



**PROPOSED PHOTOVOLTAIC SOLAR ENERGY FACILITIES (PEFS) AND
GRID CONNECTIONS NEAR WELKOM, FREE STATE PROVINCE:
KHAUTA SOLAR PV CLUSTER.**

Plant Species, Terrestrial Biodiversity Theme and Faunal Desktop
Assessment Report

November 2021

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FIGURES

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DOCUMENT CONTROL

Quality and revision record

Quality approval

	Capacity	Name	Signature	Date
Author:	Environmental Specialist (MSc Biological Sciences, UCT 2019)	Megan Smith		19/10/2021
Reviewer 2	CEO of Enviroworks, SACNASP Registered (400328/11)	Elbi Bredenkamp		19/10/2021

This report has been prepared in accordance with Enviroworks Quality Management System.

Revision record

Revision Number	Objective	Change	Date
1	Internal review	Formatting, grammar, content.	19/10/2021

DISCLAIMER

Even though every care is taken to ensure the accuracy of this report, environmental assessment studies are limited in scope, time, and budget. Discussions are to some extent made on reasonable and informed assumptions built on bona fide information sources, as well as deductive reasoning. Since environmental impact studies deal with dynamic natural systems additional information may come to light at a later stage during the impact assessment phase. The author does not accept responsibility for conclusions made in good faith based on own databases or on the information provided. Although the author exercised due care and diligence in rendering services and preparing documents, he accepts no liability, and the client, by receiving this document, indemnifies the author against all actions, claims, demands, losses, liabilities, costs, damages, and expenses arising from or in connection with services rendered, directly or indirectly by the authors and by the use of this document. This report should therefore be viewed and acted upon with these limitations in mind.

1. PROJECT DESCRIPTION

Enviroworks (Pty) Ltd has been appointed by WindCurrent (Pty) Ltd to conduct a Botanical, Faunal and Terrestrial Biodiversity desktop study on the follow photovoltaic (PV) solar installations and associated grid line connections on various erven near Welkom, Free State Province:

- 3 x 100MW PV Solar Installations (each approximately 200 hectares)
- 2 x line route options for the 132kV line (approximately 10 kilometres) (150m corridor to be assessed on either side of the proposed line)
- 2 x 19.9MW PV Solar Installations (approximately 36 hectares)
- 2 x line route options for the 44kV line (approximately 9 kilometres) (150m corridor to be assessed on either side of the proposed line)

2. METHODOLOGY

The potential plant and animal species that were likely to occur within the site and surrounding area, the current use of the land and the environmental sensitivity identified by the national web based environmental screening tool (screening tool), and the vegetation type and any potential sensitive areas were determined as part of the desktop site sensitivity investigation..

- Environmental sensitivity was determined using desktop analysis:
 - The Department of Forestry, Fisheries, and Environment (DFFE) screening tool report for the development footprint
 - Satellite imagery (Google Earth, 2021)
 - Eastern Cape Biodiversity Conservation Plan (2019)¹
 - Virtual databases to determine the habitat preferences and probability that faunal and floral species identified in the Screening Tool may inhabit the site:
 - Atlas of African Lepidoptera²
 - Southern African Bird Atlas Project 2³
 - Reptile Atlas of Africa⁴

¹ Department of Economic Development, Environmental Affairs and Tourism: and Biodiversity and Coastal Management, "Eastern Cape Biodiversity Conservation Plan," 2019.

² "Atlas of African Lepidoptera," n.d.,

http://vmus.adu.org.za/vm_search.php?database=sabca&prj_acronym=LepiMAP&db=sabca&URL=http://vmus.adu.org.za/?vm=LepiMAP&Logo=images/lepimap_logo.png&Headline=Atlas%20of%20African%20Lepidoptera&Use_main_filter=1&User_id=&Full_name=&serve_sp_list=1&drop_down_list=Latin%20names&assessment=0.

³ "Southern African Bird Atlas Project 2," n.d., <http://sabap2.birdmap.africa/>.

⁴ "Reptile Atlas of Africa," n.d.,

http://vmus.adu.org.za/vm_search.php?database=sarca&prj_acronym=ReptileMAP&db=sarca&URL=http://sarca.adu.org.za&Logo=images/reptilemap_logo.png&Headline=Reptile%20Atlas%20of%20Africa&Use_main_filter=0&User_id=&Full_name=&serve_sp_list=1&drop_down_list=Latin%20names&assessment=0.

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- Atlas of African Spiders⁵
 - Atlas of African Scorpions⁶
 - Frog Atlas of southern Africa⁷
 - Virtual Museum of African Mammals⁸
 - Global Biodiversity Information Facility (GBIF)⁹
 - iNaturalist¹⁰
 - Plants of southern Africa¹¹
- To determine the threatened status of any faunal and floral species identified in the Screening Tool Report:
- International Union for Conservation of Nature (IUCN)¹²
 - Red List of South African Plants¹³
 - The Red List of Mammals of South Africa, Swaziland and Lesotho. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa¹⁴
 - Southern African Reptile Conservation Assessment¹⁵

⁵ "Atlas of African Spiders," n.d., http://vmus.adu.org.za/vm_search.php?database=spidermap&prj_acronym=SpiderMAP&db=spidermap&URL=&Logo=images/spidermap_logo.png&Headline=Atlas%20of%20African%20Spiders&Use_main_filter=0&User_id=&Full_name=&serve_sp_list=1&drop_down_list=Latin%20names&assessment=0.

⁶ "Atlas of African Scorpions," n.d., http://vmus.adu.org.za/vm_search.php?database=scorpionmap&prj_acronym=ScorpionMAP&db=scorpionmap&URL=&Logo=images/scorpionmap_logo.png&Headline=Atlas%20of%20African%20Scorpions&Use_main_filter=0&User_id=&Full_name=&serve_sp_list=1&drop_down_list=Latin%20names&assessment=0.

⁷ "Frog Atlas of Southern Africa," n.d., http://vmus.adu.org.za/vm_search.php?database=safap&prj_acronym=FrogMAP&db=safap&URL=http://adu.org.za/frog_atlas.php&Logo=images/frogmap_logo.png&Headline=Frog%20Atlas%20of%20Southern%20Africa&Use_main_filter=0&User_id=&Full_name=&serve_sp_list=1&drop_down_list=Latin%20names&assessment=0.

⁸ "Virtual Museum of African Mammals," n.d., http://vmus.adu.org.za/vm_search.php?database=vimma&prj_acronym=MammalMAP&db=vimma&URL=http://mammalmap.adu.org.za/&Logo=images/vimma_logo.png&Headline=Virtual%20Museum%20of%20African%20Mammals&Use_main_filter=0&User_id=&Full_name=&serve_sp_list=1&drop_down_list=Common%20names&assessment=0.

⁹ "Global Biodiversity Information Facility," n.d., <https://www.gbif.org/>.

¹⁰ "iNaturalist," n.d., <https://www.inaturalist.org>.

¹¹ SANBI, "Plants of Southern Africa," n.d., <http://posa.sanbi.org/>.

¹² "IUCN 2020," The IUCN Red List of Threatened Species. Version 2019-3., accessed July 29, 2020, <https://www.iucnredlist.org>.

¹³ N.A Nick and D Raimondo, "National Assessment: Red List of South African Plants Version 2020.1.," 2007.

¹⁴ M.F Child et al., *The Red List of Mammals of South Africa, Swaziland and Lesotho* (South African National Biodiversity Institute and Endangered Wildlife Trust, 2016).

¹⁵ M.F Bates et al., *Atlas and Red List of the Reptiles of South Africa, Lesotho, and Swaziland* (Animal Demography Unit and South African National Biodiversity Institute, 2014).

3. BASELINE PROFILE DESCRIPTION OF BIODIVERSITY AND ECOSYSTEMS OF THE SITE

3.1 100MW PV Solar Installation

3.1.1 General Vegetation Description

All three PV solar installations fall within the Highveld Alluvial Vegetation Type (Please see Figure 1)

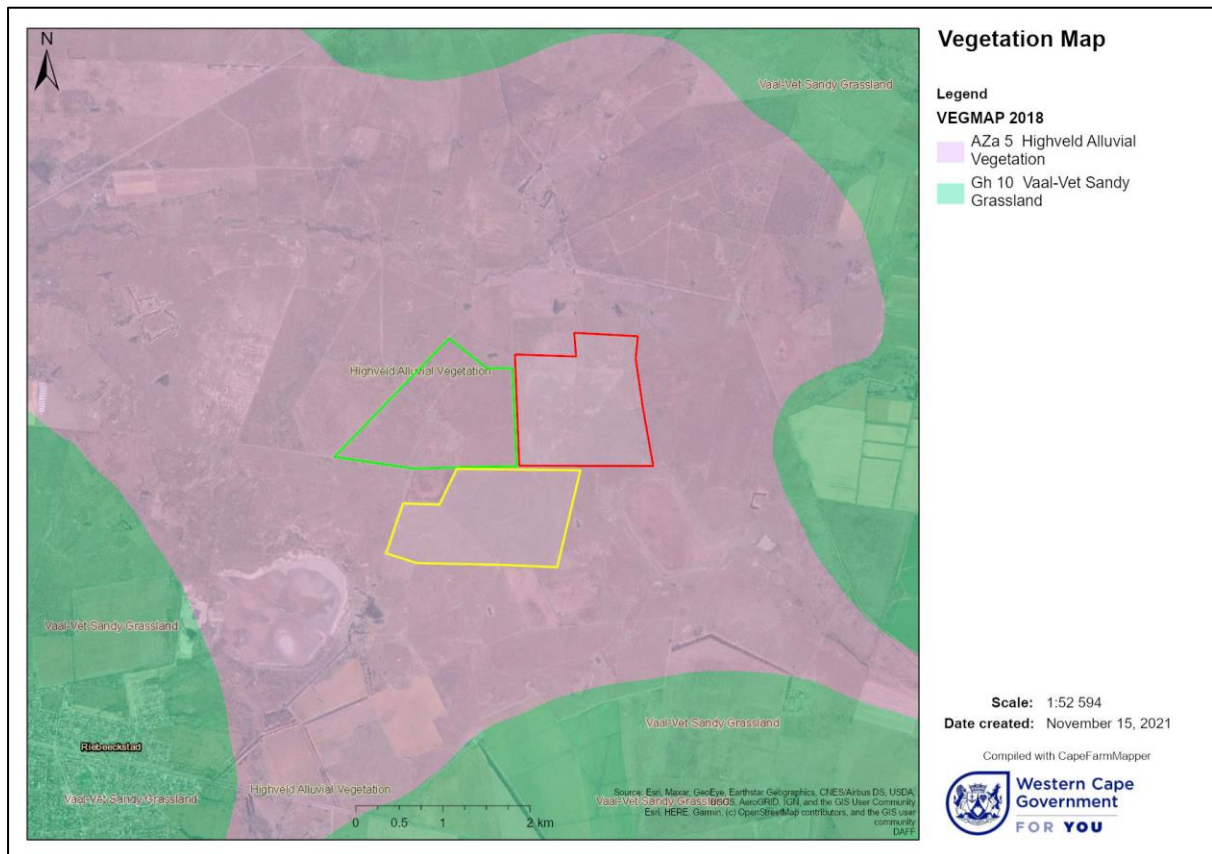


Figure 1 Vegetation Map¹⁶ for the three 100 MW photovoltaic solar installations where the red polygon demarcates Khautu 3, the green polygon demarcates Khautu 2 and the yellow polygon demarcates Khautu 1.

Highveld Alluvial Vegetation can be found throughout South Africa in the Free State, Gauteng, North West and outside of South African in Lesotho and Swaziland. The vegetation type is often found along alluvial drainage lines and floodplains in the Grassland and Savanna Biome.

Although the Highveld Alluvial Vegetation is classified as Least Concern, more than a quarter of the vegetation type has been transformed or lost as a result of cultivation, dam building, and the invasion of alien invasive plant species. Only 10% of the vegetation type is formally conserved.

¹⁶ "South African National Biodiversity Institute," The Final Vegetation Map of South Africa, Lesotho, Swaziland, 2018.

3.1.2 Sensitive Areas

All three proposed development footprints are located in Ecological Support Areas (ESAs), Critical Biodiverse Areas (CBAs) and Other Natural Areas.

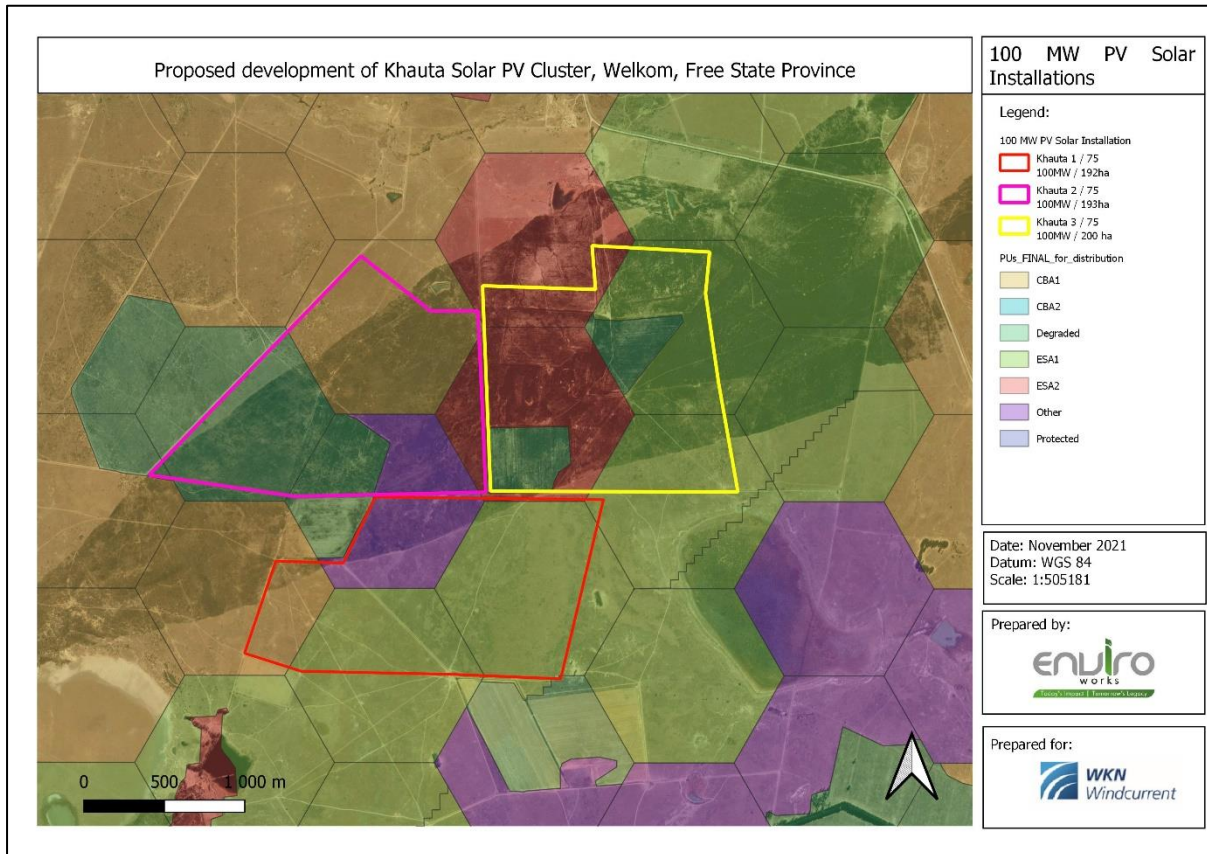


Figure 2 Biodiversity conservation map¹⁷ for the three 100 MW photovoltaic solar installations where the red polygon demarcates Khautu 3, the green polygon demarcates Khautu 2 and the yellow polygon demarcates Khautu 1.

ESAs are areas that, while not essential for meeting biodiversity targets, still play an important role in supporting the functioning of protected areas and/or CBAs and are key for providing ecosystem services. ESAs must be maintained in at least a functional and often natural state, to maintain the purpose for which they were identified, but restricted habitat loss may be acceptable. ESAs that are still likely to be functional (or in a natural, near natural or moderately degraded state) are classified as Category 1 ESAs. ESAs that have been severely degraded or have no natural cover remaining and would require restoration are classified as Category 2 ESAs¹⁸

¹⁷ Department of Economic Development, Environmental Affairs and Tourism: and Biodiversity and Coastal Management, “Eastern Cape Biodiversity Conservation Plan.”

¹⁸ R Pool-Stanvliet, A Duffell-Canham, and R Smart, *The Western Cape Biodiversity Spatial Plan Handbook*. (Stellenbosch: CapeNature., 2017).

