

# TERRESTRIAL BIODIVERSITY THEME ASSESSMENT FOR THE ABERDEEN WIND FACILITY 1



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**3Foxes Biodiversity Solutions**

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**First Draft – January 2023**

**NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) AND ENVIRONMENTAL IMPACT REGULATIONS, 2014 (AS AMENDED) – REPORTING REQUIREMENTS FOR SPECIALIST THEMES**

<b>GN 1150 of 30 October 2020: Terrestrial Biodiversity Specialist Assessment Report (Very High or High Sensitivity)</b>	<b>Section of Report</b>
3.1.1 contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the assessment including a curriculum vitae;	P5
3.1.2 a signed statement of independence by the specialist;	P7
3.1.3 a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	Section 2
3.1.4 a description of the methodology used to undertake the site sensitivity verification, impact assessment and site inspection, including equipment and modelling used where relevant;	Section 2
3.1.5 a description of the mean density of observations/number of sample sites per unit area and the site inspection observations;	Section 2
3.1.6 a description of the assumptions made and any uncertainties or gaps in knowledge or data;	Section 2
3.1.7 details of all SCC found or suspected to occur on site, ensuring sensitive species are appropriately reported;	Section 2
3.1.8 the online database name, hyperlink and record accession numbers for disseminated evidence of SCC found within the study area;	Section 3.3
3.1.9 the location of areas not suitable for development and to be avoided during construction where relevant;	Section 3
3.1.10 a discussion on the cumulative impacts;	Section 3, Section 5
3.1.11 impact management actions and impact management outcomes proposed	Section 3, Section 5
3.1.12 a reasoned opinion, based on the findings of the specialist assessment, regarding the acceptability or not of the development and if the development should receive approval or not, related to the specific theme being considered, and any conditions to which the opinion is subjected if relevant; and	Section 6
3.1.13 a motivation must be provided if there were any development footprints identified as per paragraph 2.2.12 above [of GN 1150 of 30 October 2020] that were identified as having “low” or “medium” terrestrial animal species sensitivity and were not considered appropriate.	Section 2.4

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## SHORT CV/SUMMARY OF EXPERTISE – SIMON TODD

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Simon Todd is Director and principal scientist at 3Foxes Biodiversity Solutions and has over 20 years of experience in biodiversity measurement, management and assessment. He has provided specialist ecological input on more than 200 different developments distributed widely across the country, but with a focus on the three Cape provinces. This includes input on the Wind and Solar SEA (REDZ) as well as the Eskom Grid Infrastructure (EGI) SEA and Karoo Shale Gas SEA. He is on the National Vegetation Map Committee as representative of the Nama and Succulent Karoo Biomes. Simon Todd is a recognised ecological expert and is a past chairman and current deputy chair of the Arid-Zone Ecology Forum. He is registered with the South African Council for Natural Scientific Professions (No. 400425/11).

### *Skills & Primary Competencies*

- Research & description of ecological patterns & processes in Nama Karoo, Succulent Karoo, Thicket, Arid Grassland, Fynbos and Savannah Ecosystems.
- Ecological Impacts of land use on biodiversity
- Vegetation surveys & degradation assessment & mapping
- Long-term vegetation monitoring
- Faunal surveys & assessment.
- GIS & remote sensing

### *Tertiary Education:*

- 1992-1994 – BSc (Botany & Zoology), University of Cape Town
- 1995 – BSc Hons, Cum Laude (Zoology) University of Natal
- 1996-1997- MSc, Cum Laude (Conservation Biology) University of Cape Town

### *Employment History*

- 2009 – Present – Sole Proprietor of Simon Todd Consulting, providing specialist ecological services for development and research.
- 2007 Present – Senior Scientist (Associate) – Plant Conservation Unit, Department of Botany, University of Cape Town.

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- 2004-2007 – Senior Scientist (Contract) – Plant Conservation Unit, Department of Botany, University of Cape Town
  - 2000-2004 – Specialist Scientist (Contract) - South African National Biodiversity Institute
  - 1997 – 1999 – Research Scientist (Contract) – South African National Biodiversity Institute

A selection of recent work is as follows:

#### **Strategic Environmental Assessments**

Co-Author. Chapter 7 - Biodiversity & Ecosystems - Shale Gas SEA. CSIR 2016.

Co-Author. Chapter 1 Scenarios and Activities – Shale Gas SEA. CSIR 2016.

Co-Author – Ecological Chapter – Wind and Solar SEA. CSIR 2014.

Co-Author – Ecological Chapter – Eskom Grid Infrastructure SEA. CSIR 2015.

Contributor – Ecological & Conservation components to SKA SEA. CSIR 2017.

#### **Recent Specialist Ecological Studies in the Vicinity of the Current Site**

- Nuweveld North, East and West WEFs. Fauna & Flora Specialist Study for EIA. Zutari 2021.
- Beaufort West PV Facility. Fauna & Flora Assessment. SiVest Environmental 2022.
- San Solar PV Facility, Kathu. Fauna & Flora Assessment. Savannah Environmental 2022.
- Soventix Phase 3 PV Facility, De Aar. Fauna & Flora Assessment. Ecologes Environmental Consultants, 2022.
- Sadawa PV Facilities, Tankwa Karoo. Fauna & Flora Assessment. Savannah Environmental 2021.
- Kotulo Tsatsi PV 1 Facility near Kenhardt. Fauna & Flora Assessment. Savannah Environmental 2021.
- Hyperion 2 PV Facility, Kathu. Fauna & Flora Assessment. Savannah Environmental 2021.

## SPECIALIST DECLARATION

I, ..Simon Todd....., as the appointed independent specialist, in terms of the 2014 EIA Regulations, hereby declare that I:

- I act as the independent specialist in this application;
- I perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I have no vested interest in the proposed activity proceeding;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- I have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- all the particulars furnished by me in this specialist input/study are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the specialist:  \_\_\_\_\_

Name of Specialist: \_\_\_\_ Simon Todd \_\_\_\_\_

Date: \_\_\_\_ 20 January 2023 \_\_\_\_\_

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## **1 INTRODUCTION**

Aberdeen Wind Facility 1 (Pty) Ltd is proposing to develop the Aberdeen Wind Energy Facility 1 on a ca. 9200 ha site situated about 30km west of Aberdeen within the Eastern Cape. Savannah Environmental are conducting the required EIA process and 3Foxes Biodiversity Solutions has been appointed on behalf of Aberdeen Wind Facility 1 to provide Terrestrial Biodiversity inputs for the proposed Aberdeen Wind Energy Facility 1 as part of the EIA application.

3Foxes Biodiversity Solutions has been appointed by Savannah Environmental on behalf of Aberdeen Wind Facility 1 to undertake a terrestrial biodiversity assessment of the proposed project in terms of the Environmental Impact Assessment Regulations, 2014, as amended, including the Gazetted specialist protocols (GN R 320 and GN R 1150 of 2020). The DFFE Screening Tool indicates that the Terrestrial Biodiversity Theme for the majority of the affected area is mapped as Very High sensitivity, with the result that a full terrestrial biodiversity assessment is required. To these ends, this Terrestrial Biodiversity Assessment for the Aberdeen Wind Facility 1 and associated infrastructure, addresses the potential impacts of the development on Terrestrial Biodiversity and must be included in the EIA for the development and any mitigation and monitoring measures as identified, must be incorporated into the EMP for the development.

### **1.1 SCOPE OF STUDY**

In terms of GN 320 (20 March 2020) and GN 1150 (30 October 2020) of the NEMA EIA Regulations of 2014 (as amended), prior to the commencement of a specialist assessment, a site sensitivity verification must be undertaken to confirm the current land use and environmental sensitivity of the proposed project areas as identified by the Screening Tool. In terms of the findings of the Screening Tool, the site contains areas of Very High sensitivity for the Terrestrial Biodiversity Theme due to the presence of areas of CBA 2, ESAs and FEPA Priority Subcatchments within the study area. In terms of the Assessment Criteria, this implies the following outcome:

1. An applicant intending to undertake an activity identified in the Scope of this Protocol, on a site identified as being of “very high sensitivity” for terrestrial biodiversity on the national web based environmental screening tool must submit a Terrestrial Biodiversity Impact Assessment.
2. The Terrestrial Biodiversity Impact Assessment should meet the following terms of reference:
  - 2.1 The assessment must be undertaken by a SACNASP registered specialist, on the preferred development site.



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2.2 Description of the preferred site - the following aspects, as a minimum, must be considered in the baseline description:

2.2.1 A description of the ecological drivers/processes of the system and how the proposed development will impact these;

2.2.2 Ecological functioning and ecological processes (e.g. fire, migration, pollination, etc.) that operate within the proposed development site;

2.2.3 The ecological corridors that the development would impede including migration and movement of flora and fauna;

2.2.4 The description of any significant landscape features (including rare or important flora/faunal associations, presence of Strategic Water Source Areas (SWSAs) or Freshwater Ecosystem Priority Areas (FEPA) sub catchments;

2.2.5 A description of terrestrial biodiversity and ecosystems on the proposed development site, including –

- a) Main vegetation types;
- b) Threatened ecosystems, including Listed Ecosystems as well as locally important habitat types identified;
- c) Ecological connectivity, habitat fragmentation, ecological processes and fine-scale habitats; and
- d) Species, distribution, important habitats (e.g. feeding grounds, nesting sites, etc.) and movement patterns identified.

