KLIPKRAAL WIND ENERGY FACILITY 4 (PTY) LTD

Proposed Development of the Klipkraal Wind Energy Facility (WEF) 4 and Associated Infrastructure near Fraserburg in the Northern Cape Province

Draft Scoping Report

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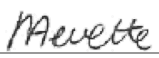
Signature:	
Client:	Klipkraal Wind Energy Facility 4 (Pty) Ltd

Confidentiality Statement

KEY PROJECT INFORMATION

PROJECT DESCRIPTION

The application site assessed during the scoping phase is approximately 1376 hectares (ha) in extent. At this stage it is anticipated that the proposed Klipkraal WEF 4 will comprise up to sixty (60) wind turbines with a maximum total energy generation capacity of up to approximately 300 MWac. In summary, the proposed Klipkraal WEF 4 development will include the following components:

Wind Turbines:

- Approximately 60 turbines, between 5MWac and 8MWac, with a maximum export capacity of up to approximately 300MWac. This will be subject to allowable limits in terms of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or any other program.
- The final number of turbines and layout of the wind farm will, however, be dependent on the outcome of the Specialist Studies in the EIA phase of the project;
- Each wind turbine will have a maximum hub height of up to approximately 200m;
- Each wind turbine will have a maximum rotor diameter of up to approximately 200m;
- Permanent compacted hardstanding areas / platforms (also known as crane pads) of approximately 100m x 100m (total footprint of approx. 10 000m^2) per wind turbine during construction and for on-going maintenance purposes for the lifetime of the proposed wind farm projects. This will however depend on the physical size of the wind turbine;
- Each wind turbine will consist of a foundation (i.e. foundation rings) which may vary in depth, from approximately 3m and up to 10m or greater, depending on the physical size of each wind turbine. It should be noted that the foundation can be up to as much as approximately 700m^3;

Electrical Transformers:

- Electrical transformers will be constructed near the foot of each respective wind turbine in order to step up the voltage to 66kV.
- The typical footprint of the electrical transformers is up to approximately 10m x 10m, but can be up to 20m x 20m at certain locations;

Step-up / Collector Substations:

- One 11-66/132-400kV step-up / collector substation, each occupying an area of up to approximately 2ha,
- The proposed substation will include an Eskom portion and an Independent Power Producer (IPP) portion, hence the substation has been included in this EIA and in the grid connection infrastructure BA (separate application - substations, switching stations and power lines) to allow for handover to Eskom.
- Following construction, the substation will be owned and managed by Eskom. The current applicant will retain control of the medium voltage components (i.e. 33kV components) of the substation, while the high voltage components (i.e. 400kV components) of the substation will likely be ceded to Eskom shortly after the completion of construction;

Main Transmission Substations (MTS):

- One (1) new 132/400kV Main Transmission Substation (MTS) is being proposed, occupying an area of up to approximately 120ha.
- The proposed MTS will include an Eskom portion and an IPP portion.
- Following construction, the substation will be owned and managed by Eskom. The current applicant will retain control of the 132-400kV and lower voltage components of each MTS, while the 132/400kV voltage components of the MTS will likely be ceded to Eskom shortly after the completion of construction;

Electrical Infrastructure:

- The wind turbines will be connected to the proposed substation via medium voltage (i.e. 33kV) cables.
- These cables will be buried along access roads wherever technically feasible, however, the cables can also be overhead (if required);
- Each WEF will then connect to the MTS via an up to 400kV powerline.

Battery Energy Storage Systems (BESS):

- One (1) Battery Energy Storage System (BESS) will be constructed for the wind farm and will be located next to the 33-66/132-400kV step-up / collector substations which form part of the respective wind farms, or in between the wind turbines.
- It is anticipated that the type of technology will be either Lithium Ion or Sodium-Sulphur (or as determined prior to construction).
- These batteries are not considered hazardous goods as they will be storing 'energy'.
- The size, storage capacity and type of technology will be determined / confirmed prior to construction. This information will be provided to I&AP's prior to the commencement of construction.

Roads:

- Internal roads with a temporary width of up to approximately 15m will provide access to the location of each wind turbine. These roads will be rehabilitated back to 8m once construction has been completed.
- Existing site roads will be used wherever possible, although new site roads will be constructed where necessary.
- Existing site roads may also be upgraded using temporary concrete stones in order to accommodate for the heavy loads.
- Turns will have a radius of up to 50m for abnormal loads (especially turbine blades) to access the various wind turbine positions.

Site Access:

- The proposed wind farm application site will be accessed via existing gravel roads from the R353 Regional Route;

Temporary Staging Areas:

- A temporary staging area will be required for the wind farm and will be located both at the foot of each wind turbine and at the storage facility (i.e. turbine development area) to allow for working requirements.
- One (1) temporary staging area per wind turbine / range of wind turbines will be required.
- Temporary staging areas will cover an area of up to approximately 100m x 100m (10 000m^2 / 1ha) each;

Temporary Construction Camps:

- One (1) temporary construction camp will be required during the construction phase for the wind farm.
- This area will be used as a permanent maintenance area during the operational phase.
- The combined Temporary Construction Camp / Permanent Maintenance Area will cover an area of up to approximately 2.25ha.
- A cement batching plant as well as a chemical storage area will fall within the Temporary Construction Camp and Permanent Maintenance Area.
- The Temporary Construction Camp and Permanent Maintenance Area will be strategically placed within the proposed wind farm site and will avoid all high sensitivity and/or 'no-go' areas;

Offices, Accommodation, a Visitors' Centre and Operation & Maintenance (O&M) Buildings:

- An office (including ablution facilities), accommodation (including ablution facilities), a Visitors' Centre and an Operation & Maintenance (O&M) building will be required and will occupy areas of up to approximately 100m x 100m (i.e. 1ha).
- Each wind farm (i.e. each phase) will have its own O&M building and Office, however, the Accommodation and Visitors' Centre will be centralised locations which will be shared between certain wind farm projects (i.e. shared between certain phases which will be confirmed at a later stage);

Septic Tank and Soak-Away Systems:

- The proposed wind farm will consist of a septic tank and soak-away system.
- This will be required for construction as well as long term use.
- The septic tank and soak-away system will be placed 100m or more from water resource (which includes boreholes);

Fencing:

- Fencing will be required and will surround the wind farm.
- The maximum height of the fencing as well as the area which the fencing will cover will be confirmed during the detailed design phase, prior to construction commencing.
- Fences will however be constructed according to specifications recommended by the Ecologist and Avifauna specialist (and as per the EMPr);

Temporary Infrastructure to Obtain Water from Available Local Sources:

- Temporary infrastructure to obtain water from available local sources will be required. Water may also be obtained from onsite boreholes and from the town of Fraserburg.

- New or existing boreholes, including a potential temporary above ground pipeline (approximately 50cm in diameter) for each wind farm, to feed water to the sites are being proposed.
- Water will potentially be stored in temporary water storage tanks.
- The necessary approvals from the Department of Water and Sanitation (DWS) will be applied for separately (should this be required); and

Temporary Containers:

- Temporary containers of up to approximately 80m^3 will be required for the storage of fuel on-site during the construction phase of the wind farm.
- The chemical storage area will fall within the Temporary Construction Camp and permanent Maintenance Area.

Component	Description / Dimensions
Location of site (centre point)	32° 1' 28.81" S 21° 43' 0.19" E
Application site area – Klipkraal WEF 4	1376 ha
Total Klipkraal WEF area	Approximately 6507 ha
Turbine development area	Turbine Foundation Area = 45m*32m*60 turbines = 8.6 Ha
SG codes	C02600000000039400003 C02600000000041100000
Export capacity	Up to 300 MWac
Proposed technology	Wind turbines and associated infrastructure
Hub height from ground	Up to 200 m
Rotor diameter	Up to 200 m
Substation Area	Approximately 2 ha
O&M building area	Approximately 1 ha
Temporary staging area	Up to 1 ha
Permanent laydown area	To be determined based on final layout
Temporary site camp	Up to 2.25ha
Hard stand areas	700m³ per turbine
Width of internal access roads	Approximately 15 m
Length of internal access roads	To be confirmed during the detailed design phase
Site Access	The Klipkraal WEF 4 development access point is from Road DR02312, bisecting the southern quadrant of Farm Matjes Fontein No. 411 and PTN 3 of the Farm Rattelfontein No. 394. Road DR02312 is classified as a Class R4 in the RCAM Classification – Rural Collector Road with an average road reserve width of 20m, a gravel surface of ±6m wide, and an average speed of 80 km/h. PTN 3 of the Farm Rattelfontein No. 394 has two (2) existing access points emanating from Road DR02312 at Km 87.82 and Km 88.81. Both access points are located on Road DR02312 in positions where the appropriate sight distance of 240m will not be achieved.
Proximity to grid connection	Approximately 70km from application site

Component	Description / Dimensions
Height of fencing (for substation)	To be confirmed during the detailed design phase, Eskom specifications.
Type of fencing (for substation)	To be confirmed during the detailed design phase, Eskom specifications.

KLIPKRAAL WIND ENERGY FACILITY (WEF) 4

DRAFT SCOPING REPORT

EXECUTIVE SUMMARY

INTRODUCTION AND PROJECT DESCRIPTION

Klipkraal Wind Energy Facility 4 (Pty) Ltd (The Applicant) is proposing to construct the Klipkraal Wind Energy Facility (WEF) 4 and associated infrastructure approximately 30 km south east of Fraserburg in the Karoo Hoogland Local Municipality, in the Northern Cape. (**Figure 1**) (**DFFE Reference Number**: **TBA**). The overall objective of the proposed development is to generate electricity by means of renewable energy technologies capturing wind energy to feed into the national grid. The proposed development will have a maximum total generation capacity of up to 300 megawatt (MWac).

SiVEST Environmental Division has subsequently been appointed as the independent Environmental Assessment Practitioner (EAP) to undertake the Environmental Impact Assessment (EIA) process for the proposed construction and operation of the Klipkraal WEF 4 and associated infrastructure. The proposed development requires an (Environmental Authorisation (EA) from the National Department Forestry, Fisheries and the Environment (DFFE). However, the provincial authority (i.e. the Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform) will also be consulted. The EIA for the proposed development will be conducted in terms of the EIA Regulations, 2014 (as amended) promulgated in terms of Chapter 5 of the NEMA. In terms of these regulations, a full EIA process is required for the proposed development. All relevant legislation and guidelines will be consulted during the EIA process and will be complied with at all times.

Four additional WEF's are concurrently being considered on the properties and adjacent properties and are assessed by way of separate impact assessment processes contained in the 2014 Environmental Impact Assessment Regulations (GN No. R982, as amended) for listed activities contained within Listing Notices 1, 2 and 3 (GN R983, R984 and R985, as amended). These projects are known as Klipkraal Wind Energy Facility 1 (**DFFE Reference Number: 14/12/16/3/3/2/2202**), Klipkraal Wind Energy Facility 2 (**DFFE Reference Number: 14/12/16/3/3/2/2203**), Klipkraal Wind Energy Facility 3 (**DFFE Reference Number: 14/12/16/3/3/2/2204**) and Klipkraal Wind Energy Facility 5 (**DFFE Reference Number: TBA**).

In order to evacuate the energy generated by the WEF's to supplement the national grid, Aura Development Company (Pty) Ltd is proposing one grid connection which will be assessed in a separate BAR (**DFFE Reference Number: To be Allocated**):

The respective WEF and grid connection infrastructure developments will require separate Environmental Authorisations (EAs) and are subject to separate Environmental Impact Assessment (EIA) and Basic Assessment (BA) processes respectively. The proposed grid connection infrastructure

developments will be handed over to Eskom once constructed (Eskom grid connection works). The substations will include an Eskom portion (switching station) and an Independent Power Producer (IPP) portion (facility substation) hence the facility substations will be included in the respective WEF EIAs and the Eskom switching stations in the respective associated grid connection infrastructure BA in order to allow for handover to Eskom.

APPLICABILITY OF NEMA EIA REGULATIONS, 2014 (AS AMENDED IN 2017)

The following activities are applied for:

Activity No(s):	Relevant Basic Assessment Activity(ies) as set out in Listing Notice 1 of the EIA Regulations, 2014 as amended
11 (i)	**GN R. 327 (as amended) Item 11:** The development of facilities or infrastructure for the transmission and distribution of electricity— (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.
12 (ii) (a) (c)	**GN R. 327 (as amended) Item 12:** The development of: ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs- (a) within a watercourse; (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.
19	**GN R. 327 (as amended) Item 19**: The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;
28 (ii)	**GN R. 327 (as amended) Item 28:** Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;
31 (i)	**GN R. 327 (as amended) Item 31:** The decommissioning of existing facilities, structures or infrastructure for - (i) any development and related operation activity or activities listed in this Notice, Listing Notice 2 of 2014 or Listing Notice 3 of 2014;
48 (i) (a) (c)	**GN R. 327 (as amended) Item 48:** The expansion of- (i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; where such expansion occurs— (a) within a watercourse; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;
56 (ii)	**GN R. 327 Item 56:** The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre - (i) where the existing reserve is wider than 13,5 metres; or (ii) where no reserve exists, where the existing road is wider than 8 metres –
Activity No(s):	**Relevant Scoping and EIA Activity(ies) as set out in Listing Notice 2 of the EIA Regulations, 2014 as amended**
1	**GN R. 325 (as amended) Item 1:** The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is

	20 megawatts or more, excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs – (a) within an urban area; or (b) on existing infrastructure
15	**GN R. 325 (as amended) Item 15:** The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for — (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan..
Activity No(s):	**Relevant Basic Assessment Activity(ies) as set out in Listing Notice 3 of the EIA Regulations, 2014 as amended**
4 (g) (ii) (ee)	**GN R. 324 (as amended) Item 4:** The development of a road wider than 4 metres with a reserve less than 13,5 metres. **g. Northern Cape** ii. Outside urban areas; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.
12 (g) (ii)	**GN R. 985 (as amended) Item 12:** The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. **g. Northern Cape** ii. Within critical biodiversity areas identified in bioregional plans;
14 ii. (a) (c) g (ii) (ff)	**GN R. 324 (as amended) Item 14:** The development of— (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour. **g. Northern Cape** i. Outside urban areas: (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;
18 g (ii) (ee)	**GN R. 324 (as amended) Item 18:** The widening of a road by more than 4 meters, or the lengthening of a road by more than 1 kilometer- **g. Northern Cape** ii. Outside urban areas: (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ii) Areas within a watercourse or wetland; or within 100m from the edge of a watercourse or wetland.
23 ii (a) (c) (g) (ii) (ee)	**GN R. 324 (as amended) Item 23:** The expansion of— (ii) infrastructure or structures where the physical footprint is expanded by 10 square metres or more; where such expansion occurs— (a) within a watercourse; (b) in front of a development setback adopted in the prescribed manner; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;

	excluding the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour. **g. Northern Cape** ii. Outside urban areas: (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;

DETAILS OF ALTERNATIVES CONSIDERED

No site alternatives have been considered during the EIA process for the proposed development. The placement of wind energy facilities is dependent on the factors discussed in **Section 13**, all of which are favourable at the proposed site location. A met mast was installed on the project site and the proposed site has been deemed suitable in terms of wind resource. The proposed project site has topography which is suitable for the development of a WEF.

Site layout alternatives will not be comparatively assessed, but rather a single layout will be refined as additional information becomes available throughout the EIA process (e.g., specialist input, additional site surveys, and ongoing stakeholder engagement). All constraints identified by the respective specialists are being considered and the layout is being refined to avoid all no-go areas.

The development area presented in the Scoping Report has been selected as a practicable option for the Klipkraal WEF 4 considering technical preference and constraints, as well as initial No-Go layers informed by the relevant specialist during the initial screening studies.

The no-go alternative will result in the current status quo being maintained as far as the avifauna, bats, ecological and the aquatic systems are concerned. The no-go option would therefore eliminate any additional impact on the ecological integrity of the proposed development site. The no-go option would also mean that the social environment is not affected as the status quo remains. This also means that all the positive aspects associated with the project would not materialise. Consequently, there would be no job creation, no revenue streams into the local economy and municipal coffers, and a lost opportunity to enhance the National Grid with a renewable source of energy.

POTENTIAL IMPACTS IDENTIFIED FOR THE PREFERRED ALTERNATIVE

Planning

Environmental Aspect	Potential Impact during Construction
Heritage - Unidentified heritage resources	• Due to the size of the area assessed, there's a possibility of encountering heritage features in un-surveyed areas does exist.

Construction Phase

Environmental Aspect	Potential Impact during Construction
Agricultural	• **Loss of agricultural potential by occupation of land** - Agricultural land directly occupied by the development infrastructure will become restricted for agricultural use, with consequent potential loss of agricultural productivity for the duration of the project lifetime. The small and widely distributed nature of the agricultural footprint of the facility means that only an insignificant proportion of the available agricultural land is impacted in this way.
Agricultural	• **Loss of agricultural potential by soil degradation** - Soil can be degraded by impacts in three different ways: erosion; topsoil loss; and contamination. Erosion can occur as a result of the alteration of the land surface run-off characteristics, which can be caused by construction related land surface disturbance, vegetation removal, and the establishment of hard surface areas including roads. Loss of topsoil can result from poor topsoil management during construction related excavations. Hydrocarbon spillages from construction activities can contaminate soil. Soil degradation will reduce the ability of the soil to support vegetation growth. Although the site is susceptible to soil erosion, it can be fairly easily and effectively prevented by standard best practice soil degradation control measures, as recommended and included in the EMPr.
Agricultural	• **Loss of agricultural potential by dust generation** - The disturbance of the soil surface, particularly during construction, will generate dust that can negatively impact surrounding veld and farm animals.
Avifaunal	• Displacement due to disturbance associated with the construction of the wind turbines and associated infrastructure.
Avifaunal	• Displacement due to habitat transformation associated with the construction of the wind turbines and associated infrastructure.
Bat - Loss of foraging habitat by clearing of vegetation.	• Bat foraging habitat will be destroyed during construction; however, the relative footprint is small.
Bat - Roost destruction during earthworks.	• Bat roosts in rock crevices may be destroyed during construction, this can cause bat mortalities or permanent disturbances to roosts.
Aquatic - Water quality	• Impact to the water quality in the aquatic feature because of inadequate stormwater management.
Aquatic - Hydrology	• Impact to the hydrological characteristics of the aquatic feature due to changes in the catchment.
Aquatic - Water quality	• Impact to the water quality in the aquatic features because of the leakages from the portable chemical toilets that will be used during construction.
Aquatic - Water quality	• Impact to the water quality in the aquatic features because of petrochemical spillages from plant and equipment.
Terrestrial Ecology - Impact on broad-scale ecological processes	• Impacts on broad-scale ecological processes as a result of construction phase activities, including disturbance and habitat loss.
Terrestrial Ecology - Construction Phase impact on FEPA Subcatchments	• Impacts on ecosystem services within FEPA Priority Subcatchments as a result of construction phase activities, including disturbance and soil erosion.
Terrestrial Ecology - Construction Phase impact on CBAs and ESAs	• Impacts on CBAs and ESAs as a result of construction phase activities, including disturbance and habitat loss.

Environmental Aspect	Potential Impact during Construction
Terrestrial Ecology – Riverine Rabbit - Construction Phase impact on the Riverine Rabbit	• Impacts on Riverine Rabbit as a result of construction phase activities, including vehicle collisions, disturbance and habitat loss.
Terrestrial Ecology - Karoo Dwarf Tortoise disturbance and habitat loss	• Impacts on Karoo Dwarf Tortoise as a result of construction phase activities, including vehicle collisions, disturbance and habitat loss.
Noise	• Potential noise impacts of the proposed development on the identified NSA's during construction.
Transport - Additional Traffic Generation	• Increase in Traffic
Transport - Additional Traffic Generation	• Increase of Incidents with pedestrians and livestock
Transport - Additional Traffic Generation	• Increase in dust from gravel roads
Transport - Additional Traffic Generation	• Increase in Road Maintenance
Transport - Abnormal Loads	• Additional Abnormal Loads
Transport - Internal Access Roads	• Increase in dust from gravel roads
Transport - Internal Access Roads	• New / Larger Access points
Visual	• Visual intrusion and potential flicker effect by wind turbines and associated structures and infrastructure on visual receptors.
Visual	• Visual intrusion by wind turbines and associated structures and infrastructure on visual and landscape receptors.
Visual	• Visual intrusion by Access Road, Substations and associated structures and infrastructure on visual and landscape receptors.
Socio-Economic	• Noise
Socio-Economic	• Increase in crime
Socio-Economic	• Increased risk of HIV infections
Socio-Economic	• Influx of construction workers
Socio-Economic	• Hazard exposure
Socio-Economic – Quality of living	• Disruption of daily living patterns. • Disruptions to social and community infrastructure.
Socio-Economic – Economic	• Job creation and skills development
Socio-Economic – Economic	• Socio-economic stimulation

Operational Phase

Environmental Aspect	Potential Impact during Construction
Agricultural	• **Increased financial security for farming operations** - Reliable income will be generated by the farming enterprises through the lease of the land to the energy facility. This is likely to increase their cash flow and financial security and could
Agricultural	• **Improved security against stock theft and other crime** due to the presence of security infrastructure and security personnel at the energy facility.
Avifaunal	• Mortality of priority species due to collisions with the wind turbines.
Avifaunal	• Mortality of priority species due to electrocutions on the overhead sections of the internal 33kV cables.
Avifaunal	• Mortality due to collisions with the overhead sections of the internal 33kV cables
Bat - Bat mortalities during foraging.	• Foraging bats can be killed by colliding with turbine blades, or by suffering barotrauma.
Bat - Bat mortalities during migration.	• Migrating bats influence several ecosystems since they are cave dwelling species, also over a larger area due to the distances that may be travelled. If turbines are placed within a migration path, a larger area and higher diversity of ecosystems may be impacted.
Bat - Increased bat mortalities due to light attraction and habitat creation.	• Floodlights and other lights at turbine bases or nearby buildings, will attract insect eating bats and therefore significantly increase the likelihood of these bats being impacted on by moving turbine blades. Habitat creation in the roofs of nearby buildings can cause a similar increased risk factor.
Aquatic - Hydrology	• Impact to the hydrological characteristics of the aquatic feature due to changes in the catchment
Aquatic - Water quality	• Impact to the water quality in the aquatic features because of inadequate stormwater management.
Aquatic - Water quality	• Impact to the water quality in the aquatic features as a result of leakages from vehicles and plant moving on the site.
Aquatic - Water quality	• Impact to the water quality in the aquatic features because of petrochemical spillages from petrochemical storage areas within the site.
Aquatic - Water quality	• Impact to the water quality in the aquatic features as a result of leakages from the sanitation infrastructure servicing the operations.
Terrestrial Ecological - Operational Phase impact on CBAs and ESAs	• Impacts on CBAs and ESAs during operation as a result of maintenance activities and turbine noise.
Terrestrial Ecological - Operational Phase impact on FEPA Subcatchments	• Impacts on ecosystem services within FEPA Priority Subcatchments as a result of presence and operation of the WEF.
Terrestrial Ecological - Operational Phase impact on broad-scale ecological processes	• Impacts on broad-scale ecological processes as a result of operational phase activities, including disturbance turbine noise.
Terrestrial Ecology - Operational Phase impact on the Riverine Rabbit	• There would potentially be impact on Riverine Rabbits at the site during operation due to operational activities (vehicles/disturbance) as well as turbine noise.
Terrestrial Ecological - Impact on the Karoo Dwarf Tortoise	• There would potentially be impact on Karoo Dwarf Tortoises at the site during operation due to operational activities (vehicles/disturbance) as well as predation by crows.

Environmental Aspect	Potential Impact during Construction
Noise	• Potential noise impacts of the proposed development on the identified NSA's during the operational phase.
Transport - Additional Traffic Generation	• Increase in Traffic
Transport - Additional Traffic Generation	• Increase of Incidents with pedestrians and livestock
Transport - Additional Traffic Generation	• Increase in dust from gravel roads
Transport - Additional Traffic Generation	• Increase in Road Maintenance
Transport - Abnormal Loads	• Additional Abnormal Loads
Transport - Internal Access Roads	• New / Larger Access points
Visual	• Visual intrusion and potential flicker effect by wind turbines and associated structures and infrastructure on visual receptors.
Visual	• Visual intrusion by wind turbines and associated structures and infrastructure on landscape receptors.
Visual	• Visual intrusion by Access Road, Substations and Associated structures and infrastructure on visual and landscape receptors.
Socio-Economic	• Shadow flicker WEF only.
Socio-Economic	• Electromagnetic field and RF interference.
Socio-Economic	• Hazard exposure.
Socio-Economic – Quality of living	• Transformation of sense of place.
Socio-Economic – Economic	• Job creation and skills development.
Socio-Economic – Economic	• Socio-economic stimulation.