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Other Natural Areas are natural vegetation areas that are not necessary to meet national biodiversity targets. However, if a Critical Biodiverse Area is lost, Other Natural Areas may replace current Critical Biodiverse Areas or Ecological Support Areas and thus transformation or degradation of these areas should be avoided¹⁹

All three proposed development footprints include an ESA 2. Approximately half of Khauta 1 and Khautu 2 include an ESA 1. Khautu 2 also includes a CBA 1. However, the majority of Khautu 1 includes degraded areas and Other Natural Areas. This indicates that Khautu 2 has the least Ecological and Biodiversity sensitivity in comparison to the other footprints, pending a site inspection to verify the desktop analysis.

3.1.3 Screening Tool results

3.1.3.1 Khautu 1

According to the Screening Tool Report compiled for the proposed 100 MW PV solar installation on Khautu 1, the Plant Species and Animal Species Theme is Low sensitivity, and the Terrestrial Biodiversity Theme is Very High sensitivity.

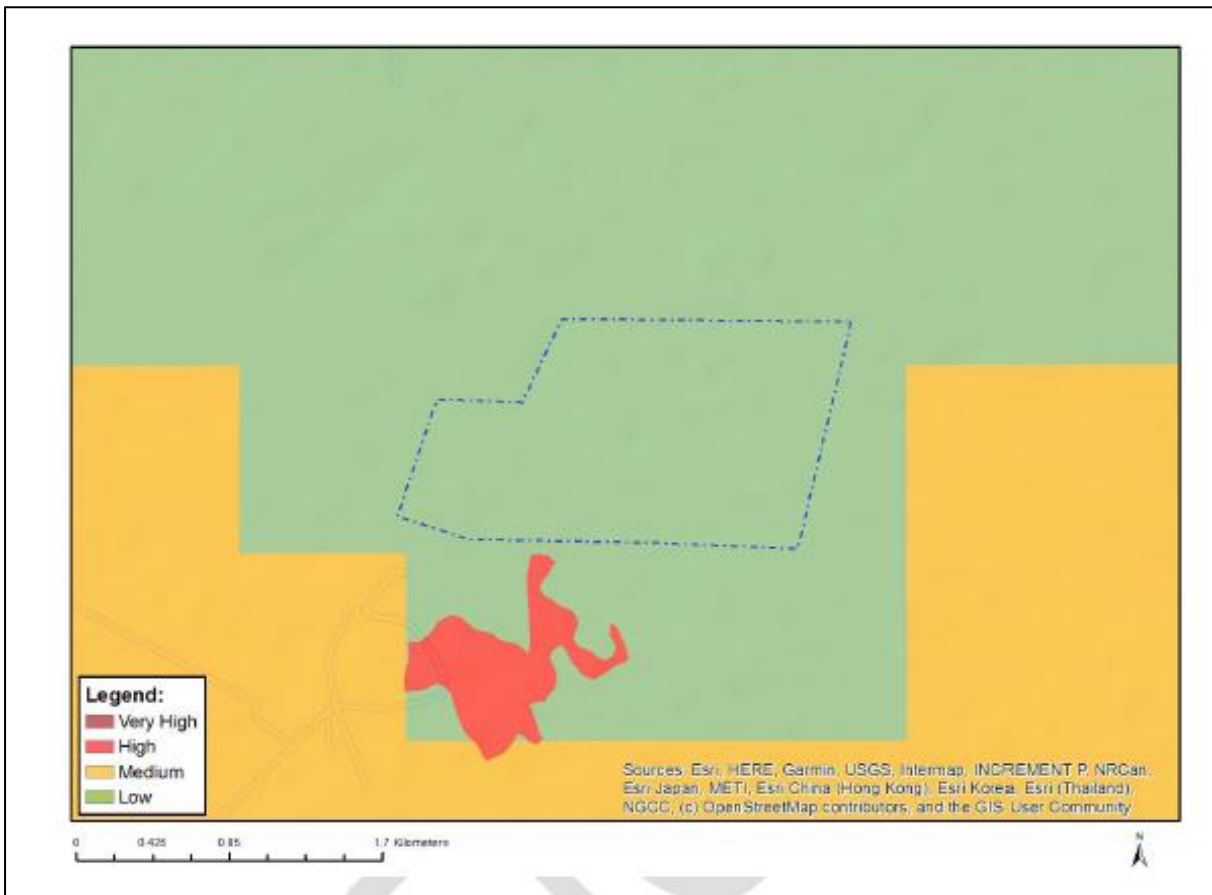


Figure 3 Animal Species Theme Sensitivity according to the Screening Tool Report for Khautu 1

¹⁹ Pool-Stanvliet, Duffell-Canham, and Smart.

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Figure 4 Plant Species Theme Sensitivity according to the Screening Tool Report for Khautu 1

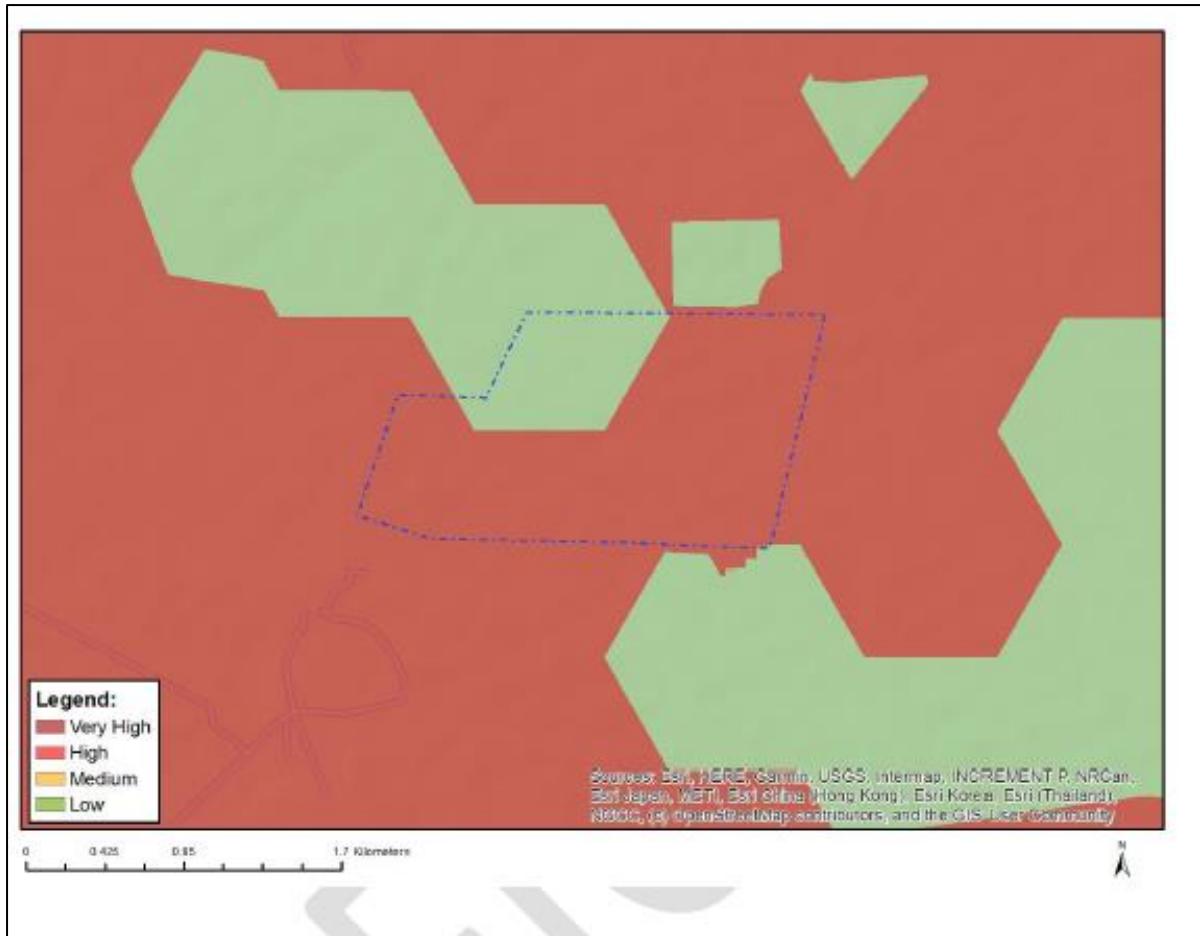


Figure 5 Terrestrial Biodiversity Theme Sensitivity according to the Screening Tool Report for Khautu 1

3.1.3.2 Khautu 2

According to the Screening Tool Report compiled for the proposed 100 MW PV solar installation on Khautu 2, the Plant Species and Animal Species Theme is Low sensitivity and the Terrestrial Biodiversity Theme is Very High sensitivity.

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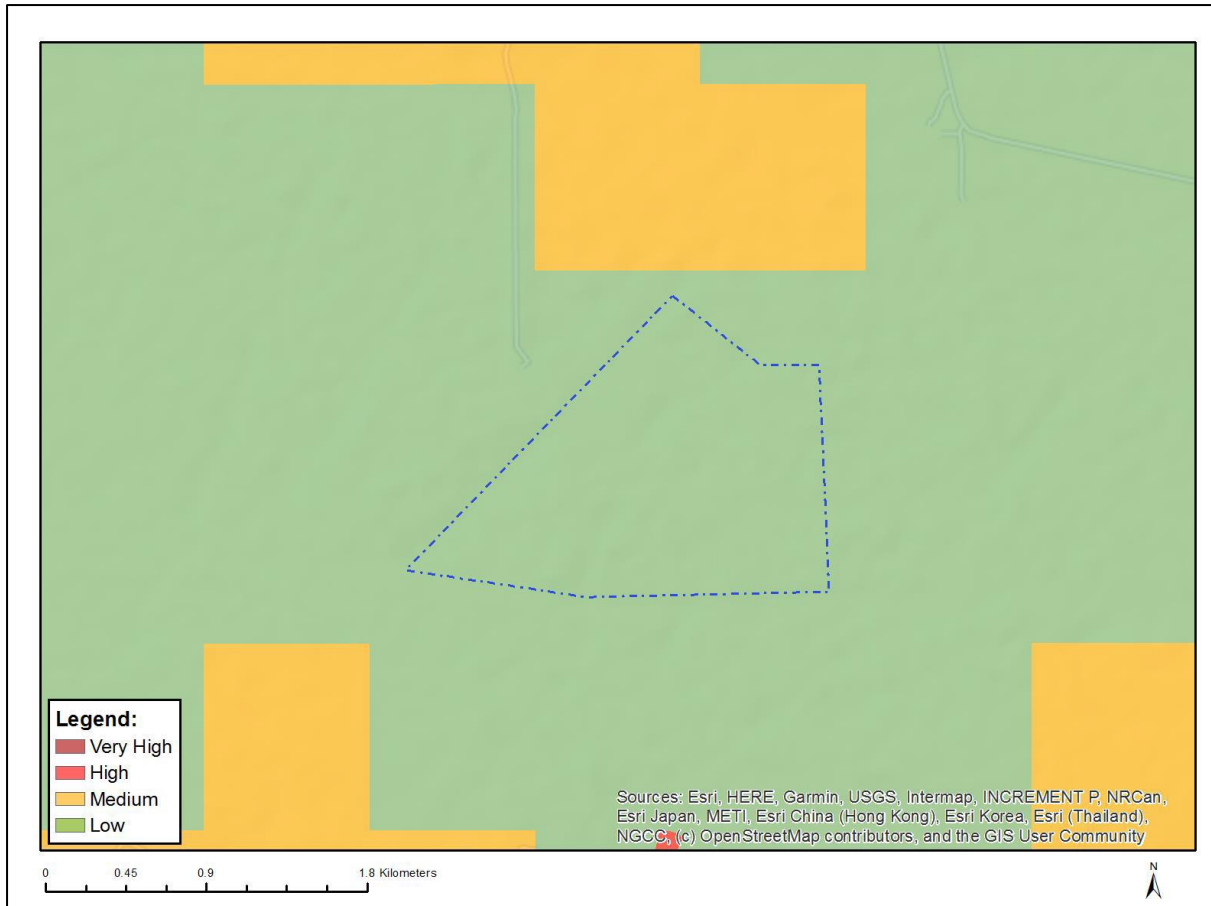


Figure 6 Animal Species Theme Sensitivity according to the Screening Tool Report for Khautu 2

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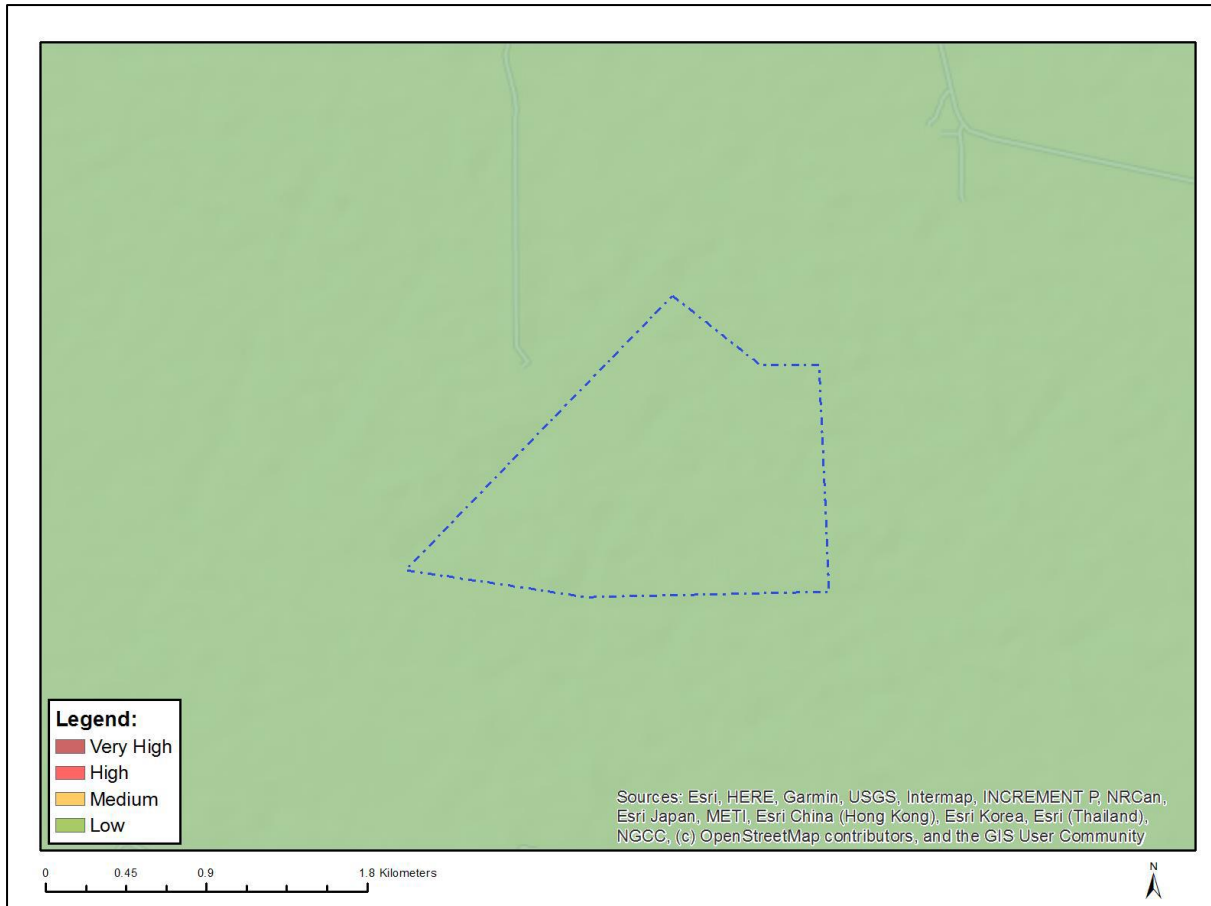


Figure 7 Plant Species Theme Sensitivity according to the Screening Tool Report for Khautu 2

