



Khangela Emoyeni WEF - Avifaunal Pre-Construction Walkdown Report

Northern and, Western Cape Provinces

November 2022

CLIENT



Prepared by:

The Biodiversity Company

Cell: +27 81 319 1225

info@thebiodiversitycompany.com

www.thebiodiversitycompany.com






Report Name	Khangela Emoyeni WEF – Avifaunal Walkdown Report
Reference	Khangela WEF
Submitted to	
Report Writer	<p>Leigh-Ann de Wet </p> <p>Ms Leigh-Ann de Wet is Pr. Nat. Sci. registered (400233/12) and has extensive experience in assessing terrestrial biodiversity. She obtained her MSc in Botany from Rhodes. She has over 12 years' experience conducting terrestrial biodiversity assessments (including both flora and fauna as well as specialist avifauna) throughout Southern Africa, West and Central Africa and Madagascar. She has experience in all 9 provinces of South Africa with a particular interest in KZN flora, and avifauna.</p>
Writer / Reviewer	<p>Andrew Husted </p> <p>Andrew Husted is Pr Sci Nat registered (400213/11) in the following fields of practice: Ecological Science, Environmental Science and Aquatic Science. Andrew is an Aquatic, Wetland and Biodiversity Specialist with more than 12 years' experience in the environmental consulting field. Andrew has completed numerous wetland training courses, and is an accredited wetland practitioner, recognised by the DWS, and also the Mondi Wetlands programme as a competent wetland consultant.</p>
Declaration	<p>The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2017. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.</p>

Table of Contents

1	Introduction	4
1.1	Background	5
1.2	Terms of Reference	7
1.3	Assumptions and Limitations	8
2	Approach	8
2.1	Spatial Data	8
2.2	Ecological Information	9
2.2.1	Avifauna	9
3	Walkdown Results	9
3.1	Observations	19
3.2	Recommendations	20
3.3	Conclusion	20
4	References	21

List of Tables

Table 3-1	Summary Site specific comments and recommendations on the selected turbines for Khangela Emoyeni WEF	13
-----------	--	----

List of Figures

Figure 3-1	The Wind turbines as well as the associated roads for the Khangela WEF.	10
Figure 3-2	The Kangel WEF and Avifauna No-Go areas along with points of SCC avifauna spotted during the walkdown.	11
Figure 3-3	The Kangel WEF and Avifauna VERA sensitivities.	12
Figure 3-5	The Kangel WEF turbine 9 with laydown/hardstand located partially in an area of high sensitivity and the turbine point located outside of high sensitivity areas according to the VERA model	15
Figure 3-6	The Kangel WEF turbine 10 laydown/hardstand located partially in a No-Go area for Avifauna with the turbine located outside of the Avifauna No-Go area	16
Figure 3-7	The Kangel WEF turbines 23 and 24 with laydown/hardstand located partially in a No-Go area for Avifauna and turbines located outside Avifauna No-Go areas.....	17
Figure 3-8	The Kangel WEF turbine 32 with laydown/hardstand located partially in a No-Go area for Avifauna and the turbine located outside the Avifauna No-Go area	18
Figure 3-9	Species of Conservation Concern recorded during the Avifaunal Walkdown. A: Karoo Korhaan, B: Verreaux's Eagle, C: Ludwig's Bustard, D: Blue Crane, E: Kori Bustard, F: Martial Eagle (juvenile) and G: Lanner Falcon.....	19

1 Introduction

The Biodiversity Company was commissioned to undertake the Avifaunal Walkdown for the Khangela Emoyeni Wind Energy Facility (WEF). The Khangela Emoyeni WEF is part of the Greater Umsinde Emoyeni WEF (previously Phase 2), which is expected to have a maximum generating capacity of 147 MW. In total, the WEF is expected to have 33 wind turbines. The turbines will be a three-bladed horizontal-axis design with a hub height of up to 160 m and a rotor diameter of up to 180 m. The electricity from the turbines will be transferred via a 33 kV electrical network (underground where feasible) to a 33 / 132 kV onsite substation. The on-site substation will house electrical infrastructure such as transformers and switch gear to enable the energy to be transferred into the existing national grid. A hardstanding area of up to 55 m by 35 m as well as temporary turbine laydown area will be established adjacent to each turbine location. This will be used to provide a platform for cranes to operate during construction (and unscheduled maintenance), as well as a clear area to lay out turbine components prior to erection. Up to three additional temporary laydown areas of up to 150 m by 60 m in size will be required for construction site camps, equipment and component storage during construction. These areas will be levelled and compacted and used for component storage etc.

The project location is situated 20 km North-East of the town Murraysburg and 14 km North from the R63 within the Beaufort West Renewable Energy Development Zone (Phase 2, REDZ 1) of the Western Cape Province. The western most part of project area also extends into the Northern Cape Province.

The project will include the following infrastructure as authorised:

- Up to 33 wind turbines with a hub height of up to 160m, blade length of 90m and rotor diameter of up to 180m;
- Hard standing area of up to 55m by 35m;
- Temporary Laydown areas of up to 150m by 60m each;
- Temporary turbine laydown areas;
- Electrical cabling and on-site substation;
- Existing farm access tracks and watercourse crossings will be upgraded;
- Internal access roads;
- On-site office compound, including site offices, parking and an operation and maintenance facility including a control room;
- Anemometer masts;
- Security fencing; and
- CCTV monitoring towers.

The following properties have been identified for the Khangela Emoyeni Wind Energy Facility and associated infrastructure:

- Portion 4 (a Portion of Portion 1) of Farm Driefontein No.26;
- Remainder of Farm Swavel Kranse No. 28;
- Portion 1 of Farm Houtkloof No. 29;
- Remainder of Portion 1 of Farm De Hoop No.30;
- Portion 2 of Farm De Hoop No.30;
- Portion 3 (a Portion of Portion 1) of the Farm De Hoop No.30;
- Portion 2 of Farm Swavel Kranse No.28;
- Portion 1 of Farm Klipplaat No.109;
- Portion 3 (a Portion of Portion 2) of Farm Klipplaat No. 109;
- Portion 4 (Portion of Portion 2) of Farm Klipplaat No.109;
- Portion 6 of Farm Klipplaat No. 109;
- Portion 7 of Farm Klipplaat No. 109;
- Remainder of Farm Klipplaat No.109; and
- Remainder of Portion 2 of Farm Klipplaat No.109.

A requirement of the Environmental Authorisation (EA) and the Environmental Management Programme report (EMPr) is the undertaking of an Avifaunal Walkdown for the approved turbines, roads and powerline footprint areas. The walkdown was undertaken from the 18th until the 24th of April 2022.

The purpose of the Avifaunal Walkdown was to locate and identify any sensitive ecological habitats, and also took into consideration identified nests and the recommended buffer areas.