Decommissioning

Environmental Aspect	Potential Impact during Construction
Agricultural	• **Loss of agricultural potential by soil degradation** - Soil can be degraded by impacts in three different ways: erosion; topsoil loss; and contamination. Erosion can occur as a result of the alteration of the land surface run-off characteristics, which can be caused by construction related land surface disturbance, vegetation removal, and the establishment of hard surface areas including roads. Loss of topsoil can result from poor topsoil management during construction related excavations. Hydrocarbon spillages from construction activities can contaminate soil. Soil degradation will reduce the ability of the soil to support vegetation growth. Although the site is susceptible to soil erosion, it can be fairly easily and effectively prevented by standard best practice soil degradation control measures, as recommended and included in the EMPr.
Avifaunal	• Displacement due to disturbance associated with the dismantling of the wind turbines and associated infrastructure.

Environmental Aspect	Potential Impact during Construction
Aquatic - Water quality	• Impact to the water quality in the aquatic features because of the leakages from the portable chemical toilets that will be used during decommissioning.
Aquatic - Water quality	• Impact to the water quality in the aquatic features because of petrochemical spillages from plant and equipment.
Aquatic - Water quality	• Impact to the water quality in the aquatic features as a result of leaking petrochemical storage facilities.
Terrestrial Ecological – Decommissioning Phase impact on the Riverine Rabbit	• Impacts on Riverine Rabbit as a result of decommissioning phase activities, including vehicle collisions, disturbance
Terrestrial Ecological – Decommissioning Phase impact on the Karoo Dwarf Tortoise	• Impacts on Karoo Dwarf Tortoise as a result of decommissioning phase activities, including vehicle collisions, disturbance.
Transport - Additional Traffic Generation	• Increase in Traffic
Transport - Additional Traffic Generation	• Increase of Incidents with pedestrians and livestock
Transport - Additional Traffic Generation	• Increase in dust from gravel roads
Transport - Additional Traffic Generation	• Increase in Road Maintenance
Transport - Abnormal Loads	• Additional Abnormal Loads
Transport - Internal Access Roads	• Increase in dust from gravel roads
Transport - Internal Access Roads	• New / Larger Access points
Visual	• Visual intrusion and potential flicker effect by wind turbines and associated structures and infrastructure on visual receptors • Visual intrusion by wind turbines and associated structures and infrastructure on visual and landscape receptors • Visual intrusion by Access Road, Substations and Associated structures and infrastructure on visual and landscape receptors
Social-Economic	• Job loss

PUBLIC PARTICIPATION PROCESS

Notification of EIA process to be undertaken as follows:

- Issuing of the notifications and initial landowner consultation to be circulated to all I&APs on the 22nd of September 2023 respectively as part of the Draft Scoping Report (proof to be included in Final Scoping Report).
- Placement of site notices in English and Afrikaans (as per regulations) were placed along the entrance road to the application site and around the site itself on the 29th of August 2022 (proof to included in the Scoping Report).

- Notification letters were sent via E-mail or sms (if cellphone number / email is available, it is assuming the I&AP have an email or cellphone).
- Public notification of the EIA process was advertised in a local newspaper (namely the Noordwester) as required according to Regulation 41(2) (c) of the EIA Regulations (2014), as amended. Proof included in Appendix 5 of the Draft Scoping Report.

Availability of report for review:

- The report was made available on SiVESTs website for download.
- Electronic copies were made available to parties upon request for the documentation.
- The Draft Scoping Report was available for review at the following location:
    - Fraserburg Library, 35 Voortrekker Street, Fraserburg, Northern Cape, South Africa

PLAN OF STUDY

The EIA phase will be informed by the scoping phase. The following steps will be undertaken as part of the EIA phase:

- The proposed final layout will be further investigated in order to avoid or minimize negative impacts and maximize potential benefits;
- Environmental impact statements regarding the potential significance of residual impacts, taking into account proposed mitigation measures will be provided in the EIA;
- An Environmental Management Programme (EMPr) covering construction and decommissioning phases of the proposed development will be prepared. The EMPr will include input from specialists and will incorporate recommendations for mitigation and monitoring.

The following specialist studies have been undertaken for the project and the significant environmental aspects will be further in the EIA Phase:

- Social Impact Assessment;
- Transport Assessment;
- Visual Assessment;
- Avifaunal Assessment;
- Bat Assessment;
- Agricultural Assessment;
- Aquatic/Freshwater Assessment;
- Heritage Assessment;
- Noise Assessment;
- Terrestrial Ecology Assessment;

The findings of the specialist studies have been included in the Scoping Phase of this project. The associated Impact Assessment tables will be included in the draft EIA report. Should the need for additional specialist studies be identified through the consultation process, these studies will be commissioned in the EIA Phase to further advise on the potential impacts that may arise from the proposed development. The specialist studies may identify opportunities and constraints as associated with the site and the proposed development.

SiVEST has consulted with DFFE as follows:

- Pre-application meeting with DFFE was undertaken on the 6th of May 2022.
- Submission of application form to obtain EIA reference number.
- The Draft Scoping report will be made available for comment to I&APs, key stakeholders and the authorizing authority from the 22nd of September 2023 until the 23rd of October 2023.
- All comments will be incorporated into the Comments and Response Report and Final Scoping Report.
- The Final Scoping Report will be submitted to DFFE for approval.

The following items will still be undertaken:

- Notify I&APs and key stakeholders of acceptance of Final Scoping Report
- The Draft EIA report will be made available for comment to I&APs, key stakeholders and the authorizing authority.
- After the Draft EIA report has been made available for comment within the public domain, comments will be incorporated into the Issues and Response Report and Final EIA Report for submission to DFFE.
- Notify I&APs of the decision.
- Apart from the above-mentioned occasions, further consultation with authorities will occur whenever necessary.

PRELIMINARY CONCLUSION FROM THE SCOPING REPORT

This Scoping Report was compiled to meet the requirements of NEMA, with the primary aim of informing I&APs of the proposed project and allowing for an opportunity to comment on the project and the plan of study for the EIA Phase.

This Scoping Report has covered activities and findings related to the scoping process for the proposed Klipkraal WEF 4 Project. Professional experience, specialist knowledge, relevant literature and local knowledge of the area have all been used to identify the potential issues associated with the proposed project. There is no guarantee that all the potential impacts arising from the proposed WEF project have been identified within the scoping phase, however the report provides an outline of the established measures that were taken to best identify all the potential impacts.

Based on the findings of the specialists and the potential impacts identified, the preliminary layout has been updated to include constraints. This layout will be further refined based on the outcomes of the public participation process of the Scoping phase. The final layout will then be assessed by all specialists in the EIA Phase. At this stage based on specialist findings and recommendations, no fatal flaws have been identified and the project may proceed to the EIA phase.

This report will provide the necessary motivation for this conclusion.

KLIPKRAAL WIND ENERGY FACILITY (WEF) 4

DRAFT SCOPING REPORT

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KLIPKRAAL WIND ENERGY FACILITY (WEF) 4

DRAFT SCOPING REPORT

1. INTRODUCTION

Klipkraal Wind Energy Facility 4 (Pty) Ltd (The Applicant) is proposing to construct the Klipkraal Wind Energy Facility (WEF) 4 and associated infrastructure approximately 30 km south east of Fraserburg in the Karoo Hoogland Local Municipality, in the Northern Cape. (**Figure 1**) (**DFFE Reference Number**: **TBA**). The overall objective of the proposed development is to generate electricity by means of renewable energy technologies capturing wind energy to feed into the national grid. The proposed development will have a maximum total generation capacity of up to 300 megawatt (MWac).

SiVEST Environmental Division has subsequently been appointed as the independent Environmental Assessment Practitioner (EAP) to undertake the Environmental Impact Assessment (EIA) process for the proposed construction and operation of the Klipkraal WEF 4 and associated infrastructure. The proposed development requires an (Environmental Authorisation (EA) from the National Department Forestry, Fisheries and the Environment (DFFE). However, the provincial authority (i.e. the Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform) will also be consulted. The EIA for the proposed development will be conducted in terms of the EIA Regulations, 2014 (as amended) promulgated in terms of Chapter 5 of the NEMA. In terms of these regulations, a full EIA process is required for the proposed development. All relevant legislation and guidelines will be consulted during the EIA process and will be complied with at all times.

Four additional WEF's are concurrently being considered on the properties and adjacent properties and are assessed by way of separate impact assessment processes contained in the 2014 Environmental Impact Assessment Regulations (GN No. R982, as amended) for listed activities contained within Listing Notices 1, 2 and 3 (GN R983, R984 and R985, as amended). These projects are known as Klipkraal Wind Energy Facility 1 (**DFFE Reference Number: 14/12/16/3/3/2/2202**), Klipkraal Wind Energy Facility 2 (**DFFE Reference Number: 14/12/16/3/3/2/2203**), Klipkraal Wind Energy Facility 3 (**DFFE Reference Number: 14/12/16/3/3/2/2204**) and Klipkraal Wind Energy Facility 5 (**DFFE Reference Number: TBA**).

In order to evacuate the energy generated by the WEF's to supplement the national grid, Aura Development Company (Pty) Ltd is proposing one grid connection which will be assessed in a separate BAR (**DFFE Reference Number: To be Allocated**):

The respective WEF and grid connection infrastructure developments will require separate Environmental Authorisations (EAs) and are subject to separate Environmental Impact Assessment (EIA) and Basic Assessment (BA) processes respectively. The proposed grid connection infrastructure developments will be handed over to Eskom once constructed (Eskom grid connection works). The substations will include an Eskom portion (switching station) and an Independent Power Producer (IPP) portion (facility substation) hence the facility substations will be included in the respective WEF EIAs and the Eskom switching stations in the respective associated grid connection infrastructure BA in order to allow for handover to Eskom.

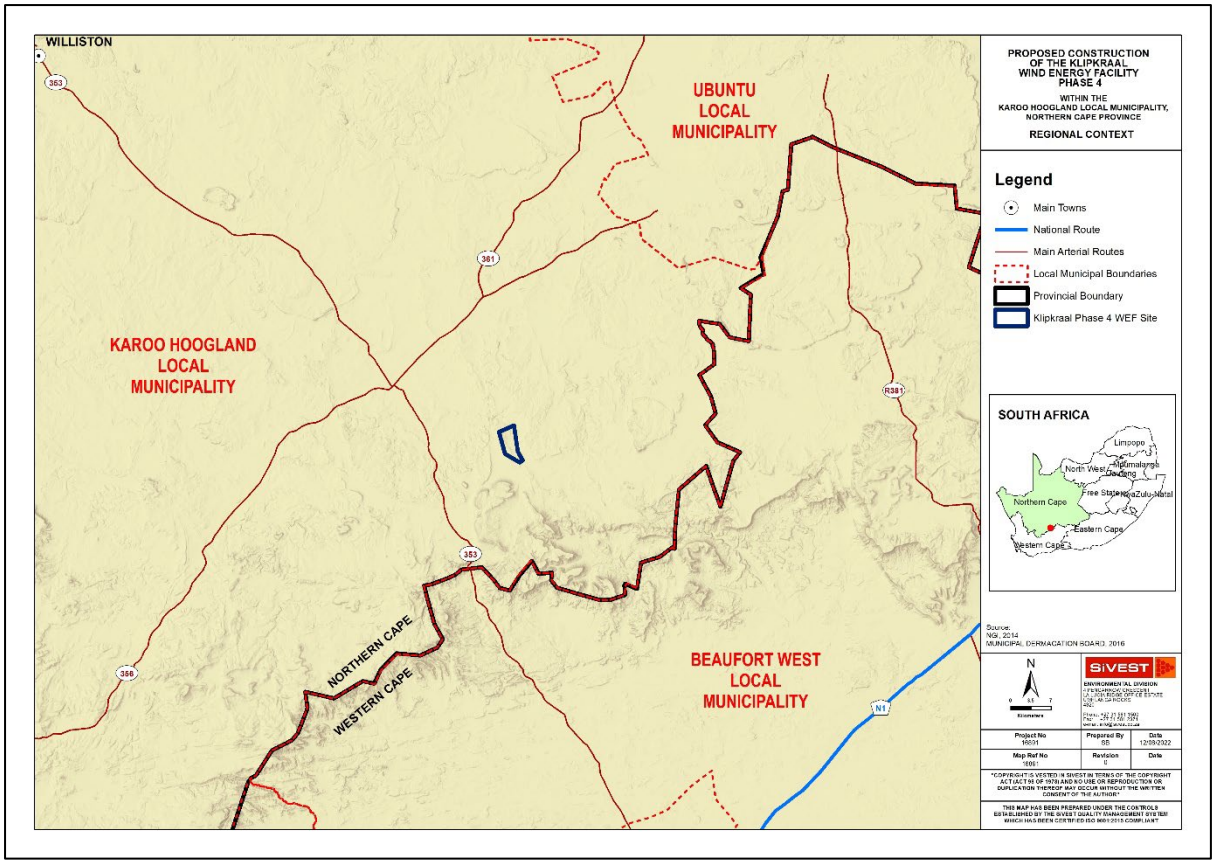

Figure 1: Klipkraal WEF 4 Regional Context

Although the respective WEFs and associated grid connection infrastructure (switching stations and overhead power lines) developments will be assessed separately, it is proposed that a single public participation process be undertaken to consider all of the proposed projects [i.e. five (5) WEF EIAs and one (1) grid connection BAs] as applicable. The potential environmental impacts associated with all of the proposed developments mentioned above will be assessed as part of the cumulative impact assessment.

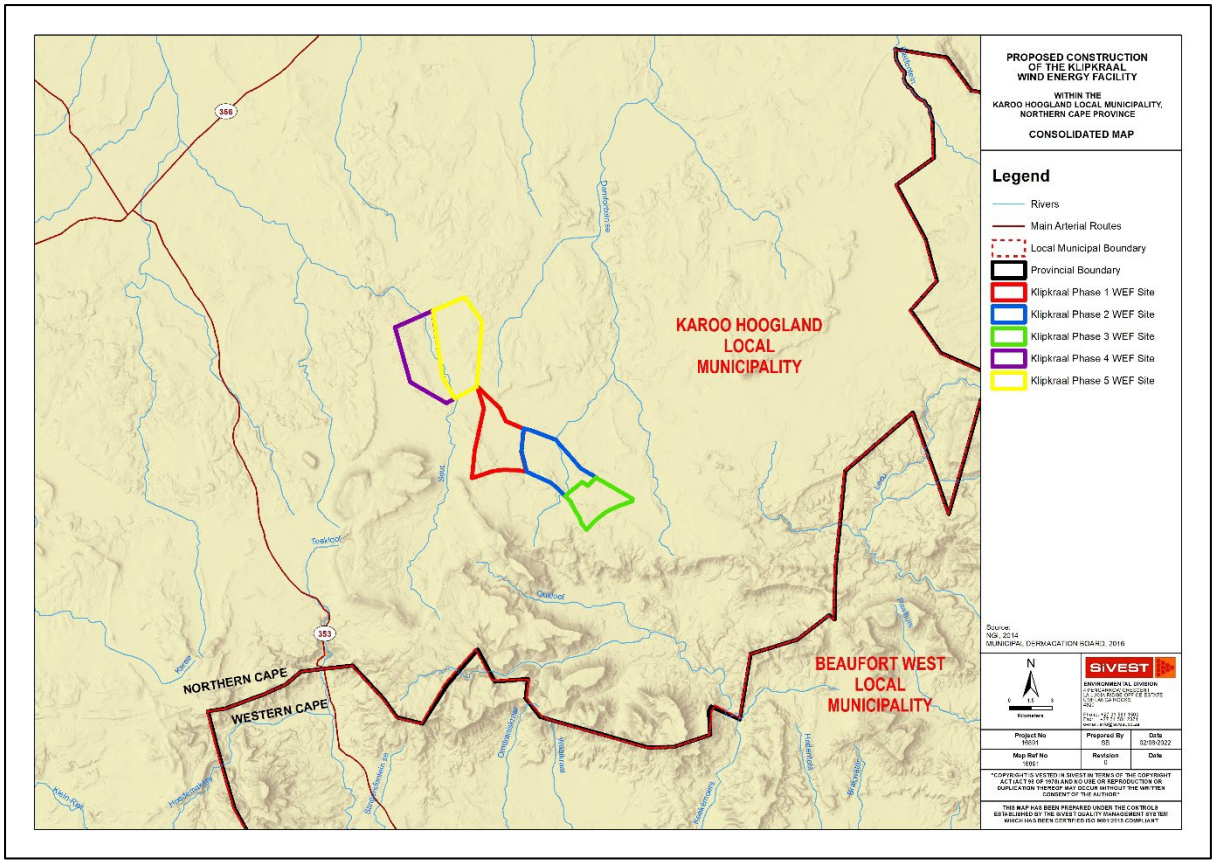

Figure 2: Layout showing context of Klipkraal WEF's 1 - 5

1.1 Overview of the EIA Process

The National Environment Management Act, 1998 (Act No 107 of 1998) (NEMA) promotes the use of scoping and EIA in order to ensure integrated environmental management. The purpose of an EIA is to provide the Authority with sufficient information to make an informed decision on whether an activity should proceed or not, and to assist with selecting an option that will provide the most benefit, and cause the least impact. The EIA process should identify activities which may have a detrimental effect on the environment, and which would therefore require Environmental Authorisation prior to commencement.

This project requires an Environmental Authorisation (EA) in terms of the National Environmental Management Act (NEMA) (Act No. 107 of 1998, as amended) and the 2014 EIA Regulations (as amended). The process triggered is a Scoping and Environmental Impact Assessment report (S&EIR). All the phases including the Environmental Management Programme report (EMPr) must be prepared in terms of the NEMA and GN R. 982, (as amended by GN R. 326) and the associated activities listed under GN R. 983, GN R. 984 and GN R. 985 (as amended by GN R 327, GN R 325, and GN R 324 respectively).

Objectives and Overview of the Scoping Phase

The Scoping Phase involves establishing the existing environmental baseline of the site proposed for development, considering the type of development and its potential impacts on the existing environment, and therefore determining what potential impacts should be assessed and how, within the

EIA process. The Scoping Phase also recommends the suggested alternative for more detailed assessment. The EAP therefore compiles a Draft Scoping Report (inclusive of a Plan of Study for the EIA phase) which is made available for public and stakeholder comment for a period of 30 days as part of the public participation process. All comments received in response to the DSR are then considered and responded to, incorporated into the Final Scoping Phase and Plan of Study for EIA Phase.

Public Participation Process

Public and Stakeholder participation is a fundamental component of the EIA Process. The inclusion of the views of the affected and interested public aids in ensuring the EIA Process is open, transparent and robust, as well as that the decision-making process is equitable and fair. This in turn guides informed choice and better environmental outcomes. It further presents a valuable source of information on key impacts, potential mitigation measures and the identification and selection of feasible alternatives. This process allows the EAP to identify key stakeholders and Interested and Affected Parties (I&APs), as well as to identify any fatal flaws, at the onset of a project. The Draft Scoping Report will be made available to all I&APs as well as Organs of State for a period of 30 days from the 22nd of September 2023 until the 23rd of October 2023, following this, all comments will be drafted and responded to in a Comments and Response Report which will then be submitted to the Department for approval. Following this, the EIA Phase can proceed.

1.2 Content Requirements for a Scoping Report

The content requirements for a Scoping Report (as provided in Appendix 2 of the EIA Regulations 2014, as amended), as well as details of which section of the report fulfils these requirements, are shown in **Table 1** below.

Table 1: Content requirements for a Scoping Report

Content Requirements	Applicable Section
(a) details of- (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	4
(b) the location of the activity, including- (i) the 21-digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	5
(c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is- (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	5.2
(d) a description of the scope of the proposed activity, including- (i) all listed and specified activities triggered; (ii) a description of the activities to be undertaken, including associated structures and infrastructure;	6
(e) a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial	10

Content Requirements	Applicable Section
tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;	
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	12
(g) a full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including - (i) details of all the alternatives considered; (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; (iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (v) the impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; (vi) the methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; (vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (viii) the possible mitigation measures that could be applied and level of residual risk; (ix) the outcome of the site selection matrix; (x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and (xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;	13
(h) a plan of study for undertaking the environmental impact assessment process to be undertaken, including- (i) a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity; (ii) a description of the aspects to be assessed as part of the environmental impact assessment process; (iii) aspects to be assessed by specialists; (iv) a description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists; (v) a description of the proposed method of assessing duration and significance; (vi) an indication of the stages at which the competent authority will be consulted;	14

Content Requirements	Applicable Section
(vii) particulars of the public participation process that will be conducted during the environmental impact assessment process; and (viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process; (ix) identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	
(i) an undertaking under oath or affirmation by the EAP in relation to- (i) the correctness of the information provided in the report; (ii) the inclusion of comments and inputs from stakeholders and interested and affected parties; and (iii) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	Appendix 1
(j) an undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties (I&APs) on the plan of study for undertaking the environmental impact assessment;	Appendix 1
(k) where applicable, any specific information required by the competent authority; and	Appendix 6
(l) any other matter required in terms of section 24(4)(a) and (b) of the Act.	All requirements have been met in this report.
(2) Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a scoping report, the requirements as indicated in such notice will apply.	Appendix 6

1.3 Preliminary conclusion from the scoping report

This Scoping Report was compiled to meet the requirements of NEMA, with the primary aim of informing I&APs of the proposed project and allowing for an opportunity to comment on the project and the plan of study for the EIA Phase.

This Scoping Report has covered activities and findings related to the scoping process for the proposed Klipkraal WEF 4 Project. Professional experience, specialist knowledge, relevant literature and local knowledge of the area have all been used to identify the potential issues associated with the proposed project. There is no guarantee that all the potential impacts arising from the proposed WEF project have been identified within the scoping phase, however the report provides an outline of the established measures that were taken to best identify all the potential impacts.

Based on the findings of the specialists and the potential impacts identified, the preliminary layout has been updated to include constraints. This layout will be further refined based on the outcomes of the public participation process of the Scoping phase. The final layout will then be assessed by all specialists in the EIA Phase. At this stage based on specialist findings and recommendations, no fatal flaws have been identified and the project may proceed to the EIA phase.