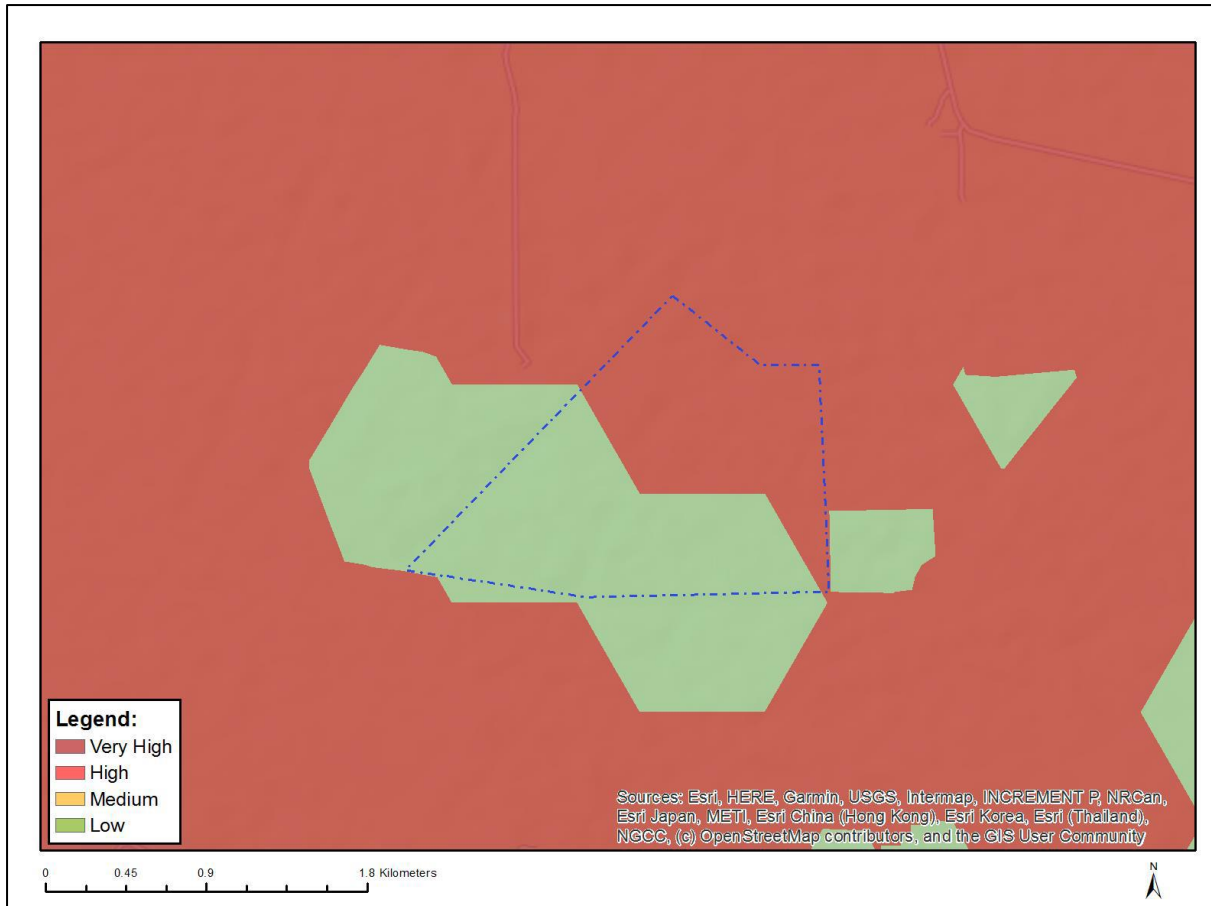


Figure 8 Terrestrial Biodiversity Theme Sensitivity according to the Screening Tool Report for Khautu 2

3.1.3.3 Khautu 3

According to the Screening Tool Report compiled for the proposed 100 MW PV solar installation on Khautu 3, the Plant Species and Animal Species Theme is Low sensitivity, and the Terrestrial Biodiversity Theme is Very High sensitivity.

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Figure 9 Animal Species Theme Sensitivity according to the Screening Tool Report for Khautu 3

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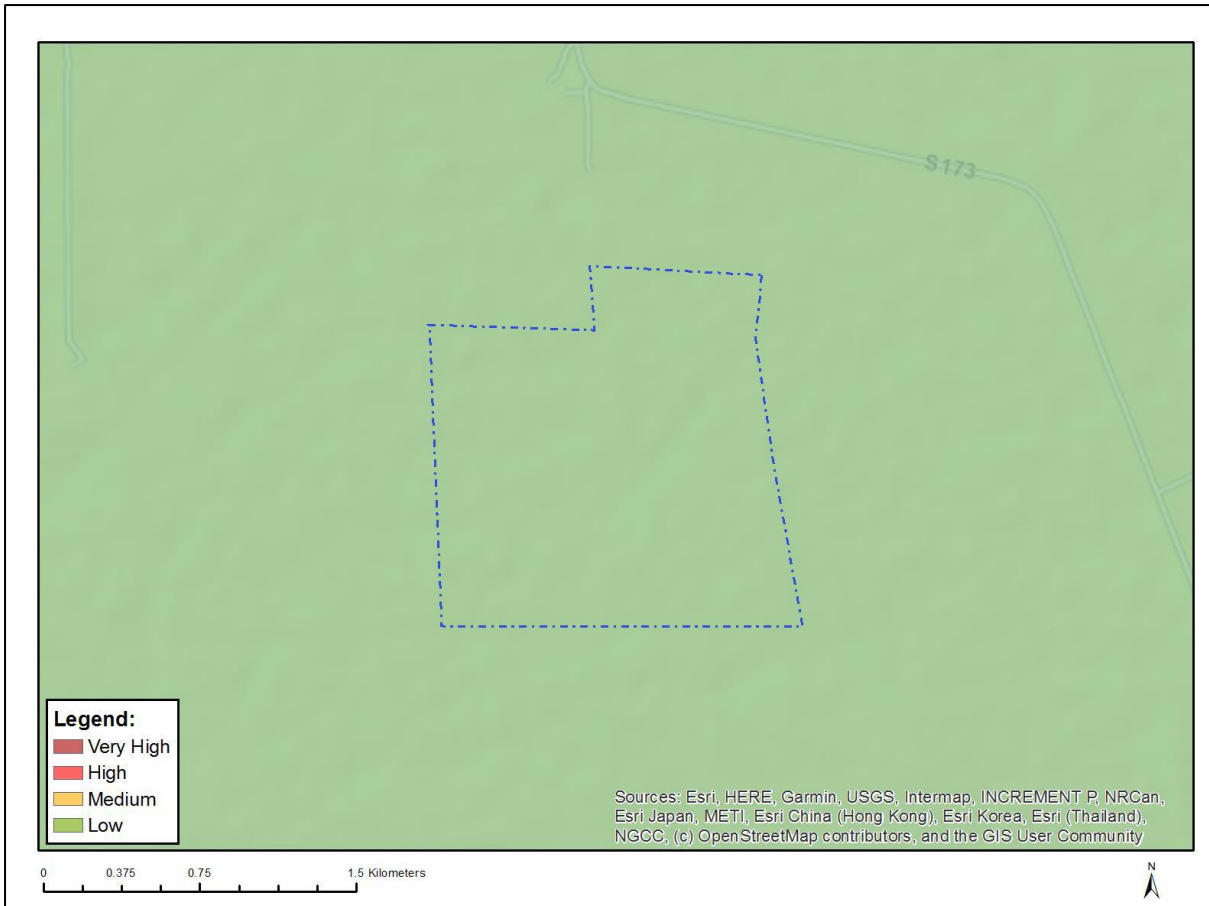


Figure 10 Plant Species Theme Sensitivity according to the Screening Tool Report for Khautu 3



Figure 11 Terrestrial Biodiversity Theme Sensitivity according to the Screening Tool Report for Khautu 3

3.1.4 Recommendations

Although all three development footprints will have an impact on Terrestrial Biodiversity, their sensitivity for the Animal and Plant Species theme is low. Therefore, this section will only be comparing the sensitivity of the sites based on the Terrestrial Biodiversity Theme.

Khautu 2 is acknowledged as having the lowest sensitivity and will likely have the least impact on the Terrestrial Biodiversity theme in comparison to Khautu 1 and 3. This is because a large portion (approximately one quarter to one half) of the development footprint is classified as Degraded. However, about one quarter of the footprint is classified as Critical Biodiverse Area 1. Should the site verification confirm that that the area is a CBA 1, the area should be kept as natural as possible. Given the large area of disturbance, it is likely that an offset may be recommended.

It must be noted that although Khautu 3 includes large areas classified as an ESA 2, these areas are transformed via agriculture (for at least ten years) according to satellite imagery. Nevertheless, there are areas on the footprint that seem undisturbed according to satellite imagery and are also classified as an ESA 1. These areas should be kept as natural or undisturbed as possible. The areas that should be avoided can only be confirmed

via the site verification. Should these areas not be able to be avoided, it is likely that offsets will be recommended.

Khautu 3 includes large portions (over half of the development footprint) of areas classified as an ESA 1. Based on satellite imagery, these areas are at least near natural but the various landscape scars throughout the footprint indicate that there has been disturbance including via roads. Should the site verification confirm that the area classified as ESA 1 are natural or near natural, these areas should be avoided as far as possible or it is likely that offsets will be recommended.

In conclusion, each development footprint is sensitive in terms of the Terrestrial Biodiversity Theme and will likely contribute to conservation. Where development is proposed to take place in large, undisturbed, and highly sensitive areas, it is expected that off-sets may be recommended. However, this can only be confirmed once the site verification has taken place. It is also expected that a Plan and Animal Species Compliance Statement and Terrestrial Biodiversity Impact Assessment Report be compiled for the proposed developments given the potentially high Terrestrial Biodiversity sensitivity of the footprints.

3.2 Line route options for the 132kV line associated with the 100MW PV Solar Installation

3.2.1 General Vegetation Description

Both grid line connection options traverse through two vegetation types: Highveld Alluvial Vegetation and Vaal-Vet Sandy Grassland (Please see Figure 12 Below).

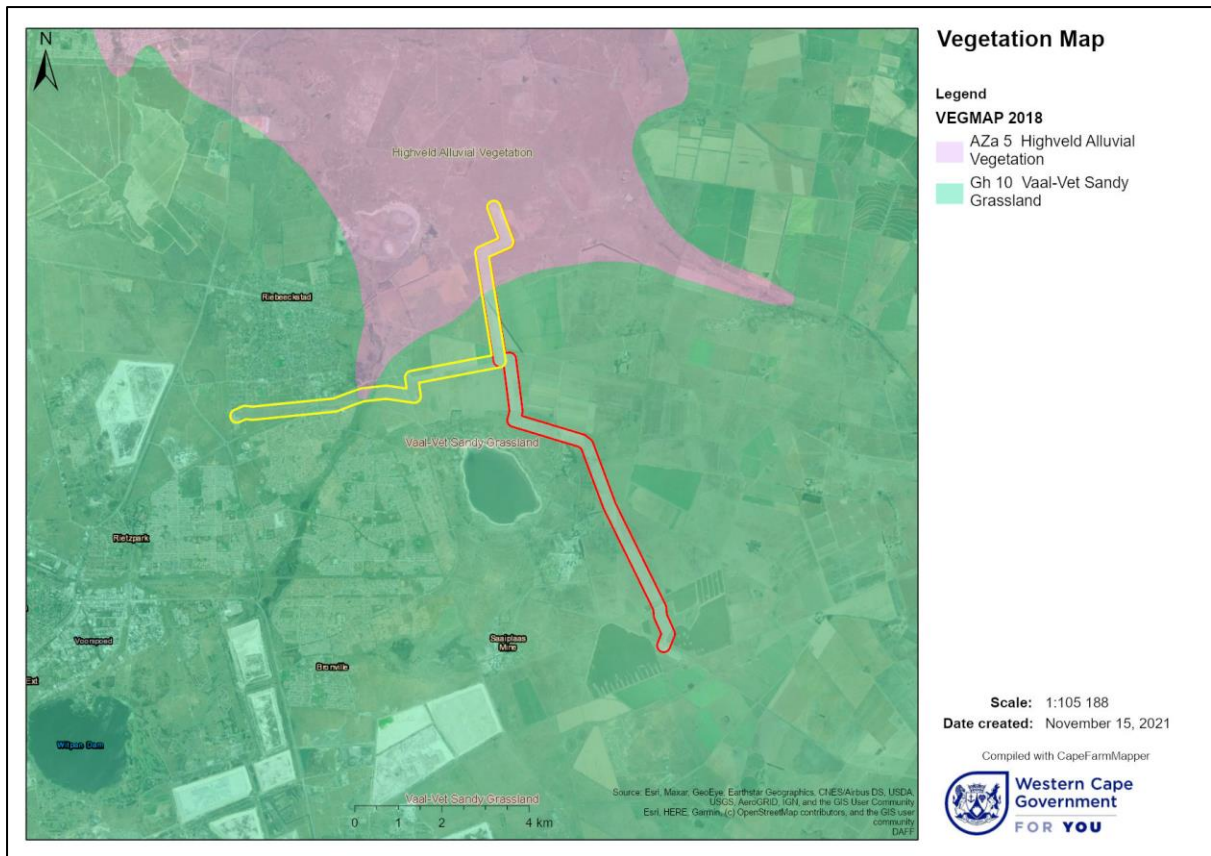


Figure 12 Vegetation Map for the three 100 MW photovoltaic solar installations where the red polygon demarcates Option 2 and the yellow polygon demarcates Option 1.

The Highveld Alluvial Vegetation Type has been described in 5.1.1 already and thus, only the Vaal-Vet Sand Grassland Vegetation type will be discussed in this section.

According to the National Environmental Management: Biodiversity Act's National List of Ecosystems That Are Threatened and In Need of Protection (2011), The Vaal-Vet Sandy Grassland is an Endangered Ecosystem, which has to be protected. Therefore, portions of the proposed development footprint that include the Vaal-Vet Sandy Grassland Vegetation Type are considered to be of conservation value.

3.2.2 Sensitive Areas

Both development footprints are located in Ecological Support Areas (ESAs), Critical Biodiverse Areas (CBAs) and Other Natural Areas. However, many of these areas are classified as Degraded (Figure 13)

Although both grid line connection footprints traverse through sensitive areas, the majority of each footprint is classified as degraded. This is especially true for Grid Connection Option 2 whereby the proposed footprint will mostly impact areas that have been transformed by cultivation and urbanisation based on satellite imagery. Grid Connection Option 1 traverses through a portion of natural or near natural area (based on satellite imagery) which also includes a watercourse. Given that the area surrounding area is classified as a CBA 1, it is likely that

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the watercourse and immediate surrounding area hosts and important ecological processes and a variety of animal and plant species (although most of these are likely to be common to the wider area and non-threatened). Therefore, it is expected that Grid Connection Option 2 will likely have the lowest impact on Terrestrial Biodiversity rather than Grid Connection Option 2.

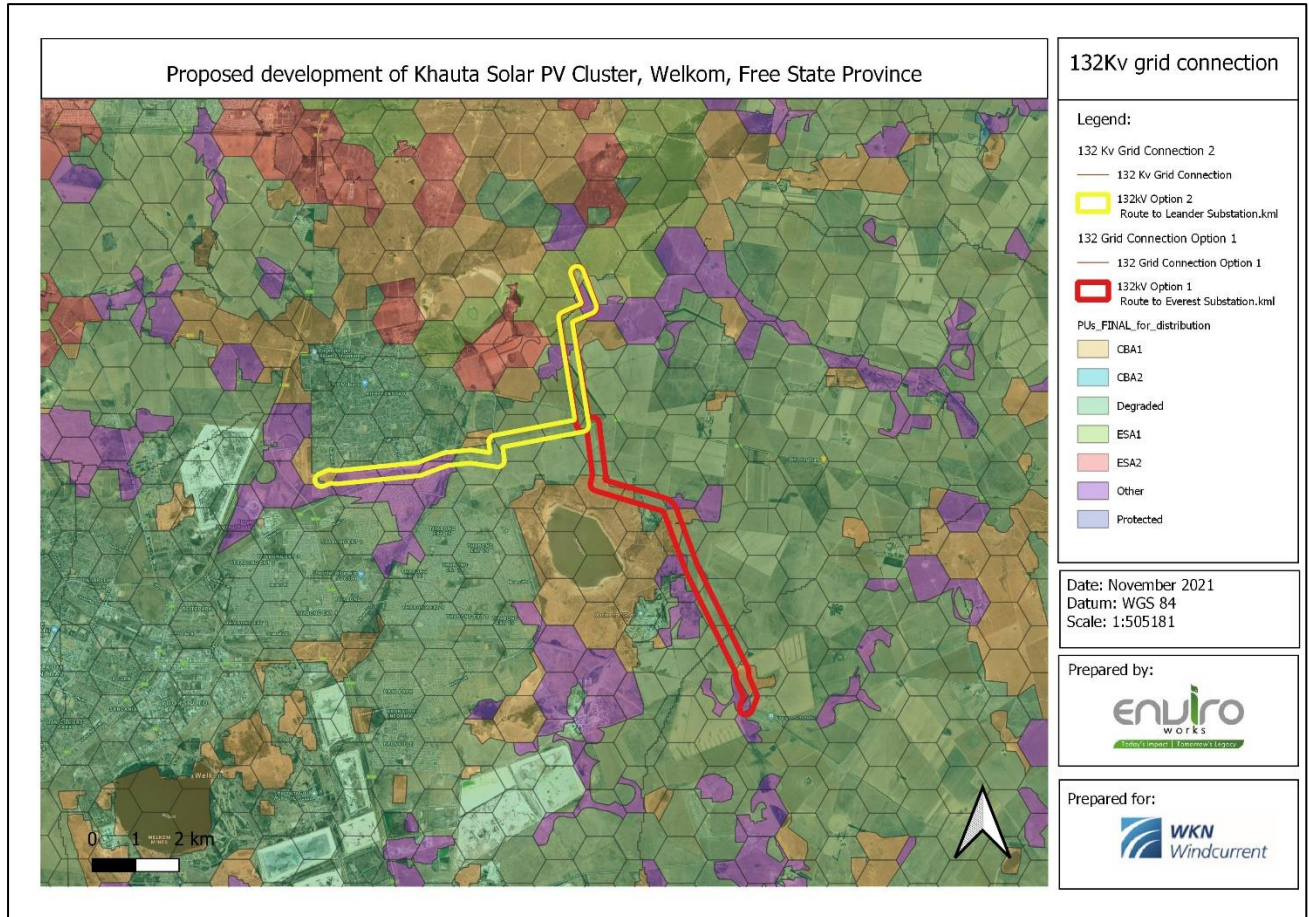


Figure 13 Biodiversity conservation map for the two 132 kV grid connection options where the red polygon demarcates option 2, and the yellow polygon demarcates option 1.