This report only presents the findings from the Avifaunal Walkdown, and should be considered in conjunction with other disciplines, specifically the bat findings. These disciplines will collectively provide the demarcation of ecological constraints for the larger area.

1.1 Background

An avifaunal assessment was undertaken by Arcus Consultancy Services (2015) as part of the original EIA process, which was considered for preliminary findings. The assessment comprised of 12 months of bird surveys, carried out between October 2013 and October 2014. The following is summarised:

- A combined total of 181 species was recorded in and around the WEF and control sites during the four seasonal surveys;
- This included 29 priority species and 28 South African endemic or near endemic species;

- A total of 13 Regional Red Data species were observed across all surveys including three species listed regionally as Endangered, namely Black Harrier, Ludwig's Bustard and Martial Eagle;
- Raptors constituted the majority of flight paths recorded at vantage points within the WEF site, with Verreaux's Eagle being the most commonly recorded target species;
- The following important nest sites were found:
- 21 active Verreaux's Eagle nests, of which five are situated within the broader assessment area;
- One active Martial Eagle nest outside the WEF site approximately 3.2 km west from the study area;
- Seven Jackal Buzzard nest sites, five of which are situated within the broader study area;
- 22 Rock Kestrel nest sites, seven of which are situated within the broader study area;
- One Rufous-breasted Sparrowhawk nest situated within the broader study area;
- One Pale Chanting Goshawk nest situated within the broader study area; and
- One Peregrine Falcon nest situated approximately 3.5 km south of the site boundary, outside the WEF site.

Updated Avifaunal Impact Report for Umsinde Emoyeni Wind Energy Facility Phase 1 & 2 and Associated Electrical Grid Connection Phase 1 & 2 was completed by Arcus Consultancy Services (2018), and the following was concluded:

- The proposed amendments would result in a post-mitigation impact significance for collisions with wind turbines (only). The cumulative impact for wind turbines was rated as high;
- The key species identified in the original avifaunal impact assessment as being most at risk are Blue Crane (Near-Threatened) and Verreaux's Eagle (Vulnerable); and
- The land use, vegetation types and bird micro-habits did not change significantly between 2013/2014, 2016/2017 and 2020.

An amendment to the (abovementioned) assessment was completed by Arcus Consultancy Services (2020), The site visit was conducted over five days between 22 to 26 June 2020 which included a confirmation of the status of nests of Priority Species, a search for additional nests and time spent on and around the project site to determine if any significant changes in land use relevant to avifauna had occurred. The following is measures are sourced from the report:

- To further reduce the potential risks imposed on Verreaux's Eagle the VERA model was employed;

- The mitigation measures in the original avifaunal impact assessment and EMPr remain relevant and necessary, but pertinent measures included:
- Areas identified by the updated sensitivity map as 'no-go' areas for the placement of turbines and overhead powerlines should be explicitly stated as such in the EMPr;
- The final layout must be informed by the updated avifaunal sensitivity map and turbines that fall inside the revised 'no-go' areas must be moved to lower sensitivity areas or removed completely from the layout (this has been done);
- Should fewer turbines be required to meet the maximum generation capacity of the development than the number authorised, turbines closest to 'no-go' areas and those in areas identified as being of Medium collision risk by the VERA model must be the first up for consideration to forgo where practically possible;
- Construction-phase monitoring as recommended by the Verreaux's Eagle guidelines;
- Post-construction/operational monitoring must be done in line with the latest Best Practice Guidelines and must be conducted as soon as the turbines become operational, any mortalities must be reported to BirdLife SA;
- Mitigation measures (e.g. curtailment or shut-down-on-demand) must be implemented on any turbines responsible for the fatalities of two or more Verreaux's Eagle;
- Consultation with the South African Civil Aviation Authority (SACAA) should be undertaken to determine the potential mitigation measure of painting one turbine blade per turbine black to further reduce the risk of bird collisions, this mitigation measure is recommended at the facility should SACAA agree to its implementation;
- No construction activities (e.g. of new roads) is allowed within 1 km of nests during the breeding season (May, June, July and August) as per the Verreaux's Eagle guidelines;
- Nests of Verreaux's Eagle must be monitored for breeding activity throughout the lifespan of the facility as per the Verreaux's Eagle guidelines, including during construction;
- It is recommended that tracking of sub-adult and non-territorial adult Verreaux's Eagles be considered in close consultation with BLSA and an academic institution to gain a better understanding of the movement of these birds across the landscape, should the timing and utility of such a study be considered to be of value by those institutions.

1.2 Terms of Reference

The Terms of Reference (ToR) for this assessment include the following:

- Review of existing information related to the development;
- Conduct an Avifaunal Walkdown for the planned footprint areas;
- Compilation of a report detailing the results of the walkdown:

- Detail any ecological constraints identified for the planned infrastructure; and
- Provide information and recommendations for the micro-siting of relevant infrastructure.
- Provide information to adequately inform any contractors, environmental officers and personnel pertaining to the ecological significance for the area.

1.3 Assumptions and Limitations

The following assumptions and limitations should be noted for the assessment:

- The assessment area was based on the spatial file provided by the client and any alterations to the development area subsequent to the site visit may affect the results;
- The field assessment was limited to accessible turbines due to time and weather constraints, where turbines and roads could not be reached, noted were made of similar habitat within the general WEF area;
- The document titled “*Arcus, 2018. Updated Avifaunal Impact Report for Umsinde Emoyeni Wind Energy Facility Phase 1 & 2 and Associated Electrical Grid Connection Phase 1 & 2, January 2018*” was not made available for review, but was considered for the amendment report (Arcus, 2020);
- Only a single season survey was undertaken, thus no temporal variances have been considered;
- The site visit was conducted in April and the layout provided in October. Thus the sensitivity and sitting analyses have been based primarily on GIS and Arcus report results; and
- All regional and site-specific environmental information are contained within the original (submitted) documents and were therefore not repeated within this document. This document focuses only on the very specific mandate and findings of the walkdown and its associated ecosystem evaluations.

2 Approach

2.1 Spatial Data

Turbine, road and powerline positions were supplied by the client. A 150 m corridor width (total width is 300 m) was considered for the road and powerline routes and a 200 m buffer around each turbine and around ancillary infrastructure. These corridors were used as guidelines during the walkdown and ecosystem evaluation phase. GPS accuracy during the field surveys varied from 4 to 15 m. The findings for the turbines and roads are discussed in the subsequent sections.

2.2 Ecological Information

2.2.1 Avifauna

Arcus Consultancy Services (2015) recommended a number of avoidance (buffer) areas for the project, all of which have been achieved for the planned layout. Figure 3-1 presents the project infrastructure.

ARCUS (2020) have developed an Avifauna No-Go map which indicates which areas should not be developed as there is a high risk of avifaunal impacts in these areas (Figure 3-2). Turbines should not be placed in these areas to avoid impacts to avifauna.