2. PROJECT TITLE

Proposed Development of the Klipkraal Wind Energy Facility 4 and Associated Infrastructure near Fraserburg in the Northern Cape Province

3. DETAILS OF APPLICANT

3.1 Name and contact details of the Applicant

Name and contact details of Applicant:

Table 2: Name and contact details of the applicant

Business Name of Applicant	Klipkraal Wind Energy Facility 4 (Pty) Ltd
Physical Address	22 Kildare Road, Newlands, Cape Town, South Africa
Postal Address	Same as physical address
Postal Code	7700
Telephone	083 499 0433
Fax	N/A
Email	terence@eluenergy.co.za

4. DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTIONER AND SPECIALISTS

4.1 Name and contact details of the Environmental Consultant

The table below provides the name and contact details of the Environmental Consultants who prepared this report:

Table 3: Name and contact details of the Environmental Consultant who prepared the report

Business Name of EAP	SiVEST SA (PTY) Ltd
Physical Address	4 Pencarrow Crescent, La Lucia Ridge Office Estate
Postal Address	PO Box 1899, Umhlanga Rocks
Postal Code	4320
Telephone	031 581 1500
Fax	031 566 2371
Email	luvanyan@sivest.co.za

4.2 Names and expertise of the Environmental Assessment Practitioner (EAP)

The table below provides the names of the EAP's who prepared this report:

Table 4: Names and details of the expertise of the EAP's involved in the preparation of this report

Name of representative of the EAP	Educational Qualifications	Professional Affiliations	Experience (years)
Michelle Nevette *(Cert.Sci.Nat.)*	MEnvMgt. (Environmental Management)	SACNASP Registration No. 120356 EAPASA Registration No. 2019/1560 IAIA	19
Luvanya Naidoo (Pr.Sci.Nat)	BSc Hons Environmental Monitoring & Modelling	SACNASP Registration No. 126107 EAPASA Registration No. 2019/1404 IAIA	12

CV's of SiVEST personnel and the EAP declaration are attached in **Appendix 1.**

4.3 Names and expertise of the specialists

The table below provides the names of the specialists involved in the project:

Table 5: Names of specialists involved in the project

Company	Name of representative of the specialist	Specialist	Educational Qualifications	Experience (years)
Johann Lanz	Johann Lanz	Agricultural	MSc Environmental Geochemistry Pr.Sci.Nat	24
GCS Water and Environment (Pty) Ltd	Magnus van Rooyen	Aquatic	MPhil Environmental Management Pr.Sci.Nat	18
AfriAvian Environmental (Pty) Ltd	Albert Froneman	Avifaunal	MSc (Conservation Biology)	24
Animalia Consultants (Pty) Ltd	Werner Marais	Bat	MSc Biodiversity and Conservation Pr.Sci.Nat (Zoological Science)	
3Foxes Biodiversity	Simon Todd	Terrestrial Ecology	MSc (Conservation Biology) Pr.Sci.Nat 400425/11	20
PGS Heritage Pty Ltd	Nicole (Nikki) Mann	Heritage	MSc Archaeology Professional Archaeologist (ASAPA)	7
SAFETECH	Dr Brett Williams	Noise	PHD Registered Occupational Hygienist	26
SiVEST SA (Pty) Ltd	Merchandt Le Maitre	Transportation	BTech Civil Engineering ECSA Pr Tech Eng	16
Bapela Cave Klapwijk	Menno Klapwijk	Visual	BL Land Arch	37

Company	Name of representative of the specialist	Specialist	Educational Qualifications	Experience (years)
			South African Council for the Landscape Architectural Professions	
Synergy	Nondumiso Bulunga	Social	Masters in Geographical Information Systems	8

5. LOCATION OF THE ACTIVITY

5.1 21 Digit Surveyor General Codes and Farm names of the sites

Table 6: 21 Digit Surveyor General Code

SG CODE	DESCRIPTION
C02600000000039400003	PORTION 3 OF THE FARM RATELFONTEIN NO. 394 (3/394)
C02600000000041100000	REMAINDER OF THE FARM MATJIESFONTEIN NO. 411 (RE/411)

5.2 Coordinates of the site

The centre point coordinates for the sites are as follows:

- Latitude: 32° 1' 28.81" S
- Longitude: 21° 43' 0.19" E

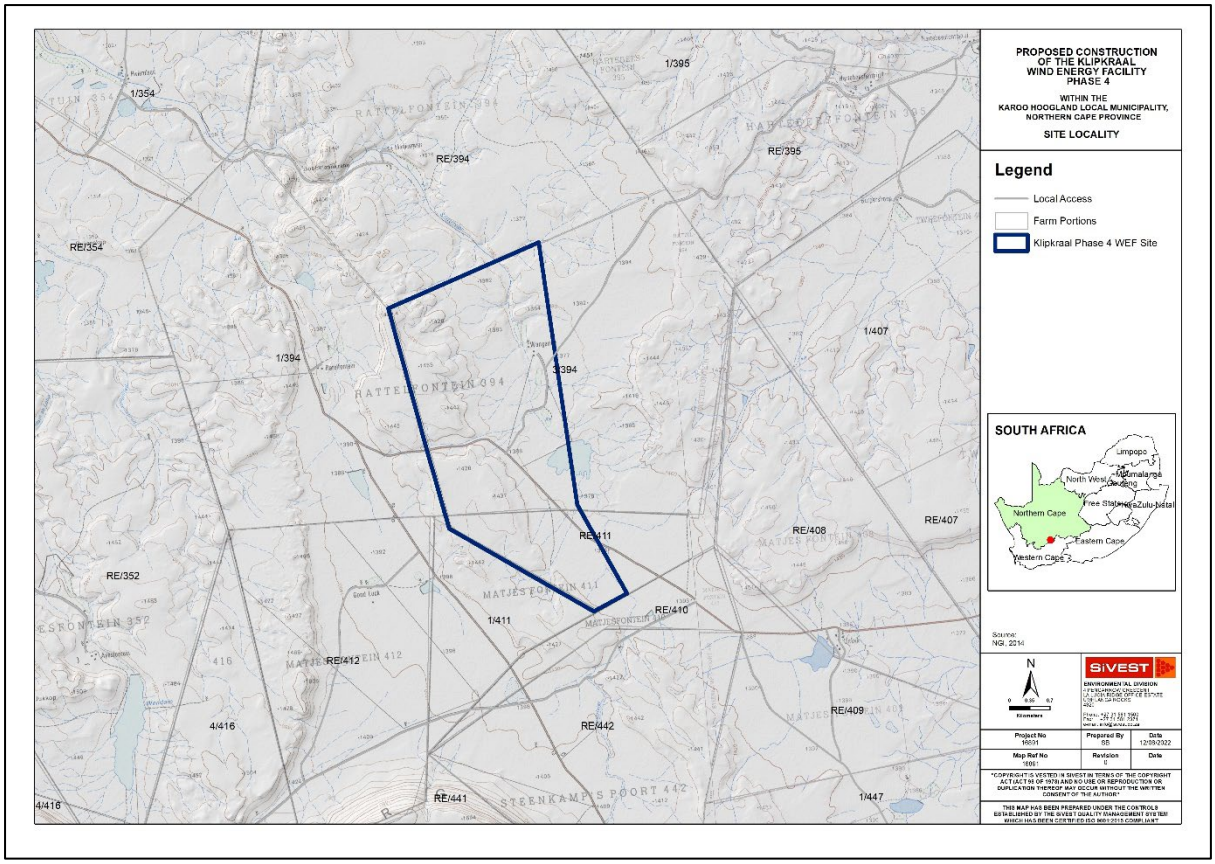

Figure 3: Site locality

The bend point coordinates of the site have been included below:

Table 7: Bend point coordinates for the Klipkraal WEF 4 site boundary

KLIPKRAAL 4 WEF: APPLICATION SITE		
COORDINATES AT CORNER POINTS (DD MM SS.sss)		
POINT	**SOUTH**	**EAST**
1	32° 0' 3.551" S	21° 41' 52.027" E
2	32° 2' 9.323" S	21° 42' 19.145" E
3	32° 3' 2.394" S	21° 43' 49.350" E
4	32° 2' 53.948" S	21° 44' 11.520" E
5	32° 2' 2.259" S	21° 43' 44.467" E
6	31° 59' 34.153" S	21° 43' 33.853" E
COORDINATES AT CENTRE POINT (DD MM SS.sss)		
POINT	**SOUTH**	**EAST**
7	32° 1'28.81"S	21°43'0.19"E

6. ACTIVITY INFORMATION

6.1 Project Description

The application site assessed during the scoping phase (which incorporates the farm portions / properties listed above) is approximately 1376 hectares (ha) in extent.

At this stage it is anticipated that the proposed Klipkraal WEF 4 will comprise up to sixty (60) wind turbines with a maximum total energy generation capacity of up to approximately 300MWac. In summary, the proposed Klipkraal WEF 4 development will include the following components:

Wind Turbines:

- Approximately 60 turbines, between 5MWac and 8MWac, with a maximum export capacity of up to approximately 300MWac. This will be subject to allowable limits in terms of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or any other program.
- The final number of turbines and layout of the wind farm will, however, be dependent on the outcome of the Specialist Studies in the EIA phase of the project;
- Each wind turbine will have a maximum hub height of up to approximately 200m;
- Each wind turbine will have a maximum rotor diameter of up to approximately 200m;
- Permanent compacted hardstanding areas / platforms (also known as crane pads) of approximately 100m x 100m (total footprint of approx. 10 000m^2) per wind turbine during construction and for on-going maintenance purposes for the lifetime of the proposed wind farm projects. This will however depend on the physical size of the wind turbine;
- Each wind turbine will consist of a foundation (i.e. foundation rings) which may vary in depth, from approximately 3m and up to 10m or greater, depending on the physical size of each wind turbine. It should be noted that the foundation can be up to as much as approximately 700m^3;

Electrical Transformers:

- Electrical transformers will be constructed near the foot of each respective wind turbine in order to step up the voltage to 66kV.
- The typical footprint of the electrical transformers is up to approximately 10m x 10m, but can be up to 20m x 20m at certain locations;

Step-up / Collector Substations:

- One 11-66/132-400kV step-up / collector substation, each occupying an area of up to approximately 2ha,
- The proposed substation will include an Eskom portion and an Independent Power Producer (IPP) portion, hence the substation has been included in this EIA and in the grid connection infrastructure BA (separate application - substations, switching stations and power lines) to allow for handover to Eskom.
- Following construction, the substation will be owned and managed by Eskom. The current applicant will retain control of the medium voltage components (i.e. 33kV components) of the substation, while the high voltage components (i.e. 400kV components) of the substation will likely be ceded to Eskom shortly after the completion of construction;

Main Transmission Substations (MTS):

- One (1) new 132/400kV Main Transmission Substation (MTS) is being proposed, occupying an area of up to approximately 120ha.
- The proposed MTS will include an Eskom portion and an IPP portion.
- Following construction, the substation will be owned and managed by Eskom. The current applicant will retain control of the 132-400kV and lower voltage components of each MTS, while the 132/400kV voltage components of the MTS will likely be ceded to Eskom shortly after the completion of construction;

Electrical Infrastructure:

- The wind turbines will be connected to the proposed substation via medium voltage (i.e. 33kV) cables.
- These cables will be buried along access roads wherever technically feasible, however, the cables can also be overhead (if required);
- Each WEF will then connect to the MTS via an up to 400kV powerline.

Battery Energy Storage Systems (BESS):

- One (1) Battery Energy Storage System (BESS) will be constructed for the wind farm and will be located next to the 33-66/132-400kV step-up / collector substations which form part of the respective wind farms, or in between the wind turbines.
- It is anticipated that the type of technology will be either Lithium Ion or Sodium-Sulphur (or as determined prior to construction).
- These batteries are not considered hazardous goods as they will be storing 'energy'.
- The size, storage capacity and type of technology will be determined / confirmed prior to construction.

Roads:

- Internal roads with a temporary width of up to approximately 15m will provide access to the location of each wind turbine. These roads will be rehabilitated back to 8m once construction has been completed.
- Existing site roads will be used wherever possible, although new site roads will be constructed where necessary.
- Existing site roads may also be upgraded using temporary concrete stones in order to accommodate for the heavy loads.
- Turns will have a radius of up to 50m for abnormal loads (especially turbine blades) to access the various wind turbine positions.

Site Access:

- The proposed wind farm application site will be accessed via existing gravel roads from the R353 Regional Route;

Temporary Staging Areas:

- A temporary staging area will be required for the wind farm and will be located both at the foot of each wind turbine and at the storage facility (i.e. turbine development area) to allow for working requirements.
- One (1) temporary staging area per wind turbine / range of wind turbines will be required.
- Temporary staging areas will cover an area of up to approximately 100m x 100m (10 000m^2 / 1ha) each;

Temporary Construction Camps:

- One (1) temporary construction camp will be required during the construction phase for the wind farm.
- This area will be used as a permanent maintenance area during the operational phase.
- The combined Temporary Construction Camp / Permanent Maintenance Area will cover an area of up to approximately 2.25ha.
- A cement batching plant as well as a chemical storage area will fall within the Temporary Construction Camp and Permanent Maintenance Area.
- The Temporary Construction Camp and Permanent Maintenance Area will be strategically placed within the proposed wind farm site and will avoid all high sensitivity and/or 'no-go' areas;

Offices, Accommodation, a Visitors' Centre and Operation & Maintenance (O&M) Buildings:

- An office (including ablution facilities), accommodation (including ablution facilities), a Visitors' Centre and an Operation & Maintenance (O&M) building will be required and will occupy areas of up to approximately 100m x 100m (i.e. 1ha).
- Each wind farm (i.e. each phase) will have its own O&M building and Office, however, the Accommodation and Visitors' Centre will be centralised locations which will be shared between certain wind farm projects (i.e. shared between certain phases which will be confirmed at a later stage);

Septic Tank and Soak-Away Systems:

- The proposed wind farm will consist of a septic tank and soak-away system.
- This will be required for construction as well as long term use.
- The septic tank and soak-away system will be placed 100m or more from water resource (which includes boreholes);

Fencing:

- Fencing will be required and will surround the wind farm.
- The maximum height of the fencing as well as the area which the fencing will cover will be confirmed during the detailed design phase, prior to construction commencing.
- Fences will however be constructed according to specifications recommended by the Ecologist and Avifauna specialist (and as per the EMPr);

Temporary Infrastructure to Obtain Water from Available Local Sources:

- Temporary infrastructure to obtain water from available local sources will be required. Water may also be obtained from onsite boreholes and from the town of Fraserburg.
- New or existing boreholes, including a potential temporary above ground pipeline (approximately 50cm in diameter) for each wind farm, to feed water to the sites are being proposed.
- Water will potentially be stored in temporary water storage tanks.
- The necessary approvals from the Department of Water and Sanitation (DWS) will be applied for separately (should this be required); and

Temporary Containers:

- Temporary containers of up to approximately 80m^3 will be required for the storage of fuel on-site during the construction phase of the wind farm.
- The chemical storage area will fall within the Temporary Construction Camp and permanent Maintenance Area.

The Preliminary Layout is reflected in the figure below and attached in **Appendix 3**. Photographs of the site are included in **Appendix 4**.

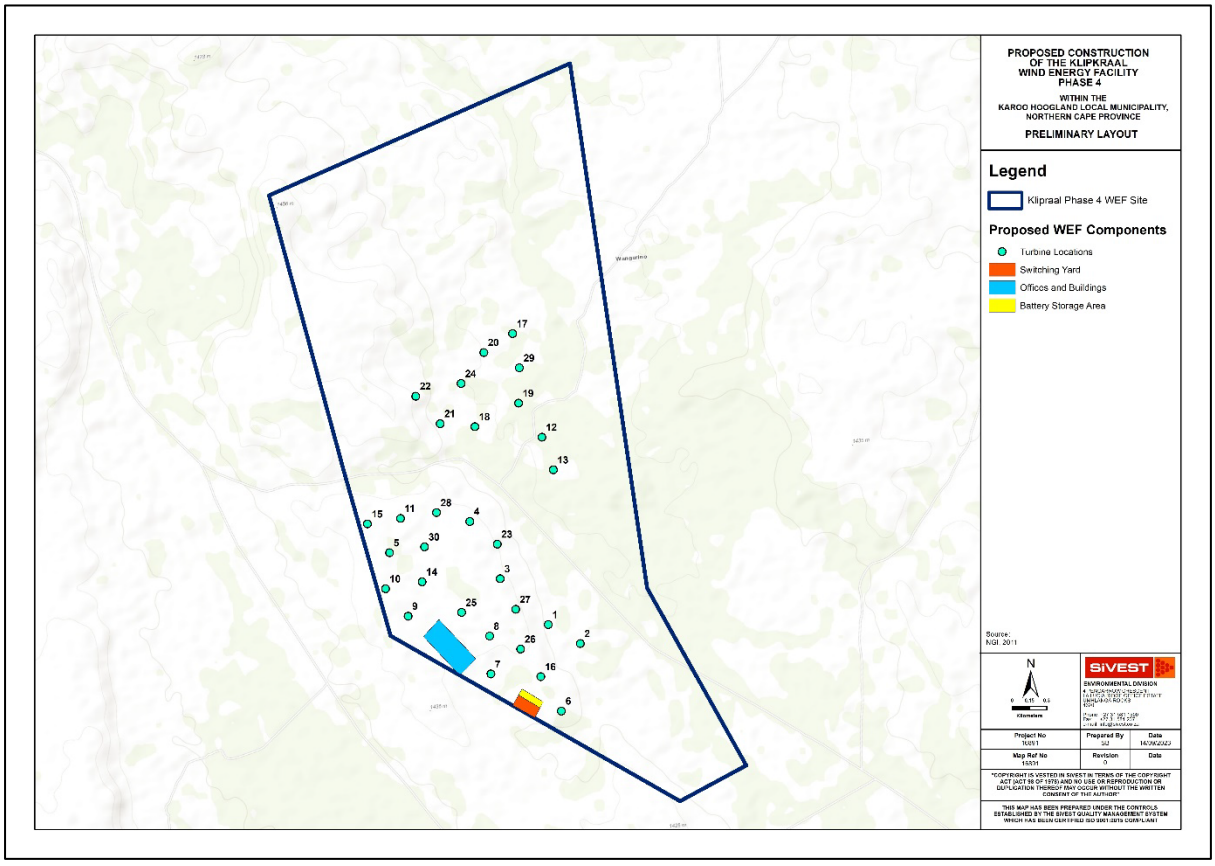

Figure 4: Preliminary layout showing proposed location of wind turbines

The wind turbines and all other project infrastructure will be placed strategically within the development area based on environmental constraints. The exact location of the turbines and associated infrastructure will be determined during the final design stages of the WEF design process.

Please refer to the figure below for the typical components of a wind turbine.

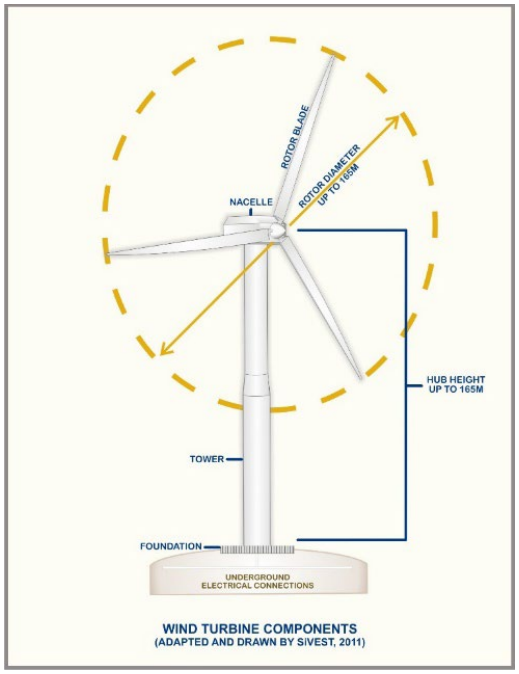

Figure 5: Typical components of a Wind Turbine

A summary of the project technical details is provided in **Table 8** below.

Table 8: Technical Detail Summary

Component	Description / Dimensions
Location of site (centre point)	32° 1' 28.81" S 21° 43' 0.19" E
Application site area	1376 ha
Total Klipkraal WEF area	Approximately 6507 ha
Turbine development area	Turbine Foundation Area = 45m*32m*60 turbines = 8.6 Ha
SG codes	C02600000000039400003 C02600000000041100000
Export capacity	Up to 300MWac
Proposed technology	Wind turbines and associated infrastructure
Hub height from ground	Up to 200 m
Rotor diameter	Up to 200 m
Substation Area	Approximately 2 ha
O&M building area	Approximately 1 ha
Temporary staging area	Up to 1 ha
Permanent laydown area	To be determined based on final layout
Temporary site camp	Up to 2.25ha
Hard stand areas	700m³ per turbine
Width of internal access roads	Approximately 15 m
Length of internal access roads	To be confirmed during the detailed design phase

Component	Description / Dimensions
Site Access	The Klipkraal WEF 4 development access point is from Road DR02312, bisecting the southern quadrant of Farm Matjes Fontein No. 411 and PTN 3 of the Farm Rattelfontein No. 394. Road DR02312 is classified as a Class R4 in the RCAM Classification – Rural Collector Road with an average road reserve width of 20m, a gravel surface of ±6m wide, and an average speed of 80 km/h. PTN 3 of the Farm Rattelfontein No. 394 has two (2) existing access points emanating from Road DR02312 at Km 87.82 and Km 88.81. Both access points are located on Road DR02312.
Proximity to grid connection	Approximately 70km from application site
Height of fencing (for substation)	To be confirmed during the detailed design phase, Eskom specifications.
Type of fencing (for substation)	To be confirmed during the detailed design phase, Eskom specifications.

6.2 NEMA Listed Activities

The amended EIA Regulations promulgated under Section 24(5) of the National Environmental Management Act, Act 107 of 1998 and published in Government Notice No. R. 326 list activities which may not commence without environmental authorization from the Competent Authority. The proposed activity is identified in terms of Government Notice No. R. 327, and 324 for activities which must follow a full Environmental Impact Assessment Process. The project will trigger the following listed activities:

Table 9: Listed activities in terms of NEMA: EIA Regulations 2014 (as amended in 2017), applicable to the proposed project

Activity No(s):	Relevant Basic Assessment Activity(ies) as set out in Listing Notice 1 of the EIA Regulations, 2014 as amended	Description
11 (i)	**GN R. 327 (as amended) Item 11:** The development of facilities or infrastructure for the transmission and distribution of electricity— (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.	New switching / collector substations and Main Transmission Substations (MTS) will be constructed as part of the proposed wind farm project. The proposed substations will be located outside urban areas. The switching / collector substations will have capacities of 33/132kV, while the MTS will have capacities of 132/400kV.
12 (ii) (a) (c)	**GN R. 327 (as amended) Item 12:** The development of: ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs- (a) within a watercourse; (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.	The proposed wind farm projects will entail the construction of WEF, buildings and other infrastructure (including the 11-66kv/132-400kv shared on-site substation and BESS) with physical footprints of approximately 100m^2 or more within a surface water feature / watercourse or within 32m of a surface water feature / watercourse. The infrastructure/structures associated with the proposed projects will most likely avoid the identified surface water features / watercourses where possible, although some infrastructure or structures will occur within a surface water

Activity No(s):	Relevant Basic Assessment Activity(ies) as set out in Listing Notice 1 of the EIA Regulations, 2014 as amended	Description
		feature / watercourse and/or within 32m of a surface water feature / watercourse.
19	**GN R. 327 (as amended) Item 19**: The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;	The proposed wind farm project will likely involve the excavation, removal, infilling, depositing and moving of more than 10 cubic metres (m^3) of soil, sand, pebbles or rock from some of the identified surface water features / watercourses. Although the layout of the proposed wind farm project will be designed to avoid the identified surface water features / watercourses as far as possible, some of the infrastructure, internal and/or access roads may need to traverse the identified surface water features / watercourses. In addition, during construction, soil may need to be removed from some of the identified surface water features / watercourses.
28 (ii)	**GN R. 327 (as amended) Item 28:** Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;	The proposed wind farm project sites are currently zoned for agricultural land use. The proposed wind farm projects will result in special zoning being required, as an area greater than 1ha outside an urban area, will be transformed into industrial / commercial use.
48 (i) (a) (c)	**GN R. 327 (as amended) Item 48:** The expansion of- (i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; where such expansion occurs— (a) within a watercourse; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;	The proposed wind farm projects will most likely entail the expansion (upgrading) of roads and other infrastructure by $100m^2$ or more within a surface water feature / watercourse or within 32m from the edge of a surface water feature / watercourse. Although the layouts of the proposed wind farm projects will be designed to avoid the identified surface water features / watercourses as far as possible, some of the internal and access roads/services to be upgraded will likely need to traverse the identified surface water features / watercourses and construction will likely occur within some of the surface water features / watercourses and/or be within 32m of some of the surface water features / watercourses.
56 (ii)	**GN R. 327 Item 56:** The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre -	Internal access roads will be required to access the wind turbines as well as the respective substations. Existing roads will be used wherever possible, although new

Activity No(s):	Relevant Basic Assessment Activity(ies) as set out in Listing Notice 1 of the EIA Regulations, 2014 as amended	Description
	(i) where the existing reserve is wider than 13,5 metres; or (ii) where no reserve exists, where the existing road is wider than 8 metres –	roads will be constructed where necessary. The existing access roads might thus need to be upgraded by widening them more than 6m, or by lengthening them by more than 1 kilometre (km).
Activity No(s):	**Relevant Scoping and EIA Activity(ies) as set out in Listing Notice 2 of the EIA Regulations, 2014 as amended**	**Description**
1	**GN R. 325 (as amended) Item 1:** The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs – (a) within an urban area; or (b) on existing infrastructure	The proposed development will entail the construction of a WEF where the respective electricity output will be approximately 300MWac. In addition, the proposed WEF developments will be located outside urban areas.
15	**GN R. 325 (as amended) Item 15:** The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for — (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan..	The proposed WEF development will involve the clearance of more than 20ha of indigenous vegetation. Clearance will also be required for the proposed substations, internal access roads and other associated infrastructure and buildings.
Activity No(s):	**Relevant Basic Assessment Activity(ies) as set out in Listing Notice 3 of the EIA Regulations, 2014 as amended**	**Description**
4 (g) (ii) (ee)	**GN R. 324 (as amended) Item 4:** The development of a road wider than 4 metres with a reserve less than 13,5 metres. **g. Northern Cape** ii. Outside urban areas; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.	The development of the WEF facilities and associated infrastructures will require the development of roads wider than 4m with a reserve of less than 13.5m within CBA 2 and an ESA. These roads will occur within the Northern Cape Province, outside urban areas.
12 (g) (ii)	**GN R. 985 (as amended) Item 12:** The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. **g. Northern Cape** ii. Within critical biodiversity areas identified in bioregional plans;	The proposed development will entail the construction of the WEF and associated infrastructure (cabling and roads) with physical footprints of approximately 300m^2 or more within CBA and an ESA. As such, approximately 300m^2 or more of indigenous vegetation will be cleared as part of the respective proposed developments.
14 ii. (a) (c) g (ii) (ff)	**GN R. 324 (as amended) Item 14:** The development of— (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs—	The proposed development will entail the development of infrastructure or structures with physical footprints of 10m^2 or more within a watercourse / surface water feature or within 32m from the edge of a watercourse / surface water feature.