3.2.3 Screening Tool results

3.2.3.1 132kV Grid Connection Option 1

According to the Screening Tool Report compiled for the proposed 132 kV Grid Connection Option 1, the Plant Species Theme is Low Sensitivity and Animal Species Theme is Medium sensitivity, and the Terrestrial Biodiversity Theme is Very High sensitivity. Included below is also the sensitive aspects for the Animal Species Theme provided by the Screening Tool Report. It must be noted that none of the species listed in Table have been previously found in the area according to iNaturalist records ²⁰

²⁰ "iNaturalist."

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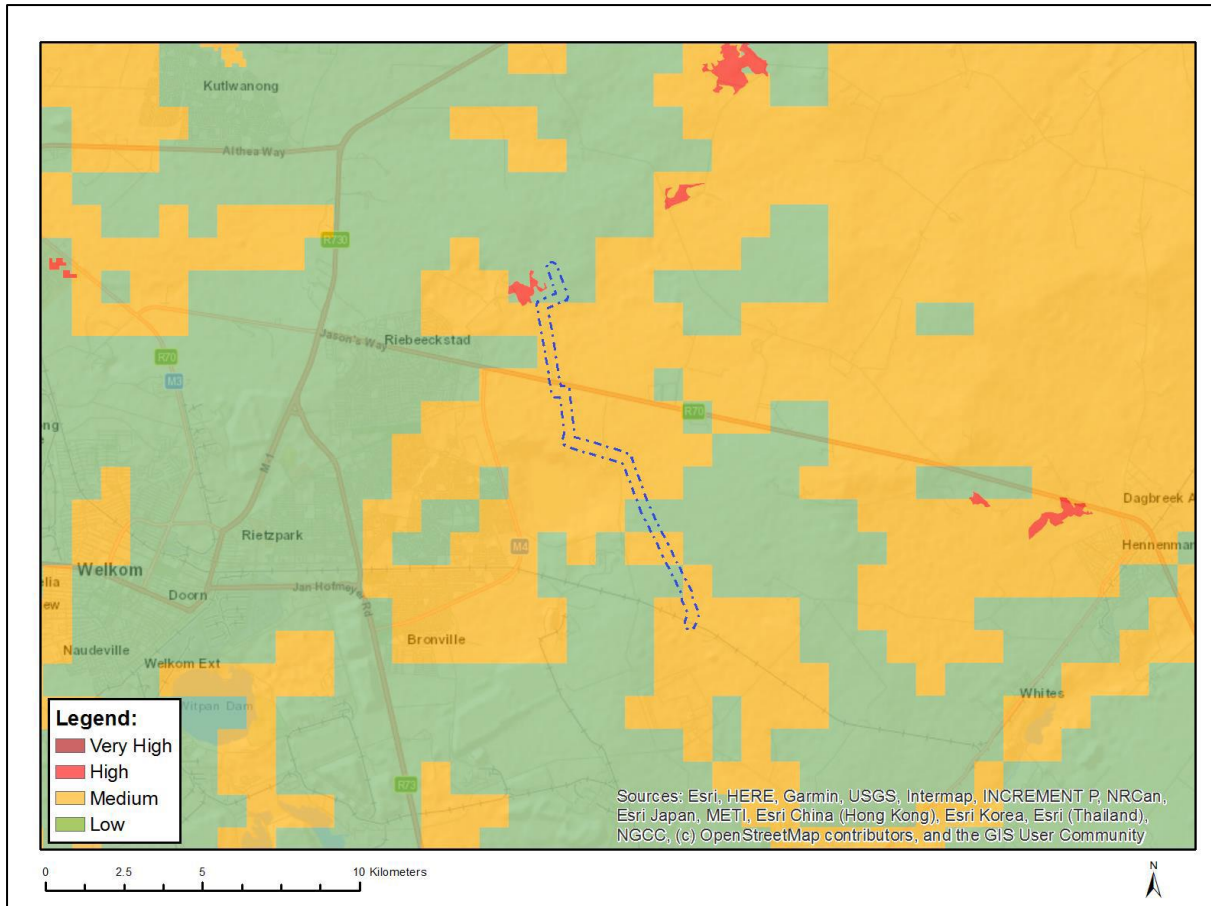


Figure 14 Animal Species Theme Sensitivity according to the Screening Tool Report for Option 1

Table 1 Sensitivity of sensitivity features, as identified by the Screening Tool Report generated for the proposed 132 kV Grid Connection Option 1. Results from the desktop study was added for each sensitivity feature in additional columns

Species Name	Threatened Status	Habitat Preference
<i>Smaug giganteus</i>	Vulnerable	Smaug giganteus are diurnal (active during the day) lizards limited to the Highveld grassland. They are one of the few terrestrial cordylids that inhabit flat or sloping Highveld grasslands. They live in self-excavated burrows, although they can be opportunistic and inhabit empty burrows.
<i>Hydriectis maculicollis</i>	Vulnerable	Spotted-necked Otters are thought to inhabit freshwater habitats where water is not silt-laden, and is unpolluted, and rich in small fishes. However, anecdotal observations suggest they can occur, and can be common, in relatively polluted rivers, such

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	as the Braamfonteinspruit, Jukskei River and Blesbokspruit, Gauteng Province and the Vaal River.
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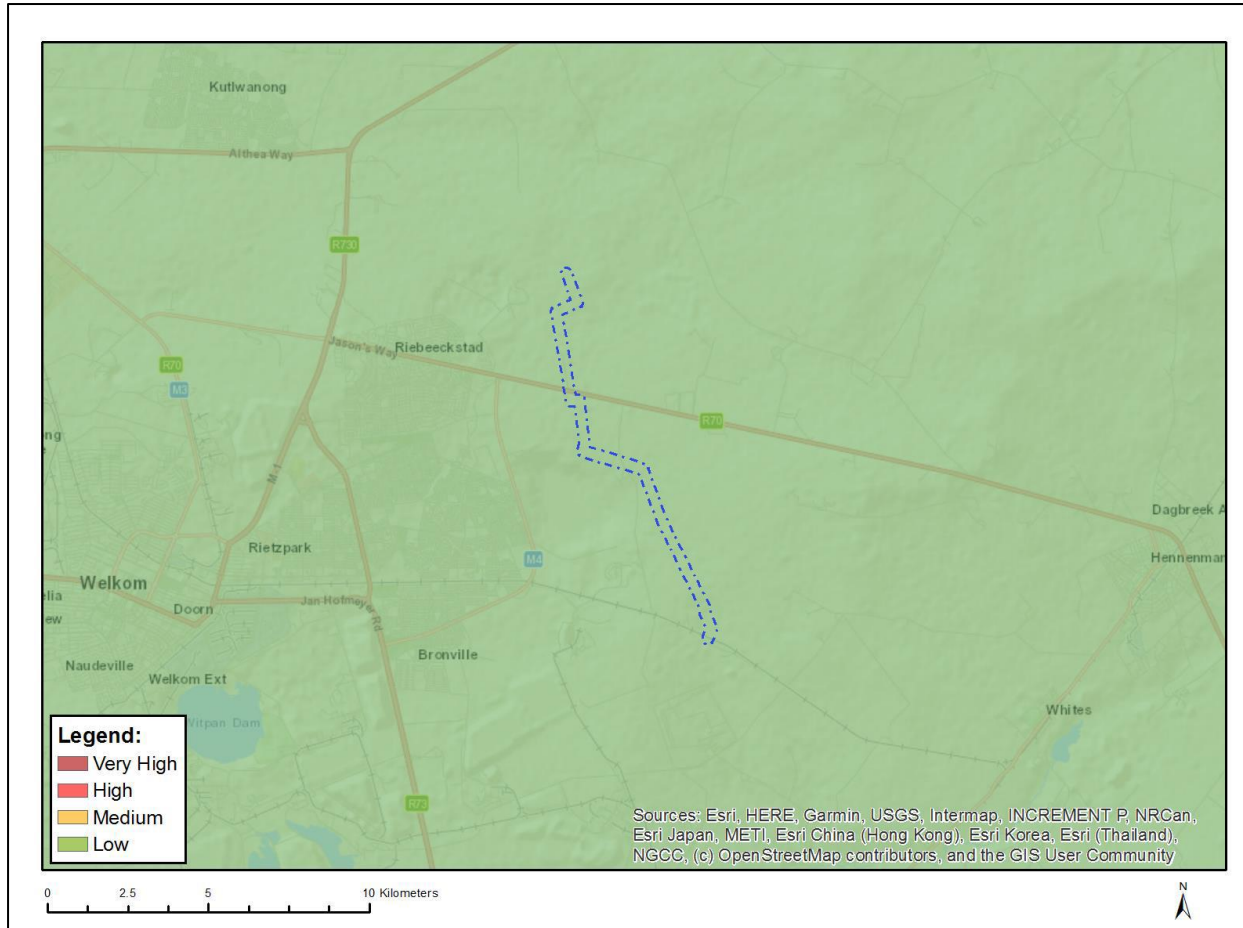


Figure 15 Plant Species Theme Sensitivity according to the Screening Tool Report for Option 1

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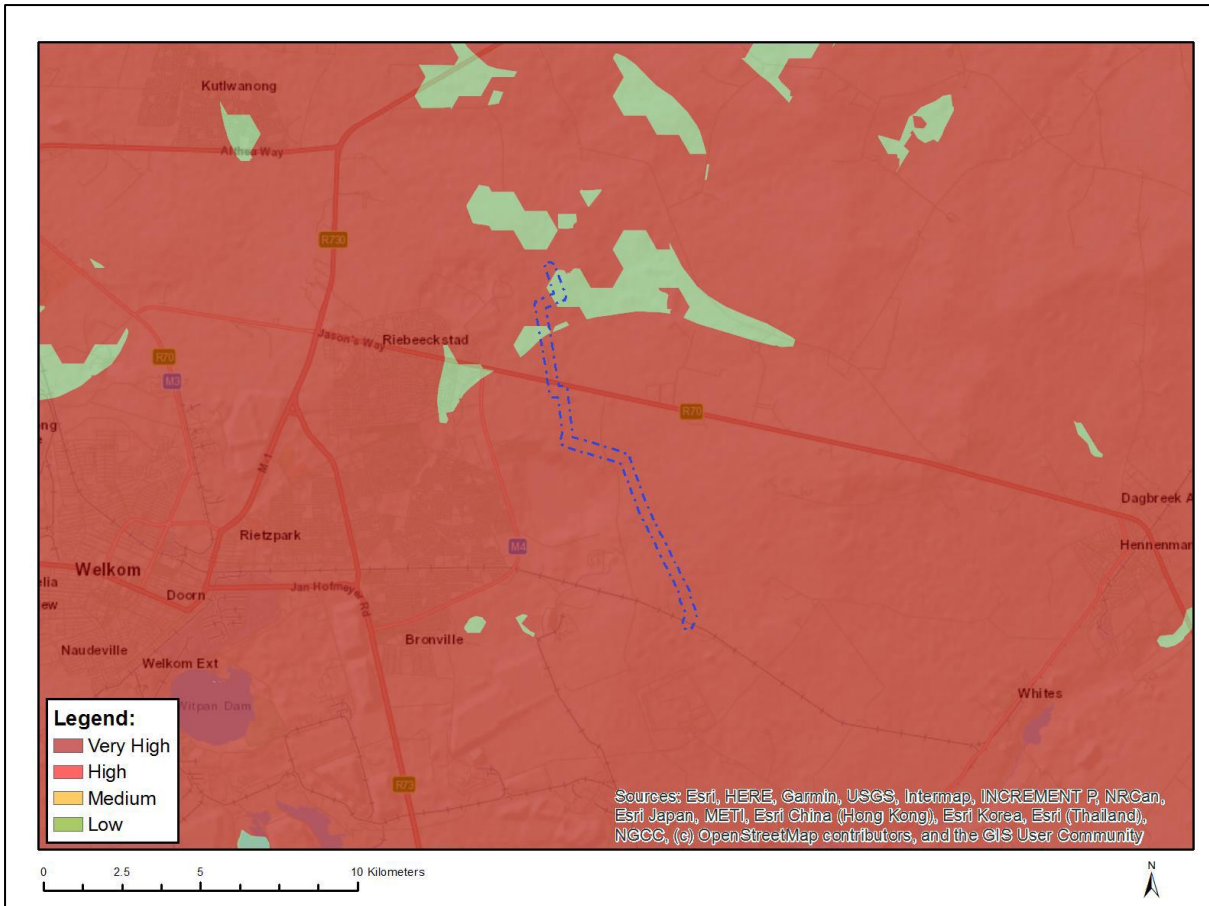
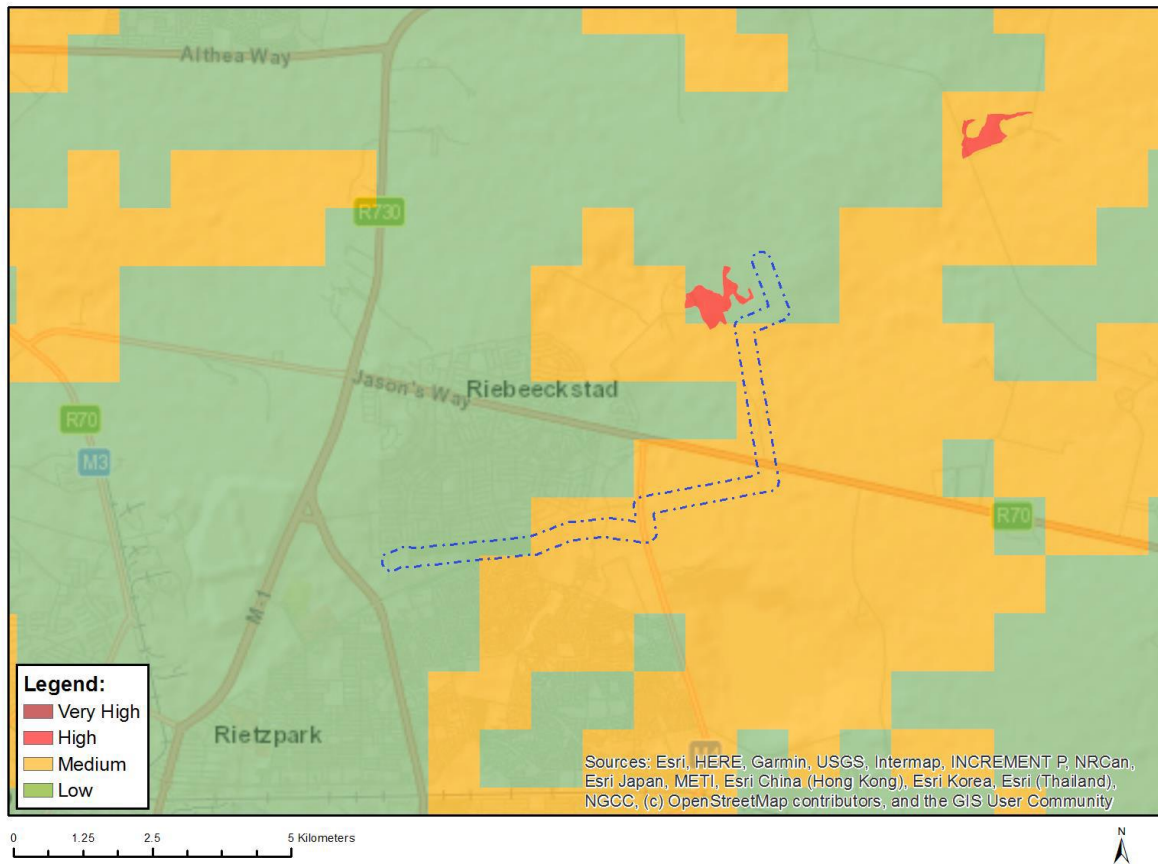


Figure 16 Terrestrial Biodiversity Theme Sensitivity according to the Screening Tool Report for Option 1

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3.2.3.2 132kV Grid Connection Option 2