As part of the sensitivity assessment, the Verreaux's Eagle Risk Assessment Tool (VERA) was used to create a relative collision risk map for Verreaux's Eagle for the site (ARCUS 2020). This allows for the placement of turbines in areas with less risk to flying eagles. This map can be seen in Figure 3-3. This model includes all nests at the site, including those unoccupied (using the precautionary principle). High collision risk (sensitivity) areas are those predicted to be the most intensely used by eagles and development of turbines should not be allowed in these areas. Medium collision risk areas should be avoided where possible and development should proceed only with specialist input (ARCUS 2020). The Khangela WEF layout has been modified to make sure that the turbine placements are within Low collision risk areas.

3 Walkdown Results

The specialist ecologists traversed the planned footprint areas searching for ecologically sensitive habitats and any species of conservation concern within the corridor. Each accessible turbine position was visited on foot and evaluated according to the potential impact on the surrounding ecosystems. Each accessible road route between turbines was inspected and evaluated.

As much as possible of the roads and turbine layout was assessed on foot and by 4x4 vehicle. Findings are presented in Table 3-1.

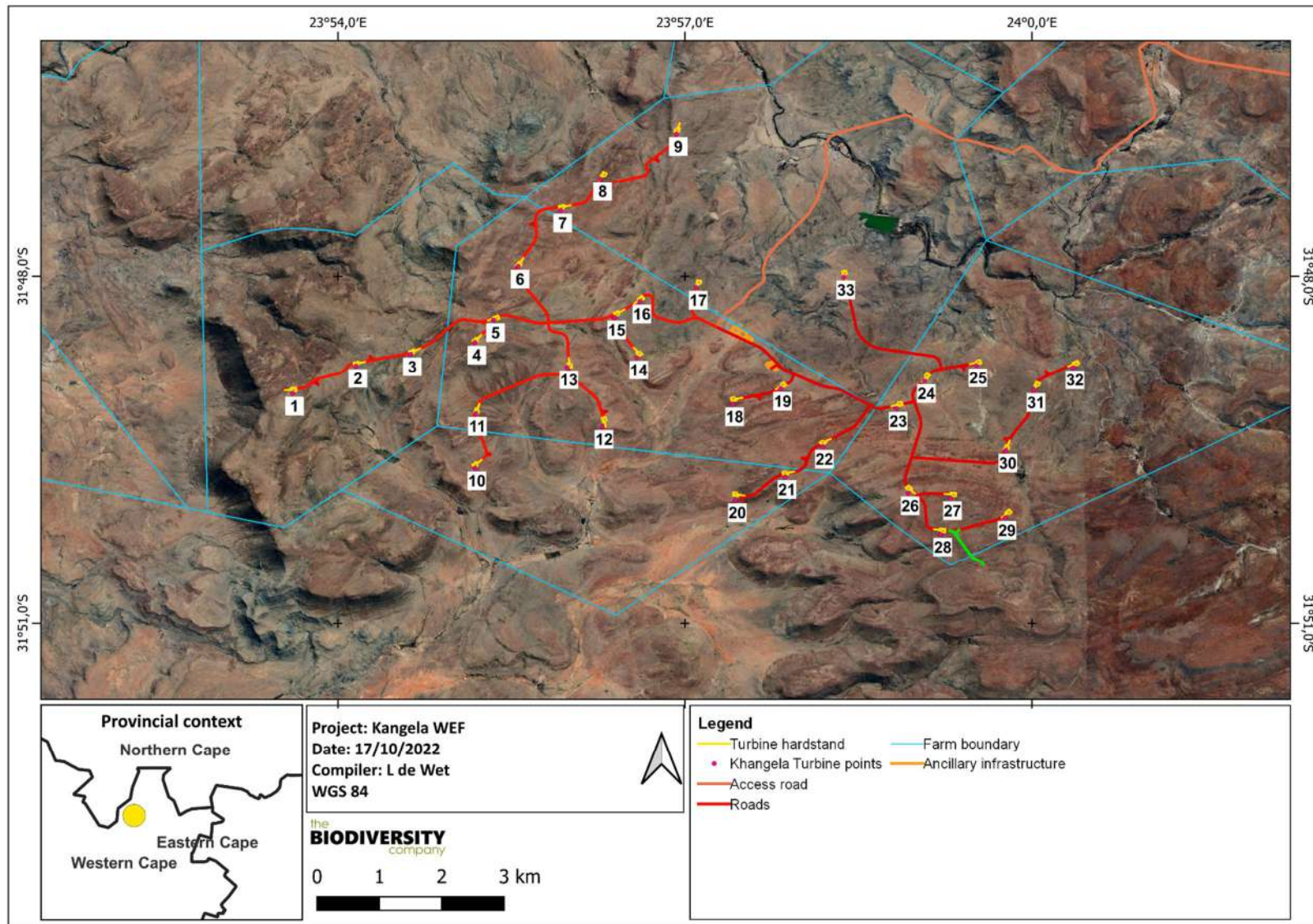


Figure 3-1 The Wind turbines as well as the associated roads for the Khangela WEF.