Activity No(s):	Relevant Basic Assessment Activity(ies) as set out in Listing Notice 1 of the EIA Regulations, 2014 as amended	Description
	(a) within a watercourse; (b) in front of a development setback; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour. **g. Northern Cape** i. Outside urban areas: (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;	Although the layouts of the respective proposed developments will be designed to avoid the identified surface water features / watercourse as far as possible, some of the infrastructure / structures will need to traverse the identified surface water features / watercourses. The construction of the infrastructure (MV cabling and roads) for the development will occur within CBA located outside of urban areas.
18 g (ii) (ee)	**GN R. 324 (as amended) Item 18:** The widening of a road by more than 4 meters, or the lengthening of a road by more than 1 kilometer- **g. Northern Cape** ii. Outside urban areas: (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ii) Areas within a watercourse or wetland; or within 100m from the edge of a watercourse or wetland.	Internal access roads will be required to access the wind turbines as well as the respective substations. Existing roads will be used wherever possible. Internal access roads will thus be widened by more than 4m or lengthened by more than 1km. These roads will occur within the Northern Cape Province, outside urban areas. The widening of the roads will occur within CBAs and or within 100m from the edge of a watercourse or wetland.
23 ii (a) (c) (g) (ii) (ee)	**GN R. 324 (as amended) Item 23:** The expansion of— (ii) infrastructure or structures where the physical footprint is expanded by 10 square metres or more; where such expansion occurs— (a) within a watercourse; (b) in front of a development setback adopted in the prescribed manner; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour. **g. Northern Cape** ii. Outside urban areas: (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;	The proposed development will entail the development and expansion of roads and other infrastructure or structures by 10m^2 or more within a surface water feature / watercourse or within 32m from the edge of a surface water feature / watercourse. Although the layout of the proposed development will be designed to avoid the identified surface water features / watercourses as far as possible, some of the existing internal and access roads will need to traverse some of the identified surface water features / watercourses. The proposed development occurs within CBA and an ESA, and are located outside urban areas.

7. NATIONAL WEB-BASED ENVIRONMENTAL SCREENING TOOL

The National Web based Environmental Screening Tool is a geographically based web-enabled application which allows a proponent intending to submit an application for environmental authorisation in terms of the Environmental Impact Assessment (EIA) Regulations 2014, as amended to screen their proposed site for any environmental sensitivity.

According to the DFFE Screening Tool Report (attached in **Appendix 8**), the following themes described in **Table 10** below are applicable to the proposed development:

Table 10: DFFE Screening Tool Environmental Sensitivity

Theme	DFFE Sensitivity	Specialist Sensitivity	Comment
Agriculture Theme	High	Low-Med	The Agricultural Compliance Statement is included in **Appendix 6** of the Draft Scoping Report. This site sensitivity verification verifies the entire site as being of less than high agricultural sensitivity with a land capability value of 4 to 5. The land capability value is in keeping with the climate limitations that make the site totally unsuitable for dryland crop production. The required level of agricultural assessment is therefore confirmed as an Agricultural Compliance Statement.
Animal Species Theme	Medium	High	The Terrestrial Ecological Report is included **Appendix 6** of the Draft Scoping Report. According to the report, in terms of the site verification, there are confirmed observations from the broader area of Riverine Rabbit as well as from within the Klipkraal 4 site, the site verification finds that the site can be classified as high sensitivity for the Riverine Rabbit. The Klipkraal 4 site can be confirmed to be High sensitivity for the Karoo Dwarf Tortoise and that a full assessment for the Karoo Dwarf Tortoise would be required.
Aquatic Biodiversity Theme	Very High	Low	The Aquatic Ecological Report is included in **Appendix 6** of the Draft Scoping Report. It is the specialist's opinion that the Aquatic Theme of the site is considered to be of **Low Significance.**

Theme	DFFE Sensitivity	Specialist Sensitivity	Comment
Archaeological and Cultural Heritage Theme	Low	Medium – Low	The Heritage Report is included in **Appendix 6** of the Draft Scoping Report. According to the heritage specialist, from the desktop assessment medium to low heritage sensitive areas were identified in the broader region. No heritage resources were identified within the Klipkraal Phase 4 WEF area, but further fieldwork is required for better coverage of the study area. This will be undertaken in the EIA Phase.
Avian (Wind) Theme	Low	High	The Avifaunal Report is included in **Appendix 6** of the Draft Scoping Report. According to the report, the project area of impact confirmed habitat for species of conservation concern (SCC) as defined in the Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species (Government Gazette No 43855, 30 October 2020). The occurrence of SCC was confirmed during the integrated pre-construction monitoring programme, with observations of Ludwig's Bustard, Karoo Korhaan, Martial Eagle, Verreaux's Eagle and Black Stork recorded within the PAOI and the immediate surrounds. Based on the field surveys to date, a classification of High sensitivity for avifauna is suggested.
Bats (Wind) Theme	High	High	The Bat Report is included in **Appendix 6** of the Draft Scoping Report. The bat sensitivity map produced by the specialist, share similarities to the screening tool sensitivities with regards to the identification of several water courses and open water sources as high sensitivity areas. However, additional watercourses, rocky cliffs and koppies have been identified as additional high sensitivities by the Specialist. The sensitivities identified in the Specialist assessment have been verified against the National Environmental Screening Tool.
Civil Aviation (Wind) Theme	Low	Low	The closest airport is the Fraserburg Aerodrome, located approximately 20 km from the site.

Theme	DFFE Sensitivity	Specialist Sensitivity	Comment
			No defence sites or civil aviation domes were recorded within or in close proximity to the Proposed Development. However, the South African Civil Aviation Authority (SACAA) as well as the National Department of Defence / South African National Defence Force (SANDF) will be included as commenting stakeholders in the Interested and Affected Parties (I&AP) Database as part of the public participation process. It is the EAP's opinion that this project will not have any significant impact on the civil aviation or national defence infrastructure. Thus, no impact assessment will need to be undertaken.
Defence (Wind) Theme	Low	Low	The entire site has a low sensitivity in terms of the defence theme. No further specialist study required. No defence sites or civil aviation domes were recorded within or in close proximity to the Proposed Development. However, the South African Civil Aviation Authority (SACAA) as well as the National Department of Defence / South African National Defence Force (SANDF) will be included as commenting stakeholders in the Interested and Affected Parties (I&AP) Database as part of the public participation process. It is the EAP's opinion that this project will not have any significant impact on the civil aviation or national defence infrastructure. Thus, no impact assessment will need to be undertaken.
Flicker Theme	Very High	Low	The Visual Assessment is included in **Appendix 6** of the Draft Scoping Report. According to the specialist, the Screening Tool report provided a Flicker Theme Sensitivity map that showed areas of low sensitivity and very high sensitivity, which specifically relate to areas with "potential temporarily or permanently inhabited

Theme	DFFE Sensitivity	Specialist Sensitivity	Comment
			residence". This coincided with the information obtained from Google Earth in terms of homesteads and structures. However, several of the homesteads appeared to be unoccupied or even abandoned. If this is the case the issue regarding flicker would not be applicable to all these dwellings. The Screening tool indicates the Flicker effect to be of low sensitivity for potential temporary or permanently inhabited residences.
Landscape (Wind) Theme	Very High	Low - High	The Visual Assessment is included in **Appendix 6** of the Draft Scoping Report. According to the report, The Screening Tool also contains a map of Relative Landscape Theme Sensitivity as it relates to wind developments. The map shows that the proposed site intersects with the areas having very high sensitivity. These relative landscape themes do not relate specifically to the visual impact except for the more aesthetically pleasing mountain tops and high ridges as well as rivers and wetlands. The flatter slopes and the low vegetation increase the visual sensitivity of the area. The mountains are experienced below the plateau on the visual periphery and are generally not visible form the study area.
Palaeontology Theme	Very High	TBC	The Heritage Report is included in **Appendix 6** of the Draft Scoping Report. The Palaeontological Assessment will be undertaken during the EIA phase.
Noise Theme	Very High	Very High	The Noise Site Sensitivity Verification Report is included in **Appendix 6** of the Draft Scoping Report. According to the report, the site visit confirmed the location of the Noise Sensitive Areas identified in the DFFE screening tool. Additional NSA's were also identified by the specialist.
Plant Species Theme	Medium	Low	The Terrestrial Ecological Report is included **Appendix 6** of the Draft Scoping Report.

Theme	DFFE Sensitivity	Specialist Sensitivity	Comment
			According to the specialist, the plant species theme sensitivity map shows that the majority of the site is classified as Medium sensitivity, due to the potential presence of Sensitive Species 484. This small cryptic succulent occurs from the Roggeveld Escarpment to the Nuweveld Mountains. This species is a localised habitat specialist that occurs on seasonally wet clay flats which were not observed within the Klipkraal 4 site and as it was not observed, it is assumed absent from the site. As such, the site is confirmed as low sensitivity for the Plant Species Theme. As conditions at the time of the field assessment were favourable and the site is relatively homogenous in terms of vegetation, it is unlikely that any such species were missed. The site verification therefore confirms the low sensitivity of the whole of the site and the lack of any plant SCC on-site.
RFI (Wind Theme)	Very High	Low	The screening tool described the study area as very high Radio Frequency Interference Theme (RFI) sensitivity due to the cluster falling within the Square Kilometre Array (SKA) Karoo Central Radio Astronomy Advantage Area 1 buffer. Based on correspondence received from SARAO, it was determined that the Klipkraal WEF 4 represents a low risk of interference to the SKA radio telescope with a compliance surplus of 9.84 dBm/Hz for the project site within the KCAAA1. SARAO therefore did not require an EMC Control Plan and had no objection to the development.
Terrestrial Biodiversity Theme	Very High	Very High	The Terrestrial Ecological Report is included **Appendix 6** of the Draft Scoping Report. The terrestrial biodiversity theme illustrates that the Klipkraal 4 WEF project area is mapped as Very High sensitivity due to the presence of areas of CBA 1, CBA 2, ESA 2 and FEPA Subcatchments. The site

Theme	DFFE Sensitivity	Specialist Sensitivity	Comment
			verification confirms the presence of some noteworthy biodiversity features within the wider site. As a result of the Very High sensitivity ranking for the Terrestrial Biodiversity Theme, a full terrestrial biodiversity assessment for the development would be required.

8. DESCRIPTION OF THE PHYSICAL ENVIRONMENT

8.1 Geographical

The proposed WEF is located approximately 30 km south-east of Fraserburg in the Northern Cape Province and is within the Karoo Hoogland Local Municipality, in the Namakwa District Municipality. The regional context of the proposed application site is shown in **Figure 6** below.

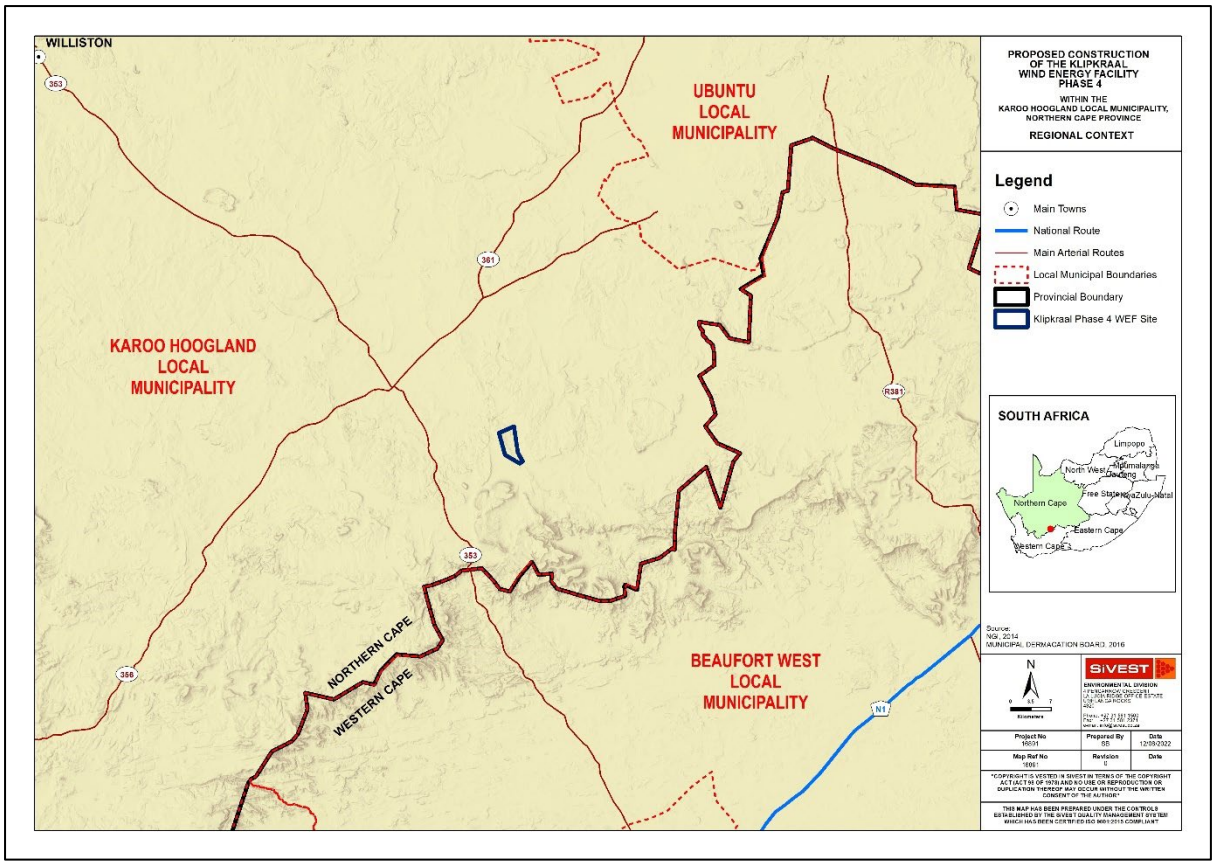

Figure 6: Regional context

8.2 Land Use

According to the South African National Land Cover dataset (2018), much of the assessment area is classified as “Bare / Barren Land”, interspersed with areas of “Low shrubland (nama Karoo)” (**Figure 7**). In most cases these patches of land are undisturbed areas with very sparse vegetation cover. The study area is an extensive flat plain with minimal relief (**Figure 8** and **9**).

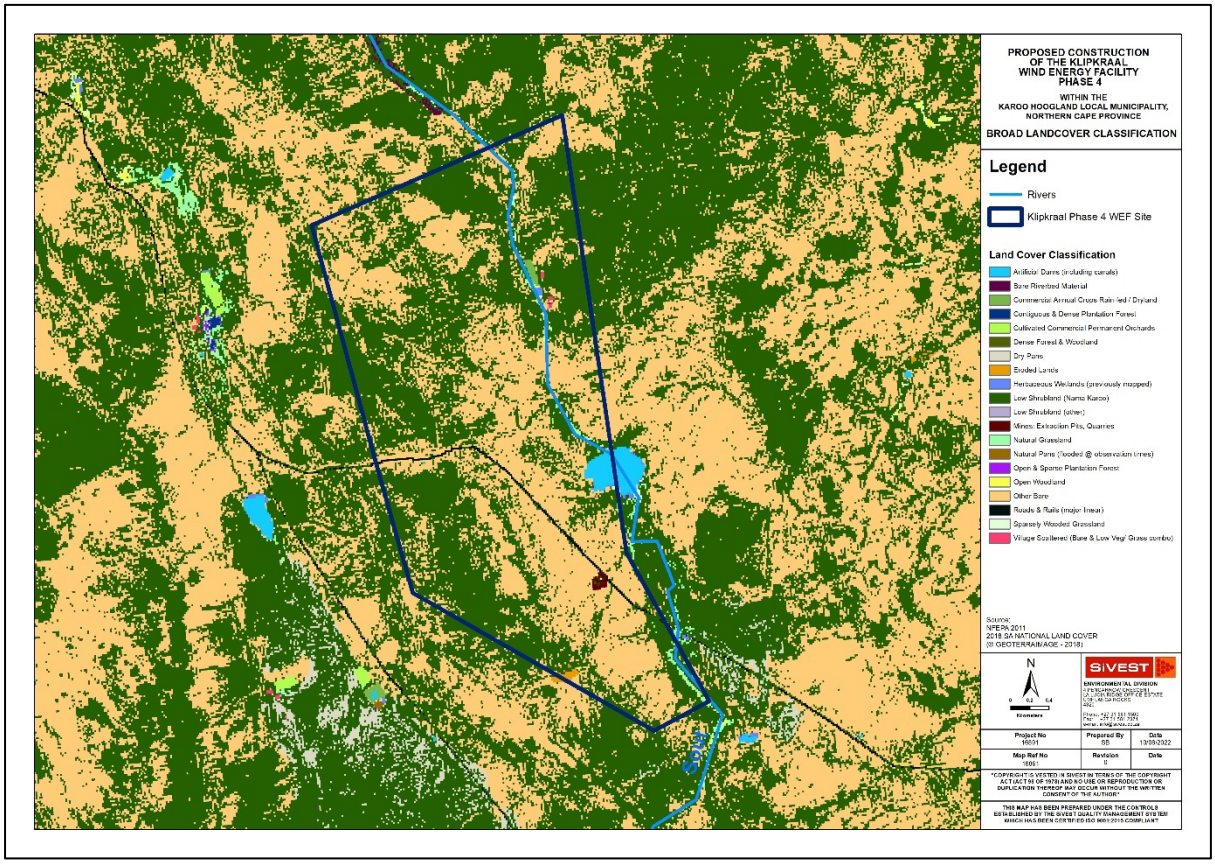

Figure 7: Land Cover Classification

Figure 8: Typical site area

Figure 9: Typical site area

8.3 Climate

The study site experiences low rainfall of approximately 110mm per annum, with the major rainfall months being in the summer months (December to April). The Koppen-Geiger Climate Zones (2071 – 2100) classifies the climate in the area as arid, desert, and cold. At Fraserburg, the summers are hot; the winters are cold; and it is dry, windy, and mostly clear year-round. Over the course of the year, the temperature typically varies from 1°C to 31°C and is rarely below -3°C or above 35°C.

The average hourly wind speed at Fraserburg experiences mild seasonal variation over the course of the year. The windier part of the year lasts for approximately 8 months, from May to January, with average wind speeds of more than 18km per hour. The windiest month of the year at Fraserburg is July, with an average hourly wind speed of approximately 20km per hour.

The calmer time of year lasts for approximately 3 months, from January to May. The calmest month of the year at Fraserburg is March, with an average hourly wind speed of approximately 16km per hour. (https://weatherspark.com/y/150028/Average-Weather-at-Fraserburg-South-Africa-Year-Round)

8.4 Topography

The project site is located immediately north of the border between the Western Cape and the Northern Cape Provinces. The Klipkraal se Berg (altitude of 1 907m) and the Skurwekop (altitude 1 599m) are the two dominant topographical features in the area and are located to the south of the project site with an unnamed ridge line located at the northern extremity of the site which reaches a height of approximately 1 400m. The areas between these two high-lying features is relatively flat falling in a northerly direction.

8.5 Aquatic/Freshwater Assessment

An Aquatic Ecological Study was undertaken by GCS (report dated July 2023).

8.5.1 Baseline Assessment

According to the assessment, there are two freshwater biodiversity conservation mapping initiatives of relevance to the study area, these are the National Freshwater Ecosystem Priority Areas (NFEPA) and the 2016 Northern Cape Critical Biodiversity Areas. The NFEPAs are intended to provide strategic

spatial priorities for conserving South Africa's freshwater ecosystem and supporting sustainable use of water resources.

The location of the NFEPA Wetland is indicated in the figure below. The wetland feature identified along the eastern boundary of the study area is classified as a Channelled Valley Bottom wetland.

Figure 10: Location of the NFEPA wetland within the study area

8.5.2 Aquatic Features

In addition to the aquatic features that were identified in the NFEPA Database indicated in the section above, the field assessment of the property undertaken by the specialist has identified a number of additional artificial and natural aquatic features. The wetland area identified in the NFEPA database was classified during the site assessment as a farm dam in the Sout River. The only other wetland areas that were identified are characterized as a Channelled Valley Bottom wetland. A number of seasonal watercourses were also identified within the study area. These watercourses predominantly form unnamed tributaries of the Sout River and drains towards this feature (to the north and east). These watercourses are very seasonal in nature and will only have flow during heavy rainfall events. Years might pass between flow events in these watercourses. The location of the larger watercourses is indicated in the figure below.

