patterns and dynamics as well as the potential uncontrolled invasion and spread of alien invasive plants within the region have been sufficiently addressed within the original Ecological Impact Assessment report. The increase in generating capacity of the solar PV facility, as well as the addition of a BESS will not contribute to / change the significance of these impacts.

However, the cumulative impact of this development along with other surrounding developments on the Ecological Support Areas and Critical Biodiversity Areas of the region was not considered/assessed during the original Ecological Impact Assessment, subsequently, an assessment of the potential impact of the development, including the addition of a BESS, on these ESAs is included within this Part 2 Amendment Letter (below).

In terms of CBAs, the entire authorised development area of the solar PV facility is located outside of any CBA (refer to Figure 3). However, small areas to the west and east fall within Ecological Support Areas (ESAs), with a portion of the proposed BESS falling within an ESA. These ESAs are associated with the larger non-perennial drainage systems which act as important faunal and floral corridors. However, the footprint itself, of the Sirius PV Project Two facility is located outside of these watercourses. With the necessary mitigation measures in place, this development (along with the construction and operation of the BESS) will not have a significant impact on the function of this ESA or the downstream CBA2. Furthermore, when considering the importance of these ESAs (intermittent rivers), it is important to bear in mind that these intermittent rivers (ESAs) drained directly into the Orange River, but have been fragmented from the Orange River through barriers and obstructions such as dams, small dams and weirs at the confluence. However, connectivity may be restored for a brief period of time following sufficient rainfall events and hence contamination or accelerated erosion of the proposed development site could potentially have a negative impact on the downstream CBA2 during such periods. The proposed development must therefore proceed in such a manner that accelerated erosion is not initiated and mitigated if it occurs, and pollution is strictly controlled, with measures in place to contain any kind of pollution immediately on site, preventing it to reach even the smaller ephemeral washes.

Cumulative Impact 1: Impacts on Ecological Support Areas and Broad-Scale Ecological Processes

Impact Nature: Transformation of intact habitat could potentially compromise ecological processes of CBAs and ESAs as well as the ecological functioning of important habitats and would contribute to the fragmentation of the landscape and would potentially disrupt the connectivity of the landscape for fauna and flora and impair their ability to respond to environmental fluctuations.		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects within the area
Extent	Local (1)	Regional (2)
Duration	Long Term (4)	Long Term (4)
Magnitude	Small (1)	Low (4)
Probability	Improbable (2)	Improbable (2)
Significance	Low (12)	Low (20)
Status	Neutral – Slightly Negative	Slightly Negative
Reversibility	Low	Low
Irreplaceable loss of resources	No	Likely
Can impacts be mitigated?	Yes, to a large extent	
Mitigation	<ul style="list-style-type: none"> » The development footprints of the individual facilities should be kept to a minimum and natural vegetation should be encouraged to return to disturbed areas. » Reduce the footprints of the facilities within sensitive habitat types as much as possible. » Small to medium-sized mammals must be allowed to move between the different development footprints and surrounding areas by creating artificial passageways underneath boundary fences (this is optional and may be implemented by the developer if deemed necessary). 	