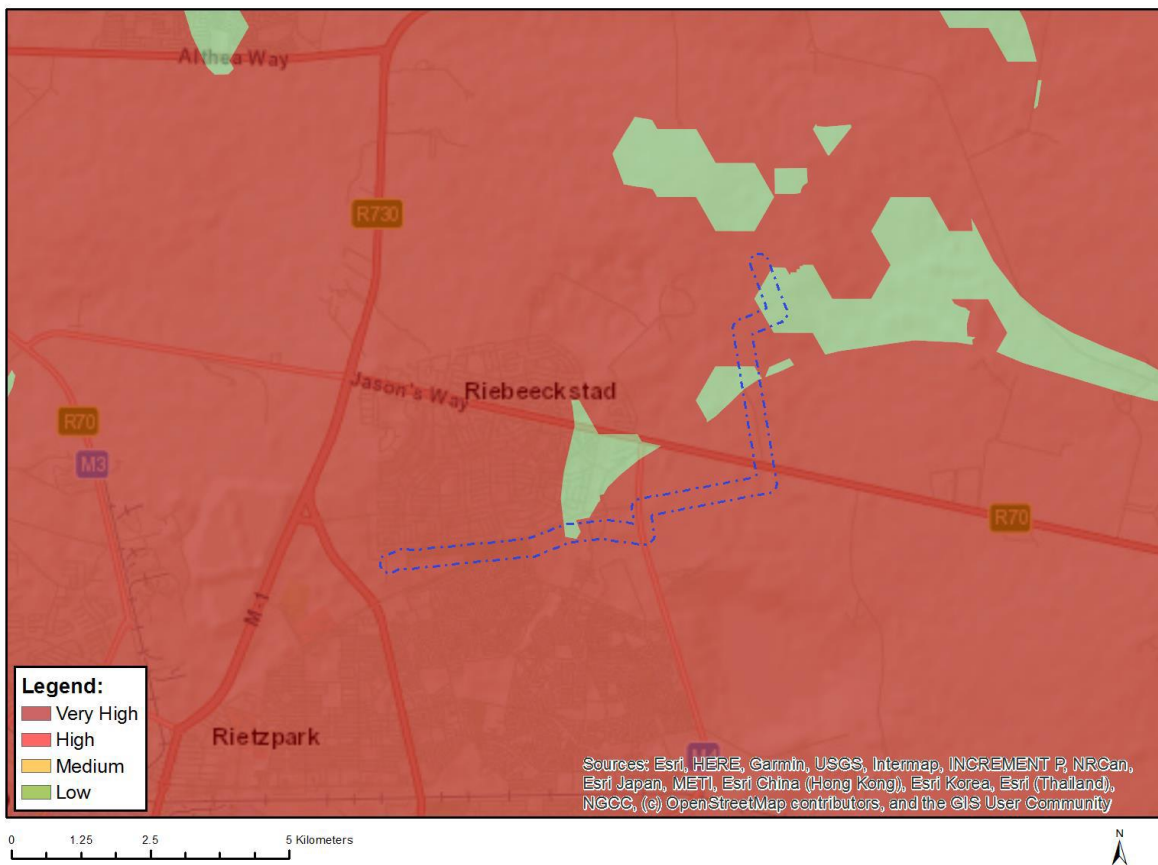
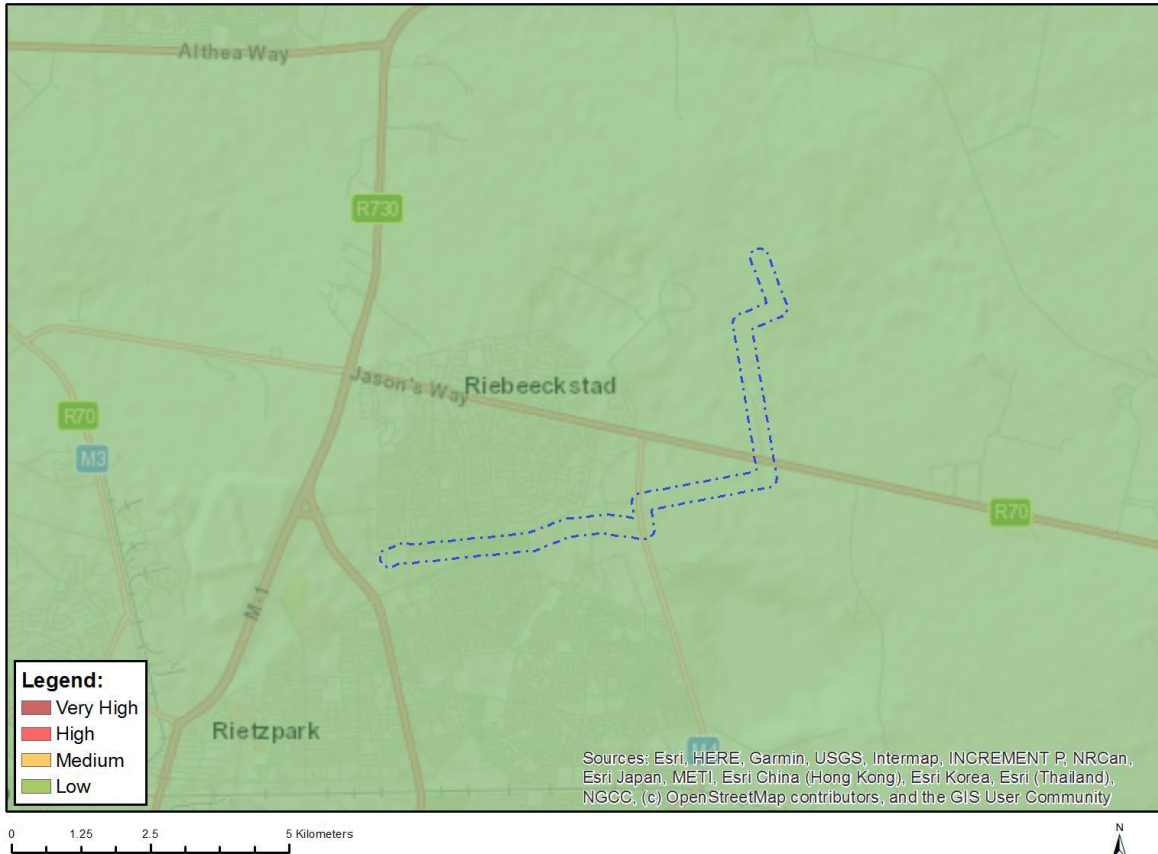


Species Name	Threatened Status	Habitat Preference
<i>Smaug giganteus</i>	Vulnerable	Smaug giganteus are diurnal (active during the day) lizards limited to the Highveld grassland. They are one of the few terrestrial cordylids that inhabit flat or sloping Highveld grasslands. They live in self-excavated burrows, although they can be opportunistic and inhabit empty burrows.
<i>Hydriectis maculicollis</i>	Vulnerable	Spotted-necked Otters are thought to inhabit freshwater habitats where water is not silt-laden, and is unpolluted, and rich in small fishes. However, anecdotal observations suggest they can occur, and can be common, in relatively polluted rivers, such as the Braamfonteinspruit, Jukskei River and

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		Blesbokspruit, Gauteng Province and the Vaal River.
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3.2.4 Recommendations

Although both footprints for the proposed 132 kV Grid Connection mostly consist of areas classified as degraded, it is expected that the Grid Connection Option 1 will have a higher impact on potential terrestrial biodiversity, plant species and animal species given that the area is likely to traverse through a portion of natural or near natural area (based on satellite imagery) which also includes a watercourse. It is thus, recommended that Grid Option 2 be developed. Should Grid Connection Option 2 be developed, it is recommended that a Plant and Animal Species Compliance Statement be compiled, and an additional Terrestrial Biodiversity Impact Assessment based on the Screening Tool Report Results and satellite imagery.

3.3 2 x 19.9MW PV Solar Installation

3.3.1 General Vegetation Description

Both proposed 19.9 MW PV solar installation footprints traverse through two vegetation types: Highveld Alluvial Vegetation (Please see Figure 17 Below). The vegetation has been described in Section 2.1.1 and thus will not be repeated in this Section. It will be noted that the Vegetation type is classified as Least Concern. However, more than a quarter of the vegetation type has been transformed or lost as a result of cultivation, dam building, and the invasion of alien invasive plant species. Only 10% of the vegetation type is formally conserved.

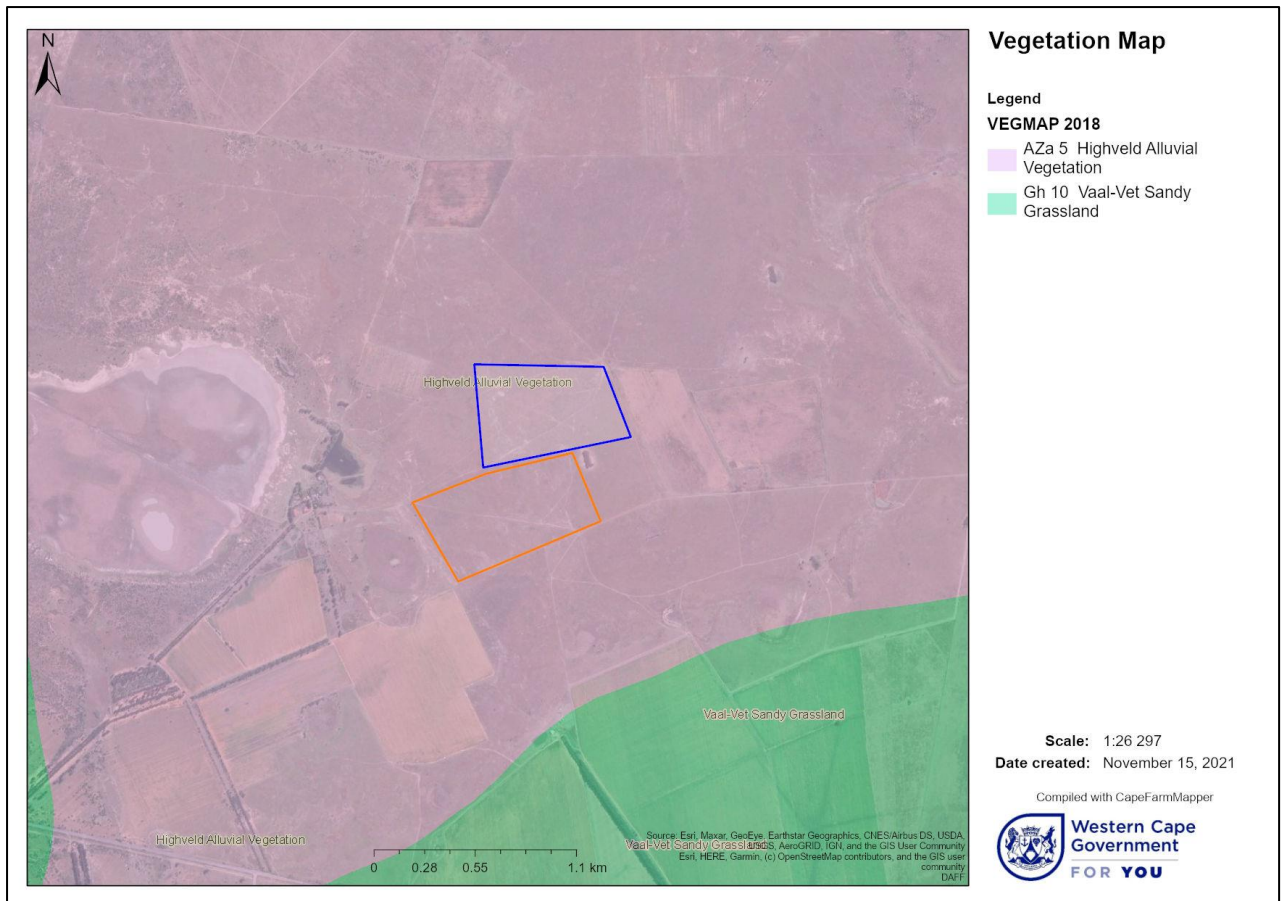


Figure 17 Vegetation Map for the two 19.9 MW photovoltaic solar installations where the orange polygon demarcates Small Option 2 and the blue polygon demarcates Small Option 1.

3.3.2 Sensitive Areas

Both proposed installation footprints include large areas (the majority of each development footprint) classified as Ecological Support Areas 2 (ESA 2) (See Section 2.1.2. for an explanation of what is regarded as an ESA 2). Therefore, both sites are considered to have conservation value. The PV Solar Installation Small 2 site also inhabits a watercourse (not mapped here, but is expected to be included in the Aquatic Desktop Assessment) which is classified as a natural depression in the National Wetland 5 Map²¹.

It must be noted that satellite imagery illustrates various scars across both footprints indicating a moderate amount of disturbed for activities such as roads. Given that the footprints have not been completely transformed by agriculture or urbanisation, it is likely that the area may be regarded as natural or near natural (pending the site verification).

²¹ Heidi van Deventer et al., "National Wetland Map 5 – An Improved Spatial Extent and Representation of Inland Aquatic and Estuarine Ecosystems in South Africa," *BioRxiv*, May 17, 2019, 640441, <https://doi.org/10.1101/640441>.

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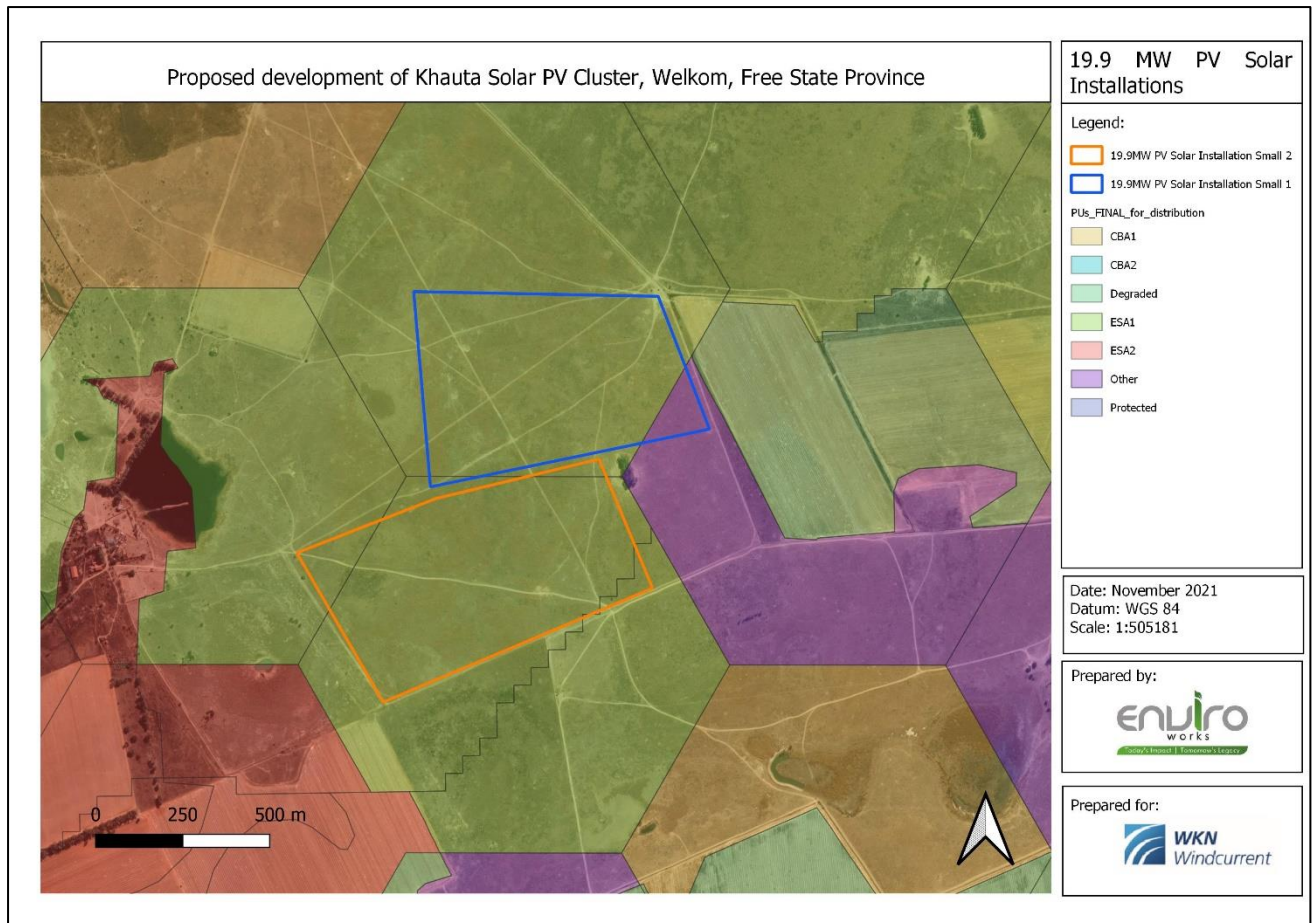


Figure 18 Biodiversity Spatial Plan²² for the two 19.9 MW photovoltaic solar installations where the orange polygon demarcates Small Option 2 and the blue polygon demarcates Small Option 1.

