Appendix E

BIODIVERSITY ASSESSMENT

TERRESTRIAL BIODIVERSITY, PLANT SPECIES AND ANIMAL SPECIES SITE SENSITIVITY VERIFICATION REPORT - MERAFONG PV SOLAR PROJECT

1. INTRODUCTION

Hawkhead Consulting was appointed by WSP Group Africa (Pty) Ltd to conduct a Terrestrial Biodiversity (incl. Plant Species and Animal Species) Assessment for the proposed Merafong PV Solar Project. The proposed Project site is situated east of Carletonville and west of Westonaria within the Merafong City Local Municipality in the West Rand District Municipality of Gauteng, South Africa. The site central coordinates are 26°21'12.68"S; 27°30'48.98"E.

Pursuant to the DFFE Screening Tool Report for the proposed Project site (completed in March 2025), this document serves as the Terrestrial Biodiversity Site Sensitivity Verification Report (SSVR) for the proposed Project, and includes information relating to the Terrestrial Biodiversity, Plant Species and Animal Species themes (Note: a separate bird specialist study is being conducted for the proposed Project. Bird species were therefore not assessed as part of the sensitivity verification process detailed in this SSVR).

During the initial site sensitivity verification, the Terrestrial Biodiversity, Animal Species and Plant Species themes were assessed to be low sensitivity, and as such this updated SSVR has been compiled in line with the following norms/standards:

- Norm for exclusion of the development and expansion of solar photovoltaic facilities in areas of low or medium environmental sensitivity;
- Norm for exclusion of identified activities associated with the development and expansion of battery storage facilities in areas of low or medium environmental sensitivity; and
- Standard for the development and expansion of power lines and substations within identified geographical areas and the exclusion of this infrastructure from the requirements to obtain environmental authorisation.

Refer to Appendix A for the relevant Exclusions Norms Checklist associated with this report.

2. PROJECT DETAILS

The Solar PV facility has a total footprint of 217 ha and will have a total generating capacity of up to 140 megawatts (MW). The proposed solar PV Facility will consist of the following infrastructure:

- Solar Arrays, modules and mounting structures;
- Inverters and transformers;
- Battery Energy Storage System (BESS) (to be included as part of a separate norms registration process);
- Operation & Maintenance building including a gate house, ablution facilities, security building, control centre, offices, warehouses and workshops for storage and maintenance;
- Temporary and permanent laydown area;
- Laydown Area;
- Facility grid connection infrastructure including:
  - 33kV cabling to connect the solar arrays to the IPP Substation
  - 33kV/132kV IPP substation
  - Internal service and maintenance roads
  - Perimeter fencing

A Loop-in Loop-out (LILO) grid connection is proposed which will be subject to a separate registration process.

The following farm portions are affected by the proposed project

Farm Name	Portion Number	sg 21 code
Driefontein	355	T0IQ00000000035500008
Driefontein	355	T0IQ00000000035500015
Driefontein	355	T0IQ00000000035500013
Driefontein	355	T0IQ00000000035500010
Driefontein	355	T0IQ00000000035500011
Driefontein	355	T0IQ00000000035500012
Driefontein	355	T0IQ00000000035500004
Smallplaats	353	T0IQ00000000035300000
Vlakplaats	112	T0IQ00000000011200000

3. SITE SENSITIVITY VERIFICATION FIELD VISITS & LITERATURE REVIEW

To account for possible seasonal variations in flora and fauna diversity, two site sensitivity verification site visits of the proposed Project site were conducted by Hawkhead Consulting; a dry season site visit was conducted on the on 9th July 2024, and a wet season site visit was conducted on the 19th November 2024.

These were undertaken to collect seasonally representative flora and fauna field data, understand the ecological character of the site and surrounding landscape, and verify the site's ecological sensitivity with respects to the proposed Project and the Terrestrial Biodiversity, Animal Species and Plant Species themes.

Both site visits were conducted by Andrew Zinn. Andrew has over 15 years of experience conducting flora and fauna surveys and ecological assessments. He holds an M.Sc. in Resource Conservation Biology and is registered as a Professional Natural Scientist (*Pr.Sci.Nat.*) – Ecological Science, with the South African Council of Natural Scientific Professions (SACNASP). Refer to Appendix A for additional details of the specialist.

To support field observations, additional biodiversity literature and datasets were reviewed at a desktop level. These data further developed the understanding of the site's ecological character, history of disturbance, and landscape context. Key literature and datasets that were reviewed are listed below:

- To assess the site's regional biodiversity and conservation context, several literature and online sources were reviewed, including, with particular reference to the proposed Project site:
  - The South African National Biodiversity Institutes (SANBI) Final Vegetation Map of South Africa, Lesotho and Swaziland (SANBI, 2018) was consulted to identify the regional vegetation types relevant to the site, and Mucina and Rutherford (2011) was reviewed to obtain full descriptions of the relevant vegetation types;
  - The National List of Threatened Ecosystems (NEMBA Threatened Ecosystems, 2021) was consulted to determine the conservation status of relevant vegetation types;
  - Gauteng Conservation Plan (C-Plan) (3.3) (2011) was assessed to identify Critical Biodiversity Areas (CBA) and Ecological Support Areas (ESA) on-site and across the adjacent landscape;
  - The South African Protected Areas Database website (SAPAD, 2021) was reviewed to identify any protected areas (legally gazetted) and conservation areas in the landscape in which the study area is located;

- The National Protected Area Expansion Strategy (NPAES) (2018) was assessed to identify on-site Priority Focus Areas for protected area expansion;
- The Key Biodiversity Areas (KBA) database was also reviewed to determine the presence of any KBAs in, or in close proximity to, the proposed Project site;

- Lists of potential fauna species occurring on-site were compiled based on the historic distribution ranges presented in Stuart and Stuart (2007) for mammals, Bates *et al*., (2014) for reptiles, and Du Preez and Carruthers (2009) for amphibians;
- Additional fauna data, including lists of invertebrate species potentially occurring on-site, were sourced from the Virtual Museum database for the 2627AD and 2627BC QDS;
- Floristic data for the region encompassing the study area was obtained from the South African National Biodiversity Institute's (SANBI) online Botanical Database of Southern Africa (BODATSA). This was supplemented by an inventory of flora species of conservation concern (SCC) obtained from the GDARD[1] (Coursey of S. Veldsman); and
- The lists of flora and fauna were cross-referenced against relevant Red Lists and conservation legislation to identify threatened (Vulnerable, Endangered and Critically Endangered), Near Threatened, and Protected species that may be present on-site.