2.3 Identify any alternative development footprints within the preferred development site which would be of a “low” sensitivity as identified by the national web based environmental screening tool and verified through the Initial Site Sensitivity Verification;

2.4 The Terrestrial Biodiversity Impact Assessment must be based on the results of a site inspection undertaken on the preferred development site and must identify:

2.5 Terrestrial Critical Biodiversity Areas (CBAs), including:

2.5.1 The reasons why an area has been identified as a CBA;

2.5.2 An indication of whether or not the development is consistent with maintaining the CBA in a natural or near natural state or in achieving the goal of rehabilitation;

2.5.3 The impact on species composition and structure of vegetation with an indication of the extent of clearing activities;

2.5.4 The impact on ecosystem threat status;

- 2.5.5 The impact on explicit subtypes in the vegetation;
- 2.5.6 The impact on overall species and ecosystem diversity of the site; and
- 2.5.7 The impact on populations of species of special concern in the CBA.

2.6 Terrestrial Ecological Support Areas, including;

- 2.6.1 The impact on the ecological processes that operate within or across the site;
- 2.6.2 The extent the development will impact on the functionality of the ESA; and
- 2.6.3 Loss of ecological connectivity (on site, and in relation to the broader landscape) due to the degradation and severing of ecological corridors or introducing barriers that impede migration and movement of flora and fauna.

2.7 Protected Areas as defined by the National Environmental Management: Protected Areas Act, 2004 including:

- 2.7.1 An opinion on whether the proposed development aligns with the objectives/purpose of the Protected Area and the zoning as per the Protected Area Management Plan;

2.8 Priority Areas for Protected Area Expansion, including:

- 2.8.1 The way in which in which the development will compromise or contribute to the expansion of the protected area network.

2.9 Strategic Water Source Areas (SWSA) including:

- 2.9.1 The impact(s) on the terrestrial habitat of a Strategic Water Source Area, and
- 2.9.2 The impacts of the development on the SWSA water quality and quantity (e.g. describing potential increased runoff leading to increased sediment load in water courses).

2.10 Freshwater Ecosystem Priority Area (FEPA) sub catchments, including:

- 2.10.1 The impacts of the development on habitat condition and/or species in the FEPA sub catchment.

2.11 Indigenous Forests, including:

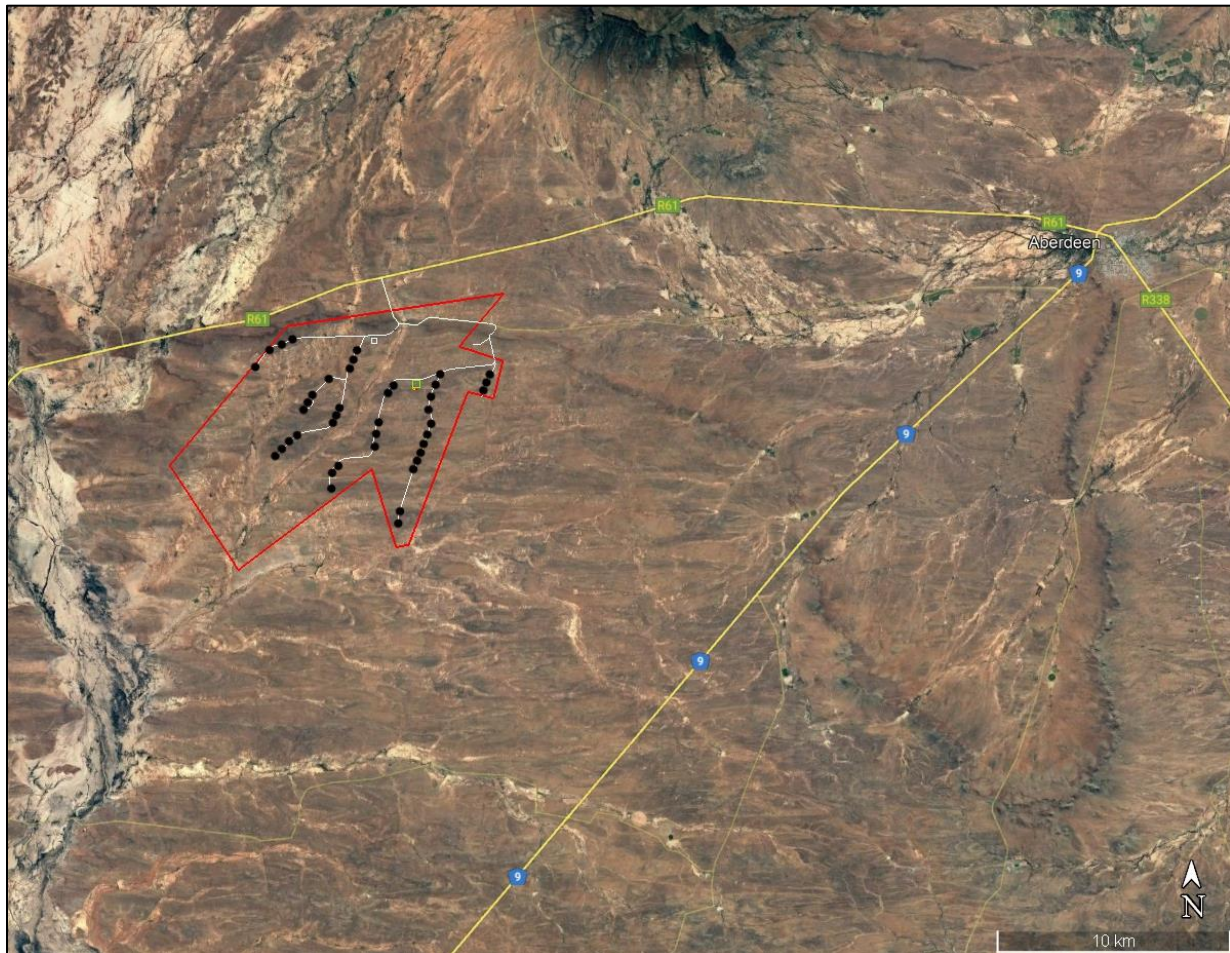
- 2.11.1 Impact on the ecological integrity of the forest;
- 2.11.2 Extent of natural or near natural indigenous forest area lost.

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3. The findings of the Terrestrial Biodiversity Impact Assessment must be written up in a Terrestrial Biodiversity Impact Assessment Report. This report must include as a minimum the following information:
    - 3.1 Contact details and curriculum vitae of the specialist including SACNASP registration number and field of expertise and their curriculum vitae;
    - 3.2 A signed statement of independence by the specialist;
    - 3.3 Duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;
    - 3.4 A description of the methodology used to undertake the impact assessment and site inspection, including equipment and modelling used where relevant;
    - 3.5 A description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations;
    - 3.6 Areas not suitable for development, to be avoided during construction and operation (where relevant);
    - 3.7 Additional environmental impacts expected from the proposed development based on those already evident on the site and a discussion on the cumulative impacts;
    - 3.8 Impact management actions and impact management outcomes proposed by the specialist for inclusion in the EMPr; and
    - 3.9 A motivation where the development footprint identified as per section 2.3 were not considered stating reasons why these were not being not considered.
    - 3.10 A reasoned opinion, based on the findings of the specialist assessment, regarding the acceptability or not of the development and if the development should receive approval or not, and any conditions to which the statement is subjected.
  4. The findings of the Terrestrial Biodiversity Impact Assessment must be incorporated into the Basic Assessment Report or the Environmental Impact Assessment Report, including the mitigation and monitoring measures as identified, which must be incorporated into the EMPr. A signed copy of the Assessment must be appended to the Basic Assessment Report or Environmental Assessment Report.

The above Terms of Reference and reporting requirements are achieved in this study and report.

## 1.2 PROJECT LOCATION

The Aberdeen Wind Facility 1 is part of the Aberdeen Wind Facilities Cluster and is located approximately 20 km west of Aberdeen within the Eastern Cape. The layout and location of the Aberdeen Wind Facility 1 is illustrated below in **Error! Not a valid bookmark self-reference.** and includes 41 potential turbine locations with a maximum output of 240MW. The estimated total permanent footprint of the Wind Facility 1 is estimated at 62ha.