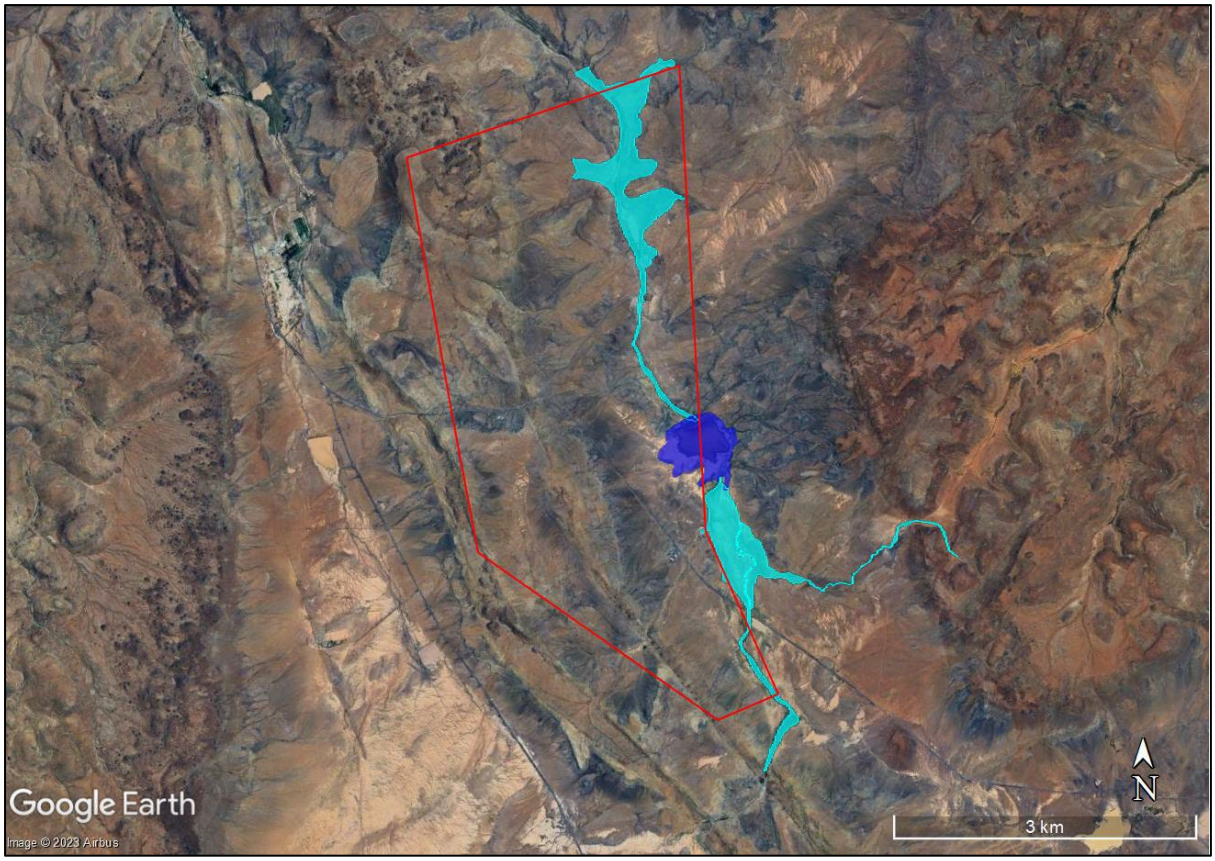

Figure 11: Location of the Channelled Valley Bottom wetlands (in light blue) and the dams (dark blue) within the study site

Figure 12: View of a typical Channelled Valley Bottom wetland found within the study site

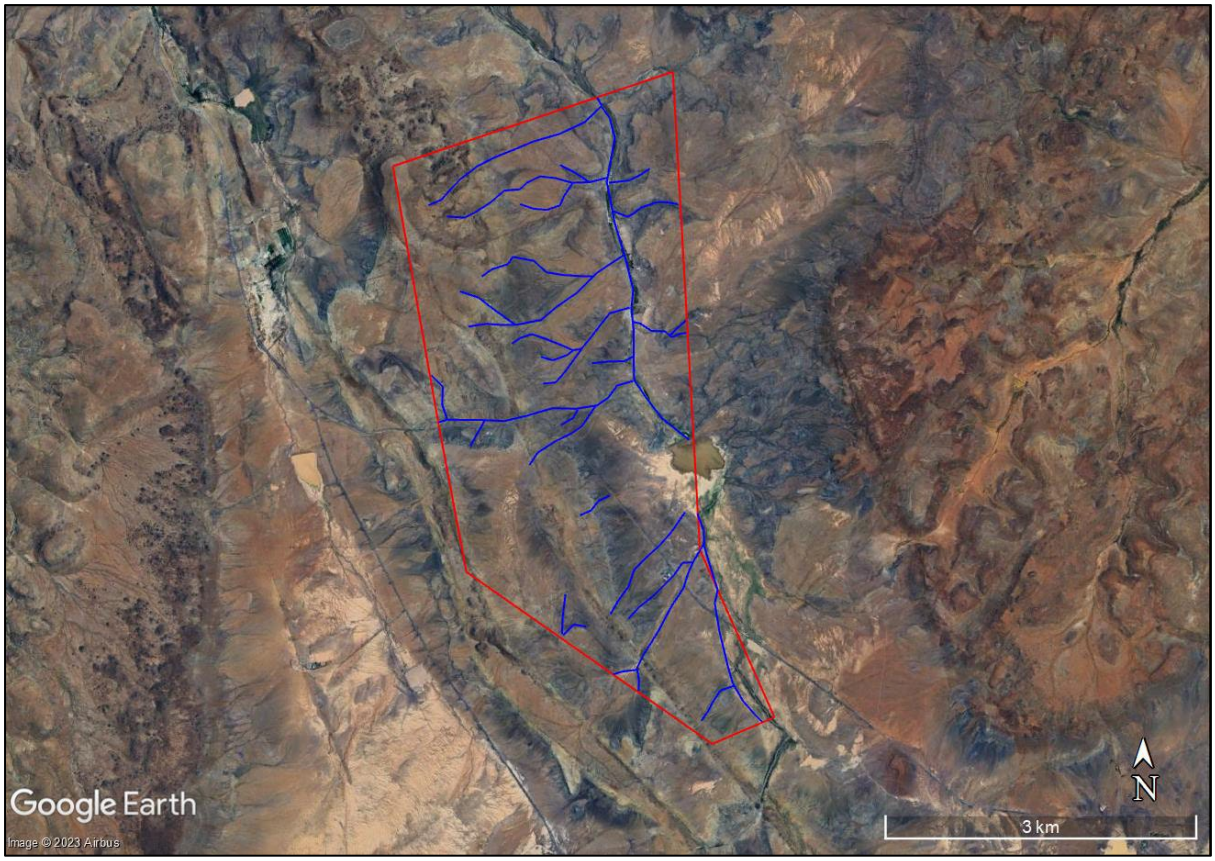

Figure 13: Location of the larger seasonal watercourses identified within the site

Figure 14: View of a typical seasonal watercourse occurring within the study area

8.5.3 Aquatic/Freshwater Sensitivities

Due to the water scarce nature of the area as well as the study site, the provision of buffers around the artificial and natural wetland areas as well as the watercourses must be adhered to. The primary reason for these buffers is to protect these features from any impacts that might arise from the development of the Klipkraal WEF. As such, the specialist has suggested the following:

- No turbine platforms (construction or operational) associated with the Klipkraal WEF must be allowed within 40m of any watercourse on the site;
- No turbine platforms (construction or operational) associated with the Klipkraal WEF must be allowed within 100m of the Channelled Valley Bottom wetlands or dams on the site; and
- No construction camp or operational facility must be allowed within 100m of any watercourses, Channelled Valley Bottom wetlands or dams on the site.

In addition, all watercourse crossings (access roads and other linear infrastructure) must be designed to be free draining during rainfall events and the size must be kept as small as possible to allow for adequate operations of the WEF. No infrastructure must be allowed within the delineated boundaries or within 100m of the Depression wetlands on the site. The figure below indicates the proposed extent of these buffers, the yellow lines make provision for the 100m buffers around the dams and wetland features while the green lines represent the 40m buffer around the watercourses.

Based on the above, the preliminary layout currently has no turbines located within the aquatic no-go areas.

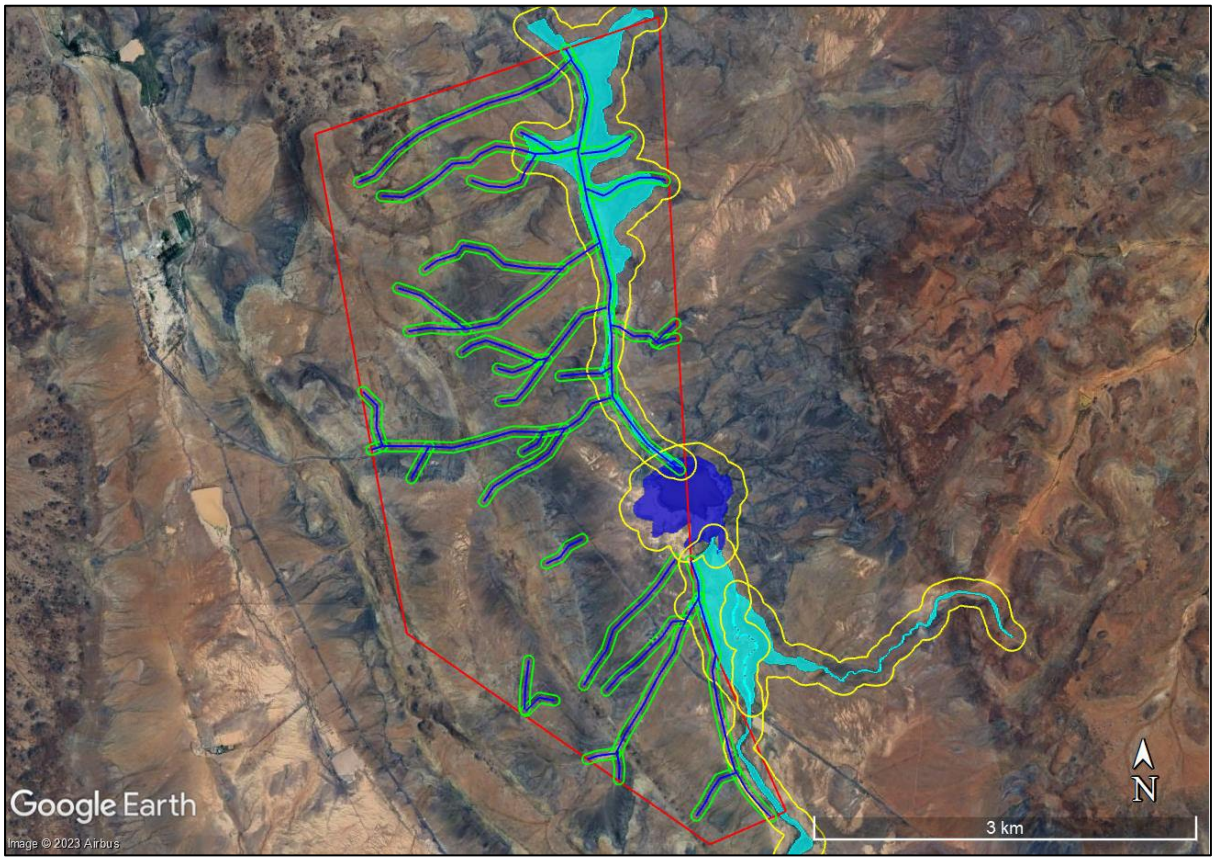

Figure 15: Proposed buffers and no-go areas within the Klipkraal WEF phase 4 (yellow lines are 100m and green lines are 40m)

8.5.4 Preliminary Conclusions

According to the Aquatic/Freshwater Assessment Report, the provided layout (revised by the screening and pre-application scoping phase inputs) has, to a large degree, avoided any sensitive aquatic features and associated buffer areas, significantly reducing the potential overall impact and risk to aquatic resources on the study site.

The specialist further added, that based on the findings of this study, there is no objection from an aquatic/freshwater perspective to the authorisation of the proposed activities assuming that all mitigation and management measures indicated in this assessment are implemented to limit the impact on the aquatic environment of the study site.

8.6 Terrestrial Biodiversity Assessment

A Terrestrial Biodiversity Assessment was undertaken by 3 Foxes (report dated July 2023).

8.6.1 Baseline Assessment

According to the report, the greater Klipkraal WEF site is located within a relatively heterogenous area with several vegetation types present including Eastern Upper Karoo, Western Upper Karoo, Upper Karoo Hardeveld and Southern Karoo Riviere. The open plains and low hills which comprise the majority of the Klipkraal 4 site are however relatively homogenous in terms of vegetation, with few species or habitats of concern present. These areas are considered low sensitivity in terms of vegetation and are considered suitable for the development of the wind farm. There are however, also numerous constraints operating across the site, associated largely with the drainage features of the area, Riverine Rabbit habitat and their associated applied buffers and the steep slopes and dolerite outcrops which occur across site and which represent Karoo Dwarf Tortoise habitat. In terms of fauna, there are several listed mammals which occur in the wider area and which would potentially be impacted by the development. This includes the Riverine Rabbit, Black-footed Cat, Brown Hyena, Grey Rhebok, Mountain Reedbuck and Karoo Padloper. The Riverine Rabbit is of greatest potential concern as it has the highest threat status and is confirmed present within the wider Klipkraal site based on camera trap observations.

8.6.2 Vegetation Types

According to the report, the Klipkraal 4 Wind Energy Facility footprint falls within the Eastern Upper Karoo and Western Upper Karoo vegetation types. The results of the field assessment confirm that this is an oversimplification of the vegetation of the site and based on the fieldwork on the site and site verification, there are also some dolerite hills present that can be considered to represent the Upper Karoo Hardeveld vegetation type, while the areas of riparian vegetation along the larger drainage systems of the site can be considered to represent the Southern Karoo Riviere vegetation type. However, of relevance to the current study, is that none of the vegetation types present within the site are threatened and all of them are still largely intact and have not experienced a large degree of transformation to date. The Southern Karoo Riviere vegetation type has experienced the highest degree of transformation and as estimated 12% has been lost to transformation for crop production. This loss is however not evenly distributed and the areas of extensive floodplains have been particularly impacted and as this is also the habitat associated with Riverine Rabbit, there has a disproportionate influence on this species with the result that any further habitat loss in these areas is considered highly undesirable.

The figures below depict the vegetation types found on the Klipkraal WEF 4 site:

Figure 16: Typical landscape present within the Klipkraal 4 WEF study area, corresponding with the Western Upper Karoo vegetation type.

Figure 17: Riparian area within the Klipkraal Wind Energy Facility with vegetation that can be considered allied with the Southern Karoo Riviere vegetation type.

Figure 18: Dolerite ridge from within the Klipkraal 4 site considered to represent the Upper Karoo Hardeveld vegetation type.

The plant species identified on the Klipkraal WEF 4 site is listed in the Terrestrial Biodiversity Report (**Appendix 6**).

8.6.3 Faunal Communities

Mammals

As many as 70 mammals are listed for the wider study area in the MammalMap database, but many of these are introduced or conservation dependent and approximately 48 can be considered to be free-roaming and potentially impacted by the development. This includes several red-listed species including the Riverine Rabbit *Bunolagus monticularis* (CR), Black-footed Cat *Felis nigripes* (VU), Grey Rhebok *Pelea capreolus* (NT), Mountain Reedbuck *Redunca fulvorufula* (EN) and Brown Hyena Hyaena brunnea (NT). Based on the camera trapping conducted on the site, the Grey Rhebok is confirmed present within the wider Klipkraal site, but not within the Klipkraal WEF 4 site. The camera trapping also picked up the Riverine Rabbit within the Klipkraal WEF 4 project area. The development would therefore potentially impact the Riverine Rabbit through habitat loss as well as disturbance and noise on the site. In addition, there would be a significant increase in traffic within and to and from the site related to the construction and to a lesser degree the operation of the Klipkraal WEF 4, which would potentially have a negative impact through mortality of rabbits related to vehicle collisions. Hence, species-specific mitigation and avoidance for this species is included in this study to reduce these possible impacts.

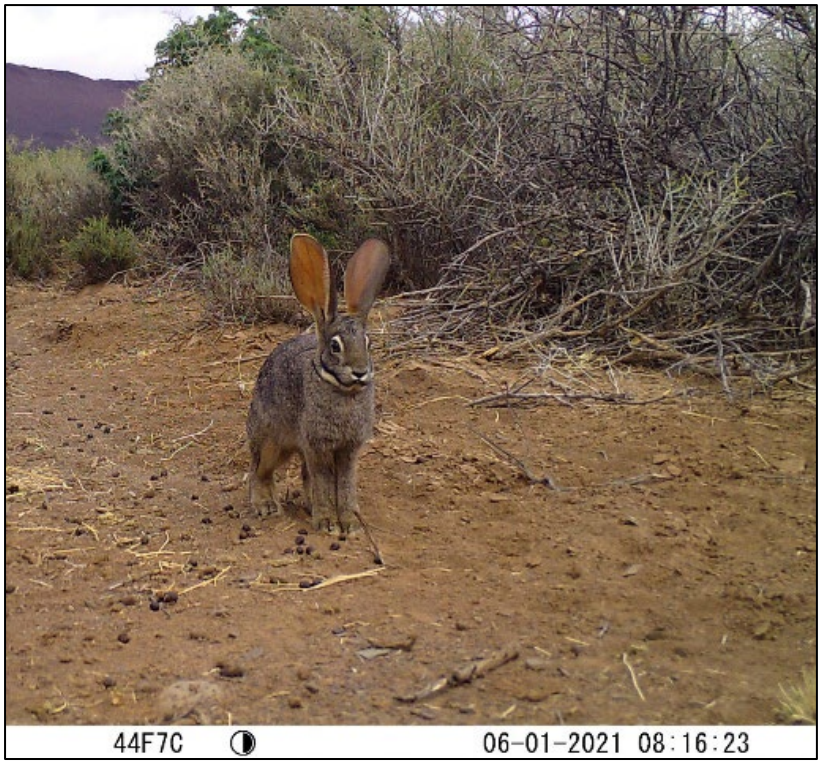

Figure 19: Riverine Rabbit image from camera trapping undertaken

Reptiles

In terms of reptiles, there are as many as 60 reptiles known from the broader area, of which 14 are of confirmed occurrence, 45 of probable occurrence and four of possible occurrence. Species of potential concern include the local endemic, Braack's Pygmy Gecko and the Karoo Padloper. Braack's Pygmy Gecko Goggia braacki is a Western Cape endemic with a restricted distribution range. Most of its distribution is associated with a section of the Hoogland Mountains range within the Karoo National Park. It has not been recorded in the Klipkraal project study area, but it may possibly (not probably) be present within the area. The only threatened (Red Listed) reptile species present in the area 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. Although it was not observed at the site, it is known from the immediate area and it is considered likely that this species is present at the site, within areas of suitable habitat. Tortoises are however one of the few groups of reptiles that have been specifically studied with regards to their responses to wind energy development and no significant negative impacts have been detected within population's resident on wind farms, at least in other parts of the world. As noise and turbine flicker are unlikely to significantly impact this species, habitat loss for this species is likely to be the major avenue of potential impact resulting from the wind farm development. Specific attention to potential habitat loss for this species was paid during the sensitivity mapping and all areas which represent highly favourable habitat for this species have been mapped as high sensitivity or no-go areas for turbines. There would however, still be some impact on the smaller ridges due to turbines and access roads and hence some degree of habitat loss for this species.

8.6.4 Critical Biodiversity Areas and Broad-Scale Processes

The CBA and FEPA Priority Catchment map for the study area is illustrated in the figure below. There is a River Corridor CBA 1 along the Sout River which flows through the Klipkraal 4 and Klipkraal 5 site, but no other CBAs within the site. The River Corridor represents a 500m buffer along the river and according to the lookup layer associated with the CBA layer, the attributes underlying the affected CBA include the following:

- Eastern Upper Karoo
- Roggeveld Shale Renosterveld
- Upper Karoo Hardeveld
- Western Upper Karoo
- Namakwa CBA 2 and associated
- All natural wetlands
- All Rivers
- FEPA catchment
- FEPA 500m
- Landscape structural elements

In terms of the above features, it is clear that the primary feature of concern is the Sout River which drives the CBA which is aimed at water resource protection and the maintenance of ecological processes along the river. Under the layout provided for Klipkraal 4, there are five turbines within the CBA along the South River. With mitigation, the impact of these on the riparian corridor and ecological functioning along the Sout River can be reduced to an acceptable level as this section of the river is not considered particularly sensitive and vulnerable to disruption. The whole of the Klipkraal 4 is however within a priority FEPA Subcatchment. The footprint of the Klipkraal 4 development is estimated at 120 ha and the size of the FEPA subcatchment is 20 767 ha and as such, the development footprint occupies approximately 0.6% of the subcatchment. While there is potential for the development to degrade the value of the FEPA subcatchment through erosion and siltation of the Sout River and downstream ecosystems, there is also potential to mitigate these potential impacts effectively through erosion control measures and other responsible construction and management practices.

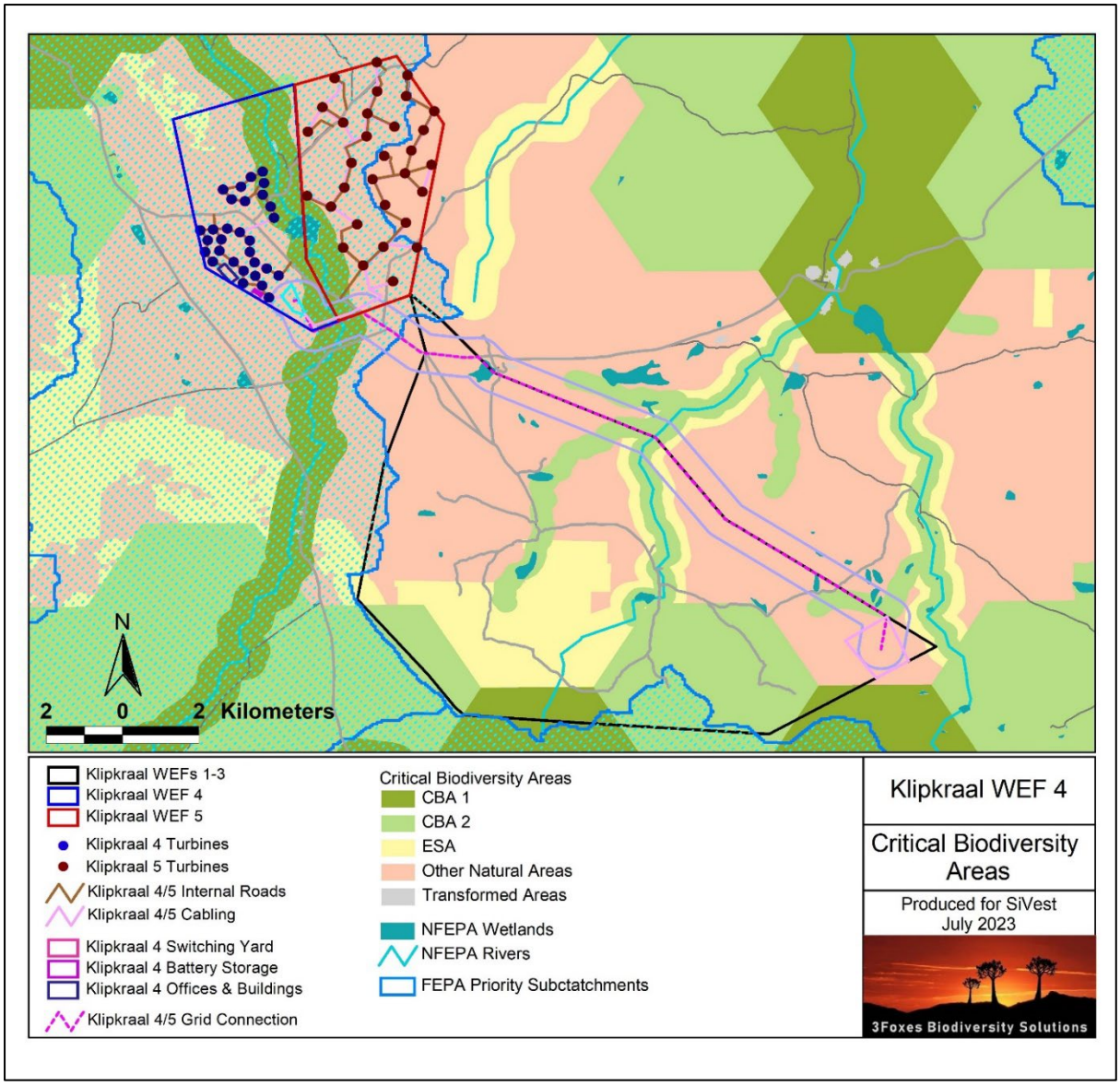

Figure 20: Extract of the Northern Cape CBA map for the Klipkraal 4 WEF and surrounds.

8.6.5 Terrestrial Biodiversity Sensitivities

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. 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 with associated Riverine Rabbit habitat and secondly with the mountains, slopes and dolerite outcrops of the site which are ecologically significant in their own right, but also represent Karoo Dwarf Tortoise habitat. 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 deemed to be sub-optimal as Karoo Dwarf Tortoise habitat. These areas should also be avoided by turbines as much as possible, but some habitat loss in these areas is considered acceptable. Under the layout provided for the assessment, there are no turbines in areas mapped as Very High and low impact on the High sensitivity areas. As a result,

the development of the Klipkraal 4 WEF would avoid significant impact on the major ecological features of the site and as such, the development is considered acceptable and would generate an acceptable impact on fauna, flora and terrestrial biodiversity generally. There are currently three turbines within a no-go area (Riverine rabbit habitat). The preliminary layout is currently being refined to ensure that these turbines are removed from the no-go areas prescribed by the specialist.