4. SUMMARY OF DFFE SCREENING TOOL AND OUTCOME OF SITE SENSITIVITY VERIFICATION

The table below provides information regarding the outcome of the DFFE Screening Tool sensitivity rating for the Terrestrial Biodiversity, Animal Species and Plant Species themes, and the outcome of the sensitivity verification process.

Table 1 Terrestrial Biodiversity, Animal Species and Plant Species theme sensitivities for the proposed Merafong Solar PV Project

ENVIRONMENTAL THEME	DFFE SCREENING TOOL SENSITVITY	APPLICABLE PROTOCOL	SPECIALIST SENSITVITY VERIFICATION
Terrestrial Biodiversity	Very High	Protocol for the specialist assessment and minimum report content requirements for environmental impacts on Terrestrial Biodiversity	The entire site has been modified by historic and/or current farming activities (cultivation). Accordingly, on-site CBA and ESA land have been incorrectly designated. Based on the verification field visit, the Terrestrial Biodiversity sensitivity rating for the site is Low.

[1] Gauteng Department of Agriculture and Rural Development

ENVIRONMENTAL THEME	DFFE SCREENING TOOL SENSITVITY	APPLICABLE PROTOCOL	SPECIALIST SENSITVITY VERIFICATION
Plant Species	Medium	Protocol for the specialist assessment and minimum report content requirements for environmental impacts on Plant Species	Outside of currently cultivated fields, on-site habitat is essentially characterised by old land secondary grassland with scattered woody species, and *Eucalyptus* dominated tree stands. No flora SCC were recorded on-site and none are expected to be present. Accordingly, the Plant Species sensitivity is rated Low.
Animal Species	Medium	Protocol for the specialist assessment and minimum report content requirements for environmental impacts on Animal Species	Considering the modified nature of the site, the site does not constitute functionally important fauna habitat. No fauna SCC were observed on-site, and it is considered unlikely that SCC are present. Accordingly, the Animal Species sensitivity is rated Low.

4.1. DFFE Screening Tool output

The Terrestrial Biodiversity Theme for the proposed Project site is rated 'Very High' sensitivity (Figure 1) due to the following features:

- Critical Biodiversity Area 1;
- Critical Biodiversity Area 2;
- Ecological Support Areas 1;
- Ecological Support Areas 2; and
- National Protected Area Expansion Strategy.

Figure 1 - Map of Terrestrial Biodiversity Sensitivity

The Plant Species Theme is rated 'Medium' sensitivity (Figure 2) due to the potential presence of the following features:

- *Khadia beswickii*;
- Sensitive species 1147; and
- Sensitive species 1248.

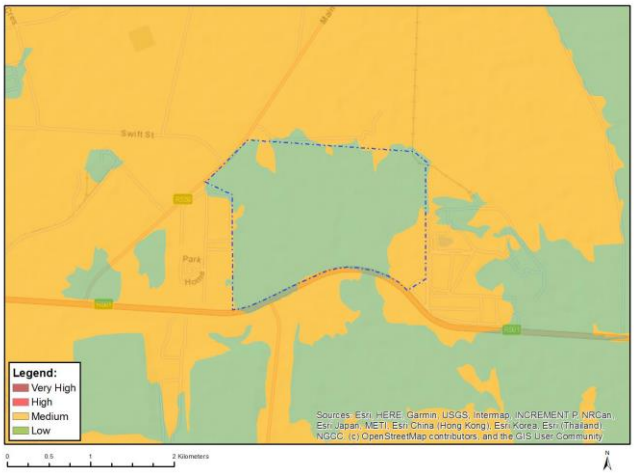

Figure 2- Map of Plant Species Sensitivity

The Animal Species Theme is rated 'Medium Sensitivity' (Figure 3) due to the following listed features:

- Two mammal species:
  - Spotted-necked Otter (*Hydrictis maculicollis*)
  - Maquassie Musk Shrew (*Crocidura maquassiensis*);
- Two bird species[2]:
  - White-bellied Bustard (*Eupodotis senegalensis*);
  - African Marsh Harrier (*Circus ranivorus*);
  - African Grass Owl (*Tyto capensis*);
- Three invertebrate species:
  - Highveld Nimble Blue (*Lepidochrysops praeterita*); and
  - Uvarov's Clonia (*Clonia uvarovi*).

[2] Bird species were assessed as part of a separate sensitivity verification process.

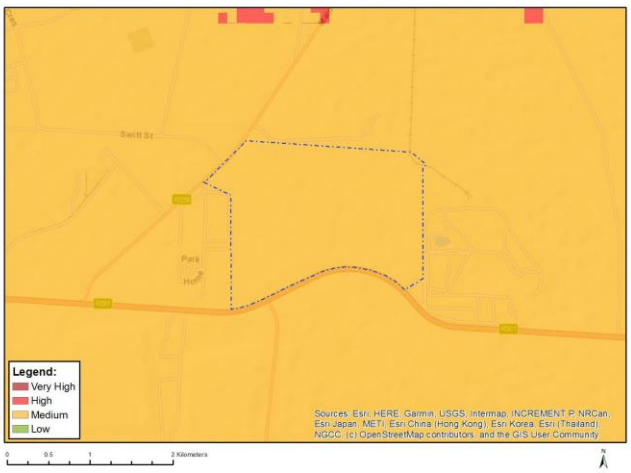

Figure 3- Map of Animal Species Sensitivity

5. FINDINGS OF THE SITE SENSITIVITY VERIFICATION FIELD VISIT

5.1. On-Site Habitat Characteristics

The entire proposed Project footprint is modified, and has been subject to anthropogenic disturbance, mostly in the form of historic and/or current dryland cultivation.

The northern portion of the site remains under active cultivation (maize production), with no indigenous vegetation present. The remainder of the site was cultivated in the past, and is now characterised by a secondary grassland community that is typical of old abandoned agricultural fields (i.e. old lands). These grasslands have hard, crusted and capped soils, low flora species richness, and are dominated by the tall thatching grass *Hyparrhenia hirta*. This species typically proliferates in abandoned cultivated fields that are depleted of nutrients. *Hyparrhenia hirta* grasslands tend to be very stable, with little shifts in structure and composition over the long-term.