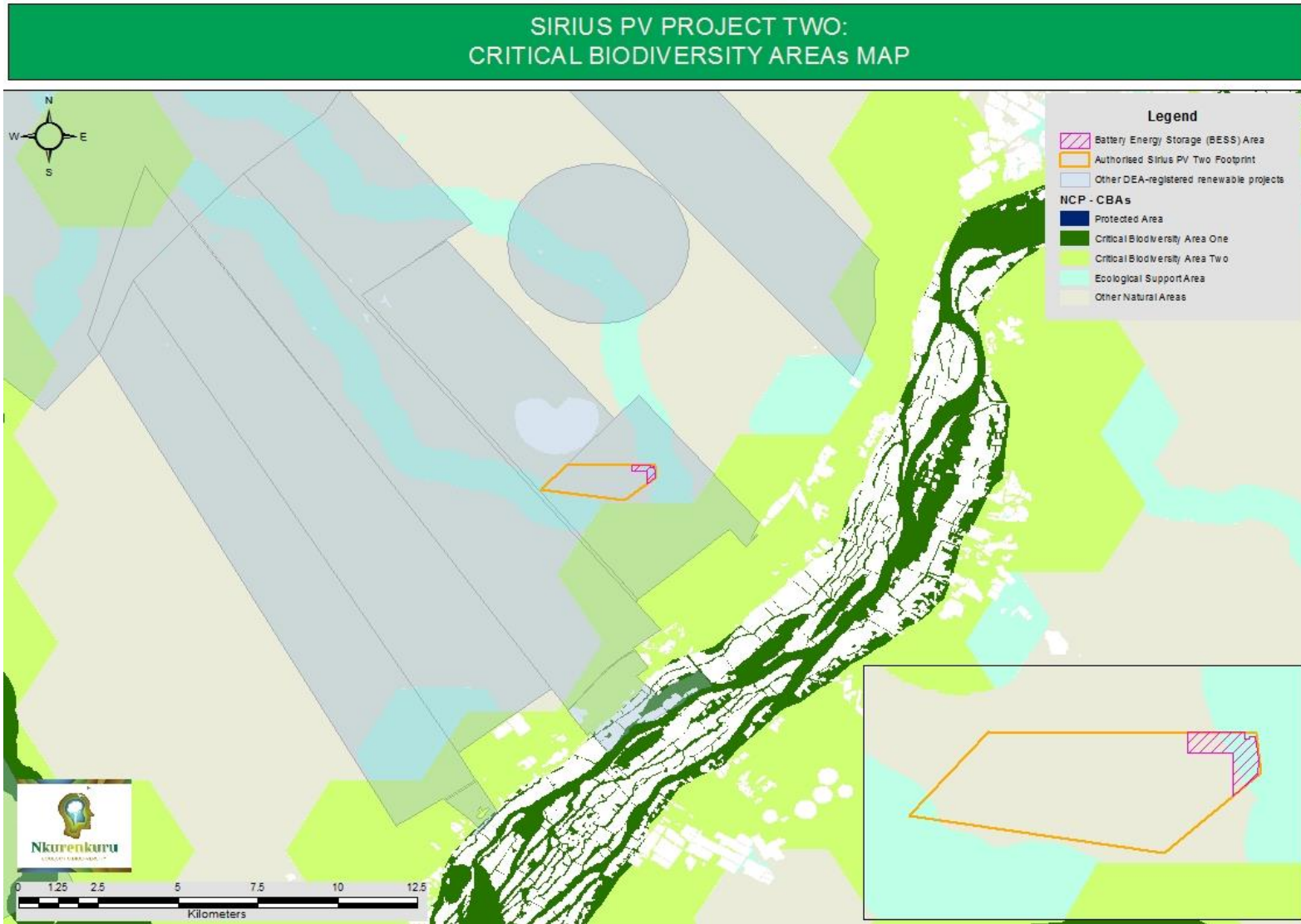


Figure 3: Map illustrating the position of the authorised Sirius Solar PV Project Two footprint (including the proposed BESS location) relative to other renewable projects within the area as well as their positions relative to the identified CBAs



2. ADDITIONAL MITIGATION MEASURES AND CHANGES TO THE EMPR

No additional or amended mitigation measures, relating to fauna, flora and avifauna, in addition to those specified in the original Ecological specialist study (dated October 2013) are recommended. The mitigation measures mentioned above, for the cumulative impacts on the Ecological Support Areas as well as on Broad-Scale Ecological Processes, are not new/additional mitigation measures, and have been recommended elsewhere within the original Ecological Impact Assessment report and have merely been mentioned as these mitigation measures are also applicable in avoiding detrimental impacts on these aspects.

3. CONCLUSION AND RECOMMENDATIONS

The following amendments to the project have been proposed by Sirius Solar PV Project Two (Pty) Ltd;

- » An increase of the contracted capacity of the authorised Sirius Solar PV Project Two by 75MW (due to technological advancements in the development of solar PV panels); and
- » the construction and operation of a Battery Energy Storage System (BESS) of up to 4.5MWh.

It should be noted that the increase in generating capacity (up to 75MW) is due to more effective PV panel technology and there will not be an increase in the authorised development footprint as well the height of the PV panels. Subsequently, this increase in the maximum generating capacity will have no additional impact on any ecological aspects pertaining to this development.

In terms of the proposed construction and operation of a BESS, this facility will not result in any additional impacts (impacts not mentioned or assessed within the "original" Ecological Impact Assessment).

However, the cumulative impact of this PV development along with other surrounding developments on the Ecological Support Areas and Critical Biodiversity Areas of the region was not considered/assessed during the original Ecological Impact Assessment, subsequently, an assessment of the potential impact of the development (including the addition of a BESS) on these ESAs has been included within this Part 2 Amendment Letter. It was found that this development in isolation will have a very small impact (significance score of only 12 (low)) on the functioning of these ESAs. The cumulative impact of the project along with other renewable projects within the area was still regarded as relatively Low (significance score of 20). These impacts on the Ecological Support Areas as well as Broad-Scale Ecological Processes can be successfully mitigated.

Furthermore, the following conclusions can be drawn:

- » The assessment of the impacts within the original Ecological Impact Assessment report will remain unchanged and are still applicable.



- » These proposed amendments hold no advantage or disadvantage to ecological functioning and services provided by the affected habitats.
- » Due to the above-mentioned reasons/motivations, a comparative assessment of listed impacts was not deemed necessary (as these impacts remain unchanged).

In conclusion, the increase in generating capacity as well as the addition of a BESS will not impact any additional areas of natural and/or sensitive vegetation, as well as sensitive faunal species or sensitive faunal/avifaunal habitats. The proposed amendments will result in similar impacts as was identified and assessed within the Ecological Impact Assessment.

Subsequently, from an ecological (faunal, floral and avifaunal) perspective, no objective or motives (identification of impacts of high ecological significance etc.) were identified which would hinder the proposed amendment. Therefore, it is the opinion that the proposed amendments are acceptable and may be authorised, subject to the implementation of the recommended mitigation measures within this letter as well as within the original Ecological Impact Assessment (Strobach, M. 2010).

Gerhard Botha (SACNASP Reg. No 400502/14)
03/09/2020