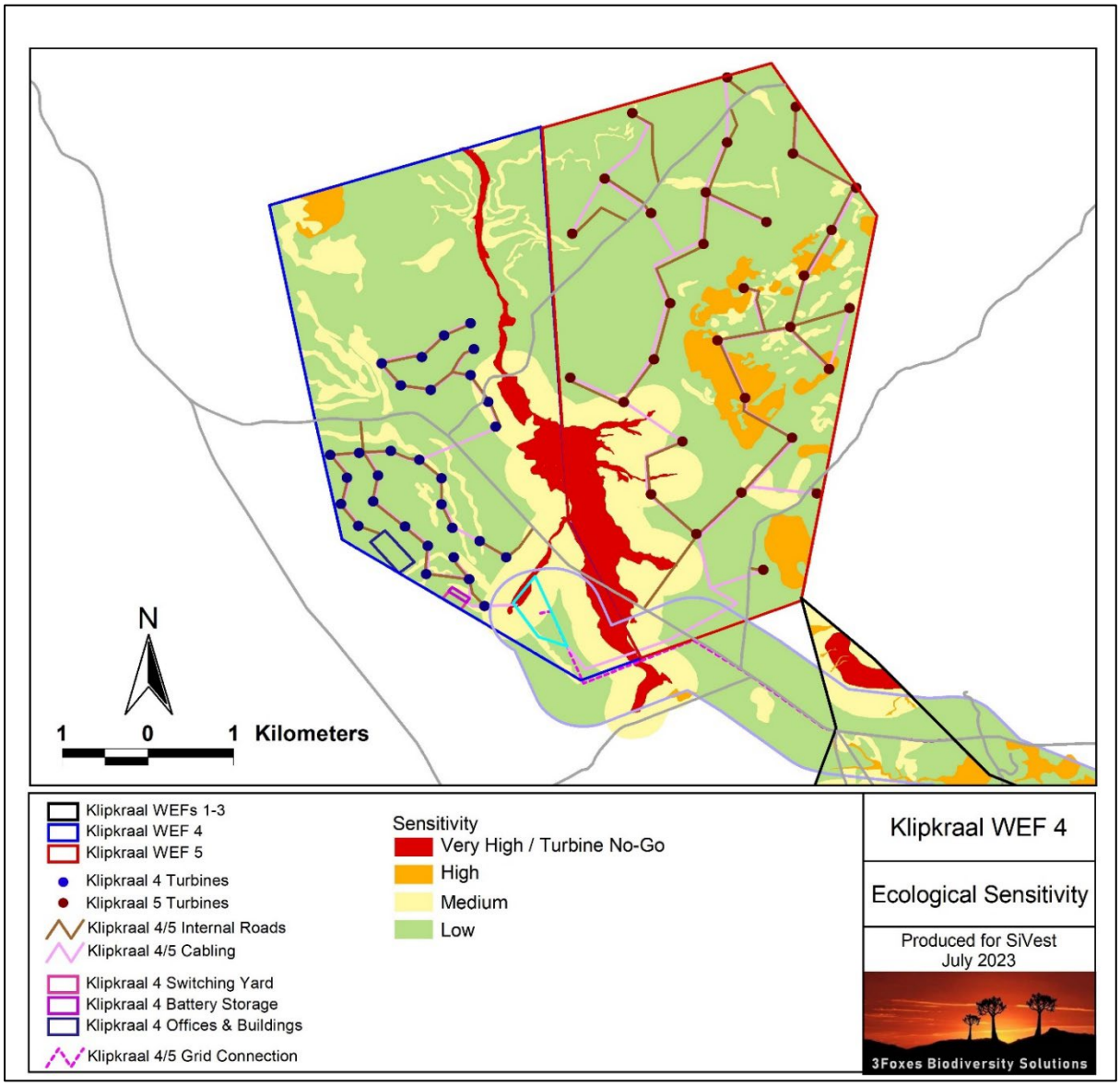

Figure 21: Ecological Sensitivities

8.6.6 Preliminary Conclusions

The Klipkraal WEF 4 is mapped as falling primarily within the Eastern Upper Karoo and Western Upper Karoo vegetation types. However, the site verification and field assessment confirmed the presence of Upper Karoo Hardeveld and Southern Karoo Riviere within the site as well. All 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 area and which would potentially be impacted by the development. Of greatest concern would be the Riverine Rabbit and Karoo Dwarf Tortoise. The Riverine Rabbit is confirmed present within the Klipkraal 4 site and the

impacts on this species are assessed in the associated species assessment. There are confirmed areas of Karoo Dwarf Tortoise habitat within the site that have been classified in the sensitivity mapping as high or very high sensitivity depending on the habitat quality and associated likelihood that the Karoo Dwarf is present. The major sensitive features of the site including Riverine Rabbit habitat and optimal Karoo Dwarf Tortoise habitat have been mapped as high or very high sensitivity. Some impact to these areas from limited amounts of overhead cabling or turbine access roads are considered acceptable.

There is a CBA 1 that represents a river buffer along the Sout River and under the layout provided, there are five turbines within the CBA. With mitigation, the impact of these on the riparian corridor and ecological functioning along the Sout River can be reduced to an acceptable level as this section of the river is not considered particularly sensitive and vulnerable to disruption. The whole of the Klipkraal 4 is however within a priority FEPA Subcatchment. While there is potential for the development to degrade the value of the FEPA subcatchment through erosion and siltation of the Sout River and downstream ecosystems, there is also potential to mitigate these potential impacts effectively through erosion control measures and other responsible construction and management practices. The development is therefore considered acceptable overall, subject to the mitigation and avoidance measures as suggested.

There are no impacts associated with the development of the Klipkraal WEF 4 on terrestrial biodiversity that cannot be mitigated to an acceptable level. As such, should all the proposed mitigation be implemented, the Klipkraal WEF 4 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 Klipkraal WEF 4 development should be authorised subject to the various mitigation and avoidance measures as indicated.

8.7 Agricultural

An Agricultural Compliance Statement was undertaken by Johann Lanz (report dated 25 August 2022).

8.7.1 Baseline Assessment

According to the report, the arid climate (low rainfall of approximately 168 to 179 mm per annum and high evaporation of approximately 1,320 to 1,360 mm per annum) is the limiting factor for land capability, regardless of the soil capability and terrain. Moisture availability is insufficient for crop production without irrigation and the potential agricultural land use of the site is therefore limited to grazing. The land is used for the grazing of sheep and game and has a low long-term grazing capacity of 32 hectares per large stock unit. Due to the climate being the limiting factor that controls production potential, it is the only aspect of the agro-ecosystem description that is required for assessing the agricultural impact of this development. As such, the agricultural impact of this proposed development is assessed here as being of low significance as indicated by the specialist.

8.7.2 Preliminary Conclusions

According to the specialist, the conclusion of this assessment is that the agricultural impact of the proposed development is acceptable because the agricultural production potential of the site is completely limited by the aridity of the climate and is therefore only suitable as grazing land, and therefore it offers a valuable opportunity for renewable energy development with insignificant loss of future agricultural production potential.

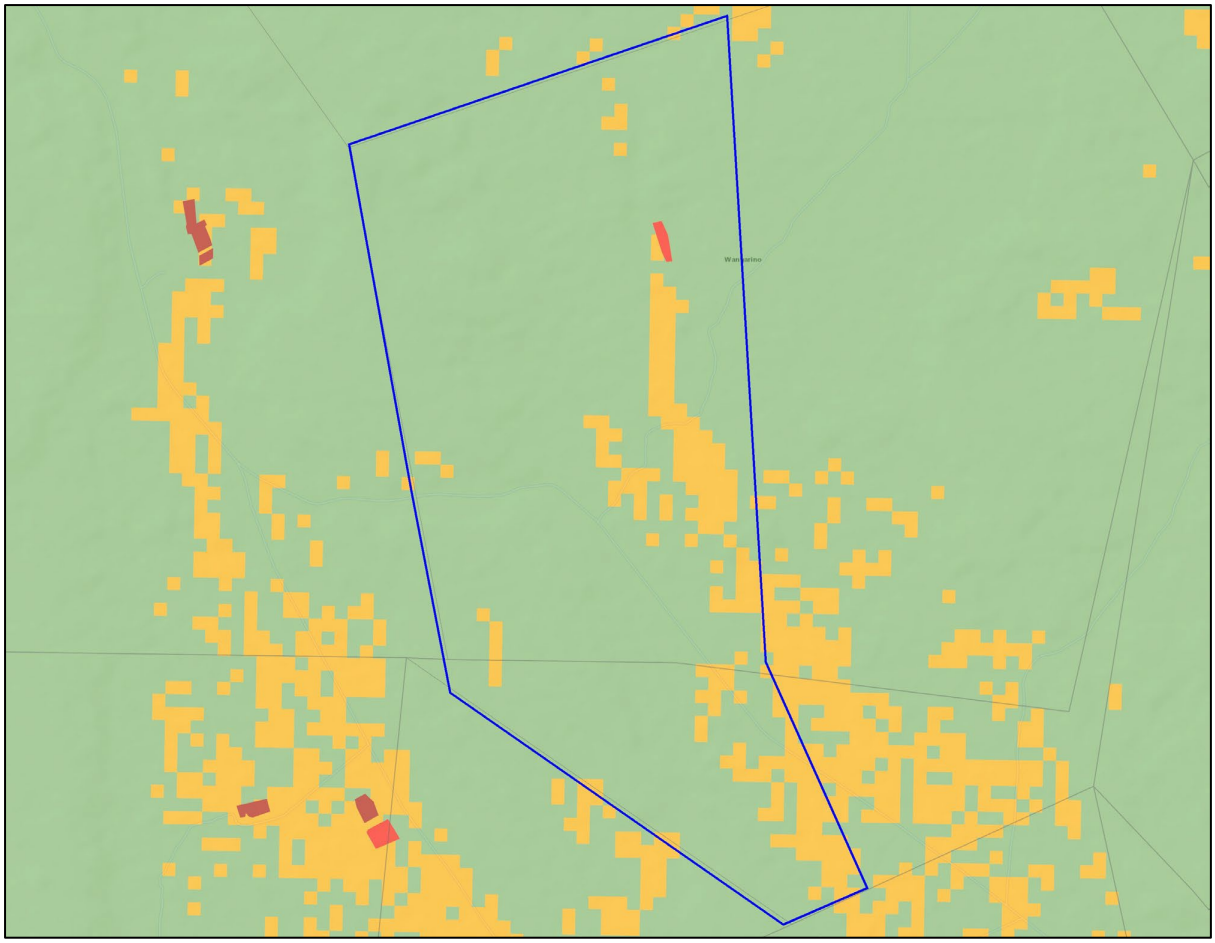

Figure 22: The proposed development site (blue outline) overlaid on agricultural sensitivity, as given by the screening tool (green = low; yellow = medium; red = high).

8.8 Avifauna

An Avifaunal Assessment was undertaken by Chris van Rooyen Consulting (report dated July 2023).

8.8.1 Baseline Assessment

According to the report, it is estimated that a total of 146 bird species could potentially occur in the broader area. Refer to the avifaunal Report (**Appendix 6**) which provides a comprehensive list of all the species in the broader area. Of these, 20 species are classified as priority species for wind developments. Of the 20 priority species, 17 are likely to occur regularly in the project area. The proposed WEF will pose a collision risk to several priority species which could occur regularly at the site. Species exposed to this risk are large terrestrial species i.e., mostly bustards such as Karoo Korhaan, although generally seem to be not as vulnerable to turbine collisions as was originally anticipated. Soaring priority species, i.e., raptors such as Martial Eagle, Pale Chanting Goshawk, Lanner Falcon, Booted Eagle and Greater Kestrel are most at risk of all the priority species likely to occur regularly at the project site. Verreaux's Eagle might also be at risk to some extent, although the species is unlikely to venture regularly into the project area. The Karoo National Park Important Bird Area (IBA) SA102 is the closest IBA and is located approximately 30km south-east of the project area at its closest point. The development is not expected to have any impact on the avifauna in this IBA due to the distance from the development area.

Bird behaviour

The priority species which could occur with some regularity at the proposed WEF can be classified as either terrestrial species, soaring species or occasional long-distance fliers. Terrestrial species spend most of the time foraging on the ground. They do not fly often and when they do, they generally fly for short distances at low to medium altitude. At the application site, Ludwig Bustard, Karoo Korhaan, Blue Crane, Grey-winged Francolin and Double-banded Courser are included in this category. Occasional long-distance fliers generally behave as terrestrial species but can and do undertake long distance flights on occasion. Species in this category are Ludwig's Bustard and Blue Crane. Soaring species spend a significant time on the wing in a variety of flight modes including soaring, kiting, hovering and gliding at medium to high altitudes. At the Project Site, these include all the raptors and storks which could occur i.e., Lanner Falcon, Booted Eagle, Martial Eagle, Greater Kestrel, Pale Chanting Goshawk, Verreaux's Eagle and Black Stork. Based on the time spent potentially flying at rotor height, soaring species are likely to be at greater risk of collision.

Avoidance behaviour

It is anticipated that most birds at the proposed WEF will avoid the wind turbines, as is generally the case at all wind farms. Exceptions already mentioned are raptors that engage in hunting which might serve to distract them and place them at risk of collision, birds engaged in display behaviour or inter- and intraspecific aggressive interaction. Complete macro-avoidance of the wind farm is unlikely for any of the priority species likely to occur at the proposed WEF.

Bird Abundance

The abundance of priority species at the proposed WEF will fluctuate depending on the season of the year, and especially in response to rainfall e.g., Ludwig's Bustard and Blue Crane.

Landscape Features

The project area does not contain many landscape features as it is situated on a plateau. Bordering the project area to the south-west is a series of rugged mountains. The most significant landscape features at the project area from a collision risk perspective are the ground dams, and the drainage lines (when flowing). Surface water attracts many birds, including Red Listed species such as Martial Eagle, Lanner Falcon, Black Stork, Blue Crane and Verreaux's Eagle.

Flight Paths

The only distinctive potential flight paths identified at the project area are the drainage lines, which may serve as a flight path for waterbirds when they flow. However, they are dry most of the time.

Food availability

The current very low levels of bird activity at the proposed WEF could be partially attributed to the lack of food, brought about by the drought conditions which were prevalent during the pre-construction monitoring so far. This could change significantly if the site experiences average to above average rainfall for a number of years, which would result in better foraging conditions.

Displacement due to disturbance and habitat loss

It is inevitable that a measure of displacement will take place for all priority species during the construction phase, due to the disturbance factor associated with the construction activities. This is likely to affect ground nesting species the most, as this could temporarily disrupt their reproductive cycle. Species which fall in this category are Ludwig's Bustard, Karoo Korhaan, Double-banded Courser, Grey-winged Francolin and Spotted Eagle-Owl. Some raptors might also be affected, e.g., Pale Chanting Goshawk which could potentially breed in the small Vachellia trees in the drainage lines. Some species might be able to recolonise the area after the completion of the construction phase, but for some species this might only be partially the case, resulting in lower densities than before once the WEF is operational, due to the disturbance factor of the operational turbines.

The network of roads is likely to result in significant habitat fragmentation, and it could have an effect on the density of several species, particularly larger terrestrial species such as Ludwig's Bustard and Karoo Korhaan, and raptors. Given the current density of the proposed turbine layout and associated road infra-structure, it is not expected that any priority species will be permanently displaced from the project area. The alternative substation locations are likely to be all situated in essentially the same habitat, i.e., Karoo scrub. The habitat is not particularly sensitive, as far as avifauna is concerned, therefore any of the alternative locations should be acceptable. The same goes for any alternative laydown and compound areas.

8.8.2 Results of the pre-construction bird monitoring

The pre-construction monitoring surveys at the proposed Klipkraal WEF 4 site have thus far been conducted during the following periods (with an additional two surveys to be completed during the EIA Phase):

- 15 – 19 February 2022
- 12 – 20 July 2022
- 17 – 22 October 2022
- 10 – 14 January 2023

Transects

The results of the transect counts are displayed in the table below:

Table 11: Results of the transect counts at the WEF and control sites

Turbine Site	**Number**
Species Composition	
All Species	63
Priority Species	2 (3%)
Non-Priority Species	61
Total Count	
Drive transects	793
Walk transects	834
Total	1627
Control Site	**Number**
Species Composition	

Turbine Site	Number
All Species	65
Priority Species	7 (11%)
Non-Priority Species	58
Total Count	
Drive transects	1409
Walk transects	958
Total	2367

Incidental Counts

The table provides an overview of the incidental sightings of priority species recorded thus far at the Klipkraal WEF 4 site:

Table 12: Incidental sightings of priority species recoded during all surveys over four seasons at Klipkraal WEF 4 and the Control Site

Priority Species (Incidentals)		V1	V2	V3	V4	Grand Total
Control Site						
Jackal Buzzard	*Buteo rufofuscus*	0	0	1	0	**1**
Karoo Korhaan	*Eupodotis vigorsii*	0	2	3	1	**6**
Lesser Kestrel	*Falco naumanni*	0	0	0	1	**1**
Verreaux's Eagle	*Aquila verreauxii*	0	0	0	2	**2**
Turbine Site						
African Rock Pipit	*Anthus crenatus*	0	0	3	0	**3**
Jackal Buzzard	*Buteo rufofuscus*	1	1	1	2	**5**
Karoo Korhaan	*Eupodotis vigorsii*	6	2	9	0	**17**
Lesser Kestrel	*Falco naumanni*	0	0	0	3	**3**
Martial Eagle	*Polemaetus bellicosus*	1	0	0	0	**1**
Pale Chanting Goshawk	*Melierax canorus*	1	0	0	1	**2**
Rufous-breasted Sparrowhawk	*Accipiter rufiventris*	0	1	0	0	**1**
Verreaux's Eagle	*Aquila verreauxii*	2	0	0	2	**4**

The figure below shows the locations of the Verreaux's Eagle nests in relation to the Klipkraal WEF 4 site.

Figure 23: Verreaux's Eagles nests recorded during the pre-construction monitoring at the Klipkraal WEF

8.8.3 Avifaunal Sensitivities

The avifaunal specialist has identified the following environmental sensitivities from an avifaunal perspective for the proposed wind energy facility:

- High sensitivity zones

Raptor Nests – A 3.7km turbine exclusion zone should be implemented and maintained around the Verreaux's Eagle nest located at -31.975694° South, 21.682583° East, and an 750m turbine exclusion zone around the Jackal Buzzard nest located at -32.011611° South, 21.727139° East, to reduce the risk of turbine collisions and the risk of displacement due to disturbance. The turbine rotor swept area should also not penetrate these buffer zones.

Surface Water – Included in this category are areas within 200m of pans and earth dams, and 150m from all major drainage lines. Surface water in this arid habitat is crucially important for priority avifauna, including several Red Data species such as Martial Eagle, Lanner Falcon, Black Stork, Blue Crane and Verreaux's Eagle, and many non-priority species, including several waterbirds. Drainage lines when flowing attract waterbirds on occasion, as do the large pools that remain in the channel after the flow has stopped. Wind turbines that are placed near these sources of surface water pose a collision risk to birds using the water for drinking and bathing, and drainage lines, when flowing, are natural flight paths for birds. The turbine rotor swept area should also not penetrate these buffer zones.

- Medium sensitivity zones

Raptor Nests – A 5.2km medium risk sensitivity zone around the Verreaux's Eagle nest located at -31.975694° South, 21.682583° East. All turbines in the area >3.7km up to 5.2km should be regarded

as medium-risk and relocated if possible. Should relocation not be feasible, these turbines should be subject to pro-active mitigation in the form of a proven mitigation methods such as Shutdown on Demand (SDoD), using either bio monitors or an automated system such as IdentiFlight. If all turbines (and their rotor swept area) are located outside the 5.2km buffer monitoring can be concluded after six surveys i.e. 72hours per vantage point.

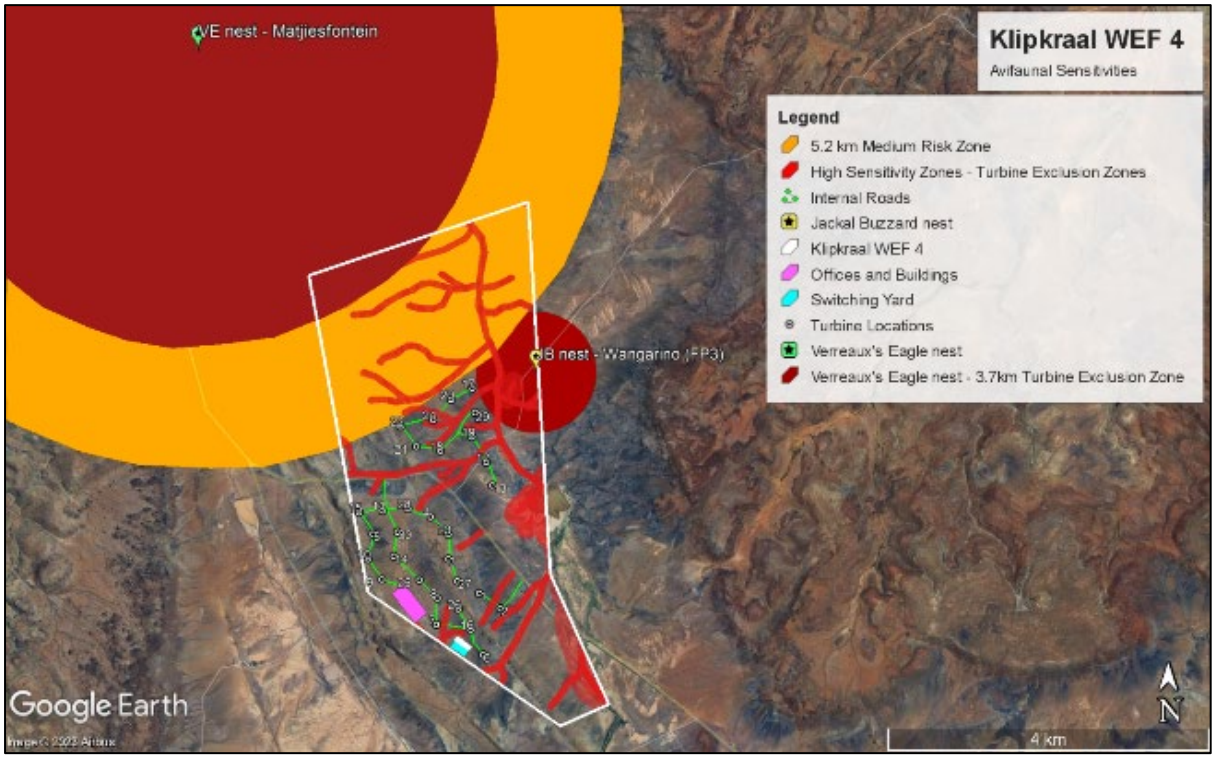

Figure 24: Proposed no-turbine zones

There are currently no turbines planned within the no-go areas identified by the specialist.

8.8.4 Preliminary conclusions

The proposed Klipkraal WEF 4 will have a moderate impact on avifauna which, in most instances, could be reduced to a low impact through appropriate mitigation. Any alternative substation and laydown locations will all be situated in essentially the same habitat, i.e., Karoo Scrubland. The habitat is not particularly sensitive, as far as avifauna is concerned. No fatal flaws were discovered during the onsite investigations. The development is therefore supported, provided the mitigation measures listed in the avifaunal report are strictly implemented.

8.9 Bat

A bat specialist study was undertaken by Animalia Consulting (report dated August 2022).

8.9.1 Baseline Assessment

According to the report, bats form part of the Order Chiroptera and are the second largest group of mammals after rodents. They are the only mammals to have developed true powered flight and have undergone various skeletal changes to accommodate this. Most South African bats are insectivorous and are capable of consuming vast quantities of insects on a nightly basis, however, they have also

been found to feed on amphibians, fruit, nectar and other invertebrates. As a result, insectivorous bats are the predominant predators of nocturnal flying insects in South Africa and contribute greatly to the suppression of these numbers. Their prey also includes agricultural pests such as moths and vectors for diseases such as mosquitoes.

According to the report, the most commonly occurring bats on site are those at greatest risk of fatal collision with wind turbines. The species at risk in this High-risk category (*Tadarida aegyptiaca* and *Sauromys petrophilus*) are open air foragers which regularly fly at heights corresponding with the rotor swept zone. *Miniopterus natalensis* and *Myotis tricolor* are cave dwelling species but may also take residence in smaller numbers in culverts and other suitable man-made hollows, these species did not show any abrupt peaks of activity that may indicate that the site is on any migration route. The species was not particularly frequently recorded on the systems, although it was present in the data from all systems.

There are several bat species in the vicinity of the site that occur commonly in the area. Some of these species are of special importance based on their likelihood of being impacted by the proposed wind farm, due to high abundances and certain behavioural traits. They have also been dominating records of fatalities at operational wind farms in South Africa.