Other common or abundant grasses recorded on-site include a range of species, such as *Andropogon schirensis*, *Aristida congesta* subsp*. congesta, Cynodon dactylon, Eragrostis chloromelas, Eragrostis curvula, Eragrostis gummiflua, Eragrostis trichophora, Heteropogon contortus*, *Pogonarthria squarrosa* and *Themeda triandra.* Common forbs and small woody shrubs recorded on-site include *inter alia, Anthospermum hispidulum, Elephantorrhiza elephantina, Eriosema cordatum, Falopia convolvulus, Felicia muricata, Helichrysum nudifolium* var. *nudifolium, Helichrysum rugulosum, Hermannia lancifolia, Hermannia transvaalensis, Indigofera comosa, Pseudopegolettia tenella* and *Seriphium plumosum.* In terms of larger woody vegetation in areas of secondary grassland, aggregations of alien *Prunus persica* trees were noted, as well as scattered indigenous *Vachellia karroo* trees/shrubs.

Linear, north-south aligned stands of alien *Eucalyptus* trees are prominent features on-site. The stand in the centre of the site is associated with a storm/process water drainage channel (sections of which, are concrete) that originates from the Driefontein Shaft and residential village, located approximately 2.7 km to the south of the proposed Project site. Several other woody species were also noted within the *Eucalyptus* stand including the indigenous *Vachellia karoo,* as well as other alien invasive taxa, such as *Acacia mearnsii, Acacia melanoxylon, Melia azedarach* and *Sesbania puniceus.*

Figure 4 to Figure 9 show representative photographs of on-site habitat taken during both the wet- and dry season site visits, with Figure 10 providing a habitat map with an overlay of proposed infrastructure. Refer to Appendix C for photographs and habitat descriptors documented at several reference points across the site during the dry season verification site visit. Also included, is a map showing the location of the reference points.

Figure 4: Cultivated field in the north of site. This transformed land is incorrectly designated a Critical Biodiversity Area (CBA) under the Gauteng Conservation Plan.

Figure 5: Hyparrhenia hirta dominated secondary grassland along the eastern boundary of the site.

Figure 6: Secondary grassland covers most of the site.

Figure 7: Small stand of alien Prunus persica trees in the centre of the site.

Figure 8: Eucalyptus stand, with alien Acacia mearnsii and Acacia melanoxylon trees also present.

Figure 9: Drainage channel running through the centre of the Eucalyptus stand.

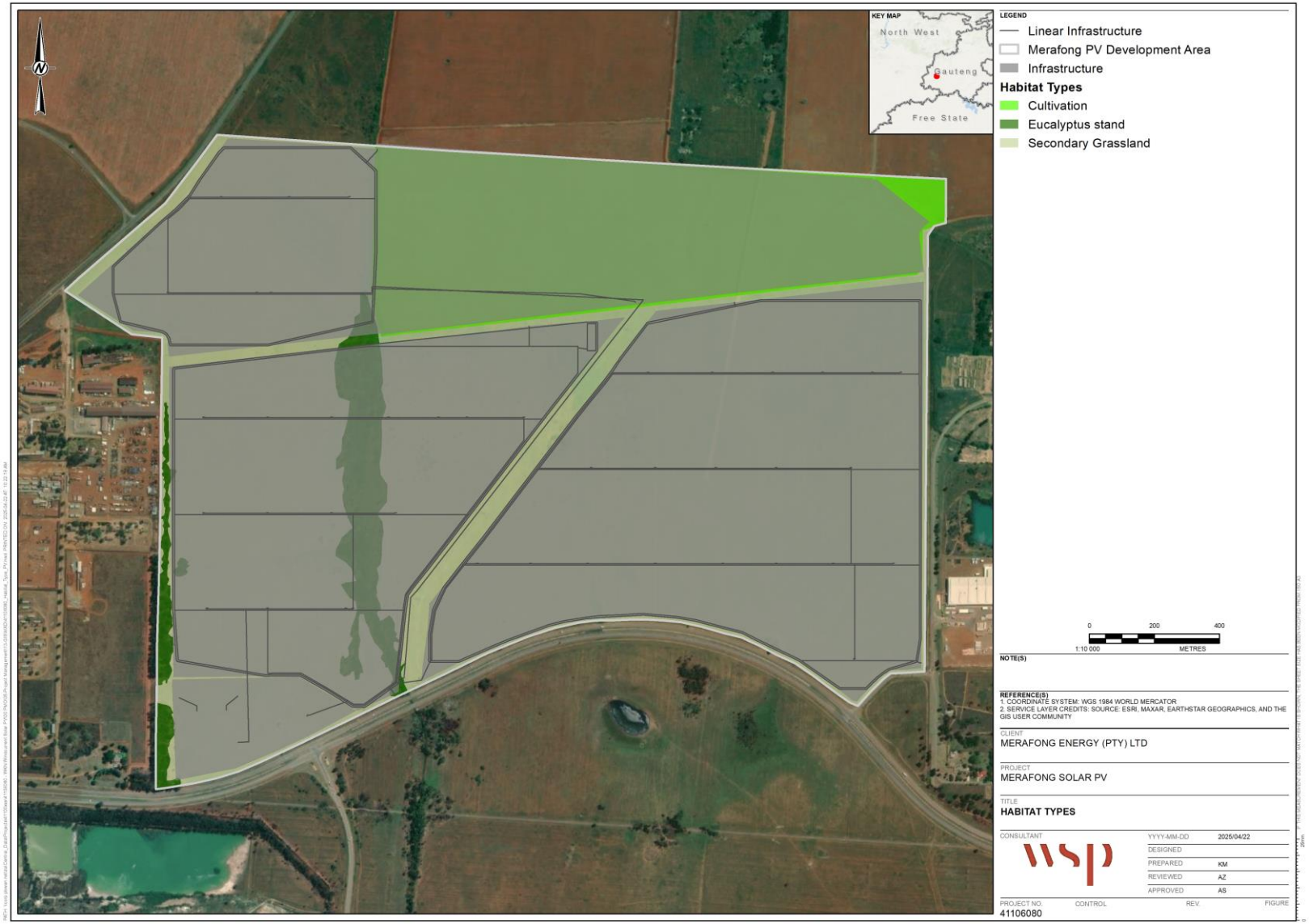

Figure 10: Habitats and the proposed infrastructure layout.