3.3.3 Screening Tool Results

According to the Screening Tool Reports compiled for the each proposed 19.9 MW PV solar installation, the Plant Species Theme is Low Sensitivity and Animal Species Theme is Medium sensitivity, and the Terrestrial Biodiversity Theme is Very High sensitivity for both footprints. Please see Figures below. Included below is also the sensitive aspects for the Animal Species Theme provided by the Screening Tool Report. It must be noted that none of the species listed in Tables 2 and 3 have been previously found in the area according to iNaturalist records²³. However, based on the habitat preferences of the species, it is likely that *Smaug giganteus* may be found within both development footprints.

19.9 MW PV solar Installation Small 1

²² Department of Economic Development, Environmental Affairs and Tourism: and Biodiversity and Coastal Management, "Eastern Cape Biodiversity Conservation Plan."

²³ "iNaturalist."

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Figure 19 Animal Species Theme Sensitivity according to the Screening Tool Report for Small 1

Table 2 Sensitivity of sensitivity features, as identified by the Screening Tool Report generated for the proposed 19.9 MW PV Solar Installation Option 1 . Results from the desktop study was added for each sensitivity feature in additional columns

Species Name	Threatened Status	Habitat Preference
<i>Smaug giganteus</i>	Vulnerable	Smaug giganteus are diurnal (active during the day) lizards limited to the Highveld grassland. They are one of the few terrestrial cordylids that inhabit flat or sloping Highveld grasslands. They live in self-excavated burrows, although they can be opportunistic and inhabit empty burrows.

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Figure 20 Plant Species Theme Sensitivity according to the Screening Tool Report for Small 1

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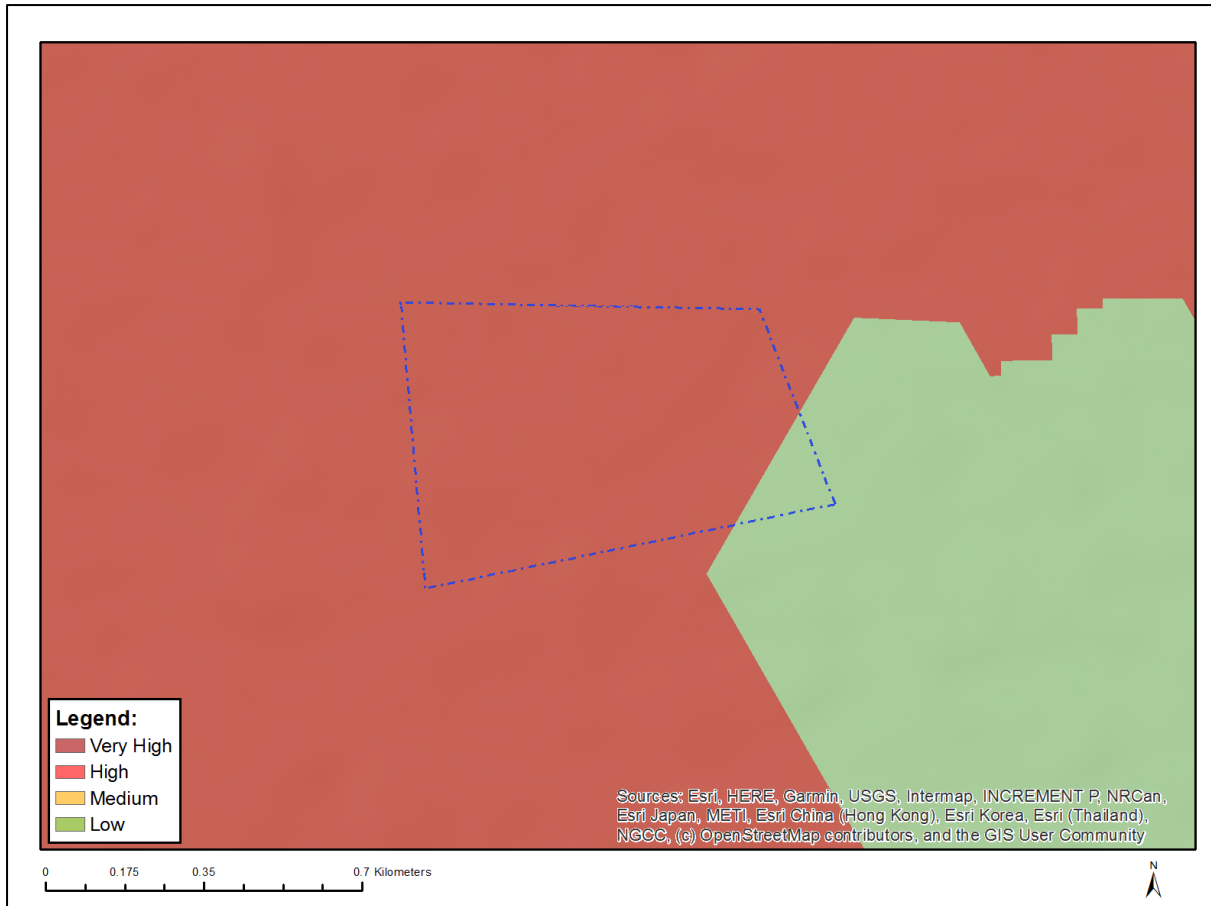


Figure 21 Terrestrial Biodiversity Theme Sensitivity according to the Screening Tool Report for Small 1

19.9 W PV solar installation Small 2

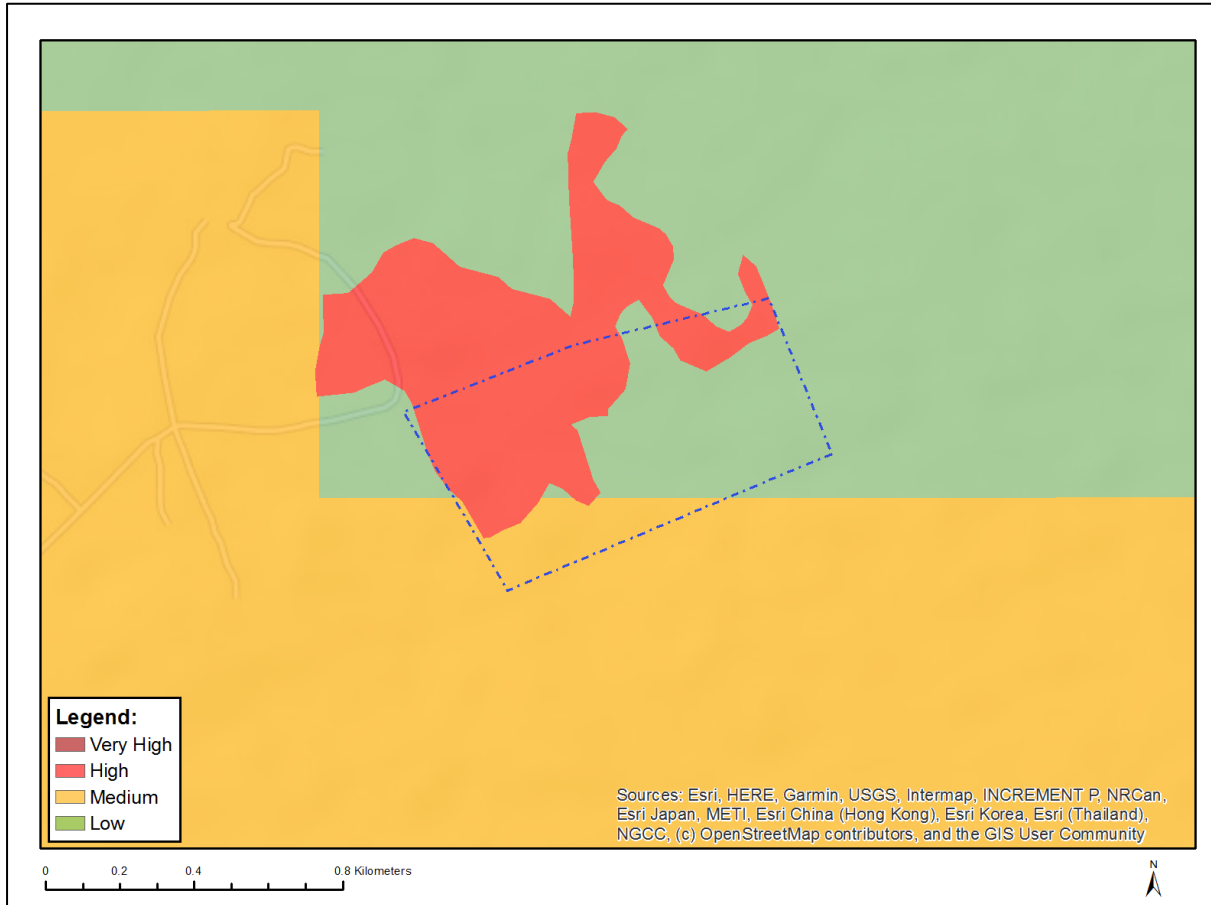


Figure 22 Animal Species Theme Sensitivity according to the Screening Tool Report for Small 2

Table 3 Sensitivity of sensitivity features, as identified by the Screening Tool Report generated for the proposed 19.9 MW PV Solar Installation Option 2. Results from the desktop study was added for each sensitivity feature in additional columns

Species Name	Threatened Status	Habitat Preference
<i>Smaug giganteus</i>	Vulnerable	Smaug giganteus are diurnal (active during the day) lizards limited to the Highveld grassland. They are one of the few terrestrial cordylids that inhabit flat or sloping Highveld grasslands. They live in self-excavated burrows, although they can be opportunistic and inhabit empty burrows.
<i>Hydricotis maculicollis</i>	Vulnerable	Spotted-necked Otters are thought to inhabit freshwater habitats where water is not silt-laden, and is unpolluted, and rich in small fishes. However, anecdotal observations suggest they can

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		<p>occur, and can be common, in relatively polluted rivers, such as the Braamfonteinspruit, Jukskei River and Blesbokspruit, Gauteng Province and the Vaal River.</p>
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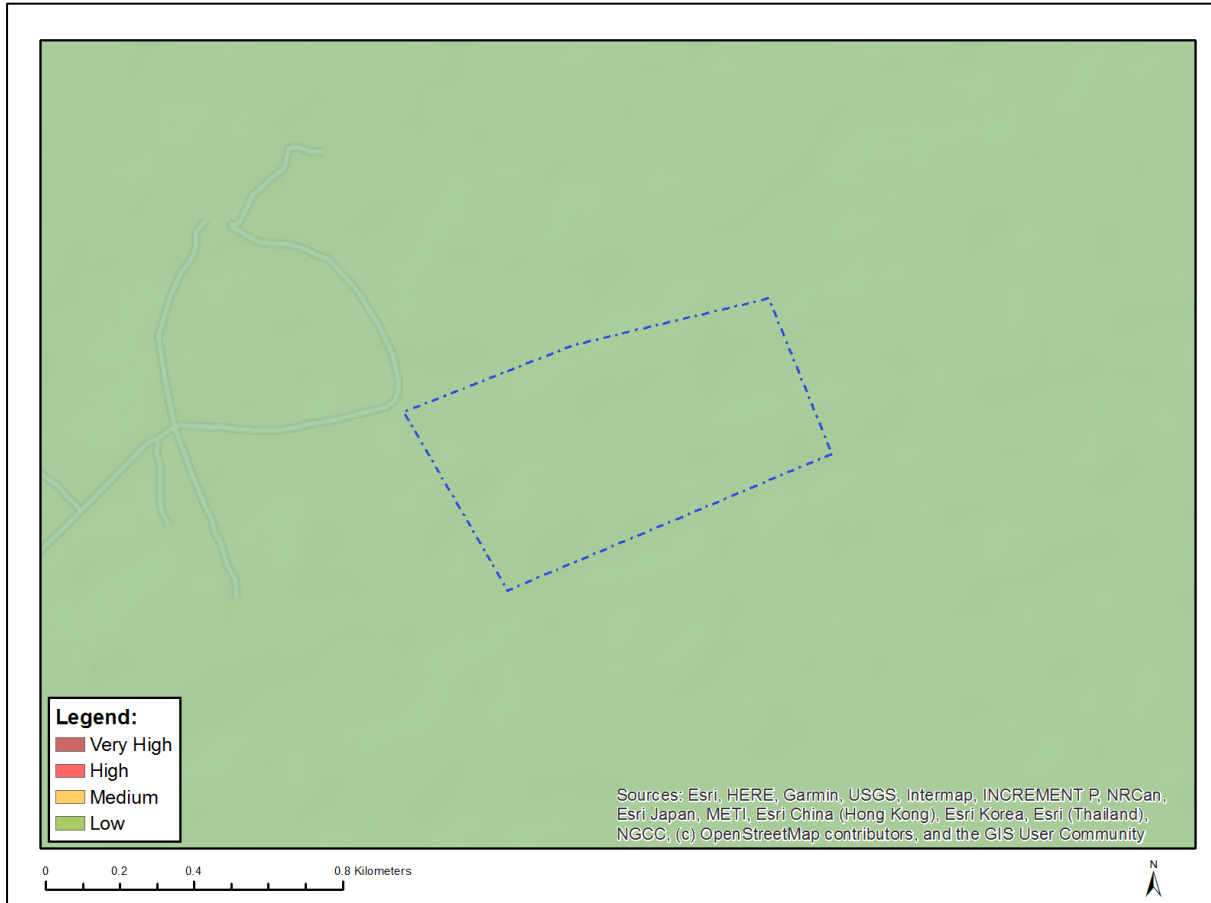


Figure 23 Plant Species Theme Sensitivity according to the Screening Tool Report for Small 2



Figure 24 Terrestrial Biodiversity Theme Sensitivity according to the Screening Tool Report for Small 2

2.3.4 Recommendations

Based on the desktop assessment, both development footprints of the 19.9 MW PV solar installation are similar in terms of sensitivity. Both development footprints are found within the same vegetation type (which is classified as Least Concern) and traverse through an Ecological Support Area 1. However, the PV solar installation Small 2 includes a mapped watercourse (depression). This watercourse is likely to provide important habitat for various plant and animal species especially given that the watercourse is located in an ESA 1. Note that the sensitivity of the sites in terms of aquatic biodiversity will be analysed by a separate Aquatic Biodiversity Desktop Assessment.

At this stage, both development footprints will have a significant impact on the Terrestrial Biodiversity Theme and potentially the Animal Species Theme. The following is recommended:

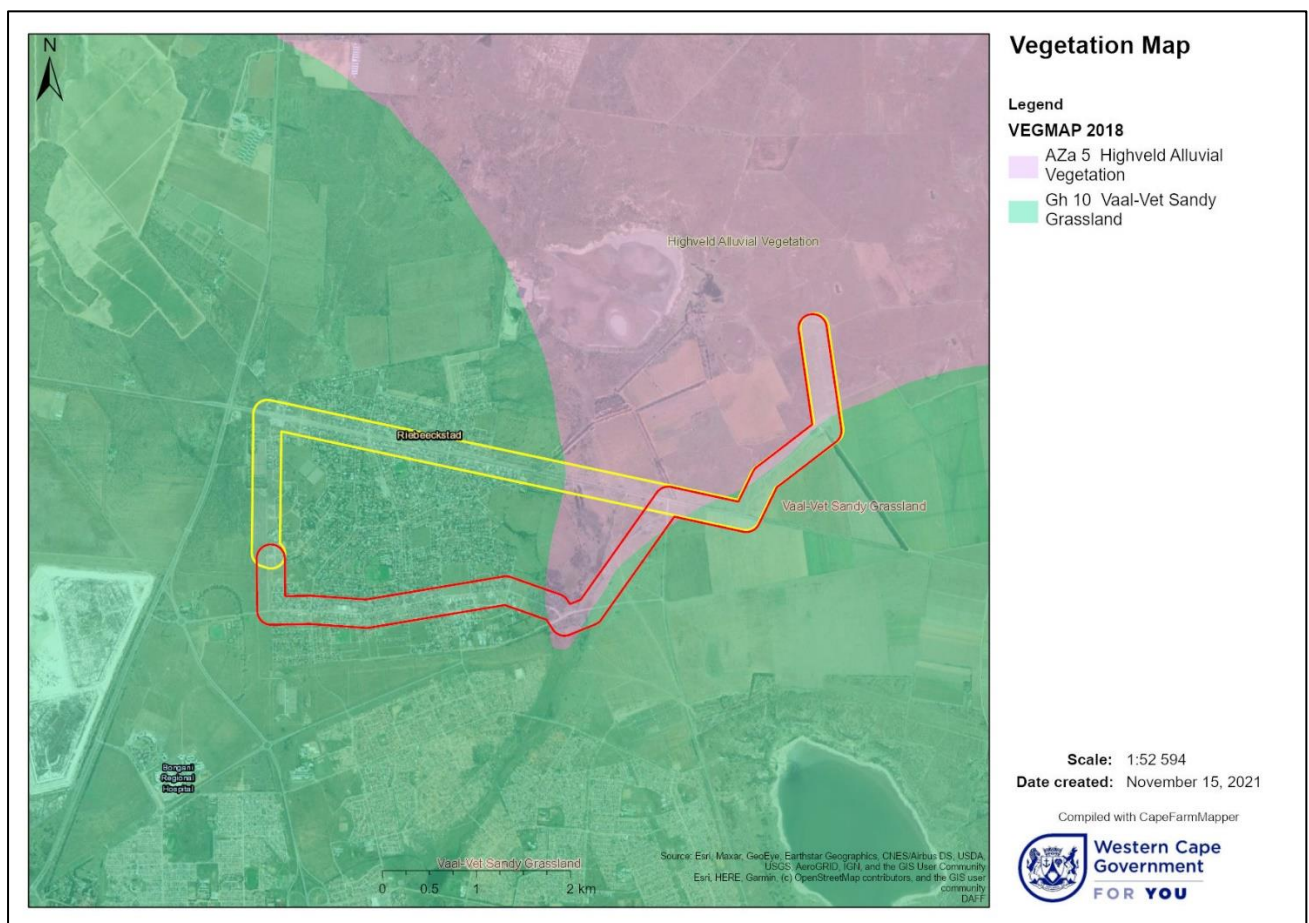
- A Animal and Terrestrial Biodiversity Impact Assessment and Plant Compliance Statement must be conducted to determine the full impact of the proposed developments.
- An Aquatic Biodiversity Assessment be conducted to determine the impact of the proposed development on the mapped water course

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- Should the watercourse be verified on site, it is recommended that the watercourse be excluded from the development area.
- Given then large areas of development (approximately 40 hectares), it may also be recommended that some offsets or ecological corridors (should the area be verified to be very sensitive) be required should the development take place. These offsets or ecological corridors will be required to ensure that at least some of the ecological processes on site remain intact. These offsets or corridors can only, however, be confirmed once the site inspection and assessment has been conducted.