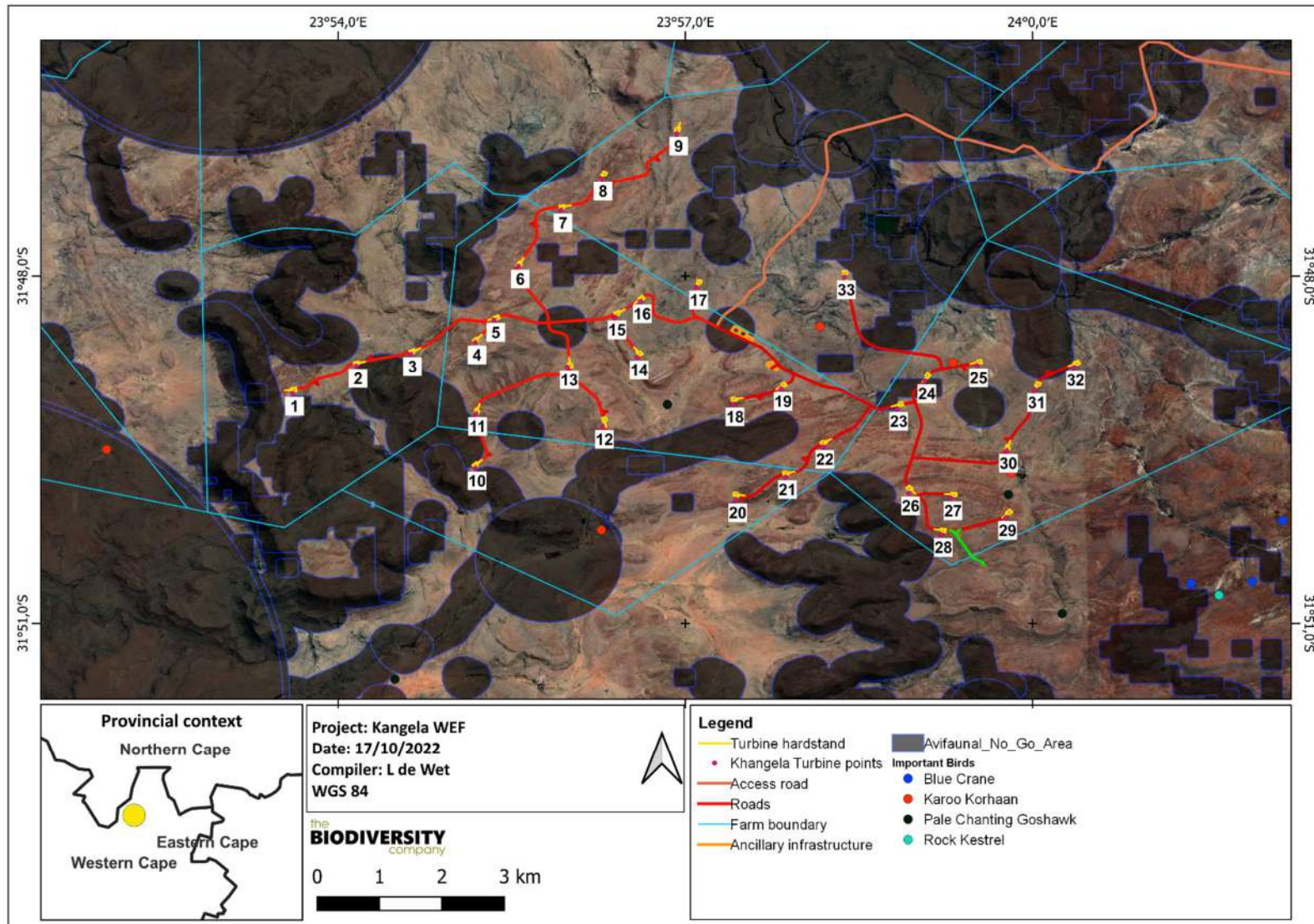


Figure 3-2 The Khangela WEF and Avifauna No-Go areas along with points of SCC avifauna spotted during the walkdown.

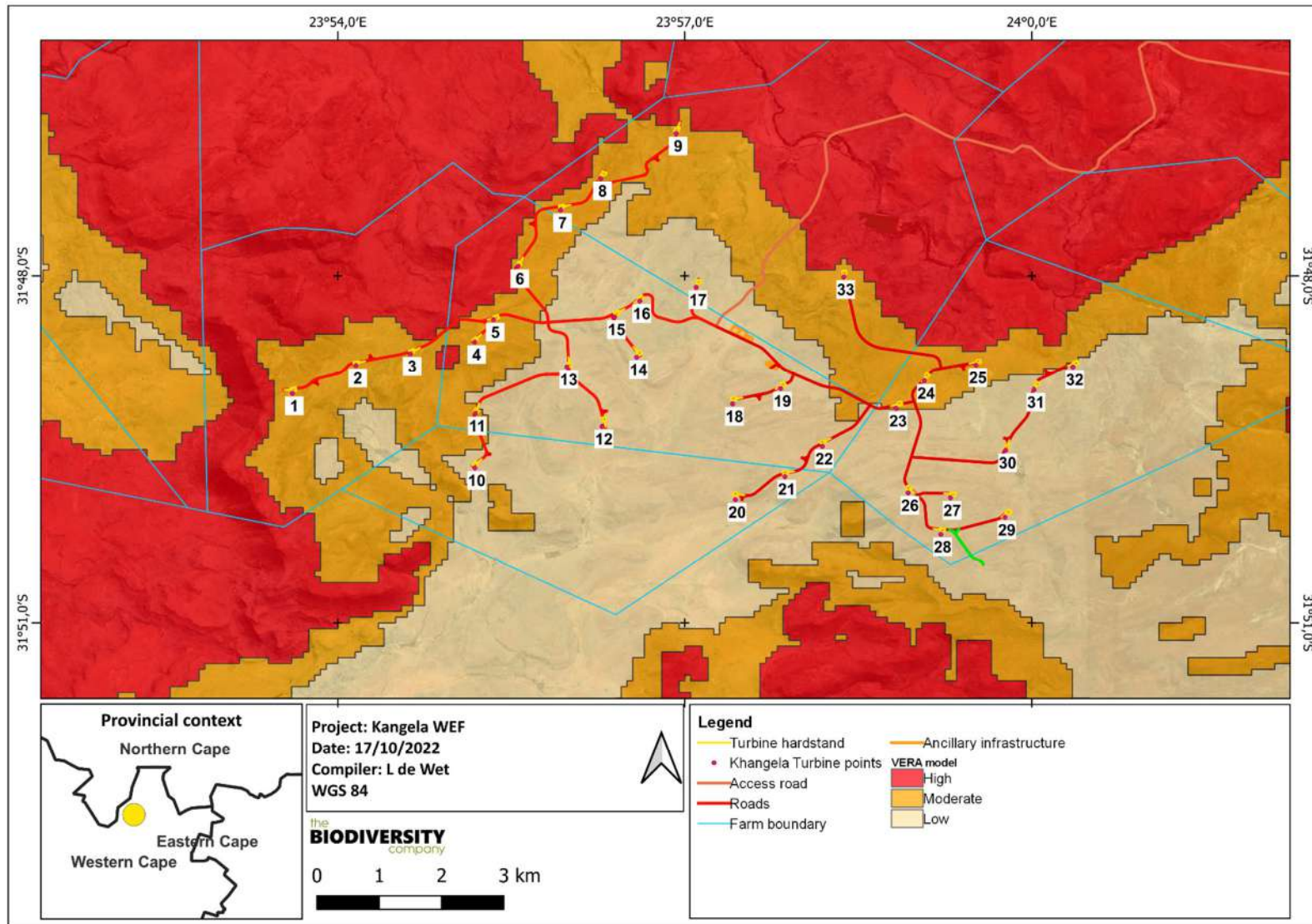


Figure 3-3 The Khangela WEF and Avifauna VERA sensitivities.