6. DISCUSSION ON THE TERRESTRIAL BIODIVERSITY, PLANT SPECIES AND ANIMAL SPECIES THEMES

6.1. Terrestrial Biodiversity Theme

According to the Gauteng Conservation Plan (C-Plan) 3.3 (2011) bands of land along the northern and eastern boundaries of the site are designated 'Ecological Support Areas (ESA)'. There is also a very small area designated 'Critical Biodiversity Area (CBA) - Important Area' in the north-east corner of the site, with 'primary vegetation' being the triggering criterion. The remainder of the study area is not classified under the Gauteng C-Plan. With reference to the National protected Area Expansion Strategy (2018), no designated Priority Focus Areas are present in the proposed Site, however, the land to the north of the site is mapped as a Priority Focus Area.

As described in Section 5.1, the findings of the verification field visit indicate that the entire site has been modified by historic farming activities, with the northern portion of the site still actively cultivated. The CBA and ESA designations for the site are therefore considered incorrect. The very small CBA patch in the north-east corner is entirely transformed, and comprises actively cultivated fields. The rest of the site, including the designated ESAs, were either cultivated in the past and now support a secondary vegetation community, or are also under active cultivation. It is also noted that a significant portion of the ESA corridor along the eastern boundary of the site is completely transformed and actually occupied by the Kwastina Corobrik Factory.

At a broader scale, the land to the north of the site is also mapped as CBA. This land however, mostly comprises active cultivated fields, while small patches of secondary grassland are also present. The designation of land to the north of the site as CBA is therefore also considered incorrect.

Pursuant to these findings, the DFFE Screening Tool's rating of 'Very High' sensitivity for the Terrestrial Biodiversity theme, is considered incorrect due to current and past levels of habitat disturbance and modification. The sensitivity rating for the Terrestrial Biodiversity theme is considered to be of 'Low' sensitivity.

6.2. Plant Species Theme

No Red List flora species were recorded on-site during the verification field visits, and considering the modified and secondary character of on-site vegetation, none are likely to be present, including those taxa highlighted by DFFE Screening Tool:

- *Khadia beswickii* favours open shallow soils, over rocks in grassland (Victor and Pfab, 2005). No suitable habitat is present on-site, and therefore it is unlikely' that *Khadia beswickii* is present;
- Sensitive species 1147 occurs in open undisturbed grasslands on dolomite or in black, sandy soils. No suitable habitat is present on-site, and therefore it is unlikely' that Sensitive species 1147 is present; and
- Sensitive species 1248 is found in open woodland and steep rocky hills in shady situations. No suitable habitat is present on-site, and therefore it is unlikely' that Sensitive species 1248 is present.

Habitat suitability assessments, based on field data collected on-site and a review of documented habitat preferences, also indicated that none of the seven flora SCC that are known from the region are likely to be present on-site – refer to Table 2. This is primarily predicated on the disturbed and secondary nature of on-site vegetation. The 'Medium' DFFE sensitivity rating for the Plant Species theme is therefore considered incorrect. The sensitivity rating for the Plant Species theme is considered to be of 'Low' sensitivity.

Table 2 Flora species of conservation concern potentially occurring on-site.

Family	Scientific Name	Regional Red List Status	Gauteng Status	Habitat Preferences	Probability of Occurrence
Asphodelaceae	*Kniphofia typhoides*	Near Threatened	Protected	*Kniphofia typhoides* occurs in the black clay soils of low-lying wetlands and seasonally wet habitats in Themeda triandra grasslands (von Staden and Victor, 2005)	Unlikely – no suitable habitat present.
Aizoaceae	*Khadia beswickii*	Vulnerable	-	Species has an EOO of only 475 km^2 and an AOO of 3-7 km^2. It is known from only ten locations, mostly across Gauteng Province, but also scattered sites in Mpumalanga. Favours open shallow soils, over rocks in grassland (Victor and Pfab, 2005).	Unlikely – no suitable habitat present.
Aizoaceae	*Lithops lesliei*	Vulnerable	Protected	This species has a widespread distribution, but is experiencing local losses due to urbanisation. This species favours rocky locations in arid grassland habitat (Mtshali, *et al*., 2023)	Unlikely – no suitable habitat present.
Crassulaceae	*Adromischus umbraticola* subsp. *umbraticola*	Near Threatened	-	Species has an EOO of 14 600 km^2 and is known from 14 locations. Grows in rock crevices on south-facing slope ridges. (Helme and Raimondo, 2006).	Unlikely – no suitable habitat present.

Family	Scientific Name	Regional Red List Status	Gauteng Status	Habitat Preferences	Probability of Occurrence
Hyacinthaceae	*Drimia sanguinea*	Near Threatened	-	This species favours open veld and scrubby woodland across northern South Africa (Willaims, *et al*., 2008).	Unlikely – no suitable habitat present.
-	Sensitive species 1147	Endangered		Occurs in six scattered subpopulations, with a total population size estimated at 230 mature individuals. Occurs in open grassland on dolomite or in black sandy soil.	Unlikely – no suitable habitat present.
-	Sensitive species 1248	Vulnerable	-	Found in open woodland and steep rocky hills in shady situations at low- and medium altitudes. No EOO for this species is listed, but its AOO is estimated at 30.70 km^2 (SANBI, 2020).	Unlikely – no suitable habitat present.