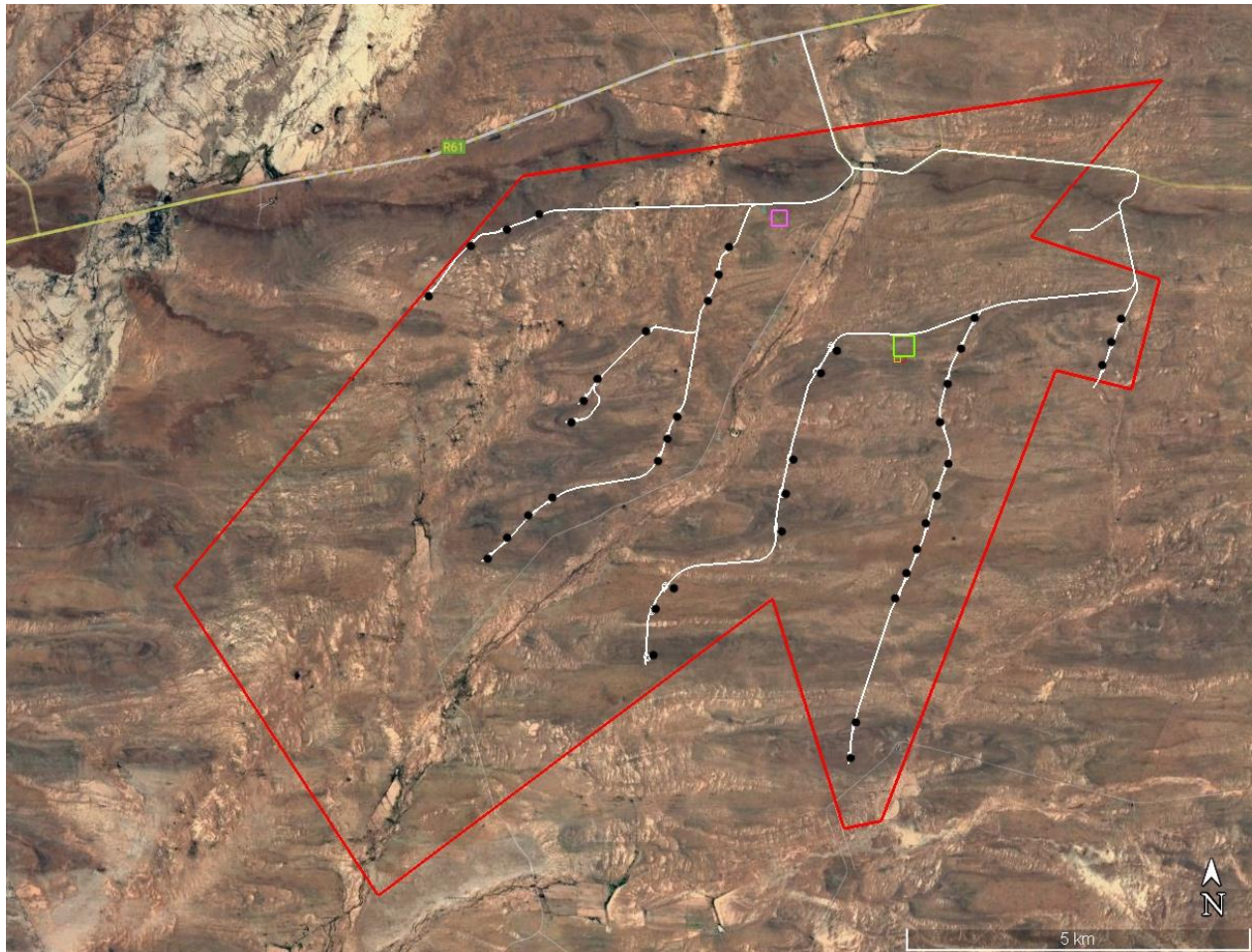


**Figure 1.** Satellite image showing the location of the proposed Aberdeen Wind Facility 1, west of Aberdeen in the Eastern Cape.

## 1.3 PROJECT DESCRIPTION

The Aberdeen Wind Energy Facility 1 is part of the Aberdeen Wind Facilities Cluster and is located approximately 20 km west of Aberdeen in the Eastern Cape. The layout and location of the Aberdeen Wind Facility 1 is illustrated below in Figure 1 and includes up to 41 potential turbine locations with a maximum output of 240 MW. The estimated total permanent footprint of the Aberdeen WEF Wind Facility 1 is estimated at 62ha. The electricity generated by the proposed

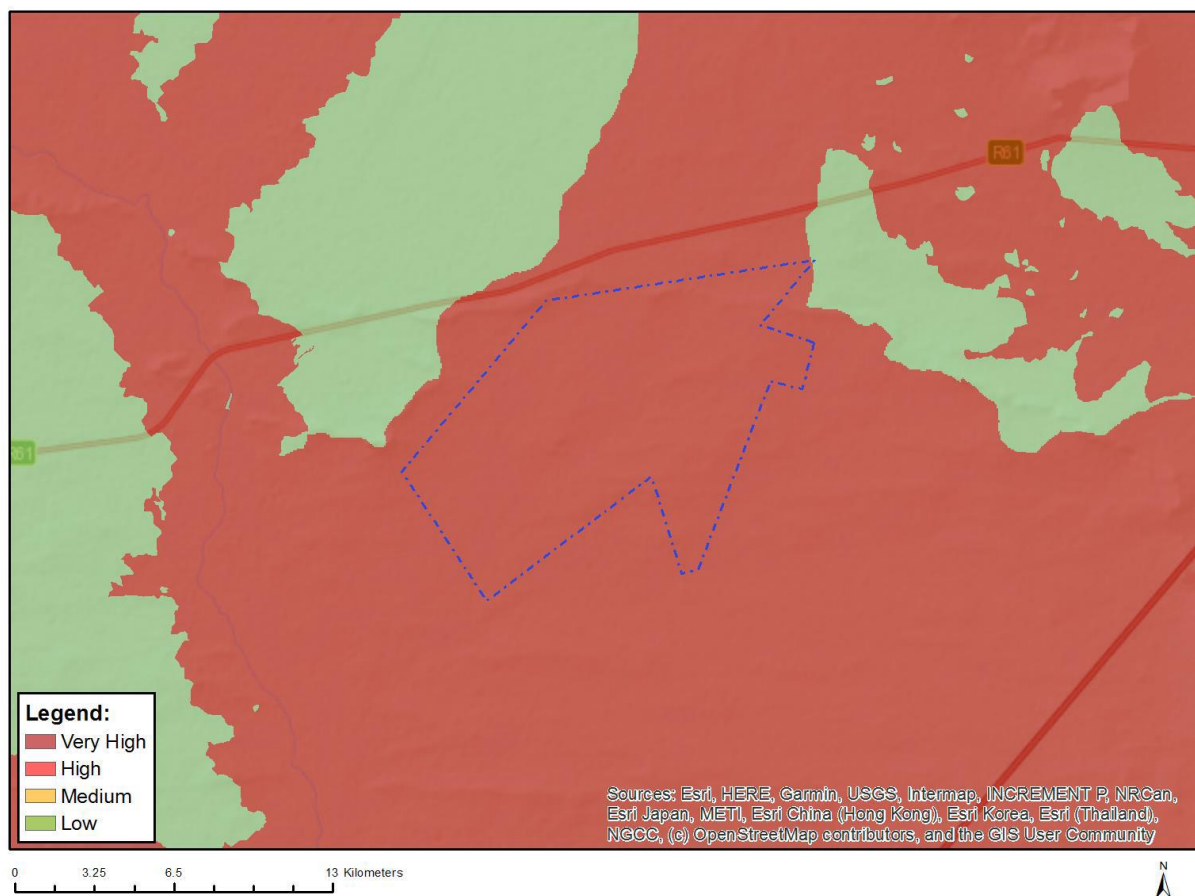
WEF development will be fed into the national grid. A Battery Energy Storage System (BESS) will be located next to the onsite up to 132kV substation.



**Figure 2.** Satellite image showing the layout of the proposed Aberdeen Wind Facility 1, with turbine locations, turbine access roads, substation, battery storage area and laydown area.

#### 1.4 DFFE SCREENING TOOL TERRESTRIAL BIODIVERSITY THEME SENSITIVITY.

The DFFE Screening Tool for the site indicates that for the combined Terrestrial Biodiversity Theme, the site consists entirely of Very High sensitivity areas due to the presence of ESAs and FEPA Subcatchments (Figure 3 and Table 1). Based on the presence of these features within the site, a full terrestrial biodiversity assessment is required and represents the rationale for the current assessment.



**Figure 3.** Terrestrial Biodiversity Theme Sensitivity Map of the Aberdeen Wind Facility 1 site and surrounds.

**Table 1.** Terrestrial Biodiversity Theme Features for the Aberdeen Wind Facility 1 study area.

Sensitivity	Feature(s)
Low	Low Sensitivity
Very High	Ecological support area 1
Very High	Ecological support area 2
Very High	FEPA Subcatchments

## 2 METHODOLOGY

### 2.1 DATA SOURCING AND REVIEW

Data sources from the literature consulted and used where necessary in the study includes the following:

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### *Vegetation:*

- Vegetation types and their conservation status were extracted from the South African National Vegetation Map (2018 update).
- Information on plant and animal species recorded for the wider area was extracted from the South African Biodiversity Information Facility (SABIF)/ SANBI Integrated Biodiversity Information System (SIBIS) database hosted by the South African National Biodiversity Institute (SANBI). Data was extracted for a significantly larger area than the study area, but this is necessary to ensure a conservative approach as well as counter the fact that the site itself has not been well sampled in the past.
- The International Union for Conservation of Nature (IUCN) conservation status of the species in the list was also extracted from the database and is based on the Threatened Species Programme, Red List of South African Plants (2023).

### *Ecosystem:*

- Freshwater and wetland information was extracted from the National Freshwater Ecosystem Priority Areas assessment, NFEPA (Nel *et al.* 2011) as well as the 2018 NBA.
- Critical Biodiversity Areas (CBAs) and ESAs in the study area were obtained from the Eastern Cape CBA Map as available from the SANBI BGIS Portal.
- There are no threatened ecosystems within the site, which was verified through inspection of the ecosystem status maps as included in the 2018 NBA.
- Strategic Water Source Areas (SWSAs) for the site were extracted from the SWSAs map available on the SANBI BGIS data portal (Water Research Commission. 2017 Surface and Groundwater SWSA [Vector] 2017).

### *Fauna*

- Lists of mammals, reptiles and amphibians which are likely to occur at the site were derived based on distribution records from the literature and the ADU databases (ReptileMap, Frogmap and MammalMap) <http://vmus.adu.org.za>.
- Literature consulted includes Branch (1988) and Alexander and Marais (2007) for reptiles, Du Preez and Carruthers (2009) for amphibians, EWT & SANBI (2016) and Skinner and Chimimba (2005) for mammals.
- The faunal species lists provided are based on species which are known to occur in the broad geographical area, as well as an assessment of the availability and quality of suitable habitat at the site.
- The conservation status of mammals is based on the IUCN Red List Categories (EWT/SANBI 2016), while reptiles are based on the South African Reptile Conservation Assessment (Bates *et al.* 2013) and amphibians on Minter *et al.* (2004) as well as the IUCN (2023).