The seven bat species detected on site thus far are: *Eptesicus hottentotus, Tadarida aegyptiaca, Sauromys petrophilus, Laephotis capensis, Myotis tricolor, Rhinolophus clivosus* and *Miniopterus natalensis*. Even though the presence of *Cistugo lesueuri* could not be confirmed or disproved since the echolocation signature overlaps with the known call structure of *L. capensis*, it is included in the assessment since it is endemic to South Africa and Lesotho and is represented in museum records from the larger area around site. The following are bat species that may be impacted the most by the WEF:

- The Egyptian Free-tailed Bat, *Tadarida aegyptiaca*, is a Least Concern species (IUCN Red List 2016) as it has a wide distribution and high abundance throughout South Africa and is part of the Free-tailed bat family (Molossidae). It occurs from the Western Cape of South Africa, north through to Namibia and southern Angola; and through Zimbabwe to central and northern Mozambique. This species is protected by national legislation in South Africa.
- *Laephotis capensis* (Cape serotine bat, formerly *Neoromicia capensis*) has a conservation status of Least Concern (IUCN Red List 2016) as it is found in high numbers and is widespread over much of Sub-Saharan Africa. High mortality rates of this species due to wind turbines would be a cause for concern as L. *capensis* is abundant and widespread and as such has a more significant role to play within the local ecosystem than the rarer bat species. They do not undertake migrations and thus are considered residents of the site.
- *Miniopterus natalensis* (Natal long-fingered bat), occurs widely across the country but mostly within the southern and eastern regions and is listed as Near Threatened. The Natal long-fingered bat undertakes short migratory journeys between hibernaculum and maternity roosts. Due to this migratory behaviour, they are considered to be at high risk of fatality from wind turbines if a wind farm is placed within a migratory path. The mass movement of bats during migratory periods could result in mass casualties if wind turbines are positioned over a mass migratory route and such turbines are not effectively mitigated. Very little is known about the migratory behaviour and paths of *M. natalensis* in South Africa with migration distances exceeding 150 kilometres. If the site is located within a migratory path the bat detection systems should detect high numbers and activity of the Natal long-fingered bat, this will be examined over the course of the 12-month monitoring survey. However, it should be noted that no migration routes are known to occur on site or in the surrounding area.

- *Cistugo lesueuri* (Lesueur's Wing-gland bat) and has a conservation status of Least Concern (IUCN Red List 2016) and Near Threatened in the 2004 IUCN Red List, it has a limited distribution and is endemic to South Africa and Lesotho with only a few museum records. It appears to be associated with high altitude montane grasslands where open drinking water and rock crevices are present. A specimen has been collected in 1979 just outside the town of Beaufort West, indicating that the habitat of the larger area can be suitable for this species. It has relatively short and broad wings with an intermediate wing loading and low aspect ratio, indicating it's a clutter edge forager. It may arguably therefore be placed in the same risk category as *Laephotis capensis* at medium likelihood of risk of fatality due to wind turbines.

8.9.2 Results of the pre-construction bat monitoring

Passive bat data are currently being collected for the EIA Bat Monitoring Report at the Klipkraal WEF. Data collection commenced from September 2021 and is ongoing, and currently represents 8 of 12 months of passive bat activity monitoring. A passive bat detection system has been set up on Meteorological Mast M2 with microphones at 7m, 60m and 115m. Additionally, four short mast bat detection systems have also been set up, with microphones at 7m (referred to ShM1 – ShM4). These systems are set to gather bat activity data every night for 12 months to form part of the long-term preconstruction monitoring and inform the Environmental Authorisation process.

This bat scoping study considered information from three several visits that were carried out from September 2021 to June 2022 thus far to both retrieve bat activity data and to ground truth bat sensitivity features and habitats delineated in the bat sensitivity map. Information from literature as well as available bat activity data from site confirms seven bat species to occur on the site and another three species likely to occur. Out of this total of ten species, six of these have a Medium – High or High likelihood to be impacted by wind energy due to their foraging and behavioural patterns. The pre-construction bat monitoring is still ongoing and should continue until 12-months of passive bat activity data has been gathered, which will provide comparative bat activity and species assemblages across all seasons as well as various habitats, terrain and/or areas of the site. This report will be updated iteratively where necessary as the seasonal data becomes available and can be analysed. If the proposed wind farm is approved, a minimum of 2 years of operational bat mortality monitoring should be conducted from the start of the operation of the facility.

The total number of bat passes from the 8 months of data retrieved thus far shows that bat activity decreased with increasing height. This is a well-known trend. The highest number of passes was recorded at the lowest microphone (7m) of Met Mast M2, with 19 324 passes recorded across all species, and with the lowest activity (7 796 passes) recorded at the highest microphone (115m). Across all heights, and indeed across each system, the High-risk category of bats displayed the greatest number of total passes compared to the other categories, with the Medium-risk category displaying the next highest number of passes, although to a far lesser degree. Bats in the Medium-High and Low-risk profiles have not been well represented in the data thus far.

8.9.3 Bat Sensitivities

The figure below depicts the preliminary sensitive areas of the site, based on features identified to be important for foraging and roosting of the species that most commonly occur on site. Thus, the sensitivity map is based on species ecology and habitat preferences. Note that the buffers provided exclude for blade overhang and a turbine blade length of 65m should be applied to take this into account.

High bat sensitivity area — High bat sensitivity buffer 200m

Moderate bat sensitivity area — Moderate bat sensitivity buffer 150m

Figure 25: Bat Sensitivities

The specialist has recommended the following sensitivity categories and buffers:

Table 13: The significance of sensitivity map categories for each infrastructure component

Sensitivity	Turbines	Roads and cables	Internal overhead transmission lines	Buildings (including substation, battery storage facility and construction camp/yards)
High Sensitivity	These areas are 'no-go' zones and turbines may not be placed in these areas. Turbine blades (blade overhang) may not intrude into these areas.	Preferably keep to a minimum within these areas where practically feasible.	Allowed inside these areas.	Avoid these areas (no-go areas).
High Sensitivity buffer	These areas are 'no-go' zones and turbines may not be placed in these areas. Turbine blades (blade overhang) may not intrude into these areas.	Allowed inside these areas.	Allowed inside these areas.	Allowed, preferably keep to a minimum within these areas where practically feasible.

Sensitivity	Turbines	Roads and cables	Internal overhead transmission lines	Buildings (including substation, battery storage facility and construction camp/yards)
Moderate Sensitivity	Turbines within these areas may require priority (not excluding all other turbines) during post-construction studies, and in some instances, there is a higher likelihood that mitigation measures may need to be applied to them.	Allowed inside these areas.	Allowed inside these areas.	Allowed inside these areas.
Moderate Sensitivity buffer	Turbines within these areas may require priority (not excluding all other turbines) during post-construction studies, and in some instances, there is a higher likelihood that mitigation measures may need to be applied to them.	Allowed inside these areas.	Allowed inside these areas.	Allowed inside these areas.

Based on the above, the preliminary layout currently has no turbines in no-go areas.

8.9.4 Preliminary Conclusions

According to the specialist, there are no fatal flaws from a bat sensitivity perspective which should prevent the proposed Klipkraal WEF 4 from being approved. Additionally, no known bat caves or large roosts occur in the vicinity of the site. No reasons have been identified for the proposed WEF not to proceed to the formal EA phase.

9. DESCRIPTION OF THE SOCIO- ECONOMIC ENVIRONMENT

9.1 Socio economic characteristics

A Social Impact Assessment was undertaken by Synergy (report dated 11 April 2023).

9.1.1 Namakwa District Municipality

According to the report, the Namakwa District Municipality (NDM) is situated in the north-western corner of South Africa and is bordered by the Atlantic Ocean to the west, Namibia to the north, ZF Mgcawu and Pixley ka Seme District Municipalities to the north-east and east, respectively and the Western

Cape Province to the south. The NDM is made up of six local municipalities, namely Richtersveld, Nama Khoi, Khai Ma, Kamiesberg, Hantam and Karoo Hoogland. The district has an area of 126 836km², making it the largest district municipality in South Africa, with the town of Springbok functions as the administrative centre. The National Route 7 (N7), an important transport route, passes through the district.

The main economic sectors contributing to the district are agriculture, mining, mari-culture, tourism, industry and electricity. Between 2003 and 2013, the tertiary sector had the highest contribution to the economy with an average annual contribution of 63.1%. This was followed by the primary sector contributing an annual average of 33.8%.

The agricultural sector is the second largest employer in the district and includes stock-farming and the cultivation of various fruits along the Orange River. Abalone and oyster production along the western coast offer further opportunities which could be developed.

Mining is a major economic contributor to the NDM and occurs in four of the six local municipalities. Minerals mined include diamonds, copper, zinc, lead and granite. Several of the mines have come to the end of their economic life, which has led to a number of mines that have either closed or are about to close. One of the largest mines, O'kiep Copper Company, is one such mine that has closed. The closure of mines has had a large negative impact on the district's economy.

The NDM had the highest solar radiation intensity in Southern Africa, making it an ideal location for of solar projects. Wind, wave and nuclear energy have also been identified as renewable energy sources which could potentially support the energy sector.

9.1.2 Karoo Hoogland Local Municipality

According to the report, the Karoo Hoogland (KH) is one of six local municipalities that make up the Namakwa District (ND) Municipality. The three main towns in Karoo Hoogland are Williston, Fraserburg and Sutherland. The town of Sutherland was founded in 1855 as a church and market town to serve the sheep farming community in the area. The town is located approximately 100 km north of the small village of Matjiesfontiein and is accessed via the R 354. The main economic activities include tourism and sheep farming. South African Astronomical Observatory (SAAO) was established outside the town in 1972 and plays a key role in the town's tourism related economy.

It is the second-largest of the six municipalities in the district, making up a quarter of its geographical area. Although the municipality's towns are separated by more than 100km by road, they share many administrative tasks. The Main Administration Office is situated in Williston.

Main Economic Sectors: Community, social and personal services (42.5%), transport, storage and communication (15%), wholesale and retail trade, catering and accommodation (13.7%), agriculture, forestry and fishing (13%), finance, insurance, real estate and business services (8.8%), manufacturing (5.9%).

9.1.3 Key Considerations/Impacts for Wind Energy Facilities

Health and social wellbeing - The health and social wellbeing impacts related to the project include air quality, noise, shadow flicker, blade glint, electromagnetic field and RF interference, increase in crime, increased risk of HIV infections, influx of construction workers and hazard exposure.

Quality of living environment - including disruption of daily living patterns, disruptions to social and community infrastructure, transformation of the sense of place

Economic – impacts related to job creation and skills development and socio-economic stimulation

Cultural - at a social level, it is likely that any cultural impact would be associated with sensitive archaeological and/or heritage sites

9.1.4 Key Findings and Recommendations

The social impacts identified (including all positive and negative impacts) will be either of a low or medium significance. No negative impacts with a high significance rating have been identified to be associated with the development of the Klipkraal Wind Energy Facility (WEF) 4. All negative social impacts are within acceptable limits with no impacts considered as unacceptable from a social perspective at scoping level. The recommendations proposed for the project are appropriate and suitable for the mitigation of the negative impacts and the enhancement of the positive impacts.

The specialist has recommended that a full EIA level Social Impact Assessment (SIA) be conducted as part of the EIA phase. Based on the findings of the social impact assessment, the following recommendations are made:

- Review comments pertaining to social impacts received from members of the public, key stakeholders, and any organ of state during the public review of the Scoping Report. Where applicable, comments received from the Department of Environment, Forestry and Fisheries on the Final Scoping Report (FSR), which may pertain to social impacts or have relevance to the SIA, will also be reviewed.
- Collect primary data during a site visit. Interview directly affected and adjacent landowners, and key stakeholders to obtain primary information related to the project site, social environment, and to gain their inputs on the proposed project and its perceived social impact (positive and /or negative).
- Update the baseline information with information received during the site visit, as well as any additional information received from the client, or updates to the project description.
- Assess impacts identified for the project in terms of their nature, extent, duration, magnitude, probability, status, and significance; as well as the degree to which the impact can be reversed, may cause irreplaceable loss of resources, and can be mitigated.
- Identify mitigation measures with which to reduce negative impacts and enhance positive impacts for inclusion in the Environmental Management Programme (EMPr). As far as possible the mitigation hierarchy of “avoid, minimise, and reduce” will be followed in the mitigation of potential negative impacts.
- Identify any conditions for inclusion in the Environmental Authorisation (EA).
- Identify any monitoring requirements for inclusion in the EMPr or EA.
- Provide a reasoned opinion regarding the acceptability of the project, and whether the proposed project should be authorised.
- Prepare a SIA Report for inclusion in the EIA Report to be prepared for the project.
- Subject the SIA Report prepared for the project for inclusion in the EIA Report to external peer review.

9.2 Cultural/Historical Environment

A Heritage Impact Assessment was undertaken by PGS Heritage (report dated August 2022).

9.2.1 Baseline Assessment

According to the report, the evaluation of satellite imagery and the analysis of the studies previously undertaken in the area has indicated that certain areas may be sensitive from a heritage perspective. Archaeological surveys and studies in the area have shown rocky outcrops, dry riverbeds, riverbanks and confluence to be prime localities for archaeological finds and specifically Stone Age sites. The following areas within the study area have been referenced as having possible heritage sensitivity:

Drainage lines/ Dry water course

Drainage lines, such as dry riverbeds, erosion dongas as well as sheet erosion has been shown to yield rich archaeological deposits due to the exposure of archaeological material as well as the fact that human settlement is drawn to water sources in arid regions.

Ridges/Outcrops

Numerous ridges, koppies and mountains have been identified in the study area and are associated with human settlement and activity. Stonewalling from herders, rock engravings and knapping sites associated with Later Stone Age manufacturing technology is known to occur in these areas.

Palaeontology

According to the report and the Palaeosensitivity Map available on the South African Heritage Resources Information System database (SAHRIS), the Palaeontological Sensitivity, a portion of the proposed study area is rated as Very High. This means that a Palaeontological field assessment and protocol for finds would be required.

Fraserburg is recognised as a region that has a wealth of fossil remains. The local Old Rectory museum houses exquisite fossil displays with exhibits of Karoo tetrapods – pareiasaurids, therapsids, palaeoniscoid fish, petrified wood etc. A significant palaeosurface (Palaeo-site) is found on Gansfontein Farm, showing well-preserved Permian trackways and other trace fossils.

A full Palaeontological Impact Assessment (PIA) will be conducted during the EIA phase.

9.2.2 Heritage Fieldwork Findings in the study area

The heritage specialist undertook a selective survey of the study area from the 22nd to the 27th September 2021. Due to the nature of cultural remains, with the majority of artefacts occurring below surface, one archaeologist from PGS and a field assistant conducted a vehicle and foot-survey of the proposed development area. The fieldwork was logged with GPS devices to provide a tracklog of the area covered. Approximately 130km of the larger assessment region was traversed. No heritage resources were identified within the Klipkraal WEF 4 area, however further fieldwork will be undertaken during the EIA Phase for better coverage of the study area.

9.2.3 Heritage Sensitivities

The heritage specialist has recommended that a 30m buffer be applied any identified heritage sites (no-go area). No turbines or associated infrastructure may encroach into these areas.

9.2.4 Preliminary Conclusions

No heritage resources were identified within the Klipkraal Phase 4 WEF area, but further fieldwork is required for better coverage of the study area. This will be undertaken during the EIA Phase. The overall impact of the Klipkraal WEF, on the heritage resources, is seen as acceptably low after the recommendations have been implemented and therefore, impacts can be mitigated to acceptable levels allowing for the development to be authorised. A full palaeontological Assessment is being undertaken during the EIA Phase.

9.3 Noise

A Site Sensitivity Verification Report was undertaken by Safetech (report dated 14 April 2023).

9.3.1 Baseline Assessment

According to the report, the sources of sounds emitted from operating wind turbines can be divided into two categories, firstly mechanical sounds, from the interaction of turbine components, and secondly aerodynamic sounds, produced by the flow of air over the blades and past the tower. Sound emitted from large modern wind turbines during constant speed operation tend to increase more slowly with increasing wind speed, than wind generated sound. As a result, wind turbine noise is more commonly a concern at lower wind speeds.

Infrasound was a significant characteristic of some wind turbine models that has been attributed to early designs in which turbine blades were downwind of the main tower. The effect was generated as the blades cut through the turbulence generated around the downwind side of the tower. Modern designs generally have the blades upwind of the tower. Wind conditions around the blades and improved blade design minimize the generation of the effect. The typical range of sound power level for wind turbine generators is in the range of 100 to 105 dB(A) – a much lower sound power level (10 dB or more) than the majority of construction machinery such as bulldozers. For infrasound to be audible even to a person with the most sensitive hearing at a distance of 300 m would require a sound power level of at least 140 dB at 10 Hz and even higher emission levels than this at lower frequencies and at greater distances. There is no information available to indicate that wind turbine generators emit infrasound anywhere near this intensity.

9.3.2 Noise sensitivities

According to the report, the project could impact on several noise sensitive areas. A total of 23 Noise Sensitive Areas (NSAs) were identified for the entire Klipkraal project (i.e. Klipkraal WEF 1- 5). However only three (3) of these (NSA 5, NSA 6 and NSA 7) falls within the site boundary of the Klipkraal WEF 4 site. The study confirmed that the primary land use of the area as agricultural. The topography of the of the area is a combination of flat plains, undulating hills and mountains. The receptors identified were mostly farm houses and staff houses. The noise emissions could have an impact on the residents at the NSA's. The figure below shows the NSA's that are most likely to be impacted by Klipkraal WEF 4, due to their distance to the closest turbine.

The noise specialist has recommended that a 500m buffer be applied to the noise sensitive areas identified for the Klipkraal WEF 4 Project. As shown in the figure below, one WTG is located within 500m of NSA 5. The specialist indicated that it is likely that this NSA is an unoccupied structure and recommended that the land owner be contacted to confirm the status of this NSA.

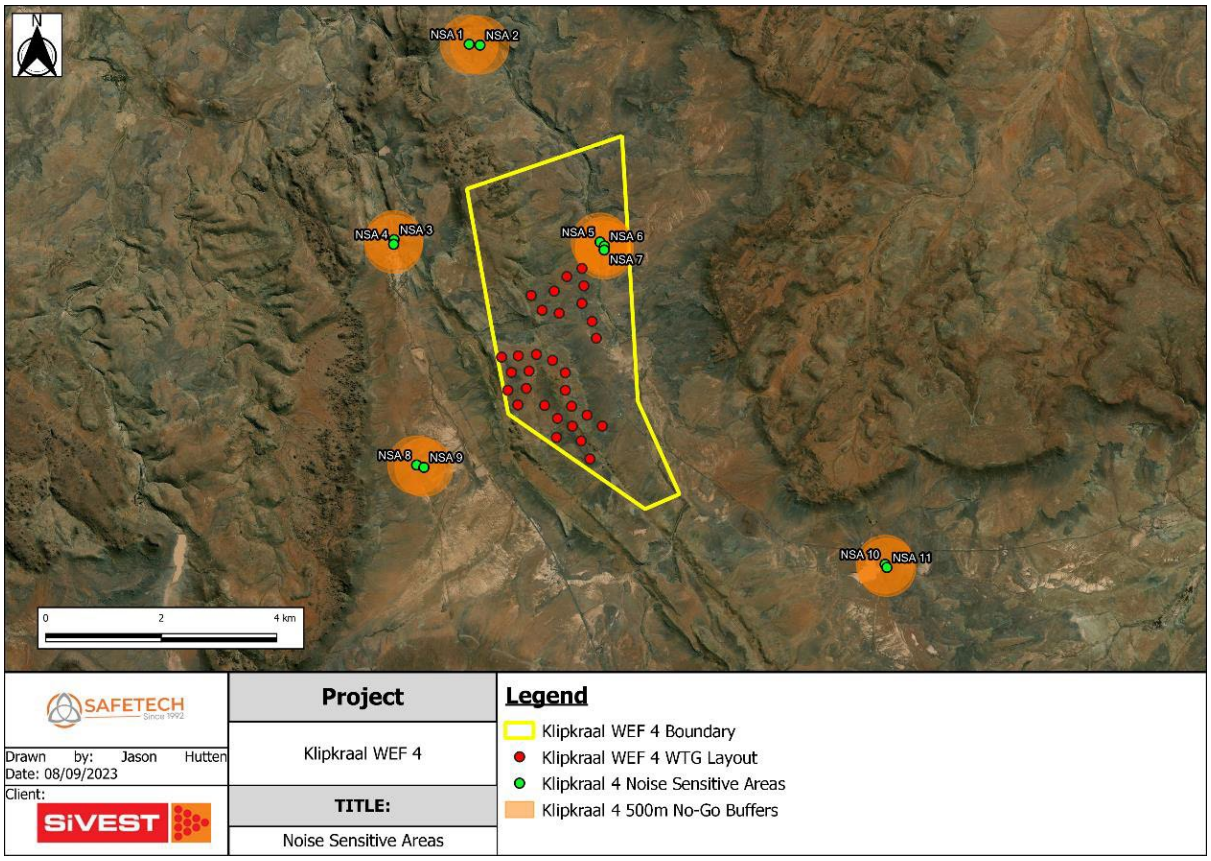

Figure 26: Noise sensitivity areas for the Klipkraal WEF 4

9.3.3 Preliminary Conclusions

According to the report, the following is concluded and verified:

- The project site is situated in a rural district.
- The project could impact on several noise sensitive areas.
- It is recommended that a 500m buffer be placed around all noise sensitive receptors for planning purposes. The WTG layout for Klipkraal WEF 4 should be adhere to this recommendation.

It is recommended that a full noise impact assessment, that includes emission modelling be conducted. A comprehensive report will be provided by the specialist, that will include noise mitigation measures to be included in the environmental management plan as well as predicted noise levels during the construction and operation phase.

9.4 Visual

A Visual Impact Assessment (Scoping) was undertaken by Bapela Cave Klapwijk (report dated April 2023).

9.4.1 Baseline Assessment

The site is situated on the top of a plateau landform. The edge of the landform forms an escarpment that descends generally to the south. Intermittent views are contained mainly to the upper plateau levels. The landscape is flat and stony dotted with hills and mountains. The groundcover is mainly grassy dwarf shrubland containing very few trees if at all any. The low ground cover does not assist in any visual screening or blending with the landscape, especially bearing in mind the scale and magnitude of the wind turbines.

9.4.2 Visual Sensitivities

Visibility

The visibility is dependent on the topography. The existing topography is very flat which does not assist in limiting the views. Visibility of the structures, due to the tall and imposing scale of the turbines, will be continuous and uninterrupted to beyond 40-50 km. It is considered that beyond 50 km views of the development, though still visible are considered insignificant in the landscape due to the exponential diminishing effect of distance.

The critical views are from those visual receptors that are most impacted by the visual intrusion of the proposed development. These would include users of public roads, towns, villages, game farms and lodges, settlements as well as farmsteads in the nearby vicinity. Although not all homesteads are occupied fulltime, (see **Figure 32** below) many of these will be in direct line of sight and within the 0-5 km zone where the magnitude of impact could be high. Other sensitive receptors include Fraserburg, the Karoo National Park, travellers on the main roads such as the R353, R356 and the R61, activities and institutions that rely on the aesthetic environment such as game farms, national parks, lodges, guesthouses as well as hunting and or photographic safari operations.

Farmsteads and other housing in close proximity to the wind turbines could experience the effect of flicker. A wind turbine's moving blades can cast a moving shadow on locations within a certain distance of a turbine. These moving shadows are called shadow flicker and can be a temporary phenomenon experienced by people at nearby residences or public gathering places. The impact area depends on the time of year and day (which determines the sun's azimuth and altitude angles) and the wind turbine's physical characteristics (height, rotor diameter, blade width, and orientation of the rotor blades). Shadow flicker generally occurs during low angle sunlight conditions, typically during sunrise and sunset times of the day. However, when the sun angle gets very low (less than 3 degrees), the light has to pass through more atmosphere and becomes too diffused to form a coherent shadow. Shadow flicker will not occur when the sun is obscured by clouds or fog, at night, or when the source turbine(s) are not operating.