6.3. Animal Species Theme

No Red List fauna species were recorded on-site during the verification field visit. Considering the modified and secondary character of on-site vegetation, the site is not considered important fauna habitat. Habitat suitability assessments for the species highlighted by the DFFE Screening Tool's indicate that these taxa are 'unlikely' to be present:

- Spotted-necked Otter is restricted to areas with permanent, large open-water bodies (Ponsonby, *et al*., 2016). No suitable open-water bodies are present on-site for this species. It is therefore 'unlikely' that Spotted-necked Otter is present;
- Maquassie Musk Shrew favours moist grassland habitats in savanna and grassland ecosystems (Taylor *et al*., 2016). Limited moist grassland habitat is present on-site, and therefore it is 'unlikely' that the Maquassie Musk Shrew is present;
- *Lepidochrysops praeterita* inhabits rocky grassed south-facing slopes, with the host plant *Ocimum obovatum* present (Dobson, 2018). *Ocimum obovatum* was recorded on-site during the field visit, however, considering the overall disturbed and secondary nature of on-site vegetation, it is considered unlikely that the *Lepidochrysops praeterita* is present in the study area; and
- *Clonia uvarovi* favours tall woodland and savanna (Bazelet and Naskrecki, 2014). Habitat of this form is essentially limited to the alien *Eucalyptus* tree stand, and the small open stands of alien *Prunus persica* trees. Suitable tall indigenous woodland is therefore not present, and it is 'unlikely' that *Clonia uvarovi* occurs on-site.

Reviewed literature also indicates that up to 15 Red List mammal species and two herpetofauna taxa listed as Protected on the NEMBA ToPs List (2007) are known to occur in the broader region in which the site is located. These are listed in Table 3, along with their conservation status, and a 'probability of occurrence' based on habitat suitability assessments.

The 'Medium' DFFE sensitivity rating for the Animal Species theme is therefore considered incorrect. The sensitivity rating for the Animal Species theme is considered to be of 'Low' sensitivity.

Table 3 Fauna species of conservation concern potentially occurring on-site.

Family	Scientific Name	Common Name	Regional Red List Status	NEMBA ToPS List (2007)	Gauteng Status	Habitat Preferences	Probability of Occurrence
Mammals							
Bovidae	*Pelea capreolus*	Grey Rhebok	Near Threatened	-	Protected	Sourveld grassland and scrubland in hills and mountainous areas.	Unlikely – no suitable habitat
Bovidae	*Redunca fulvorufula fulvorufula*	Mountain Reedbuck	Endangered	-	Protected	Rolling grassy hillsides and mountain slopes.	Unlikely – no suitable habitat
Canidae	*Vulpes chama*	Cape Fox	Least Concern	Protected	-	Range of habitats, including grassland and arid savanna.	Unlikely – limited suitable habitat present
Chrysochloridae	*Amblysomus septentrionalis*	Highveld Golden Mole	Near Threatened	-	-	Sandy soils in undisturbed grassland areas.	Unlikely – no suitable habitat
Chrysochloridae	*Chrysospalax villosus*	Rough-haired Golden Mole	Vulnerable	Critically Endangered	-	Sandy soils in undisturbed grassland areas.	Unlikely – no suitable habitat
Erinaceidae	*Atelerix frontalis*	South African Hedgehog	Near Threatened	Protected	Protected	Range of habitats, including undisturbed grassland and savanna.	Unlikely – limited suitable habitat
Felidae	*Felis nigripes*	Black-footed Cat	Vulnerable	Protected	-	Open, short grass areas in savanna and grassland habitats.	Unlikely – limited suitable habitat
Felidae	*Leptailurus serval*	Serval	Near Threatened	Protected	-	Wetland, tall grassland and well-watered savanna habitats.	Unlikely – limited suitable habitat
Felidae	*Acinonyx jubatus*	Cheetah	Vulnerable	-	-	Occurs in a wide-range of habitats including savanna, grassland, thicket and karoo shrublands.	Unlikely – no suitable habitat & sensitive to disturbance
Felidae	*Panthera pardus*	Leopard	Vulnerable	Vulnerable	-	Wide range of habitats, including grassland and savanna.	Unlikely – no suitable habitat & sensitive to disturbance
Hipposideridae	*Cloeotis percivali*	Short-eared Trident Bat	Endangered	-	-	Savanna and woodland habitats, with caves or mine adits present.	Unlikely – no suitable habitat

Family	Scientific Name	Common Name	Regional Red List Status	NEMBA ToPS List (2007)	Gauteng Status	Habitat Preferences	Probability of Occurrence
Hyaenidae	*Parahyaena brunnea*	Brown Hyaena	Near Threatened	Protected	Protected	Savanna and grassland habitats.	Unlikely - sensitive to disturbance
Muridae	*Dasymys robertsii*	Robert's Marsh Rat	Vulnerable	-	-	Moist grassland and wetland habitats.	Unlikely – no suitable habitat
Mustelidae	*Aonyx capensis*	Cape Clawless Otter	Near Threatened	Protected	-	Riparian habitats, with permanent water.	Unlikely – no suitable habitat
Mustelidae	*Hydrictis maculicollis*	Spotted-necked Otter	Vulnerable	Protected	-	Riparian habitats, favouring large, open water bodies.	Unlikely – no suitable habitat
Nesomyidae	*Mystromys albicaudatus*	White-tailed Rat	Vulnerable	-	-	Undisturbed grassland habitats, as well as succulent karoo and fynbos.	Unlikely – no suitable habitat
Soricidae	*Crocidura maquassiensis*	Maquassie Musk Shrew	Vulnerable	-	-	Moist grassland habitats in savanna and grassland ecosystems.	Unlikely – no suitable habitat
Soricidae	*Crocidura mariquensis*	Swamp Musk Shrew	Near Threatened	-	-	Reedbeds, wetlands and thick moist grassland in riverine habitats.	Unlikely – no suitable habitat
Herpetofauna							
Pythonidae	*Python natalensis*	South African Python	Least Concern	Protected	-	Occurs in a wide variety of habitats but generally favours riverine and rocky areas.	Unlikely – no suitable habitat
Pyxicephalidae	*Pyxicephalus adspersus*	Giant Bullfrog	Least Concern	Protected	Protected	Seasonally shallow pans, wetland and rained-filled depressions in savanna and grassland ecosystems.	Unlikely – no suitable habitat
*Habitat preferences as per Stuart and Stuart (2007) and Child *et al.,* (2016) for mammals, and Bates, *et al*., (2014) and Du Preez and Carruthers (2009) for herpetofauna.							

7. ADDITIONAL DISCUSSION

7.1. Ecological Corridors

The proposed Project site is surrounded by transformed (i.e., developed) or modified land. The south of the Project site is bordered by the R501 tarred provincial road, while land to the east and west is characterised by existing industrial operations (*viz*. Kwastina Corobrik Factory and Murray and Roberts Cementation) and the R 559 tarred provincial road, which is a major transport route connecting Johannesburg and Carletonville.