Table 3-1 Summary Site specific comments and recommendations on the selected turbines for Khangela Emoyeni WEF

Turbine	Comments and recommendations
1	This turbine is located in an area of Medium sensitivity as per the VERA model as well as being located surrounded by Avifaunal No-Go areas. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to.
2	This turbine laydown/hardstand area is located partially within an Avifauna No-Go area but the turbine point is located outside of this area. Some short-term construction impacts may be acceptable in such an area but no operational phase impacts should be considered here. This turbine is also located in Medium sensitivity (VERA) area and mitigation measures prescribed by ARCUS must be strictly adhered to.
3	This turbine is located in an area of Medium sensitivity as per the VERA model. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to.
4	This turbine is located in an area of Medium sensitivity as per the VERA model. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to.
5	This turbine is located in an area of Medium sensitivity as per the VERA model. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to.
6	This turbine is located in an area of Medium sensitivity as per the VERA model. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to.
7	This turbine is located in an area of Medium sensitivity as per the VERA model. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to.
8	This turbine is located in an area of Medium sensitivity as per the VERA model. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to.
9	This turbine laydown/hardstand area is located partially within an area of High sensitivity according to the VERA model (Figure 3-4). The turbine is located outside of the area of High sensitivity. Some short-term construction impacts may be acceptable in such an area but no operational phase impacts should be considered here. Mitigation measures prescribed by ARCUS must be adhered to.
10	This turbine laydown/hardstand is located partially within an Avifauna No-Go area (Figure 3-5) with the turbine located outside of the Avifauna No-Go area. Some short-term construction impacts may be acceptable in such an area but no operational phase impacts should be considered here. Mitigation measures prescribed by ARCUS must be adhered to.
11	This turbine is located in an area of Medium sensitivity as per the VERA model. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to.
12	This turbine is located in an area of Low collision risk (sensitivity) according to the VERA model. This turbine need not be moved but all mitigation measure prescribed by ARCUS must be adhered to
13	This turbine is located in an area of Low collision risk (sensitivity) according to the VERA model. This turbine need not be moved but all mitigation measure prescribed by ARCUS must be adhered to
14	This turbine is located in an area of Low collision risk (sensitivity) according to the VERA model. This turbine need not be moved but all mitigation measure prescribed by ARCUS must be adhered to
15	This turbine is located in an area of Low collision risk (sensitivity) according to the VERA model. This turbine need not be moved but all mitigation measure prescribed by ARCUS must be adhered to
16	This turbine is located in an area of Low collision risk (sensitivity) according to the VERA model. This turbine need not be moved but all mitigation measure prescribed by ARCUS must be adhered to
17	This turbine is located in an area of Low collision risk (sensitivity) according to the VERA model. This turbine need not be moved but all mitigation measure prescribed by ARCUS must be adhered to

18	This turbine is located in an area of Low collision risk (sensitivity) according to the VERA model. This turbine need not be moved but all mitigation measure prescribed by ARCUS must be adhered to
19	This turbine is located in an area of Low collision risk (sensitivity) according to the VERA model. This turbine need not be moved but all mitigation measure prescribed by ARCUS must be adhered to
20	This turbine is located in an area of Low collision risk (sensitivity) according to the VERA model. This turbine need not be moved but all mitigation measure prescribed by ARCUS must be adhered to
21	This turbine is located in an area of Low collision risk (sensitivity) according to the VERA model. This turbine need not be moved but all mitigation measure prescribed by ARCUS must be adhered to
22	This turbine is located in an area of Low collision risk (sensitivity) according to the VERA model. This turbine need not be moved but all mitigation measure prescribed by ARCUS must be adhered to
23	This turbine is located partially within an Avifauna No-Go area (Figure 3-6) with the turbine located outside of the Avifauna No-Go area. Some short-term construction impacts may be acceptable in such an area but no operational phase impacts should be considered here. Mitigation measures prescribed by ARCUS must be adhered to.
24	This turbine is located partially within an Avifauna No-Go area (Figure 3-6) with the turbine located outside of the Avifauna No-Go area. Some short-term construction impacts may be acceptable in such an area but no operational phase impacts should be considered here. Mitigation measures prescribed by ARCUS must be adhered to.
25	This turbine is located in an area of Medium sensitivity as per the VERA model. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to.
26	This turbine is located in an area of Low collision risk (sensitivity) according to the VERA model. This turbine need not be moved but all mitigation measure prescribed by ARCUS must be adhered to
27	This turbine is located in an area of Low collision risk (sensitivity) according to the VERA model. This turbine need not be moved but all mitigation measure prescribed by ARCUS must be adhered to
28	This turbine is located in an area of Low collision risk (sensitivity) according to the VERA model. This turbine need not be moved but all mitigation measure prescribed by ARCUS must be adhered to
29	This turbine is located in an area of Low collision risk (sensitivity) according to the VERA model. This turbine need not be moved but all mitigation measure prescribed by ARCUS must be adhered to
30	This turbine is located in an area of Low collision risk (sensitivity) according to the VERA model. This turbine need not be moved but all mitigation measure prescribed by ARCUS must be adhered to
31	This turbine is located in an area of Low collision risk (sensitivity) according to the VERA model. This turbine need not be moved but all mitigation measure prescribed by ARCUS must be adhered to
32	This turbine is located partially within an Avifauna No-Go area (Figure 3-7) with the turbine located outside of the Avifauna No-Go area. Some short-term construction impacts may be acceptable in such an area but no operational phase impacts should be considered here. Mitigation measures prescribed by ARCUS must be adhered to.
33	This turbine is located in an area of Medium sensitivity as per the VERA model. This turbine need not be relocated, mitigation measures prescribed by ARCUS must be adhered to.