## **2.2 SITE VISITS & FIELD ASSESSMENT DATES**

The Aberdeen Wind Facilities cluster site was visited on two occasions for the current study, from 18-20 March 2022 and 26 August – 02 September 2022. The initial field assessment was used largely to investigate the broad features of the site and the major biodiversity features present. This information was then used to inform a draft sensitivity map of the site. The second field assessment included extensive walk-throughs of sensitive areas, including all rocky outcrops where the regular presence of Sensitive Species 1212 was confirmed. Potentially sensitive features within the site were investigated, validated and characterised in the field including any pans, rocky outcrops and major drainage features that were observed in the field or from satellite imagery of the site. Particular attention was paid to the integrity of habitats present as well as the broader ecological context in terms of connectivity and broad-scale ecological processes likely to be operating at the site.

## **2.3 FIELD SAMPLING APPROACH**

In order to characterise the biodiversity of the site, a number of sampling techniques were used, these are summarized below and are also detailed in the Species Assessment for Species 1212 and the Fauna Compliance Statement. However, this includes direct sampling of the vegetation through vegetation surveys across the site, and direct observation of the fauna present through habitat assessment, dung, track and other observation. The sampling and the manner in which that is integrated into the study is further detailed below.

### *Vegetation & Ecosystems*

Sensitivity mapping of the site was conducted by the consultant based on the identification of important/sensitive habitats as observed on the site and then mapped both in the field and using satellite imagery of the site. The identification of potentially sensitive areas included the mapping of wetlands and drainage features, steep slopes, rocky hills and areas of gravel or calcrete patches. In terms of the actual sampling approaches that were used, the vegetation of the site was characterised through walk-through surveys distributed across the site, in which plant species lists for the different habitats observed were compiled. Specific attention was paid to areas where the presence of species of conservation concern (SCC) are likely to be found or had been confirmed present. Sensitive plant habitats such as wetlands, rock pavements and rocky slopes were specifically investigated and checked for the presence of plant SCC. The information collected on-site was used to identify no-go areas and sensitive features that would need to be avoided in order to minimise the potential impact of the development on sensitive habitats and associated species of concern. As a result, the final layout of the development would in-effect be a mitigated layout avoiding or minimising the impact on the sensitive features of the area.



## 2.4 SAMPLING LIMITATIONS AND ASSUMPTIONS

While there had been significant rains prior to the initial survey, this followed a prolonged drought in the area, with the result that the vegetation had not fully recovered and was still in a relatively poor condition. The rains had however stimulated a lot of fauna and there was a lot of reptile and amphibian activity on the site at the time of the initial site visit. The vegetation was however in an excellent condition by the time of the second field assessment and there was a high abundance of forbs and geophytes present. As a result, it is considered that there are few limitations and assumptions required with regards to the vegetation of the site and the presence of plant SCC within the development footprint. It is highly unlikely that there are any significant vegetation features present that would not have been observed during the study. Given the amount of time spent on the site, the consultants' knowledge of the area and the favorable conditions at the time of the site visits, there are few limitations and assumptions required with regards to the vegetation of the site and the presence of plant SCC within the site.

## 3 ABERDEEN WEF 1 WEF BASELINE DESCRIPTION

### 3.1 VEGETATION TYPES

The Aberdeen Wind\ Facility 1 footprint falls almost entirely within the Eastern Lower Karoo vegetation type with a small extent of Southern Karoo Riviere along the Gannaleegte River in the south of the site (Figure 5). Although there is some variation in vegetation composition within the site depending on soil depth, underlying geology and rockiness, these differences represent different communities rather than different vegetation types. The two vegetation types present and some of the observed variation is described below.

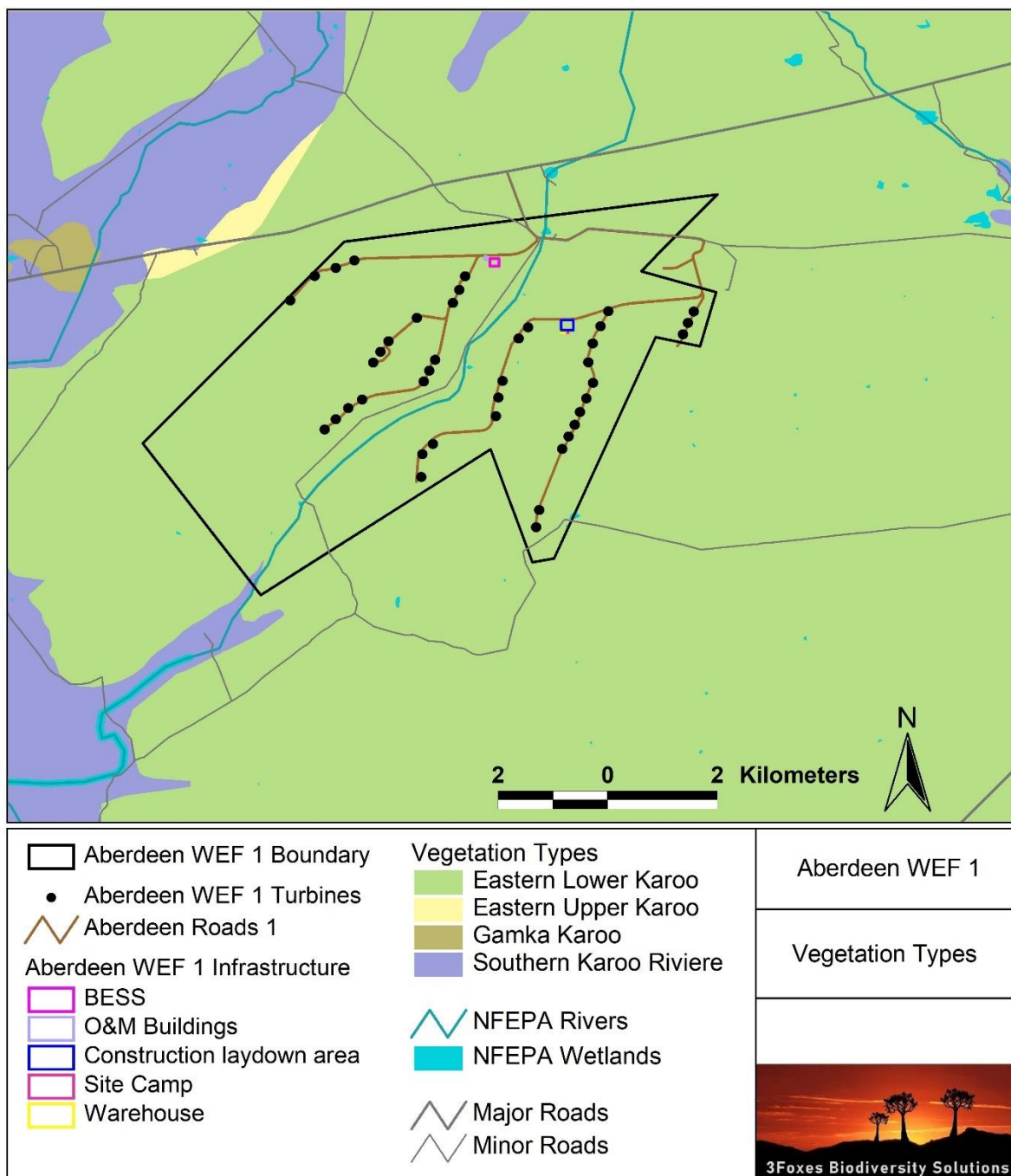
#### *Eastern Lower Karoo*

Eastern Lower Karoo occurs in the Eastern Cape and Western Cape Provinces, where it is distributed on the plains east of the Kariega and Buffels Rivers in the area south of the Camdebo Mountains and the line of mountains linking to the Coetzeesberge encompassing Aberdeen, Graaff-Reinet and Pearston (region called Camdebo) and plains south of Aberdeen to Klipplaat and Miller. Within the study area, common and dominant species include trees and tall shrubs such as *Vachellia karroo*, *Lycium oxycarpum*, *Carissa haematocarpa*, *Grewia robusta* and *Rhigozum obovatum*; Lower shrubs such as *Eriocephalus ericoides* subsp. *ericoides*, *Pentzia incana*, *Rosenia humilis*, *Asparagus suaveolens*, *Blepharis capensis*, *Chrysocoma ciliata*, *Euryops anthemoides*, *Felicia muricata*, *Galenia secunda*, *Garuleum latifolium*, *Helichrysum zeyheri*, *Hermannia cuneifolia*, *Indigofera sessilifolia*, *Pegolettia retrofracta*, *Phymaspermum parvifolium*, *Plinthus karooicus*, *Pteronia adenocarpa*, *P. glauca*, *P. sordida*, *Selago fruticosa* and *Zygophyllum microphyllum*; with a variable mix of succulent shrubs comprising mostly *Ruschia cradockensis* subsp. *cradockensis*, *Mesembryanthemum coriarium*, *Drosanthemum lique*, *Euphorbia ferox*, and *Sarcocaulon camdeboense*. The grass layer is variable but at the time of

the site visits comprised a significant proportion of annual grasses which had likely increased in response to the rains following the extended drought which had opened up the vegetation to some degree. Common and dominant grasses present include *Aristida adscensionis*, *Eragrostis lehmanniana*, *E.obtusa*, *Tragus berteronianus*, *T.koelerioides*, *Cynodon incompletus* and *Enneapogon desvauxii*. Common forbs and geophytes include *Gazania krebsiana*, *Albuca setosa*, *Drimia anomala* and *Moraea polystachya*.



**Figure 4.** Example of the open plains habitat that dominates the the Aberdeen Wind Facility 1 study area, corresponding with the Eastern Lower Karoo vegetation type. The vegetation in the picture is dominated by the purple-flowered *Ruschia cradockensis*.