The Kwastina Corobrik Factory and Murray and Roberts Cementation industrial operations are enclosed by security fencing, and characterised by various forms of built infrastructure. Land to the north of the site boundary is under cultivation, and is regularly disturbed through ploughing, seeding and harvesting, and is dominated by commercial crop species (e.g., maize).

The proposed Project site is therefore surrounded by either transformed or highly modified land. It is thus not considered a functionally important component of local landscape connectivity or an ecological corridor. The proposed development of the Project site is therefore considered unlikely to cause a significant reduction in landscape connectivity.

7.2. Development Adjustment Buffer

With respects to identifying buffers to allow for the adjustment of the proposed Project layout, it is noted that land to the immediate south, east and west of the proposed Project site is already developed or partly developed (refer to Section 7.1), and as such offers only limited scope for adjustments to the infrastructure layout.

Land to the north of the proposed Project site however, is undeveloped and is currently characterised by cultivated fields, with small patches of secondary grassland. This land has similarly low sensitivity with respects to the Terrestrial Biodiversity, Animal Species and Plant Species themes, and any adjustments to the proposed Project layout could potentially be contemplated within this buffer area (shown in yellow in Figure 11).

Figure 11: The yellow highlighted buffer area to the north of the proposed Project site (outlined white) is characterised by cultivated fields, with small patches of secondary grassland.

7.3. Cumulative Impacts

Large portions of the surrounding landscape are fragmented and modified, by *inter alia*, farming (cultivation), roads, mining and urbanisation. The loss of the secondary habitat within the proposed Project site as a result of proposed

development activities, coupled with ongoing land uses changes across the broader landscape, may have cumulative negative impacts on local terrestrial biodiversity, flora and fauna species that are greater in extent than that of any one project. Potential cumulative impacts that are typically associated with infrastructure development include:

- Habitat loss, disturbance and fragmentation;
- Secondary forms of disturbance, such as soil erosion, alien invasive species establishment, and frequent accidental wildfires;
- Death, injury and disturbance of fauna from, *inter alia*, vehicle collisions, snaring/hunting, and sensory disturbances (e.g., noise and dust).

8. MANAGEMENT MEASURES

The proposed Project's contribution to cumulative impacts can be effectively minimised by implementing several standard measures aimed at responsible environmental management:

- Restricting all construction related disturbances to the minimum area required for safe implementation;
- Actively controlling alien invasive flora species;
- Stabilising and rehabilitating any sites where construction disturbances have occurred, and ensuring that correct storm water infrastructure is in place across the proposed facility;
- Measures to limit death, injury and disturbance of fauna include:
  - Retaining an Environmental Control Officer (ECO) on-site during construction to manage any fauna-human interactions, and train on-site construction workers/contractors on the correct and responsible treatment of wildlife;
  - Enforcing on-site speed limits for all construction and maintenance vehicles;
  - Prohibiting hunting and snaring of fauna by on-site workers; and
  - Implementing noise suppression (fit mufflers and silencers to noisy equipment) and dust suppression (water spraying etc.) on-site, as required.

9. CONCLUDING STATEMENT

The verification field visits indicated that the entire proposed Project footprint is modified, and has been subject to anthropogenic disturbances, mostly in the form of historic- and current dryland cultivation. On-site habitat is mostly characterised by *Hyparrhenia hirta* secondary grassland (old lands). The northern portion of the site remains under active cultivation (maize production), with no indigenous vegetation present. Linear stands of alien *Eucalyptus* trees are also present. All on-site and surrounding habitat is therefore considered modified. The sensitivity rating for the Terrestrial Biodiversity theme is therefore considered to be Low.

No Red List flora were recorded on-site during the verification field visit and considering the modified and secondary character of on-site vegetation, no Red List flora are likely to be present. Similarly, no Red List fauna species were recorded on-site during the verification field visit, and habitat suitability assessments indicate that no Red List species are likely to be present. The sensitivity ratings for both the Plant Species and Animal Species theme are therefore also considered to be Low.

Negative ecological impacts may arise as a result of the development of the proposed Project activities. These, however, can be effectively mitigated through the application of several standard environmental management measures, as outlined in this report.

This site sensitivity verification was undertaken by *Andrew Zinn* from *Hawkhead Consulting*

Andrew Zinn

REFERENCES

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APPENDIX A: MERAFONG SOLAR PV FACILITY – EXCLUSION NORMS CHECKLIST

No	Requirement	Comment/s
4.1	Where possible, land which has already been modified should be considered for the location of the proposed facility and the consideration of such land for the location of the proposed facility must be discussed in the site sensitivity verification report.	Refer to Section 4.1: On Site Habitat Characteristics The entire proposed Project site has been modified in the past.
4.2	It is advised that a buffer is identified around the footprint to allow for slight adjustments without the need to resubmit the request for registration contemplated in this Norm,5 which buffer— 4.2.1 must be clearly indicated; 4.2.2 must envelope the footprint; and 4.2.3 must be subjected to the site sensitivity verification requirements of which the findings must confirm that it is in an area of low or medium environmental sensitivity.	Refer to Section 6.2: Development Buffer
4.3	A proponent must ensure that a site sensitivity verification inspection is undertaken for the environmental themes contemplated in paragraph 2.1.2 to confirm whether or not the environmental sensitivity of the footprint and corridor is as identified by the screening tool.	Refer to Section 2: Site Sensitivity Verification Field Visits and Literature Review
4.4	A “very high” or “high” environmental sensitivity rating may be disputed by the specialist, provided that evidence and motivation to substantiate such a change of environmental sensitivity is provided.	Refer to: Section 3: Summary of DFFE Screening Tool and outcome of Site Sensitivity Verification Section 4.1: On Site Habitat Characteristics Section 5: Discussion on Terrestrial Biodiversity, Plant Species and Animal Species Themes.
4.5	The site sensitivity verification must be undertaken-	As per below:
4.5.1	for the environmental themes contemplated in paragraph 2.1.2;	Refer to: Section 3: Summary of DFFE Screening Tool and outcome of Site Sensitivity Verification Section 4.1: On Site Habitat Characteristics Section 5: Discussion on Terrestrial Biodiversity, Plant Species and Animal Species Themes.
4.5.2	for the footprint as well as the proposed corridor for the linear infrastructure;	Refer to: Section 4.1: On Site Habitat Characteristics Appendix C: Reference Point Photographs and Map