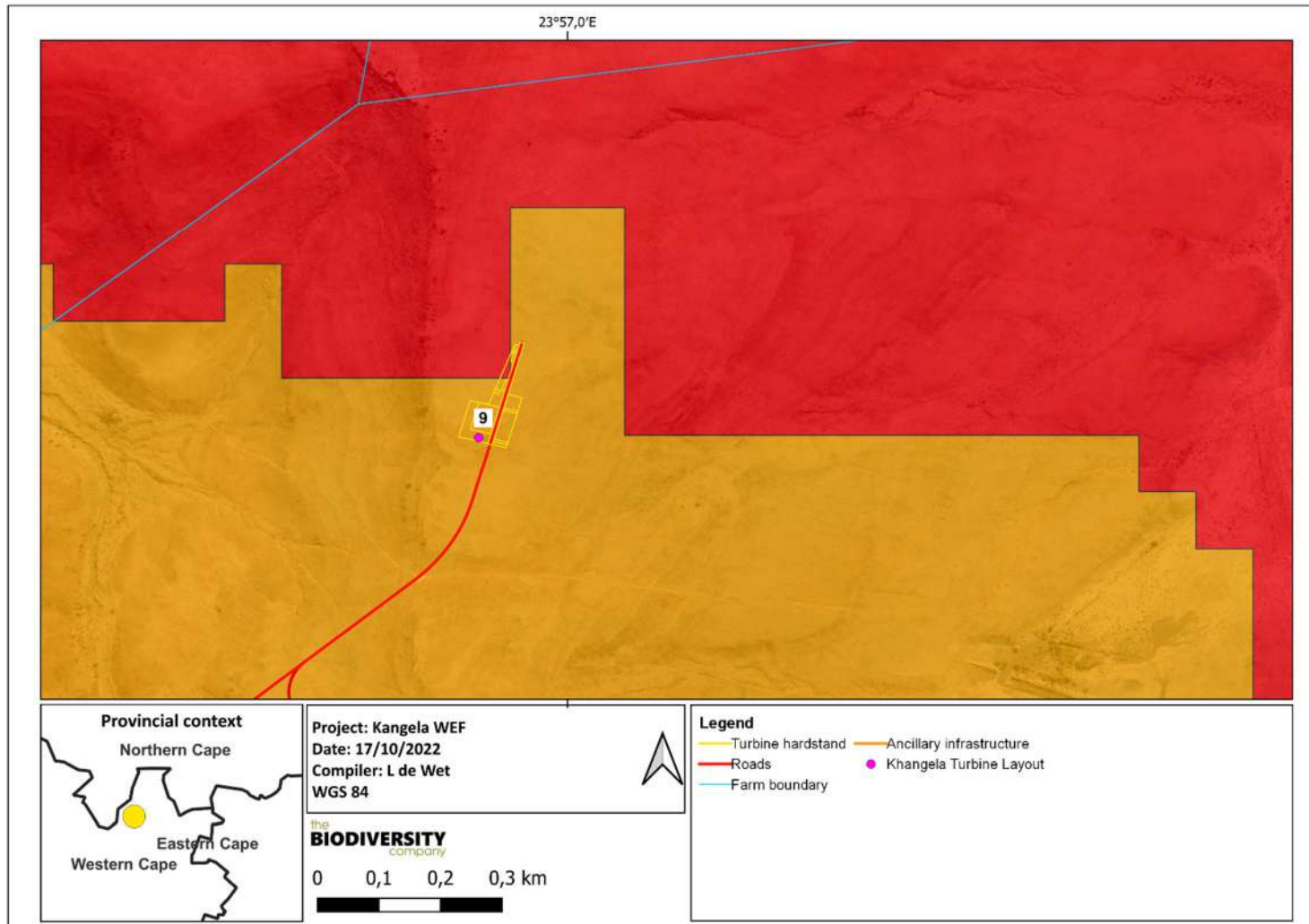


Figure 3-4 The Khangela WEF turbine 9 with laydown/hardstand located partially in an area of high sensitivity and the turbine point located outside of high sensitivity areas according to the VERA model

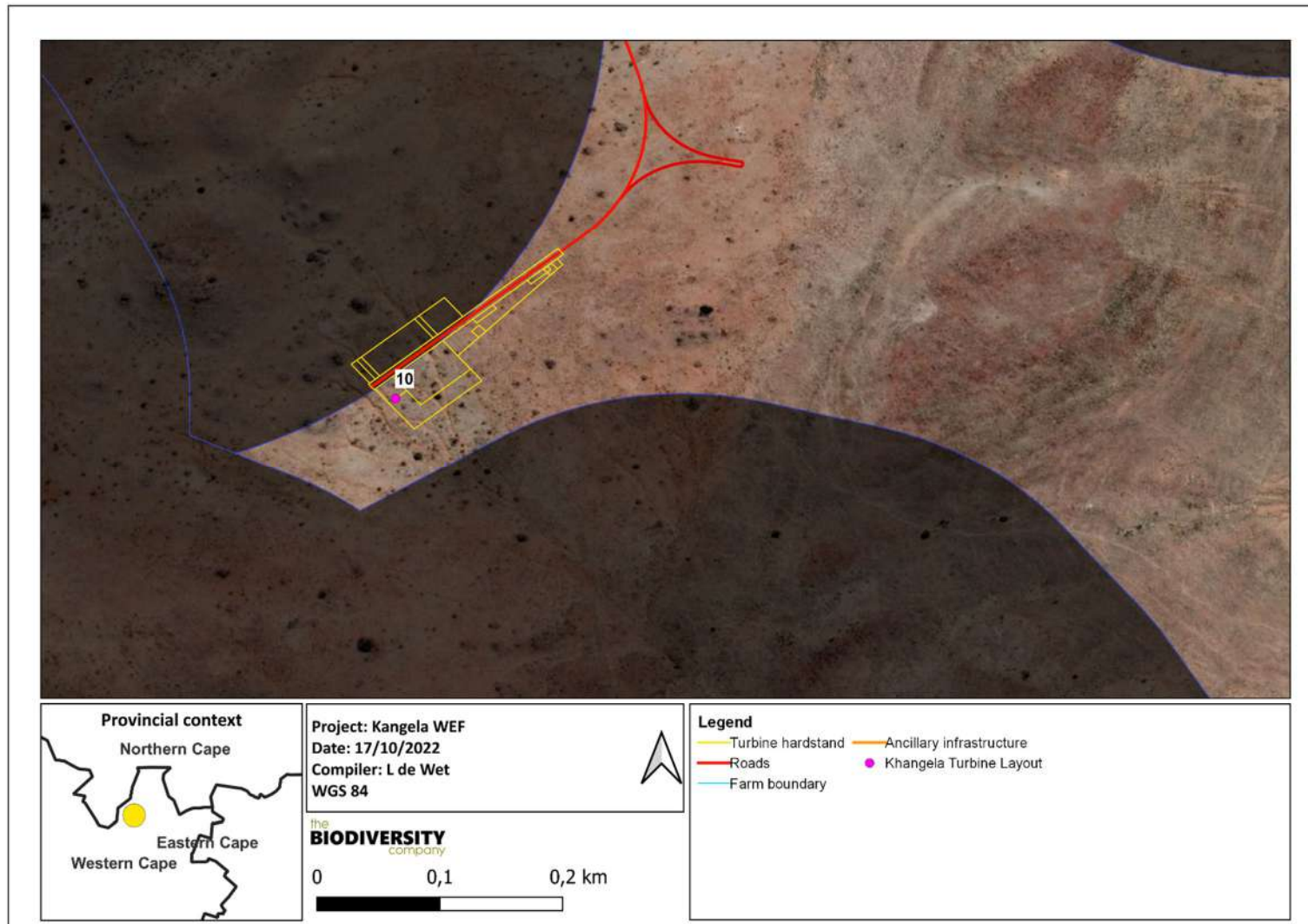


Figure 3-5 The Khangela WEF turbine 10 laydown/hardstand located partially in a No-Go area for Avifauna with the turbine located outside of the Avifauna No-Go area