2.4 2 x line route options for the 44kV line associated with the 2 x 19.9MW PV Solar Installation
General Vegetation Description

Both grid line connection options traverse through two vegetation types: Highveld Alluvial Vegetation and Vaal-Vet Sandy Grassland (Please see Figure 25 Below). Note that the detailed description of each vegetation type is included in Sections 3.1.1 and 3.2.1. However, it will be noted that Highveld Alluvial Vegetation is classified as Least Concern and Vaal-Vet Sandy Grassland is classified as Endangered.



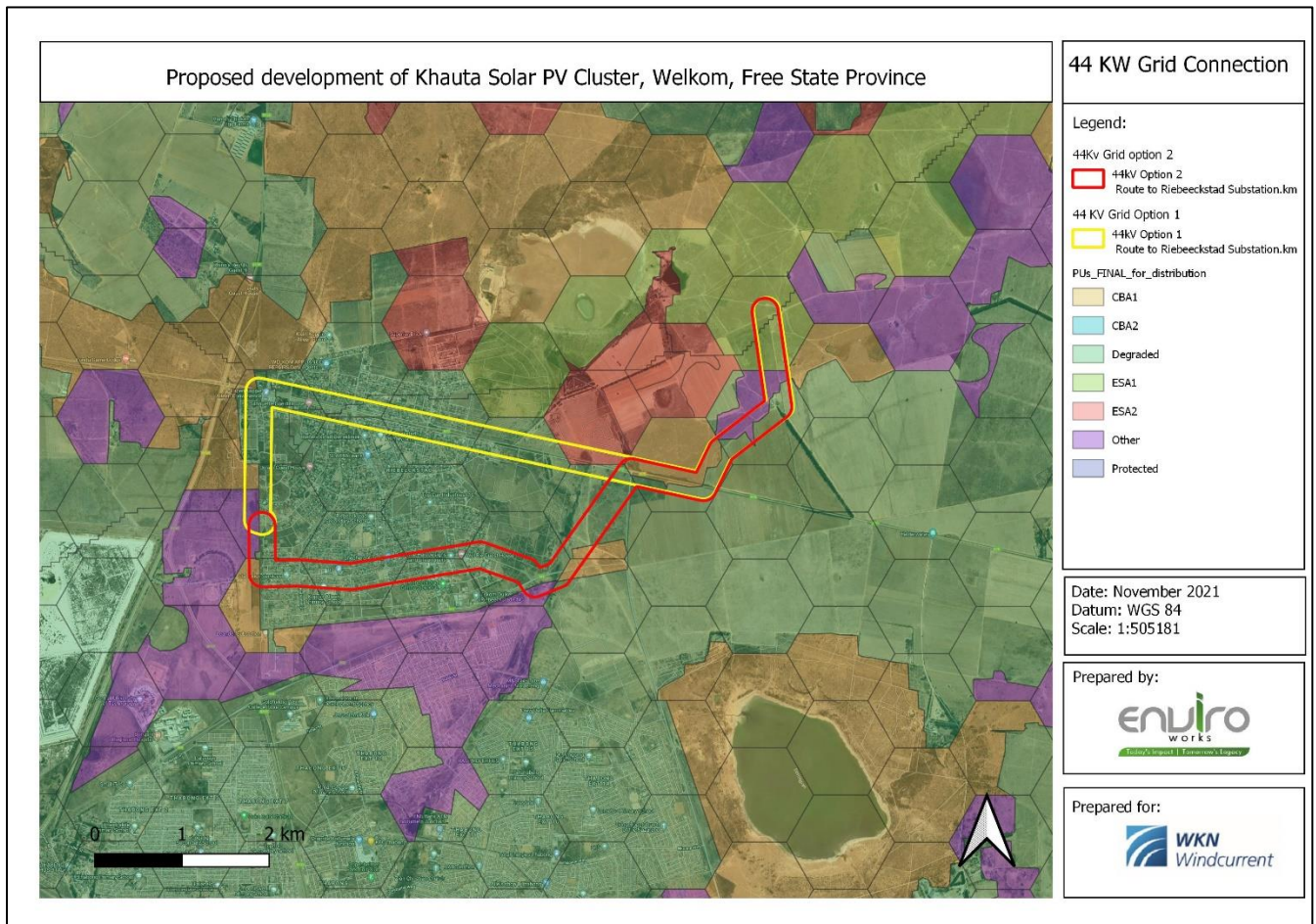
PLANT SPECIES, ANIMAL SPECIES AND TERRESTRIAL BIODIVERSITY THEME DESKTOP ASSESSMENT: KHAUTA SOLAR PV CLUSTER

Figure 25 Vegetation Map²⁴ for the two 44 kV Grid Connection Options where the red polygon demarcates Option 2 and the yellow polygon demarcates Option 1.

Sensitive Areas

Both development footprints are located in a small portion of an Critical Biodiverse Area 1 and Other Natural Area (Please see Section 3.1.2 for detailed description of each type of Terrestrial Biodiversity sensitivity). However, most of the footprints are classified as Degraded (See Figure 26)

Although both grid line connection footprints traverse through some sensitive areas, the majority of each footprint is classified as degraded. Therefore, most areas that constitute of the Vaal-Vet Sandy Grassland Vegetation Type (Endangered) are likely to be highly transformed mostly due to agriculture and urbanisation (from satellite imagery). Consequently, it is not expected that these areas will have conservation value. Areas that are classified as a CBA and located in the Vaal-Vet Sandy Grassland Vegetation Type (i.e., the eastern portion of both developments) are expected to have conservation values given that these areas are likely to be a natural to near natural state (from satellite imagery).



²⁴ "South African National Biodiversity Institute."

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Figure 26 Biodiversity Spatial Plan²⁵ for the two 44 kV Grid Connection Options where the red polygon demarcates Option 2 and the yellow polygon demarcates Option 1.

Screening Tool results

According to the Screening Tool Report compiled for the proposed 44 kV Grid Connection Options (1 and 2), the Plant Species Theme is Low Sensitivity and Animal Species Theme is Medium sensitivity, and the Terrestrial Biodiversity Theme is Very High sensitivity. Please see the Figures below. Included below is also the sensitive aspects for the Animal Species Theme provided by the Screening Tool Report. It must be noted that none of the species listed in Table 4 and 5 have been previously found in the area according to iNaturalist records ²⁶. However, based on the habitat preferences of the species, it is likely that *Smaug giganteus* may be found within both development footprints where the areas are considered to be natural or near natural.

44kV Grid Connection Option 2

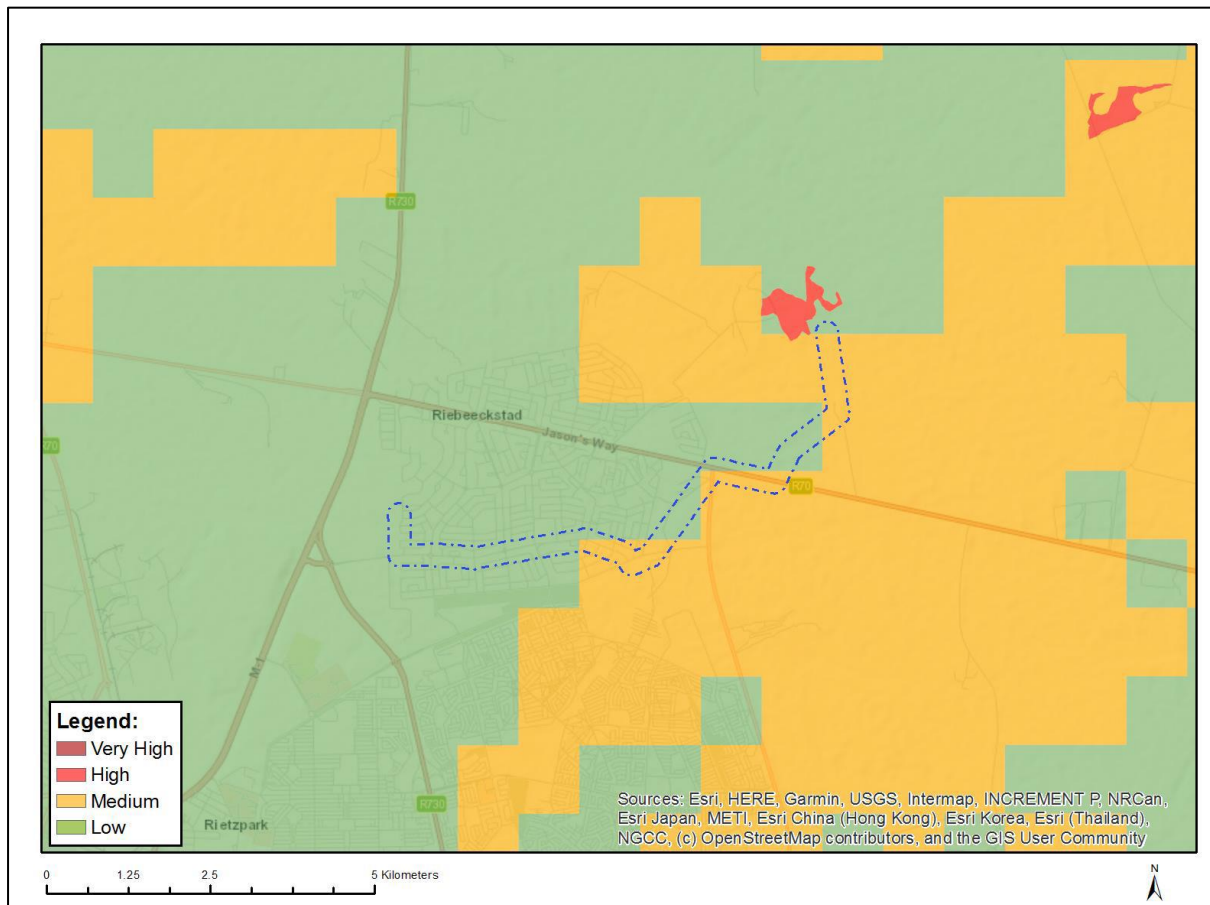


Figure 27 Animal Species Theme sensitivity for the 44 kV Grid Connection Option 2.

Table 4 Sensitivity of sensitivity features, as identified by the Screening Tool Report generated for the proposed 44 kV Grid Connection Option 2. Results from the desktop study was added for each sensitivity feature in additional columns

²⁵ Department of Economic Development, Environmental Affairs and Tourism: and Biodiversity and Coastal Management, “Eastern Cape Biodiversity Conservation Plan.”

²⁶ “iNaturalist.”

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Species Name	Threatened Status	Habitat Preference
<i>Smaug giganteus</i>	Vulnerable	Smaug giganteus are diurnal (active during the day) lizards limited to the Highveld grassland. They are one of the few terrestrial cordylids that inhabit flat or sloping Highveld grasslands. They live in self-excavated burrows, although they can be opportunistic and inhabit empty burrows.
<i>Hydrichtis maculicollis</i>	Vulnerable	Spotted-necked Otters are thought to inhabit freshwater habitats where water is not silt-laden, and is unpolluted, and rich in small fishes. However, anecdotal observations suggest they can occur, and can be common, in relatively polluted rivers, such as the Braamfonteinspruit, Jukskei River and Blesbokspruit, Gauteng Province and the Vaal River.

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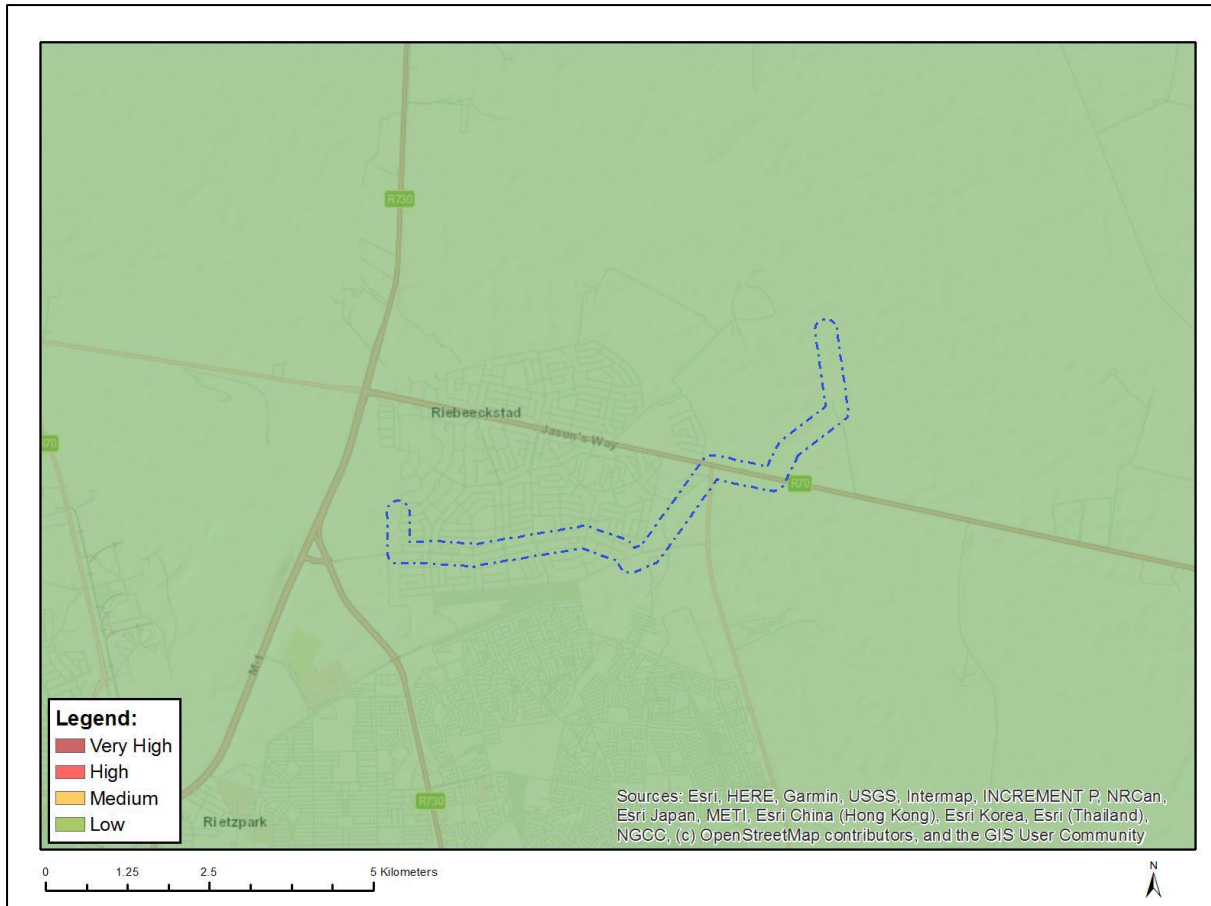


Figure 28 Plant Species Theme sensitivity for the 44 kV Grid Connection Option 2.