No	Requirement	Comment/s
4.5.3	by specialists, registered in the field for which they are undertaking the site sensitivity verification and where relevant, with demonstrated experience in the taxonomic group of the species being considered;	Refer to: Section 2: Site Sensitivity Verification Field Visits and Literature Review Appendix B: Details of Expertise of Specialist
4.5.4	within the season which would be most relevant to identify the specific species or vegetation of interest; and	Both dry- and wet season field visits were conducted to verify site sensitivity. Refer to Section 2: Site Sensitivity Verification Field Visits and Literature Review
4.5.5	for a period of time as necessitated by the sensitivity of the proposed site and size of the proposed facility.	Both dry- and wet season field visits were conducted to verify site sensitivity. Refer to Section 2: Site Sensitivity Verification Field Visits and Literature Review
4.6	The site sensitivity verification inspection must be a physical inspection,6 which must, where relevant, be supplemented by utilising any desk top information available, including any fine scale data available from the provincial department responsible for the environment, provincial conservation authorities, iNaturalist records or the relevant municipality, where available.	Refer to Section 2: Site Sensitivity Verification Field Visits and Literature Review
4.7	Where additional information identified in paragraph 4.6 has been used in the verification process, this information must be identified and referenced in the site sensitivity verification report.	Refer to Section 2: Site Sensitivity Verification Field Visits and Literature Review
4.8	For the agriculture theme, the site sensitivity verification report must confirm that the “allowable development limits” set for solar photovoltaic technology on agricultural land in the Agricultural Specialist Assessment Protocol, are not exceeded.	N/A
4.9	For the plant and animal species themes, the relevant specialist must confirm the presence, likely presence, or absence of a species of conservation concern within the footprint and corridor identified as “medium” sensitivity by the screening tool.	Refer to: Section 5.1. Plant Species Theme Section 5.3 Animal Species Theme
4.10	Should a species of conservation concern be found or have been confirmed to be likely present on the footprint, this exclusion does not apply and an application for an environmental authorisation must be submitted.	Refer to: Section 5.1. Plant Species Theme Section 5.3 Animal Species Theme
4.11	Should a species of conservation concern be found or have been confirmed to be likely present in the corridor, this exclusion applies under the conditions contemplated in paragraph 2.2.	Refer to: Section 5.1: Plant Species Theme Section 5.3: Animal Species Theme
4.12	The relevant specialists must consider the cumulative effects for the themes identified in paragraph 2.1.2 and provide a discussion on possible cumulative impacts, the ability to mitigate such impacts and a statement of environmental acceptability of any cumulative impacts after mitigation in any report produced.	Refer to Section 6.3: Cumulative Impacts

No	Requirement	Comment/s
4.13	Should the cumulative impact not be acceptable after mitigation this exclusion does not apply and an application for an environmental authorisation must be submitted.	Refer to Section 6.3: Cumulative Impacts
4.14	The relevant specialists must consider the presence and preservation of ecological corridors and discuss the possible presence and preservation of such ecological corridors.	Refer to Section 6.1: Ecological Corridors
4.15	The outcome of the relevant site sensitivity verification must be recorded by the specialist in the form of a specialist report, and collated into a final site sensitivity verification report that confirms or disputes the environmental sensitivity, as identified by the screening tool for each environmental theme identified in paragraph 2.1.2	This document presents the Site Sensitivity Verification Report (SVVR) for the Terrestrial Biodiversity, Animal Species and Plant Species Themes.
4.16	The specialist report must be appended to the final site sensitivity verification report and must be signed by the relevant specialist.	EAP to append.
4.17	The final specialist report must include verifiable evidence from the specialist's site inspection, including as a minimum: 4.17.1 a map showing the specialist's GPS track in relation to the proposed footprint; and 4.17.2 at least 4 spatially representative sample site descriptions from across the inspected area that include as a minimum precise geographical coordinates of the sample site, one in situ photograph of the sample site and a habitat description of the sample site; and 4.17.3 a map identifying any areas within the corridor in which development is not permitted due to environmental sensitivity, where relevant.	Refer to Appendix C: Reference Points Photographs, Map and GPS Tracks
4.18	A final site sensitivity verification report must be prepared by a registered environmental assessment practitioner or a registered environmental scientist and signed off by the relevant specialists, all of whom must meet the requirement of regulation 13(1) of the EIA Regulations, read in the context of this Norm.	EAP to prepare.