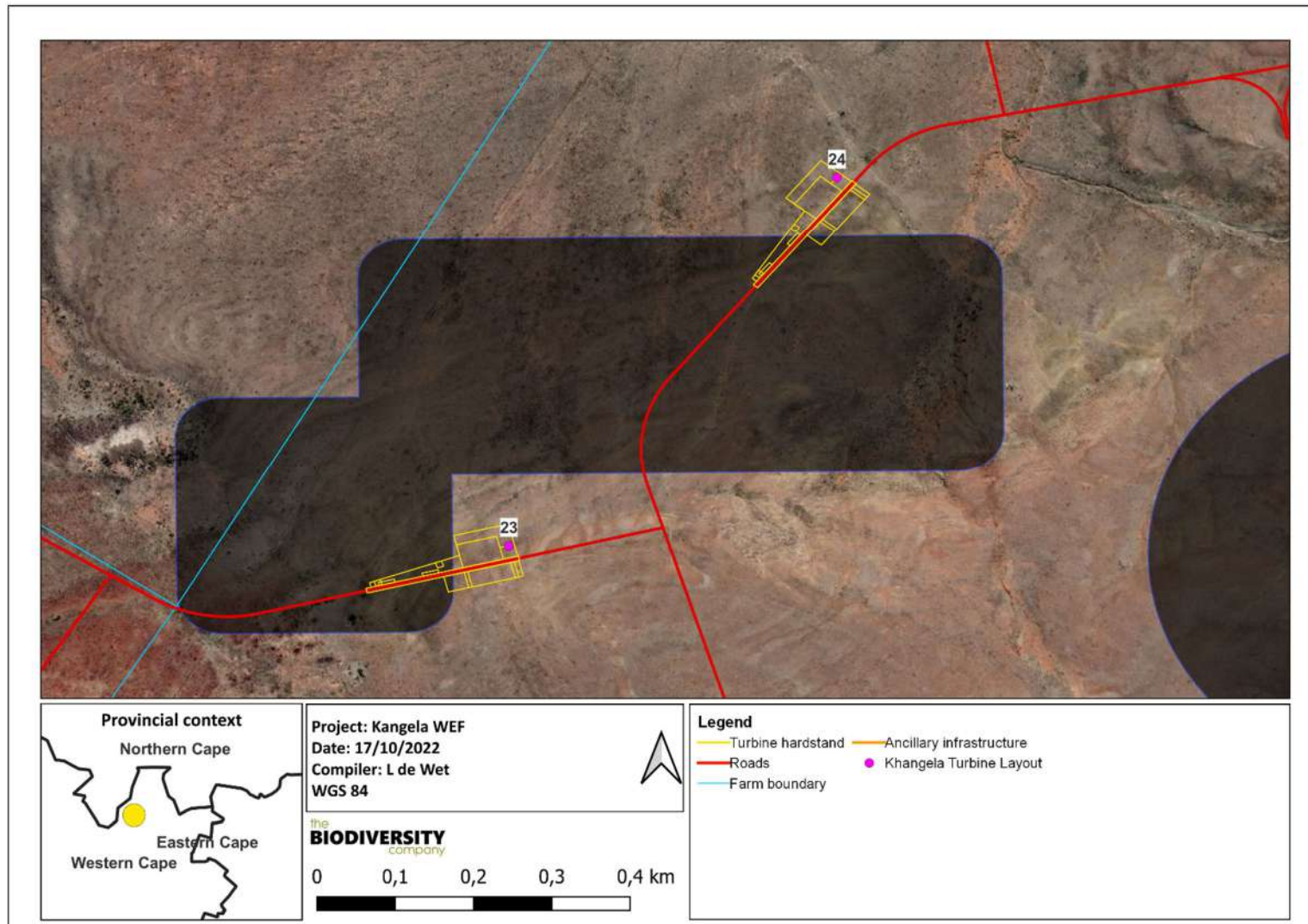


Figure 3-6 The Khangela WEF turbines 23 and 24 with laydown/hardstand located partially in a No-Go area for Avifauna and turbines located outside Avifauna No-Go areas.

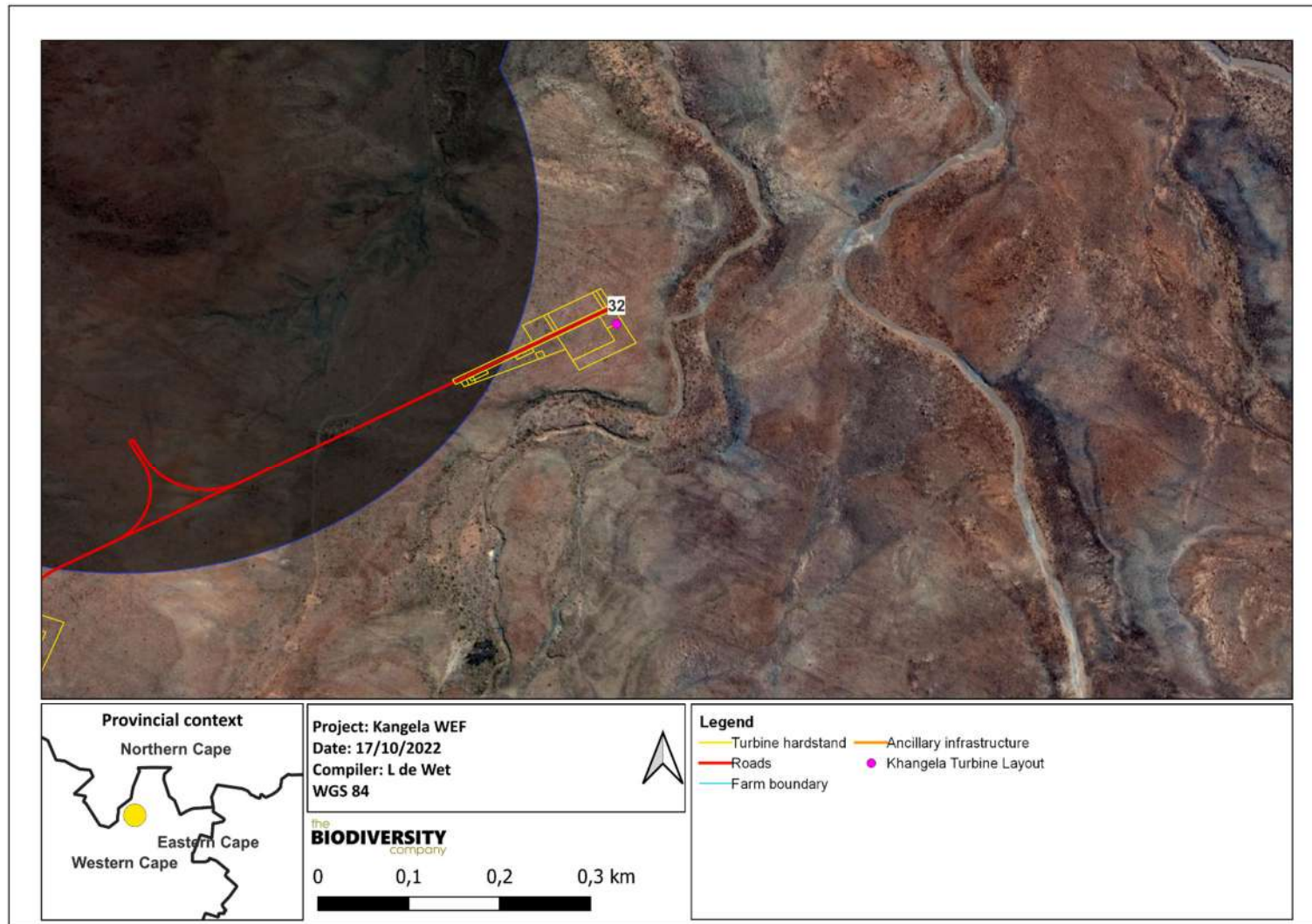


Figure 3-7 The Khangela WEF turbine 32 with laydown/hardstand located partially in a No-Go area for Avifauna and the turbine located outside the Avifauna No-Go area.