**Figure 5.** The national vegetation map (SANBI 2018 Update) for the Aberdeen Winf Facility 1and surrounding area.



**Figure 6.** Looking out over the Aberdeen Wind Facility 1 site from one of the low ridges that occur within the site, showing the overall homogenous nature of the site.

#### *Southern Karoo Riviere*

According to the VegMap, there is only a small extent of Southern Karoo Riviere present within the site, restricted to the far south of the project area along the Gannaleegte River. The Southern Karoo Riviere vegetation type is however generally under-mapped within the VegMap and the vegetation along the major drainage lines of the site such as the rest of the Gannaleegte River can be considered to represent this vegetation type. The Southern Karoo Riviere vegetation type is associated with the rivers of the central karoo such as the Buffels, Bloed, Dwyka, Gamka, Sout, Kariega and Sundays Rivers. About 12% has been transformed as a result of intensive agriculture and the construction of dams. Although it is classified as Least Threatened, it is associated with rivers and drainage lines and as such represents areas that are considered ecologically significant. Common and dominant species in the drainage lines and within the adjacent floodplain vegetation include *Vachelia karroo*, *Searsia lancea*, *Diospyros lycioides*, *Cadaba aphylla*, *Lycium oxycarpum*, *Bassia salsoloides*, *Carissa haematocarpa*, *Pentzia incana*, *Malephora uitenhagensis*, *Salsola aphylla*, *Salsola geminiflora*, *Cynodon incompletus* and *Cenchrus ciliaris*.



**Figure 7.** Riparian area within the Aberdeen Wind Facility 1 with vegetation that can be considered allied with the Southern Karoo Riviere vegetation type.

### 3.2 DFFE SENSITIVE PLANT SPECIES

According to the DFFE Screening Tool, there are four plant species of concern that may occur within the Aberdeen Wind Facility 1 site. These are listed and briefly described below in Table 2. Only Sensitive Species 1212 was observed at the site and it is considered unlikely to very unlikely that any of the other three species are present within the Aberdeen Wind Facility 1 site. No other plant SCC were observed within the site. Since Sensitive Species 1212 was confirmed present at the site, the Aberdeen Wind Facility 1 site is considered High sensitivity for the Plant Species Theme and a full species-level assessment for Species 1212 has been included in the EIA.

**Table 2.** Sensitive Species as listed by the DFFE Screening Tool for the Aberdeen Wind Facility 1 site and the likely presence of these species within the site.

DFFE Site Status	Name	IUCN Status	Possible presence within the Aberdeen WEF cluster site
Medium	<i>Peersia frithii</i>	VU	Occurs from Laingsburg to Aberdeen. A species previously collected widely throughout the southern Nama Karoo with an historic extent of occurrence (EOO) of 28913 km <sup>2</sup> . It has only been recorded seven times since 1990 and is suspected to be extant at 6 locations

			from a current EOO of 690 km <sup>2</sup> . Decline is suspected to be the result of livestock overgrazing and trampling. Not observed within the Aberdeen site and is considered absent from the site.
Medium	<i>Tridentea virescens</i>	Rare	A widespread species that occurs in the Northern Eastern and Western Cape as sporadic small subpopulations of up to six plants. No threats are known to impact this species. It occurs on stony ground, or hard loam in floodplains. Not observed within the Aberdeen site and is considered absent.
Medium	Sensitive Species 1212	VU	Willowmore to Beaufort West and Aberdeen. EOO <7 000 km <sup>2</sup> , known from fewer than 10 locations and habitat quality and number of mature individuals are declining as a result of livestock (sheep and goat) overgrazing and illegal collection for the succulent plant trade.  Confirmed present within the Aberdeen site.
Medium	Sensitive Species 1039	VU	This taxon occurs in the southern Great Karoo from Aberdeen and Graaff-Reinet southwards to Rietbron and eastwards to Willowmore, Klipplaat and Steytlerville. It occurs on flat areas between low hills on slightly gravelly ground, rarely on hill slopes.  Not observed within the site and considered absent from the site.

### 3.3 FAUNAL COMMUNITIES

As many as 60 mammals are listed for the wider study area in the MammalMap database, but many of these are introduced or conservation-dependent and approximately 45 can be considered to be free-roaming and potentially impacted by the development (Annex 2). This includes two red-listed species the Black-footed Cat *Felis nigripes* (VU) and Mountain Reedbuck *Redunca fulvorufula* (EN). The Mountain Reedbuck occurs in the wider area but as there is no suitable habitat for this species within the site, the site is considered low sensitivity for the Mountain Reedbuck and it is confirmed as absent from the site. The Black-footed Cat is also known from occasional records from the wider area but prefers areas with a mix of more open and higher cover areas. As this is a shy and secretive species, it is difficult to confirm as absent or present within a site. However, given the generally sparse cover at the site, it is considered to have a low favourableness for this species and as a result, the site is considered low sensitivity for the Black-footed Cat. No other mammals of concern were observed at the site and it is unlikely that any such species are present.

In terms of reptiles, only 14 species have been recorded from the four quarter-degree squares closest to the site, suggesting that the area has not been well-sampled in the past. When this is expanded to encompass the majority of the Eastern Lower Karoo, this rises to 45 species, which is a more realistic total for the wider area. Diversity within the site is however likely to be relatively low as the habitat is relatively homogenous and there are no significant rocky outcrops present that would attract rupicolous species. A total of 15 species are considered likely to be present within the site. The only red-listed species that may be present is the Karoo Dwarf Tortoise (EN). This small tortoise is seldom observed, even when specifically targeted during herpetofaunal surveys as it is active for only very short parts of the day and may also aestivate for extended periods during unfavourable environmental conditions. They are associated with dolerite ridges and rocky outcrops of the southern Succulent and Nama Karoo biomes. Threats to this species include habitat degradation due to agricultural activities and overgrazing, and predation by the Pied Crows which, in recent decades, have expanded in distribution range. There is however little to no suitable habitat for this species within the site and it is considered absent from the site. No other reptile species of concern are likely to be present within the site.

The site is relatively unfavourable for amphibians, given the lack of permanent water within the site. Species observed within the site include the Common Caco, Common Platanna and Giant Bullfrog. No species of concern are known from the area with the result that the site is considered low sensitivity for amphibians and it is only the drainage features that are considered to be of significance for amphibians.

**Table 3.** Faunal species conservation concern known from the broad area, and their likely presence within the site.

Species	Wider area	Aberdeen WEF 1 WEF
Mountain Reedbuck (NT)	Confirmed present on the mountainous terrain north of the site.	Not observed within the Aberdeen Wind Facility 1 site. The Aberdeen Wind Facility 1 site is considered low sensitivity for this species.
Black-footed Cat (VU)	Previously recorded occasionally from the wider area. But the shy and secretive nature of this species makes it difficult to confirm absence or presence within an area.	The regular presence of this species within the site is considered unlikely. The site is considered low sensitivity for this species.
Karoo Dwarf Tortoise (NT)	Occasional records from the broad area. Associated with dolerite outcrops.	Considered highly unlikely to be present as there are no dolerite outcrops present that would represent suitable habitat for this species.

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### 3.4 CRITICAL BIODIVERSITY AREAS & BROAD-SCALE PROCESSES

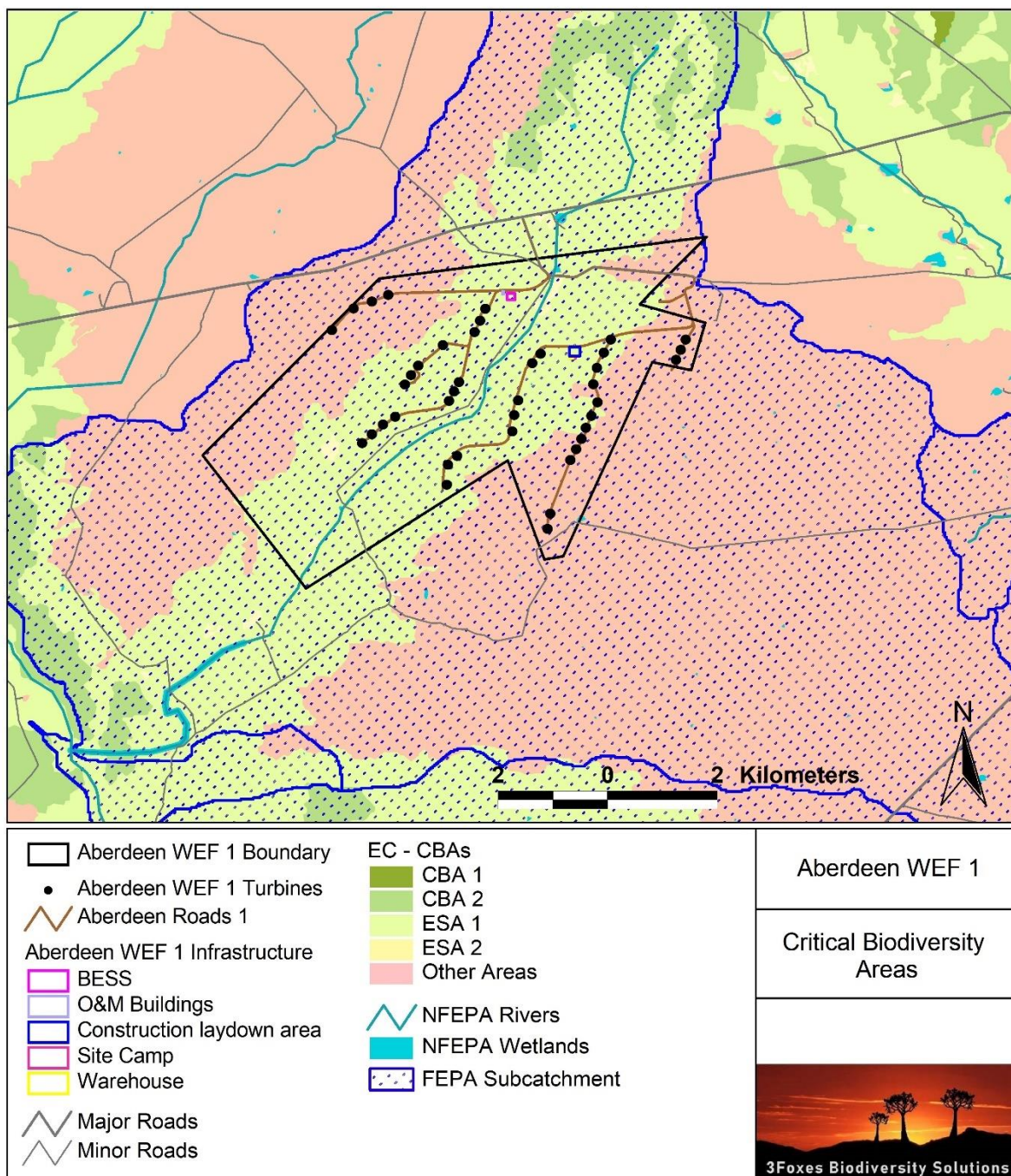
Although there are no CBAs within the Aberdeen Wind Facility 1 site, there is a large Ecological Support Area buffer along the Gannaleegte River (Figure 8). This corridor is over 4km wide and is presumably designed to act as a movement corridor for fauna through the area. Under the layout assessed there are 28 turbines as well as the construction camp and BESS located within the ESA. The Gannaleegte River has however been avoided and there are no turbines within 600m of the river, with the result that the development allows for a 1.2km development-free corridor along the Gannaleegte River. It is unlikely that the presence of the turbines and the operation of the wind-energy facility would significantly compromise the ecological functioning of the broad-scale ESA corridor along the Gannaleegte River. There do not appear to be any fauna that are likely to be particularly negatively impacted by the facility in their ability to disperse around the landscape. Although development within ESAs is undesirable and may compromise the ecological functioning of the affected ESA, the fine-scale feature-mapping presented in Section 4, ensures that the actual terrestrial biodiversity features of concern and significance that are present within the site have been avoided and there would be no turbines in areas considered to be High or Very High sensitivity. As a result, impacts on terrestrial biodiversity within the site and within the affected ESA would be reduced to an acceptable level.