APPENDIX B: DETAILS OF THE EXPERTISE OF THE SPECIALIST

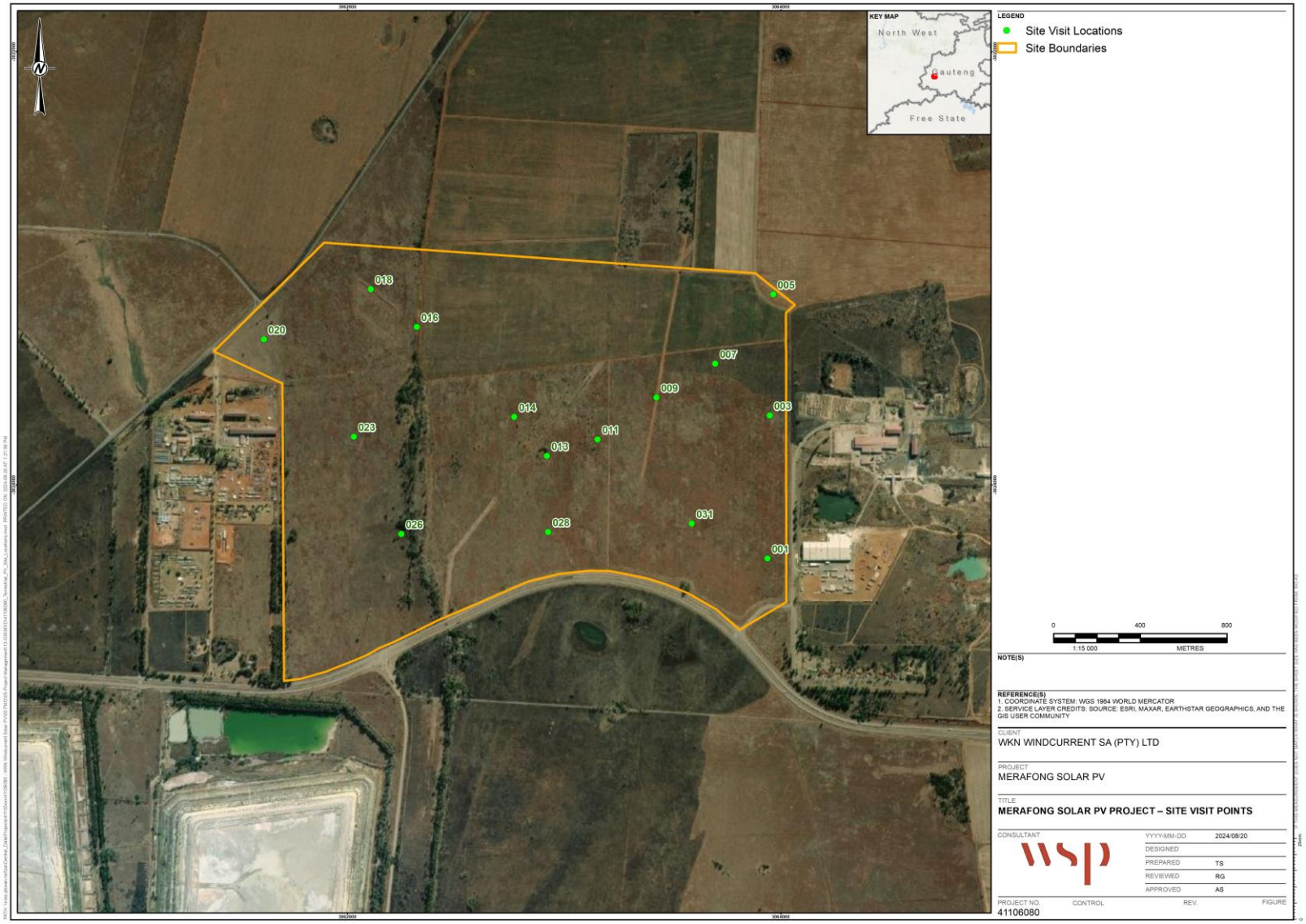
Specialist Information	
Name	Andrew D. Zinn Pr.Sci.Nat. - Ecological Science (400687/15)
Designation	Report Author – Terrestrial Ecologist
Cell Phone Number	+27 83 361 0373
Email Address	andrew@hawkhead.co.za
Qualifications	M.Sc. Resource Conservation Biology B.Sc. Hons. Ecology and Conservation Biology B.Sc. Zoology and Grassland Science
Affiliations	Member of the South African of Natural Scientific Professions Member of the South African of Wildlife Management Association Member of the South African of Association of Botanists
Summary of Past Experience	Andrew Zinn is a terrestrial ecologist with Hawkhead Consulting. In this role, he conducts varied specialist ecology studies, including flora and fauna surveys, for baseline ecological assessments and ecological impact assessments. He has over 15 years of experience working in the fields of ecology and conservation research, and is registered as a Professional Natural Scientist (*Pr.Sci.Nat.*) – Ecological Science, with the South African Council of Natural Scientific Professions (SACNASP). Andrew has worked on projects in several African countries including Botswana, Democratic Republic of Congo, Ethiopia, Ghana, Mozambique, South Africa, Tanzania and Zambia.

APPENDIX C: REFERENCE POINT PHOTOGRAPHS, MAP AND GPS TRACKS FROM SITE VISIT

Ref. point No.	Co-ordinates	Habitat Descriptor	Photograph
001	S26 21.391 E27 31.430	*Hyparrhenia hirta* secondary grassland. This area is incorrectly designated an Ecological support Area (ESA) under the under the Gauteng Conservation Plan.	
003	S26 21.070 E27 31.435	*Hyparrhenia hirta* secondary grassland. This area is incorrectly designated an ESA under the under the Gauteng Conservation Plan.	
005	S26 20.798 E27 31.444	Cultivated field. This area is transformed, and incorrectly designated a Critical Biodiversity Area (CBA) under the Gauteng Conservation Plan.	
007	S26 20.954 E27 31.300	*Hyparrhenia hirta* secondary grassland.	
009	S26 21.030 E27 31.154	Cleared gravel road through the centre of the study area.	

Ref. point No.	Co-ordinates	Habitat Descriptor	Photograph
011	S26 21.124 E27 31.007	Small stand of *alien Prunus persica* trees.	
013	S26 21.161 E27 30.881	Sink hole, flanked by alien *Prunus persica* trees.	
014	S26 21.074 E27 30.800	*Hyparrhenia hirta* secondary grassland.	
016	S26 20.872 E27 30.557	Cultivated field (left), *Eucalyptus* windrow (centre) and *Hyparrhenia hirta* secondary grassland (right).	
018	S26 20.787 E27 30.443	Old dam/water impoundment, flanked by *Hyparrhenia hirta* secondary grassland.	
020	S26 20.787 E27 30.443	Short, mown lawn, dominated by the lawn grass *Cynodon dactylon,* that is located adjacent to the Murray and Roberts Cementation facility.	

Ref. point No.	Co-ordinates	Habitat Descriptor	Photograph
023	S26 21.118 E27 30.400	*Hyparrhenia hirta* secondary grassland in foreground and, in background, *Eucalyptus* tree stand along an artificial drainage channel that conveys surface water from Driefontein Mine annd village.	
026	S26 21.336 E27 30.519	*Eucalyptus* tree stand, with alien *Acacia mearnsii* and *Acacia melanoxylon* trees also present.	
028	S26 21.332 E27 30.884	*Hyparrhenia hirta* secondary grassland	
031	S26 21.313 E27 31.241	*Hyparrhenia hirta* secondary grassland	



Appendix C Figure 1: Map showing the location where reference point photographs and habitat description notes were taken.

Appendix C Figure 2: GPS tracks from the dry season survey (9th July 2024)

Appendix C Figure 3: GPS tracks from the wet season survey (19th November 2024)

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