3.1 Observations

The following are observations made in the general area during the walkdown:

- No turbines are located in areas with high collision risk as defined by the VERA model, nor are any turbines located within avifauna No-Go areas;
- Habitats include a variety of avifaunal microhabitats ranging from flat alluvial plains to cliffs;
- Species of Conservation Concern (SCC) are present within the project area (Figure 3-8).

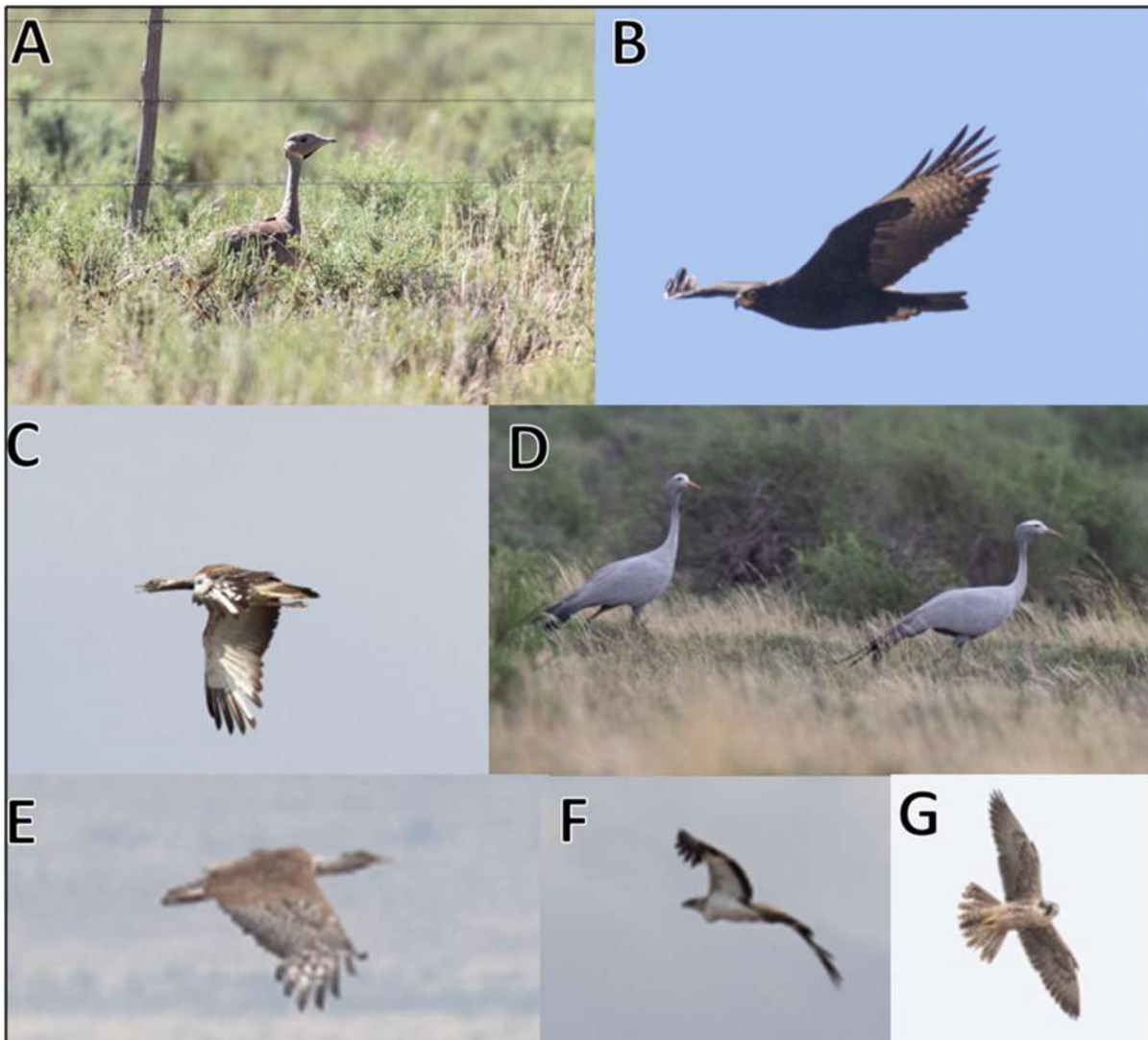


Figure 3-8 Species of Conservation Concern recorded during the Avifaunal Walkdown. A: Karoo Korhaan, B: Verreaux's Eagle, C: Ludwig's Bustard, D: Blue Crane, E: Kori Bustard, F: Martial Eagle (juvenile) and G: Lanner Falcon.

3.2 Recommendations

Recommendations have been provided for the footprint areas that will have notable impacts on the local habitats and / or species of conservation concern. The following recommendations are in addition to what has been provided for the footprint areas:

- All mitigation measures prescribed by Arcus (2015 and 2020) remain applicable for the development and must be adhered to;
- Proven best proactive mitigation measures must be implemented prior to commencement of construction as per Arcus (2015 and 2020) recommendations;
- Where feasible, and other constraints permit, all 33kV cables should be installed below ground;
- Where cables are required to be aboveground, pole designs and spanning mitigation measures should be informed by the Endangered Wildlife Trust; and
- Bird flight diverters should be fitted to all overhead powerlines within the WEF.

3.3 Conclusion

The current layout of the Khangela Emoyeni WEF is acceptable as no turbines are located within areas of high collision risk as per the VERA model, nor do any occur within Avifauna No-Go areas.

4 References

Arcus Consultancy Services (2015). Avifauna Specialist Report. Umsinde Emoyeni Wind Energy Facility Phase 1 & 2 Western Cape & Northern Cape.

Arcus, 2018. Updated Avifaunal Impact Report for Umsinde Emoyeni Wind Energy Facility Phase 1 & 2 and Associated Electrical Grid Connection Phase 1 & 2, January 2018.

Arcus Consultancy Services (2020). Amendment to the Avifaunal Impact Assessment conducted for the authorised Khangela Emoyeni (Phase 2) Wind Energy Facility near Murraysburg, Western Cape Province.