The whole of the Aberdeen Wind Facility 1 site falls within a FEPA Priority Subcatchment. Although the development would potentially have negative impacts on the riparian environment through disturbance and changes to water quality downstream of the site as a result of erosion, pollution and other forms of disturbance and associated degradation of the freshwater ecosystems of the site, these negative impacts can be well-mitigated. The majority of the site is relatively flat with the result that water erosion risk is relatively low, while wind-erosion potential is moderate but can be effectively reduced through dust suppression during construction. The development footprint, which is estimated at 162ha is less than 0.5% of the extent of the FEPA subcatchment which is over 50 000ha. As a result, with the effective implementation of mitigation and avoidance, it is unlikely that the development of the Aberdeen Wind Facility 1 would significantly compromise the long-term ecological integrity and associated ecosystem services of the affected FEPA Subcatchment. The impact of the development on the aquatic ecosystems and water quality components of the affected FEPA Subcatchment are covered in the freshwater study (Colloty 2023), but similarly finds that impacts can be reduced to acceptable levels and that impacts after mitigation would be low.

In terms of the conservation planning priorities and features of the site, there are no NPAES Focus Areas within the site. Given the low transformation rate and extensive nature of the affected vegetation types, the development would have minimal impact on the future ability to meet



conservation targets for these vegetation types. There are no Strategic Water Source Areas (SWSA's) within the study area.



**Figure 8.** Extract of the Eastern Cape CBA map for the Aberdeen Wind Facility 1 and surrounds.

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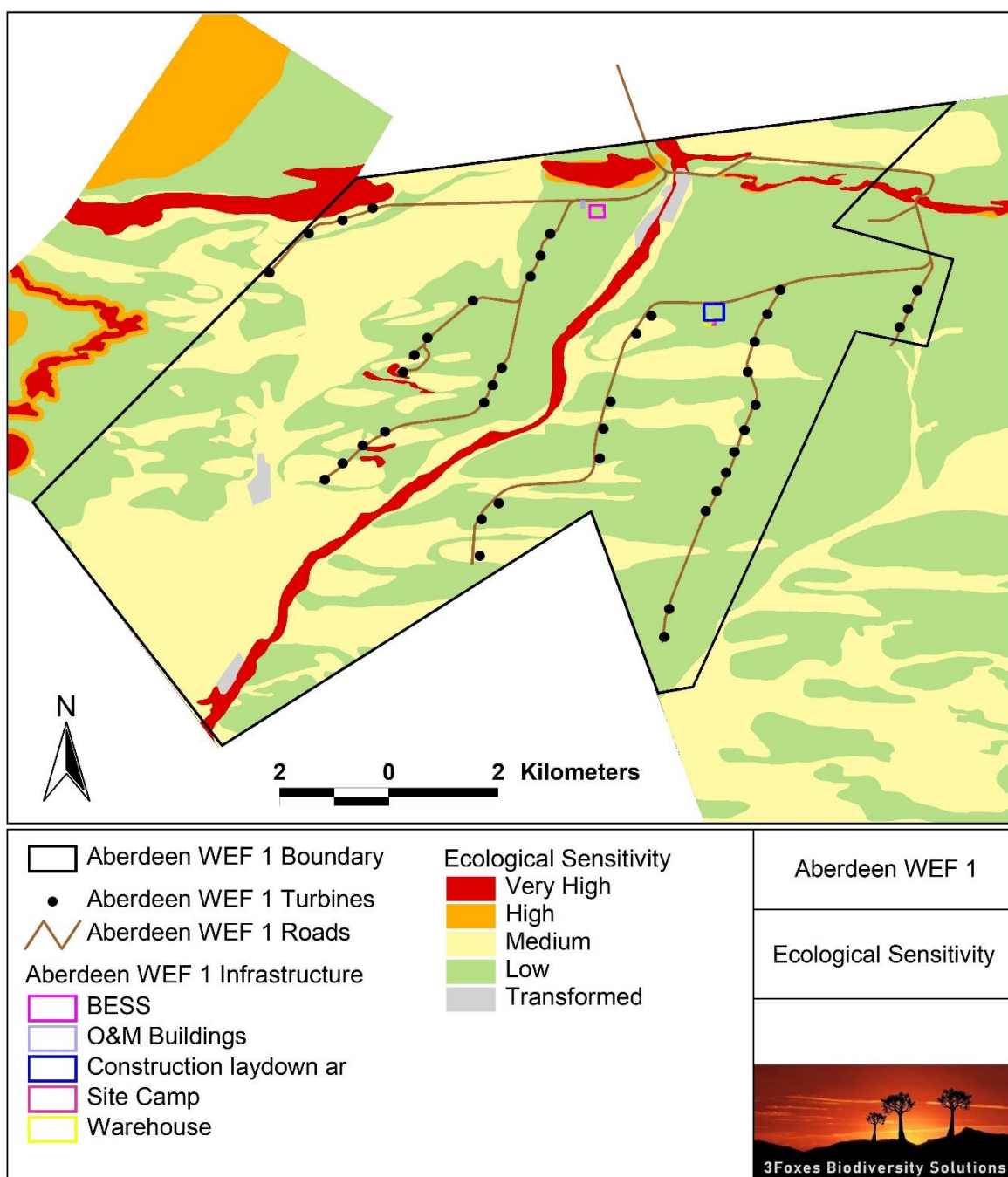
### **3.5 CUMULATIVE IMPACTS**

In terms of cumulative impacts in and around the site, there are no built wind energy facilities within 30km of the site. There are however several planned facilities in the area most notable of which would be the adjacent Aberdeen 2 and Aberdeen 3 Wind Energy Facilities, which are part of the current suite of projects and as such would largely share the same environment as the current project. The estimated combined footprint of these two projects would be approximately 186ha. Other known in-process or authorised projects in the area include the approved the Aberdeen 200MW Wind Farm. However, the overall pattern is that there is currently significant interest in the area, from the current suite of projects as well as several other existing and potential projects. This is largely due to the strategic location of the project within the Beaufort West REDZ. Current levels of cumulative impact from renewable energy are however very low as there are no constructed facilities in the area. The construction of the current project with a direct development footprint of 62ha would therefore be the first such development in the area. As the affected Eastern Lower Karoo vegetation type and the broader area is still largely intact, cumulative impacts associated with the current project are considered low and acceptable. There do not appear to be any ecological processes or corridors that would be specifically disrupted by the Aberdeen WEF 1. In addition, should all the planned projects in the area be built, the overall extent of habitat loss would not be significant relative to the overall extent of the affected vegetation types. As such, the contribution of the Aberdeen WEF 1 to habitat loss would not change the overall threat status of any vegetation types or special habitats and the overall level of cumulative impact in the area is considered acceptable.

### **4 ABERDEEN WIND FACILITY 1 CONSTRAINTS**

In order to ensure the maintenance of ecological processes within the site and the minimisation of impacts on terrestrial biodiversity, a constraints map for the site was produced (Figure 9). This has been used to inform the wind farm layout and ensure that impacts on the sensitive features of the site are maintained within acceptable limits. There are numerous constraints operating across the site, associated firstly with the major drainage features of the site such as the Gannaleegte River and then secondly with the low hills and rocky areas within the site which have been confirmed as home to sensitive plant species. The areas mapped as Very High sensitivity are considered no-go areas for wind turbines but may be traversed by overhead cables or turbine access roads where required, subject to review. The areas mapped as High sensitivity represent other sensitive features such as minor drainage lines or slopes. These areas should also be avoided by turbines as much as possible. Under the layout provided for the assessment, there are no turbines in areas mapped as Very High or High sensitivity. As a result, the development of the Aberdeen Wind Facility 1 would avoid significant impact on the major ecological features

of the site and as such, the development is considered acceptable and would generate a low impact on fauna, flora and terrestrial biodiversity generally.