PLANT SPECIES, ANIMAL SPECIES AND TERRESTRIAL BIODIVERSITY THEME DESKTOP ASSESSMENT: KHAUTA
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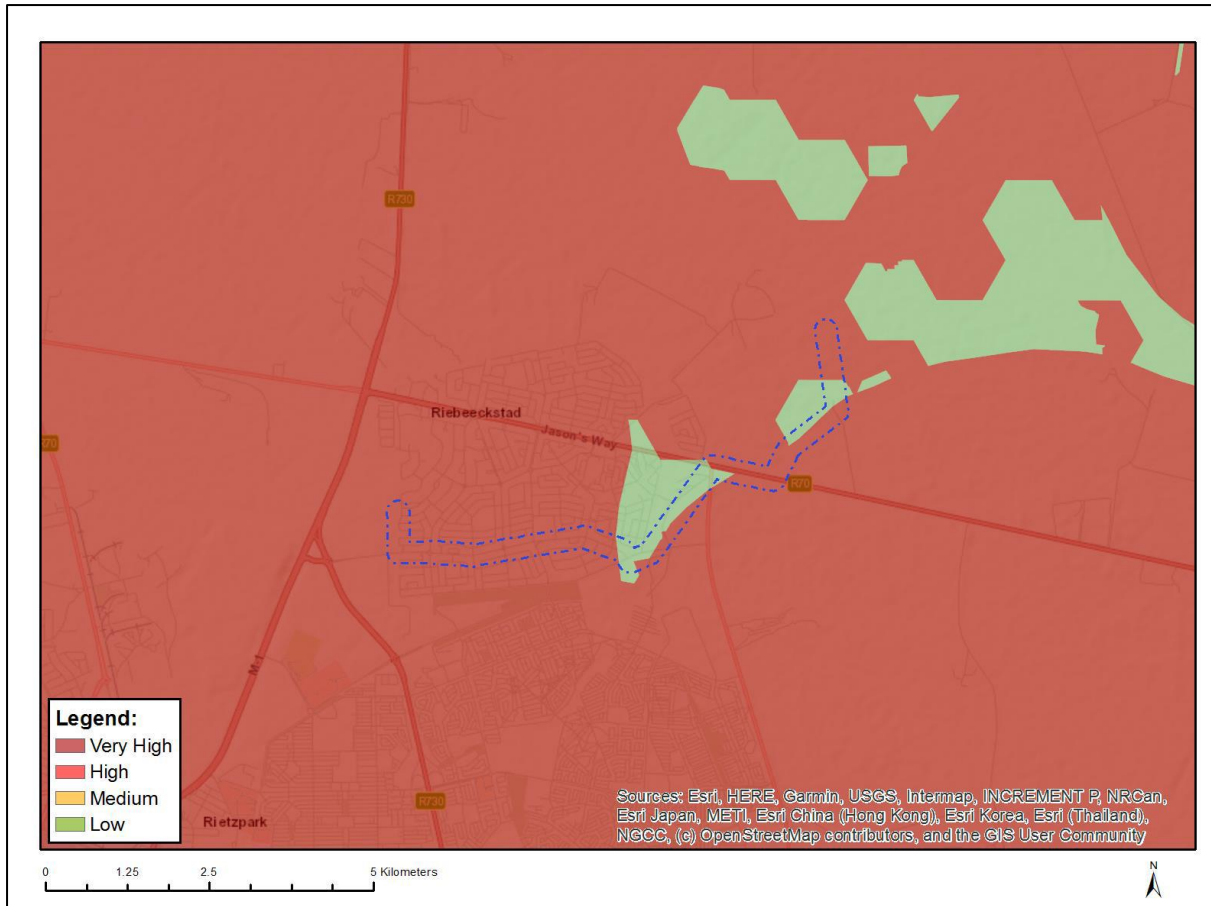


Figure 29 Terrestrial Biodiversity Theme sensitivity for the 44 kV Grid Connection Option 2.

44kV Grid Connection Option 1

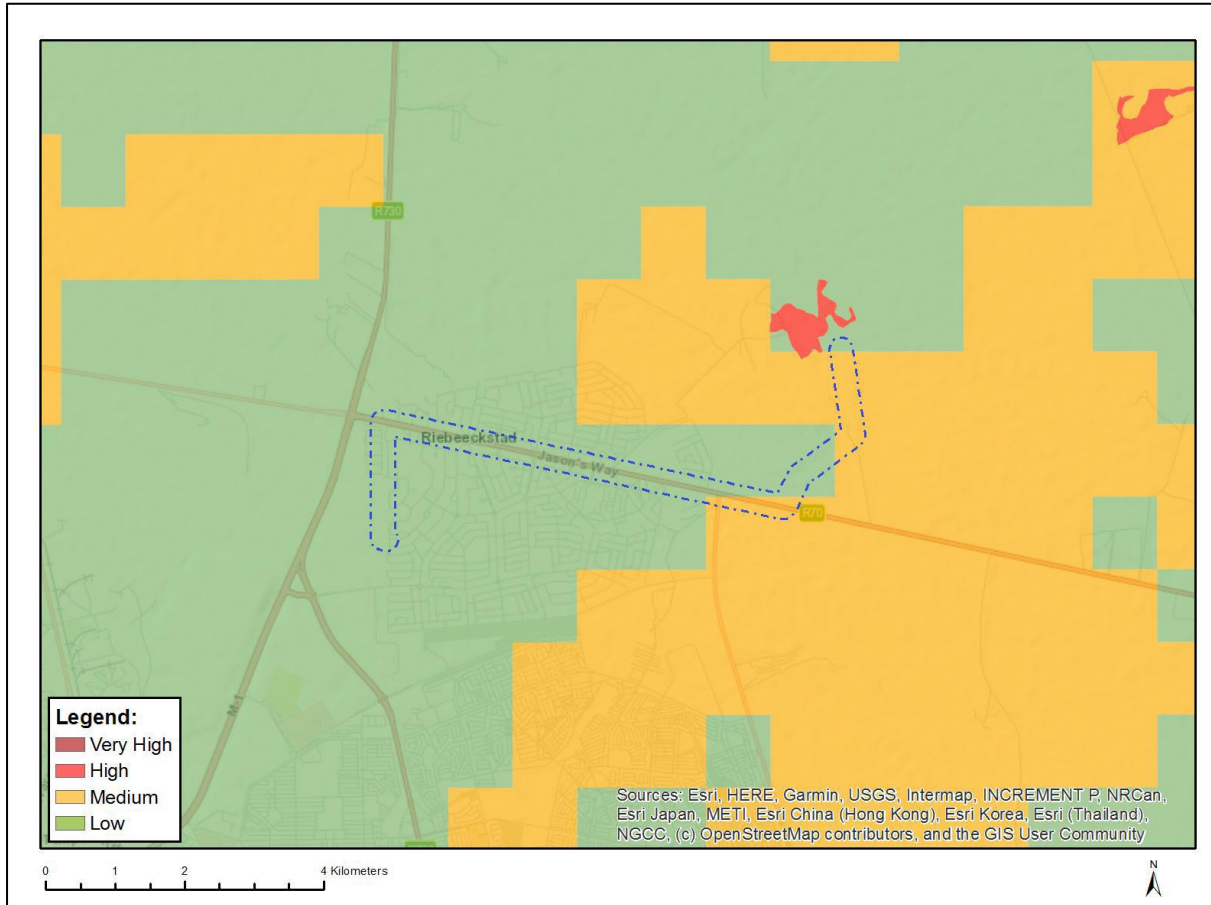


Figure 30 Animal Species Theme sensitivity for the 44 kV Grid Connection Option 1.

Table 5 Sensitivity of sensitivity features, as identified by the Screening Tool Report generated for the proposed 44 kV Grid Connection Option 1. Results from the desktop study was added for each sensitivity feature in additional columns

Species Name	Threatened Status	Habitat Preference
<i>Smaug giganteus</i>	Vulnerable	Smaug giganteus are diurnal (active during the day) lizards limited to the Highveld grassland. They are one of the few terrestrial cordylids that inhabit flat or sloping Highveld grasslands. They live in self-excavated burrows, although they can be opportunistic and inhabit empty burrows.
<i>Hydriectis maculicollis</i>	Vulnerable	Spotted-necked Otters are thought to inhabit freshwater habitats where water is not silt-laden, and is unpolluted, and rich in small fishes. However, anecdotal observations suggest they can

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		<p>occur, and can be common, in relatively polluted rivers, such as the Braamfonteinspruit, Jukskei River and Blesbokspruit, Gauteng Province and the Vaal River.</p>
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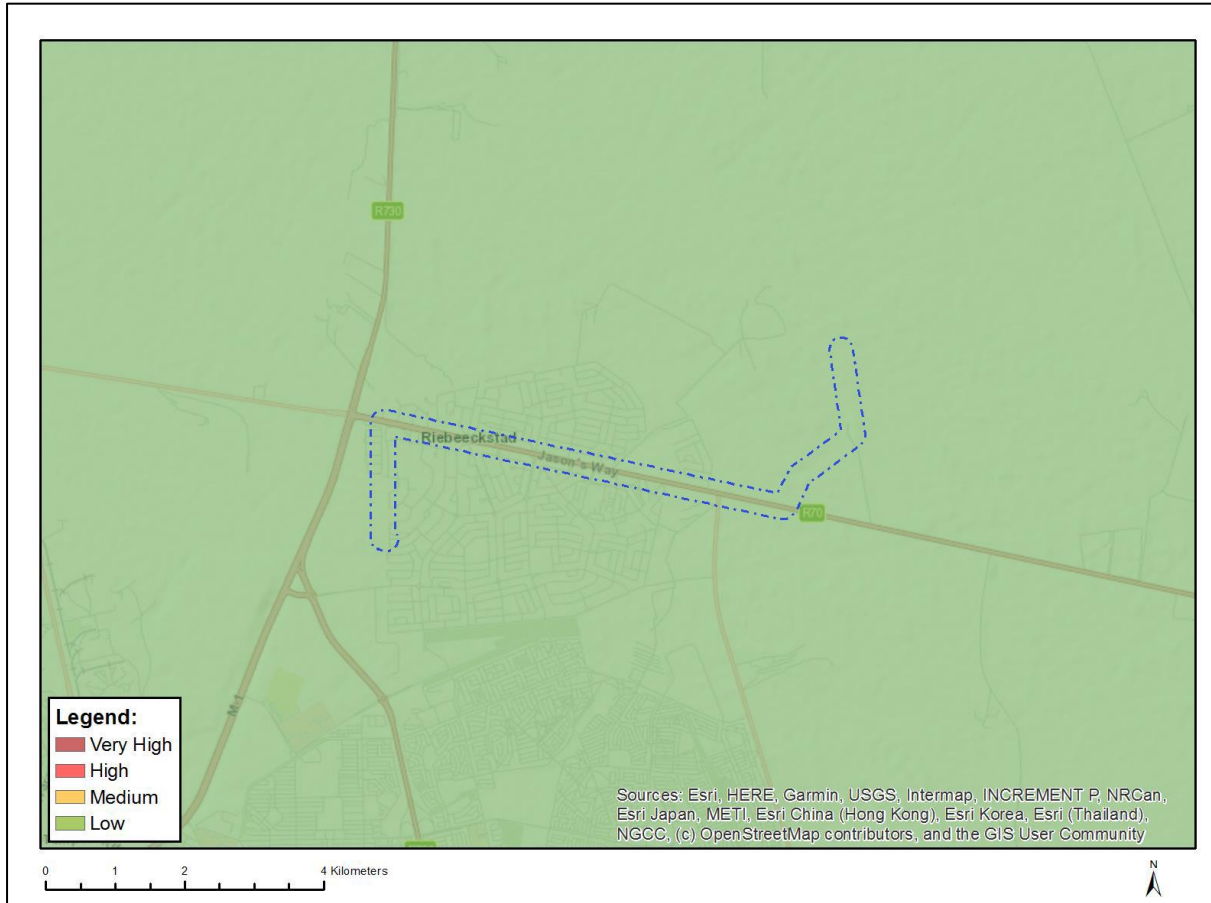


Figure 31 Plant Species Theme sensitivity for the 44 kV Grid Connection Option 1.

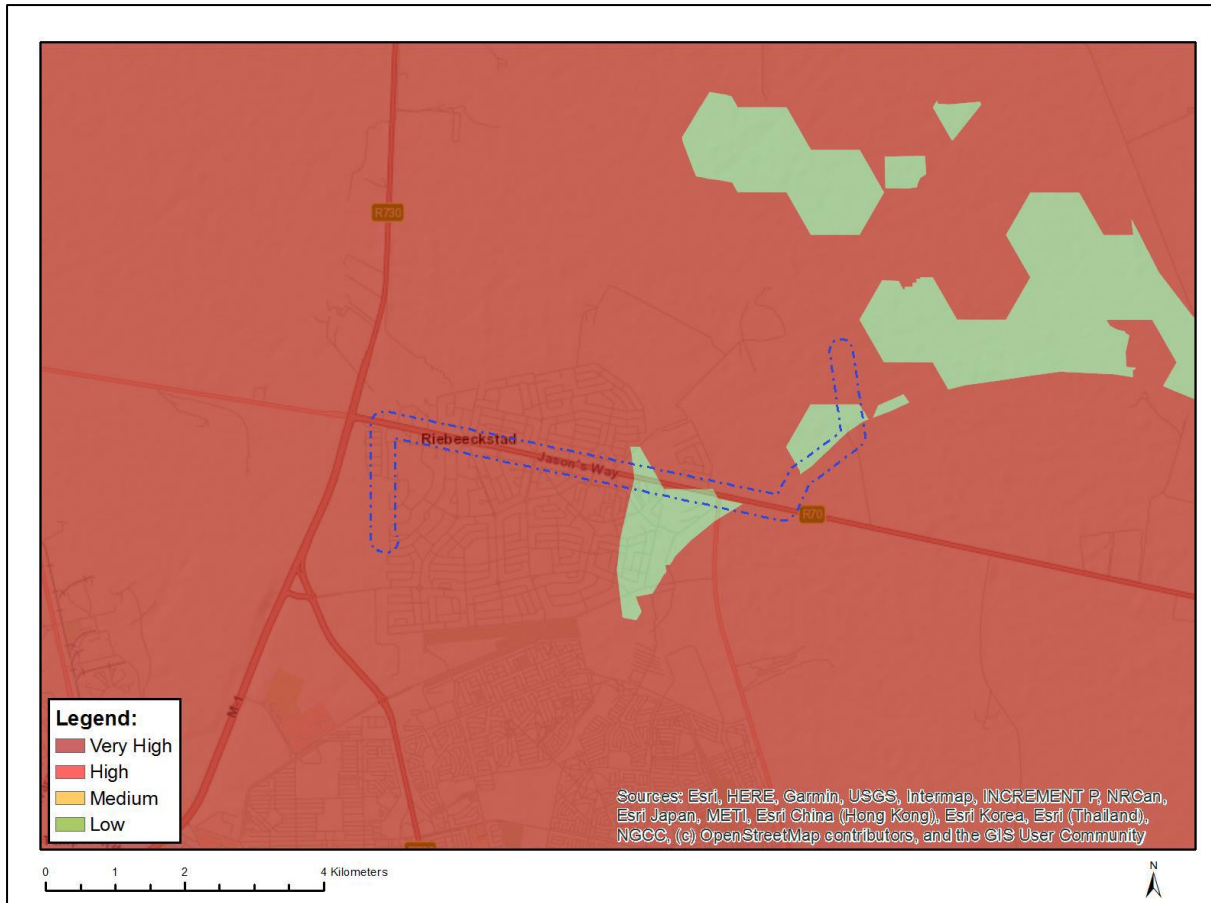


Figure 32 Terrestrial Biodiversity Theme sensitivity for the 44 kV Grid Connection Option 1.

Recommendations

Both sites are similar in faunal, botanical and terrestrial biodiversity sensitivity. The majority of each footprint is not likely to have a significant impact on the aforementioned themes given that the areas are classified as Degraded. However, it must be noted that Grid Option 2 is likely to traverse through a larger area (approximately 1-3 km) that is considered to be near natural or natural (although classified as Degraded) based on satellite imagery. Should this section of near natural or natural vegetation be confirmed via the site inspection, Grid Connection Option 1 will be the preferred alternative.

It must also be noted that the eastern section of both development footprints includes an area classified as a CBA 1 and an Endangered Vegetation Type (see Figure 25 and 26). Should the site verification confirm that this portion of the proposed footprints are natural and represent the indigenous vegetation type, the following is recommended:

- An Animal Species, Plant Species and Terrestrial Biodiversity Impact Assessment be conducted

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- All areas considered natural, and within a CBA, and classified as an Endangered ecosystem should be avoided as far as practically possible.
- Should the development impinge on the above-mentioned areas, stringent rehabilitation measures are expected.

4. CONCLUSION

Taking into consideration the sensitivity of the development footprint, sensitive features identified by the screening tool, the results from the baseline biodiversity and ecosystem of the site, which was verified by a site visit for Alternative one, it can be concluded that all the proposed development sites have some Ecological Sensitivity (Animal Species , Plant Species or Terrestrial Biodiversity) and will likely require further assessments to determine the full extent of the impact of proposed developments on the Environmental.