**Figure 9.** Ecological constraints map for the Aberdeen Wind Facility 1 for turbines.

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## **5 IMPACTS AND ISSUES IDENTIFICATION**

### **5.1 IDENTIFICATION OF POTENTIAL IMPACTS**

The development of the Aberdeen Wind Facility 1 would result in a number of potential impacts on Terrestrial Biodiversity during the construction and operational phases of the development. During construction, the major impact would likely be habitat loss and anthropogenic disturbance while during the operational phase, direct disturbance would be much reduced although there may be some potential impact from operational and maintenance activities. The following impacts are identified as the major impacts that are likely to be associated with the development of the Aberdeen Wind Facility 1 on Terrestrial Biodiversity.

#### ***Impact 1. Impacts on Ecological Support Areas***

A significant number of turbines as well as other infrastructure are located within the extended ESA along the Gannaleegte River. While the fine-scale sensitivity mapping with the identification and mapping of no-go areas, conducted as part of this study, will reduce the impact of the development on important biodiversity features within the ESA, there would still be some residual habitat loss and negative impact on the effected ESA.

#### ***Impact 2. Impacts on FEPA Priority Subcatchments***

The whole of the site falls within a FEPA Priority Subcatchment, and the development would potentially have some impact on this subcatchment and the delivery of ecosystem services from this area. The total footprint of the development would represent less than 0.2% of the subcatchment, with the result that with the implementation of suitable mitigation, this impact would be localized and not of high likely overall long-term significance.

#### ***Cumulative Impact 1. Cumulative Impacts on broad-scale ecological processes***

The development of the Aberdeen WEF 1 infrastructure would result in habitat loss and an increase in overall cumulative impacts on fauna and flora in the area. The contribution of the Aberdeen Wind Facility 1 to cumulative impact at less than 62ha is not considered highly significant, given the avoidance of the sensitive features of the site. There are no observable corridors or gradients evident across the site that would be likely to be disrupted by the development. In addition, the wind farm would remain porous for most species and while some species would likely avoid the inner parts of the wind farm, it is likely that most species would at least be able to move through the wind farm area for migration or movement purposes if required.

## 6 ASSESSMENT OF IMPACTS ON TERRESTRIAL BIODIVERSITY– ABERDEEN WEF 1

An assessment of the likely significance of the impacts identified above is made below for the impacts of the Aberdeen Wind Facility 1 on Terrestrial Biodiversity.

### 6.1 CONSTRUCTION PHASE IMPACT ON ECOLOGICAL SUPPORT AREAS

<b>Impact Nature:</b> Transformation and presence of the facility will contribute to cumulative habitat loss within ESAs and impacts on broad-scale ecological processes such as fragmentation.		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (1)	Local (1)
<b>Duration</b>	Long-term (4)	Long-term (4)
<b>Magnitude</b>	Low (3)	Minor (2)
<b>Probability</b>	Certain (5)	Probable (3)
<b>Significance</b>	Medium (40)	Low (21)
<b>Status</b>	Negative	Negative
<b>Reversibility</b>	Moderate	Moderate
<b>Irreplaceable loss of resources</b>	No	No
<b>Can impacts be mitigated?</b>	To some degree, but the habitat loss associated with the project is largely unavoidable.	
<b>Mitigation</b>	<ul style="list-style-type: none"> <li>• Minimise the development footprint as far as possible.</li> <li>• Locate temporary-use areas such as construction camps and lay-down areas in low sensitivity or previously disturbed areas.</li> <li>• Minimise the development footprint in areas mapped as high sensitivity (i.e. near watercourses and other ecologically significant features).</li> <li>• Clearly demarcate riparian areas near to the development footprint as No-Go areas with appropriate signage and barriers.</li> <li>• Appropriate design of roads and other infrastructure to minimise faunal impacts and allow fauna to pass over, through or underneath these features as appropriate.</li> <li>• The fencing around substations or other infrastructure should not have any electrified strands within 30cm of the ground as this may result in tortoises being electrocuted. Alternatively, guard wires or mesh can be placed outside of the fence to prevent tortoises from accessing the electrified fence.</li> </ul>	

	<ul style="list-style-type: none"> <li>Monitoring of construction activities to ensure that the development footprint within sensitive areas is restricted to the authorised development footprint.</li> </ul>
<b>Residual Risks</b>	Habitat loss within the ESAs cannot be fully mitigated or avoided with the result that some residual habitat and local disturbance, for affected fauna and flora will occur during operation of the facility.

## 6.2 CONSTRUCTION PHASE IMPACT ON FEPA SUBCATCHMENTS

<b>Impact Nature:</b> Impacts on ecosystem services within the affected FEPA Priority Subcatchment as a result of construction phase activities, including disturbance and soil erosion.		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (1)	Local (1)
<b>Duration</b>	Long-term (4)	Long-term (4)
<b>Magnitude</b>	Low (3)	Minor (2)
<b>Probability</b>	Certain (5)	Probable (3)
<b>Significance</b>	Medium (40)	Low (21)
<b>Status</b>	Negative	Negative
<b>Reversibility</b>	Moderate	Moderate
<b>Irreplaceable loss of resources</b>	No	No
<b>Can impacts be mitigated?</b>	Yes, degradation and negative impacts on the FEPA Subcatchment can be largely mitigated.	
<b>Mitigation</b>	<ul style="list-style-type: none"> <li>Disturbance within or near the drainage lines should be kept to a minimum and any disturbance in these areas should be rehabilitated as quickly as possible.</li> <li>An erosion monitoring programme should be put in place for at least 3 years after construction. Any problems observed should be rectified as soon as possible using the appropriate revegetation and erosion control works.</li> </ul>	
<b>Residual Risks</b>	Habitat loss within the FEPA Subcatchment cannot be fully mitigated or avoided with the result that some residual disturbance and degradation will occur during operation of the facility.	

## 6.3 OPERATIONAL PHASE IMPACTS ON ECOLOGICAL SUPPORT AREAS

<b>Impact Nature:</b> The presence and operation of the facility will contribute to cumulative habitat loss within ESAs and impacts on broad-scale ecological processes such as fragmentation.		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (1)	Local (1)

<b>Duration</b>	Long-term (4)	Long-term (4)
<b>Magnitude</b>	Low (3)	Minor (2)
<b>Probability</b>	Highly Probable (4)	Probable (3)
<b>Significance</b>	Medium (32)	Low (21)
<b>Status</b>	Negative	Negative
<b>Reversibility</b>	Moderate	Moderate
<b>Irreplaceable loss of resources</b>	No	No
<b>Can impacts be mitigated?</b>	To some degree, but some residual disturbance associated with the project is likely unavoidable.	
<b>Mitigation</b>	<ul style="list-style-type: none"> <li>Any potentially dangerous fauna such as snakes or fauna threatened by the maintenance and operational activities should be removed to a safe location.</li> <li>If any parts of the site must be lit at night for security purposes, this should be done with downward-directed low-UV type lights (such as most LEDs and HPS bulbs), which attract fewer insects.</li> <li>All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.</li> <li>All vehicles accessing the site should adhere to a low speed limit (30km/h max for heavy vehicles and 40km/h for light vehicles) to avoid collisions with susceptible species such as snakes and tortoises.</li> <li>If any parts of the facility are fenced, then no electrified strands should be placed within 30cm of the ground as some species such as tortoises are susceptible to electrocution from electric fences because they do not move away when electrocuted but rather adopt defensive behaviour and are killed by repeated shocks. Alternatively, the electrified strands should be placed on the inside of the security fence and not the outside.</li> </ul>	
<b>Residual Risks</b>	Habitat loss within the ESAs cannot be fully mitigated or avoided with the result that some residual habitat and local disturbance, for affected fauna and flora will occur during operation of the facility.	

#### 6.4 OPERATIONAL PHASE IMPACT ON FEPA SUBCATCHMENTS

<b>Impact Nature:</b> Disturbance created during construction will leave the site and its immediate surroundings vulnerable to erosion and alien plant invasion for several years into the operational phase, with associated negative impacts on the affected FEPA Priority Subcatchment and the provision of associated ecosystem services.		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (1)	Local (1)

<b>Duration</b>	Medium-term (2)	Short-term (1)
<b>Magnitude</b>	Medium (4)	Low (3)
<b>Probability</b>	Likely (4)	Likely (3)
<b>Significance</b>	Low (28)	Low (15)
<b>Status</b>	Negative	Negative
<b>Reversibility</b>	Medium	High
<b>Irreplaceable loss of resources</b>	Moderate	Low
<b>Can impacts be mitigated?</b>	Yes, with proper management and avoidance, this impact can be mitigated to a low level.	
<b>Mitigation</b>	<ul style="list-style-type: none"> <li>Erosion management at the site should take place according to the Erosion Management Plan and Rehabilitation Plan. This should make provision for annual monitoring and rehabilitation.</li> <li>All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques.</li> <li>There should be follow-up rehabilitation and revegetation of any remaining bare areas with indigenous perennial shrubs, grasses and trees from the local area.</li> <li>Alien management at the site should take place according to the Alien Invasive Management Plan.</li> <li>Regular (annual) monitoring for alien plants during operation to ensure that no alien invasive problems have developed as result of the disturbance, as per the Alien Management Plan for the project.</li> <li>Woody aliens should be controlled on at least an annual basis using the appropriate alien control techniques as determined by the species present.</li> </ul>	
<b>Residual Risks</b>	Some erosion and alien plant invasion is likely to occur even with the implementation of control measures, but would have a low impact if effectively managed.	

## 6.5 DECOMMISSIONING PHASE IMPACTS ON ECOLOGICAL SUPPORT AREAS

<b>Impact Nature:</b> The decommissioning of the facility will contribute to cumulative habitat loss within ESAs and impacts on broad-scale ecological processes such as fragmentation.		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (1)	Local (1)
<b>Duration</b>	Long-term (4)	Long-term (4)



<b>Magnitude</b>	Low (3)	Minor (2)
<b>Probability</b>	Certain (5)	Highly Probable (4)
<b>Significance</b>	Medium (40)	Low (28)
<b>Status</b>	Negative	Negative
<b>Reversibility</b>	Moderate	Moderate
<b>Irreplaceable loss of resources</b>	No	No
<b>Can impacts be mitigated?</b>	To some degree, but the habitat loss associated with the project is largely unavoidable.	
<b>Mitigation</b>	<ul style="list-style-type: none"> <li>All vehicles should adhere to a low speed limit on site. Heavy vehicles should be restricted to 30km/h and light vehicles to 40km/h.</li> <li>Any potentially dangerous fauna such as snakes or fauna threatened by the decommissioning activities should be removed to a safe location prior to the commencement of decommissioning activities.</li> <li>All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.</li> <li>No excavated holes or trenches should be left open for extended periods as fauna may fall in become trapped.</li> <li>All above-ground infrastructures should be removed from the site. Below-ground infrastructure such as cabling can be left in place if it does not pose a risk, as removal of such cables may generate additional disturbance and impact, however, this should be in accordance with the facilities' decommissioning and recycling plan.</li> </ul>	
<b>Residual Risks</b>	There may be some residual risks of degradation after decommissioning, but ultimately the functioning of the site should be restored through rehabilitation and revegetation of disturbed areas.	

## 6.6 DECOMMISSIONING PHASE IMPACT ON FEPA SUBCATCHMENTS

<b>Impact Nature:</b> Disturbance created during decommissioning will leave the site and its immediate surroundings vulnerable to erosion and alien plant invasion for several years after decommissioning, with associated negative impacts on the affected FEPA Priority Subcatchment.		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (1)	Local (1)
<b>Duration</b>	Medium-term (2)	Short-term (1)

<b>Magnitude</b>	Medium (4)	Low (3)
<b>Probability</b>	Likely (4)	Likely (3)
<b>Significance</b>	Low (28)	Low (15)
<b>Status</b>	Negative	Negative
<b>Reversibility</b>	Medium	High
<b>Irreplaceable loss of resources</b>	Moderate	Low
<b>Can impacts be mitigated?</b>	Yes, with proper management and avoidance, this impact can be mitigated to a low level.	
<b>Mitigation</b>	<ul style="list-style-type: none"> <li>Decommissioning disturbance within or near the drainage lines should be kept to a minimum and any disturbance in these areas should be rehabilitated as quickly as possible.</li> <li>An erosion monitoring programme should be put in place for at least 3 years after decommissioning and should make provision for annual monitoring and rehabilitation.</li> <li>All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques.</li> <li>There should be follow-up rehabilitation and revegetation of any remaining bare areas with indigenous perennial shrubs, grasses and trees from the local area.</li> <li>Alien management at the site should be implemented post-decommissioning in accordance with an Alien Invasive Management Plan.</li> <li>Regular (annual) monitoring for alien plants during decommissioning to ensure that no alien invasive problems have developed as result of the disturbance, as per the Alien Management Plan for the project.</li> <li>Woody aliens should be controlled on at least an annual basis using the appropriate alien control techniques as determined by the species present.</li> </ul>	
<b>Residual Risks</b>	Some erosion and alien plant invasion is likely to occur even with the implementation of control measures but would have a low impact if effectively managed.	

## 6.7 CUMULATIVE IMPACT 1. CUMULATIVE IMPACT ON TERRESTRIAL ECOLOGY.

**Impact Nature:** Development of the Aberdeen Wind Facility 1 may impact on broad-scale ecological processes such as the ability of fauna to disperse. The development would potentially contribute to habitat degradation and the loss of landscape connectivity and ecosystem function within the area, but this is

likely to be relatively low as most species are likely to be able to move through the facility as large turbine-free areas are likely to remain available to fauna for movement.		
	<b>Overall impact of the proposed project considered in isolation</b>	<b>Cumulative impact of the project and other projects in the area</b>
<b>Extent</b>	Local (1)	Local (1)
<b>Duration</b>	Long-term (4)	Long-term (4)
<b>Magnitude</b>	Low (3)	Low (4)
<b>Probability</b>	Improbable (2)	Probable (3)
<b>Significance</b>	Low (16)	Low (27)
<b>Status</b>	Negative	Negative
<b>Reversibility</b>	Moderate	Moderate
<b>Irreplaceable loss of resources</b>	Low	Low
<b>Can impacts be mitigated?</b>	Only partly as a significant proportion of the impact results from the presence and operation of the facility which cannot be well mitigated.	
<b>Mitigation</b>	<ul style="list-style-type: none"> <li>• Avoid impact on the sensitive features of the site such as the larger drainage features and low hills of the site.</li> <li>• Ensure that the mitigation hierarchy is applied with a particular emphasis on reducing the development footprint, rehabilitating disturbed areas and minimising degradation around the site.</li> <li>• An open space management plan should be developed for the site, which should include management of biodiversity within the affected areas, as well as that in the adjacent veld.</li> </ul>	
<b>Residual Risks</b>	The presence and operation of the facility would potentially represent an obstacle for some fauna which would experience some fragmentation as a result of the facility. The facility would also potentially increase access to the site, which may have negative impacts on the abundance of species targeted by poachers and illegal plant collectors.	

## 6.8 NO-GO ALTERNATIVE

Assuming that the project does not go ahead, the wind farm would not be built and the current land use would continue into the future. The area is currently used for extensive livestock which is considered to be largely compatible with long-term biodiversity maintenance. Many fauna species are to some degree negatively affected by farming including many predators which are targeted due to their negative impact on livestock, while some species may also be vulnerable to habitat loss or degradation and may experience depressed populations within the farming landscape. In terms of vegetation and plant species, extensive grazing may result in changes in composition towards less palatable species and a reduction in plant cover. It is however important to recognise that the development does not represent an alternative to extensive livestock

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farming, but rather an additional impact independent of the current land use. Overall, the no-go alternative is considered to result in a low negative impact on terrestrial biodiversity.

## **7 CONCLUSION & RECOMMENDATIONS**

The Aberdeen Wind Facility 1 is mapped as falling primarily within the Eastern Lower Karoo vegetation type with a small extent of Southern Karoo Riviere in the south of the site. Both of these vegetation types have only been impacted to a limited extent by transformation and are classified as Least Threatened. In terms of fauna, there are several listed fauna which occur in the wider area and which would potentially be present and be impacted by the development. This includes the Mountain Reedbuck, Small-spotted Cat and Karoo Dwarf Tortoise. None of these species were observed at the site and it is considered unlikely that any of them are present and the site is considered low-sensitivity for these species due to a lack of suitable habitat. The major sensitive features of the site such as the major drainage systems and low hills have been mapped as high or very high sensitivity and would not be impacted by turbine footprint areas. Some impact to these areas from limited amounts of overhead cabling or turbine access roads are considered acceptable.

While there are no CBAs within the development footprint, there is a large ESA along the Gannaleegte River that traverses the site and would be impacted by the Aberdeen Wind Facility 1. It is unlikely that the presence of the turbines and the operation of the wind-energy facility would significantly compromise the ecological functioning of the broad-scale ESA corridor along the Gannaleegte River. In addition, there do not appear to be any fauna that are likely to be particularly negatively impacted by the facility in their ability to disperse around the landscape. Although development within ESAs is undesirable and may compromise the ecological functioning of the affected ESA, the fine-scale feature-mapping that has been used to inform the layout, ensures that the actual terrestrial biodiversity features of concern that are present within the site have been avoided and there would be no turbines in areas considered to be High or Very High sensitivity. As a result, impacts on terrestrial biodiversity within the site and within the affected ESA would be reduced to an acceptable level.

The whole of the Aberdeen Wind Facility 1 site falls within a FEPA Priority Subcatchment. Although the development would potentially have negative impacts on the riparian environment through disturbance and associated degradation of the freshwater ecosystems of the site these potential negative impacts can be well-mitigated. The development footprint, which is estimated at 120ha is less than 0.5% of the extent of the FEPA subcatchment which is over 50 000ha. As a result, with the effective implementation of mitigation and avoidance, it is unlikely that the development of the Aberdeen Wind Facility 1 would significantly compromise the long-term ecological integrity and associated ecosystem services of the affected FEPA Subcatchment.

*Impact Statement – Aberdeen Wind Facility1 Impact on Terrestrial Biodiversity*

There are no impacts associated with the development of the Aberdeen Wind Facility 1 on terrestrial biodiversity that cannot be mitigated to an acceptable level. As such, should all the proposed mitigation be implemented, the Aberdeen Wind Facility 1 development is deemed acceptable from a terrestrial ecological impact perspective. In terms of cumulative impacts, the affected area has not been significantly impacted by renewable energy development to date and the contribution of the current wind farm development to cumulative impact is considered low and acceptable. It is thus the reasoned opinion of the specialist that the Aberdeen Wind Facility 1 development should be authorised subject to the various mitigation and avoidance measures as indicated.

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