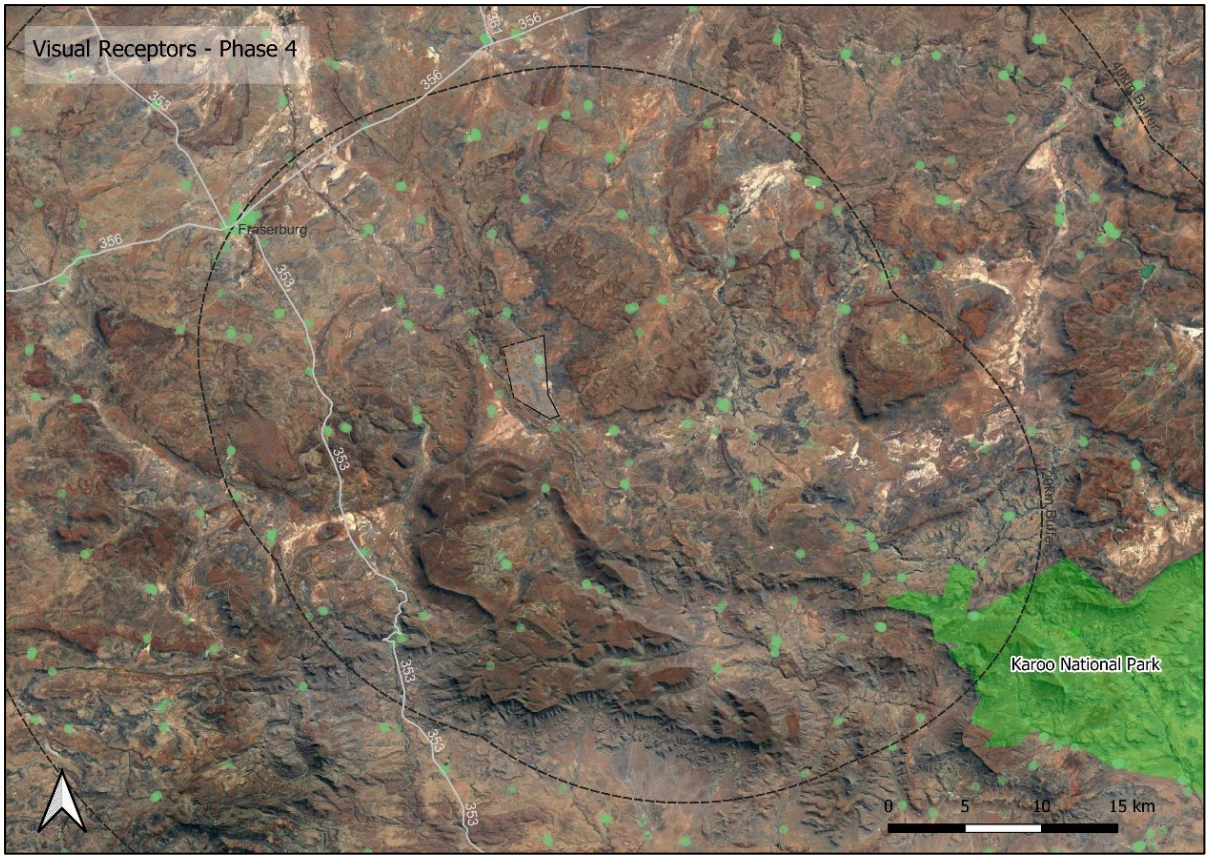

Figure 27: Visual Receptors

Landscape Diversity

The study area's landscape varies from relatively flat to rolling with low ridges. The area is located on top of a rather featureless plateau which drops down over the edge to the south. The landscape is covered with low growing and sparse vegetation. The current land-use is primarily small stock grazing. The peripheral visual boundaries to the north and east are truncated by low ridges. The peripheral visual boundary to the south and west is relatively undistinguished. The area appears to be sparsely populated, which was borne out during the site visit. The study area is not regarded as having a high visual quality when compared to other areas in the region such as the Swartberg Mountains, Meiringspoort and the mountains around Beaufort West and the Karoo National Park but it does display the typical and iconic Karoo landscape. However, the very nature of the vegetation in this area (Western Upper Karoo, Eastern Upper Karoo and Roggeveld Shale Renosterveld is low growing and visually uniform which does not provide much visual screening. Although the vegetation is not overly sensitive to the development it does not assist in reducing the visual expose of the turbines. The vegetation is typical of the Karoo ambience, and it is this together with the topography which provides the Karoo sense of place.

The existing land-use does not add to the diversity of the area being mainly low-density small stock farming. Low hills and shallow drainage ways occur. The tallest structures in the area are power lines and wind pumps. The area exhibits a low visual diversity. The higher the visual diversity, the greater is the opportunity to visually blend the project with the environment as these will more readily accept visual change or any structure placed within them. The higher the diversity, the higher the Visual Absorption Capacity (VAC) or the ability of the environment to accept visual change. The low visual diversity of area will result in a low VAC and will in turn result in any large scale or tall structure to be highly visible

due to the lack of screening and the high visual contrast. The surrounding hills and mountains on the visual periphery contain the views and terminate the views.

Landscape Quality and Character

The quality of *Genius Loci* is a function of attributes such as the scenic beauty or uniqueness and distinctive character of the built and cultural landscape. The *Genius Loci* or sense of place of the study area is typical Nama Karoo with its low arid bushes, wide open landscape and the sheep and goat farming. The only tall structures in the area are the odd wind pump and transmission lines. The sense of place of the rural and natural ambience and character of the setting will be changed by the high visual prominence of the turbines. The visual quality can be categorised as low visual quality for the study area. The low visual quality is based on the lack of visual diversity as a result of the uniformity of the vegetation which lack specific interest, and the surrounding flat and open landscape.

9.4.3 Preliminary Conclusions

The description of the visual impacts of the phases of construction and decommissioning are not considered as significant visual impacts since the period of activity is of relatively short duration and of a primary impact (localized, of short duration and easily mitigated at the end of the phase). The fact that disturbed areas, e.g. camps / lay-down areas will be rehabilitated also reduces the impacts of these phases. It is the operational phase that presents the most significant long term visual impact. This is due primarily to the scale and form of the proposed development. Visibility reduces exponentially the further the viewer is from the proposed development.

The project will exert a negative influence on the visual environment. However, due to the low relative visual quality of the area the overall significance of the visual impact is regarded as Moderate. Based on the field observations and the studies herein and with the implementation of the mitigation measures, it is the Visual Specialist's opinion the visual impact of the wind farm layout does not present a potential fatal flaw provided that the recommended mitigation measures are implemented.

9.5 Transportation

A transportation study was undertaken by SiVEST SA (PTY) Ltd (dated 19th August 2022).

9.5.1 Baseline Assessment

Existing Road Network

The existing road network surrounding the proposed development is well established and provides a high degree of mobility and access. The mobility roads join the major centres and towns with each other, while access roads provide access roads to serve smaller nodes and individual properties.

Existing Traffic Conditions

Based on typical traffic data for remote areas in the Northern Cape Province, it can be concluded that the existing peak traffic on the N001 section of the road is in the morning at 07:00 (AM) and afternoon at 17:00 (PM). In contrast, on lower order roads, the peak would occur midday between 11:00 – 14:00. Therefore, the specialist has recommended that the transportation of material and abnormal loads on the N001 Freeway be completed in the off-peak periods 09:00 – 15:00. In contrast, we recommend transporting staff from Fraserburg to Klipkraal WEF 4 on Road MR0584 and DR2312 be completed in the mornings before 09:00 and the afternoons after 15:00.

9.5.2 Existing Access

Klipkraal WEF 4 and associated grid infrastructure will be located on a portion of two farms, REM of the Farm Matjes Fontein No. 411 and PTN 3 of the Farm Rattelfontein No. 394. Klipkraal WEF 5 will also be located on these farms, including the REM of the Farm Klipfontein No. 447. Both developments will share a common access point from Road DR02312, bisecting the southern quadrant of both farms.

Road DR02312 is classified as a Class R4 in the RCAM Classification – Rural Collector Road with an average road reserve width of 20m, a gravel surface of ±6m wide, and an average speed of 80 km/h. PTN 3 of the Farm Rattelfontein No. 394 has two (2) existing access points emanating from Road DR02312 at Km 87.82 and Km 88.81. Both access points are located on Road DR02312 in positions where the appropriate sight distance of 240m will not be achieved.

The current access positions located at Km 87.82 and Km 88.81 do not have the recommended sight distance to the east or west of 240 m; therefore, we recommend that the new access position be considered 590 m to the south east at Km 87.23. The new access position will be a priority-controlled intersection with Road DR02312 being free-flowing with a sight distance of 240 m on both the east and western approaches.

9.5.3 Additional Traffic Generation

The construction phase for this development will typically generate the highest number of additional vehicles. Of these additional vehicles, ±82 trips / hour will occur in the morning and afternoon outside of the peak period, while ±2 trips / hour will occur during the midday peak for construction material and abnormal loads. The impact will, however, be temporary and is considered to be nominal if adequately mitigated. During the operation phase, it is expected that the facility will accommodate ±30 employees and generate an additional ±15 trips / day in the morning and afternoon peak period. This impact is considered to be nominal.

9.5.4 Preliminary Conclusions

According to the report, it is the specialist's opinion that the Klipkraal WEF 4 will have a nominal impact on the existing traffic network. The project is therefore deemed acceptable from a transport perspective, provided the recommendations and mitigation measures in this report are implemented.

9.6 Wake Effect

A Wake Effect Specialist and DFFE were consulted with regarding the need for a Wake Effect Assessment. Based on discussions held, due to the location of the project and individual turbine locations, a Wake Effect Assessment is not required and therefore has not been undertaken for the Klipkraal 4 WEF project.

10. POLICY AND LEGISLATIVE CONTEXT

The relationship between the project and certain key pieces of environmental legislation is discussed in the subsections to follow.

10.1 The Constitution

The Constitution of the Republic of South Africa, Act 108 of 1996 sets the legal context in which environmental law in South Africa occurs and was formulated. All environmental aspects should be interpreted within the context of the Constitution, National Environmental Management Act 107 of 1998 and the Environment Conservation Act 73 of 1989.

The Constitution has enhanced the status of the environment by virtue of the fact that an environmental right has been established (Section 24) and because other rights created in the Bill of Rights may impact on environmental management through, for example, access to health care, food and water and social security (Section 27). An objective of local government is to provide a safe and healthy environment (Section 152) and public administration must be accountable, transparent and encourage participation (Section 195(1) (e) to (g)).

Section 24 of the Constitution states that:

"Everyone has the right –

- *To an environment that is not harmful to their health or well-being; and*
- To *have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:*

    - Prevent pollution and ecological degradation;
    - Promote conservation and
    - Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

The Constitution is the overarching legislation for South Africa. Although it provides for certain rights and obligations, the NEMA has been promulgated in order to manage the various spheres of both the social and natural environment.

10.2 National Environmental Management Act (107 of 1998)

The National Environmental Management Act (Act No. 107 of 1998) was promulgated in 1998 but has since been amended on several occasions from this date. The act intends to provide for:

- co-operative environmental governance by establishing principles for decision-making on matters affecting the environment;
- institutions that will promote co-operative governance and procedures for coordinating environmental functions exercised by organs of state;
- to provide for the prohibition, restriction or control of activities which are likely to have a detrimental effect on the environment; and
- to provide for matters connected therewith.

NEMA is the overarching legislation which governs the EIA process and environmental management in South Africa. Sections 24 and 44 of NEMA make provision for the promulgation of regulations that identify activities which may not commence without an EA. Activities that may significantly affect the environment must be considered, investigated and assessed prior to implementation.

According to Section 2(3) of the National Environmental Management Act (NEMA) (Act No. 107 of 1998), "development must be socially, environmentally and economically sustainable", which means the integration of these three factors into planning, implementation and decision-making so as to ensure that development serves present and future generations.

The EIA Regulations, 2014 (as amended) identify lists of activities which have the potential to result in detrimental environmental impacts and thus require EA, subject to either "Basic Assessment" or "Scoping and Environmental Impact Assessment". The Regulations prescribe the procedural and substantive requirements for the undertaking of EIAs and the issue of EA's.

The proposed project triggers listed activities under Listing Notice 1, 2 and 3 (as detailed in Section 6 above), and thus requires an EA subject to an Environmental Impact Assessment (EIA) Process.

10.3 Environmental Impact Assessment (EIA) Guideline for Renewable Energy Projects, DFFE Notice 989 of 2015

The purpose of this document is primarily to provide guidance on the environmental management legal framework applicable to renewable energy operations and all the role players in the sector. The guideline is principally intended for use by the following stakeholder groups:

- Public Sector Authorities (as regulator and/or competent authority);
- Joint public sector authorities and project funders (e.g., Eskom, IDC, etc.);
- Private Sector Entities (as project funder / developer / consultant); and
- Other interested and affected parties (as determined by the project location and/or scope).

This guideline seeks to identify activities requiring authorisation prior to commencement of that activity and provide an interface between national EIA Regulations and other legislative requirements of various authorities.

The guidelines are applicable for the construction, installation and/or development of the following renewable energy projects:

- Concentrating Solar Power (CSP) Plant;
- Wind Energy Facility (WEF);
- Hydropower Station; and
- Photovoltaic (PV) Power Plant.

10.4 National Water Act (Act 36 of 1998)

The National Water Act (NWA) No 36 of 1998 was promulgated on the 20th of August 1998. This Act is important in that it provides a framework to protect water resources against over exploitation and to ensure that there is water for socio-economic and economic development, human needs and to meet the needs of the aquatic environment. The Act also recognises that water belongs to the whole nation for the benefit of all people.

Water resources as defined include a watercourse, surface water, estuary or aquifer. Specifically, a watercourse is defined as (inter alia):

- A river or spring;
- A natural channel in which water flows regularly or intermittently; and
- A wetland, lake or dam into which, or from which water flows.

Due to the possible encroachment into the wetland areas, the following Section 21 water uses in terms of the NWA may be triggered and require licensing:

- (c) impeding or diverting the flow of water in a watercourse; and
- (i) altering the bed, banks, course or characteristics of a watercourse.

In light of the above, there are a number of stipulations within the NWA that are relevant to the potential impacts on rivers, streams and wetlands that may be associated with the proposed development. An Aquatic / Freshwater Impact Assessment (**Appendix 6**) has been conducted to explore how the proposed development may impact on identified water resources as protected by the Act. Should the proposed development require a General Authorisation (GA) or Water Use Licence (WUL), it will be determined and applied for separately prior to construction**.**

10.5 The National Heritage Resources Act 1999 (25 of 1999)

The National Heritage Resources Act promotes good management of the heritage resources of South Africa which are deemed to have cultural significance and to enable and encourage communities to ensure that these resources are maintained for future generations.

The aim of the Act is to introduce an integrated, three-tier system for the identification, assessment and management of national heritage resources (operating at a national, provincial and local level). This legislation makes provision for a grading system for the evaluation of heritage resources on three levels which broadly coincide with their national, provincial and local significance.

This Act requires investigation to determine the impact of heritage resources when developments exceed the thresholds list in section 38 (1) of the act:

a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
b) the construction of a bridge or similar structure exceeding 50 m in length;
c) any development or other activity which will change the character of a site—
   (i) exceeding 5 000 m^2 in extent; or
   (ii) involving three or more existing erven or subdivisions thereof; or
   (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
   (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
d) the re-zoning of a site exceeding 10 000 m2 in extent; or
e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,

The proposed development would involve; (c) the development of a WEF and associated infrastructure that will change the character of more than 0.5ha, and (d), the rezoning of a site that will exceed 1ha.

Under the legislation the South African Heritage Resources Agency (SAHRA), was established, which replaced the National Monuments Council. SAHRA is responsible for the preservation of heritage resources with exceptional qualities of special national significance (Grade I sites). A Provincial Heritage Resources Authority, established in each province, will protect Grade II heritage resources which are significance within the context of a province or region. Buildings and sites of local interest (Grade III sites) is the responsibility of local authorities as part of their planning functions. In this case, the Heritage Western Cape (HWC) will need to be consulted with extensively throughout the process.

Within the scope of this project, Section 38 of the NHRA (25 of 1999), states that, as described above, an assessment of potential heritage resources in the development area needs to be done. A Heritage Impact Assessment (HIA), Archaeological Impact Assessment (AIA) and Paleontological Impact Assessment (PIA) has therefore been commissioned to explore how the proposed development may impact on heritage resources and potential cultural artefacts as protected by the Act.

10.6 National Environmental Management: Biodiversity Act (NEM:BA) (Act No. 10 of 2004, as amended)

As the principal national act regulating biodiversity protection, the National Environmental Management: Biodiversity Act (NEM:BA) (Act No. 10 of 2004), which is administered by the DFFE, is concerned with the management and conservation of biological diversity, as well as the use of indigenous biological resources in a sustainable manner.

The overarching aim of the NEM:BA, within the framework of the NEMA, is to provide for:

- The management and conservation of biological diversity within South Africa, and of the components of such biological diversity;
- The use of indigenous biological resources in a sustainable manner; and
- The fair and equitable sharing among stakeholders of benefits arising from bio-prospecting involving indigenous biological resources.

In terms of this Act, the developer has a responsibility to:

- Conserve endangered ecosystems and restriction of activities according to the categorisation of the area (not just by listed activity as specified in the EIA regulations);
- Promote the application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all development within the area are in line with ecological sustainable development and protection of biodiversity; and
- Limit further loss of biodiversity and conserve endangered ecosystems.

The South African National Biodiversity Institute (SANBI) was established in terms of the NEM:BA, its purpose being (inter alia) to report on the status of the country's biodiversity and the conservation status of all listed threatened or protected species and ecosystems.

The NEM:BA provides for a range of measures to protect ecosystems and for the protection of species that are threatened or in need of protection to ensure their survival in the wild, including a prohibition on carrying out a 'restricted activity' involving a specimen of a listed threatened or protected species without a permit issued in terms of Chapter 7 of the Act. According to Section 57 of the Act, 'Restricted activities involving listed threatened or protected species':

A Terrestrial Ecological Assessment (**Appendix 6**) has been conducted to explore how the proposed development may impact on biodiversity as protected by the Act.

In addition, all relevant conservation departments (such as the SANBI and DENC) will be invited to provide comments with regards to the proposed development.

10.7 National Environmental Management: Protected Areas Act, 2003 (Act No.57 of 2003 as amended)

The overarching aim of the National Environmental Management: Protected Areas Act (NEMPAA) Act No. 57 of 2003, within the framework of NEMA, is to provide for:

- the declaration and management of protected areas;
- co-operative governance in the declaration and management of protected areas;
- effect a national system of protected areas in South Africa as part of a strategy to manage and conserve its biodiversity;
- a representative network of protected areas on state land, private land and communal land;
- promote sustainable utilisation of protected areas for the benefit of people, in a manner that would preserve the ecological character of such areas;
- promote participation of local communities in the management of protected areas, where appropriate; and
- the continued existence of South African National Parks.

The proposed project is located within 15km of the Karoo National Park.

10.8 National Forests Act (NFA) (Act No. 84 of 1998)

The National Forest Act (NFA) (Act No. 24 of 1998) was enacted to:

- Provide for the protection, management and utilisation of forests;
- The protection of certain plant and animal life;
- The regulation of trade in forest produce; and
- The control and management of a national hiking way system and National Botanic Gardens.

The NFA enforces the necessity for a license to be obtained prior to destroying any indigenous tree in a natural forest and, subject to certain exemptions, cutting, disturbing, damaging, destroying or removing any protected tree. The list of protected trees is currently contained in GN 908 of 21 November 2014. Licenses are issued by the Minister and are subject to periods and conditions as may be stipulated.

Protected trees

According to this act, the Minister may declare a tree, group of trees, woodland or a species of trees as protected. The prohibitions provide that 'no person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister'.

Forests

Prohibits the destruction of indigenous trees in any natural forest without a licence.

The NFA is relevant to the proposed development as the removal and/or disturbance and/or clearance of indigenous vegetation will be required and a license in terms of the NFA may be required for this to be done.

A Terrestrial Ecological Assessment (**Appendix 6**) has been conducted to explore how the proposed development may impact on vegetation as protected by the Act.

In addition, all relevant conservation departments (such as the SANBI and DENC) will be invited to provide comments with regards to the proposed development.

10.9 National Veld and Forest Fire Act (Act No. 101 of 1998)

Provides requirements for veldfire prevention through firebreaks and required measures for firefighting. Chapter 4 of the Act places a duty on landowners to prepare and maintain firebreaks. Chapter 5 of the Act places a duty on all landowners to acquire equipment and have available personnel to fight fires.

10.10 Conservation of Agricultural Resources Act (CARA) (Act No. 43 of 1983)

The Conservation of Agricultural Resources Act (CARA) (Act No. 43 of 1983) controls the utilisation of natural agricultural resources in South Africa. The Act promotes the conservation of soil, water sources and vegetation as well as the combating weeds and invader plants. The Act requires the protection of land against soil erosion and the prevention of water logging and salinization of soils by means of suitable soil conservation works to be constructed and maintained. The utilisation of marshes, water sponges and watercourses are also addressed.

The primary objective of the Act is to conserve natural agricultural resources by:

- maintaining the production potential of land;
- combating and preventing erosion and weakening or destruction of the water resources;
- protecting vegetation; and
- combating weeds and invaders plants.

In terms of this Act, no degradation of natural land is permitted. Rehabilitation after disturbance to agricultural land is also managed by this Act. The CARA is relevant to the proposed development as the construction of a WEF as well as other components (such as the on-site switching substation and permanent guard house) may impact on agricultural resources and vegetation on the site. The Act prohibits the spreading of weeds and prescribes control measures that need to be complied with in order to achieve this. As such, measures will need to be taken to protect agricultural resources and prevent weeds and exotic plants from invading the site as a result of the proposed development.

Declared Weeds and Invaders in South Africa are categorised according to one (1) of the following categories:

- Category 1 plants: are prohibited and must be controlled.
- Category 2 plants: (commercially used plants) may be grown in demarcated areas providing that there is a permit and that steps are taken to prevent their spread.
- Category 3 plants: (ornamentally used plants) may no longer be planted; existing plants may remain, as long as all reasonable steps are taken to prevent the spreading thereof, except within the flood line of watercourses and wetlands.

An Agricultural and Soils Site Verification (**Appendix 6**) has been conducted to explore how the proposed development may impact on the agricultural production potential of the proposed site.

10.11 National Road Traffic Act (NRTA) (Act No. 93 of 1996, as amended)

The National Road Traffic Act (NRTA) (Act No. 93 of 1996, as amended) provides for all road traffic matters and is applied uniformly throughout South Africa. The Act enforces the necessity of registering and licensing motor vehicles. It also stipulates requirements regarding fitness of drivers and vehicles as well as making provision for the transportation of dangerous goods.

All the requirements stipulated in the NRTA will need to be complied with during the construction and operational phases of the proposed development.

10.12 Civil Aviation Act (CAA) (Act No. 13 of 2009)

The Civil Aviation Act (CAA) (Act No. 13 of 2009) controls and regulates aviation within South Africa. It provides for the establishment of a South African Civil Aviation Authority (SACAA) and independent Aviation Safety Investigation Board in compliance with Annexure 13 of the Chicago Convention. It gives effect to various conventions related to aircraft offences, civil aviation safety and security, and provides for additional measures directed at more effective control of the safety and security of aircrafts, airports and matters connected thereto.

Although the Act is not directly relevant to the proposed development, it should be considered as the establishment of electricity distribution infrastructure (such as a substation and powerlines) may impact on aviation and air traffic safety, if located directly within aircraft flight paths.

The Air Traffic and Navigation Services Company Limited (ATNS) and the SACAA will be consulted throughout the EIA process and the required approvals will be obtained, where necessary. It is not however anticipated that any approvals will be required.

10.13 Astronomy Geographic Advantage Act (Act No. 21 of 2007)

The Astronomy Geographic Advantage Act (Act No. 21 of 2007) provides for:

- The preservation and protection of areas that are uniquely suited for optical and radio astronomy; and
- Intergovernmental cooperation and public consultation on matters concerning nationally significant astronomy advantage areas and matters connected therewith.

Under Section 22(1) of the Act, the Minister has the authority to protect the radio frequency spectrum for astronomy observations within a core or central astronomy advantage area. As such, the Minister may under section 23(1) of the Act, declare that no person may undertake certain activities within a core or central Astronomy Advantage Area (AAA). These activities include the construction, expansion or operation; of any fixed radio frequency interference source, facilities for the generation, transmission or distribution of electricity, or any activity capable of causing radio frequency interference or which may detrimentally influence the astronomy and scientific endeavours.

In terms of section 7(1) and 7(2) of this Act, national government established the following AAAs:

- Karoo Central AAA (GN 198 of 2014) – proposed development falls inside of this AAA
- Sutherland Central AAA – proposed development falls outside this AAA
- Northern Cape AAA (GN 115 of 2010) – proposed development falls outside of this AAA

The proposed site falls within the Square Kilometre Array (SKA) Karoo Central Radio Astronomy Advantage Area (KCAAA) 1 buffer (refer to the **Figure** below). The main impacts of renewable energy developments on the SKA is RFI. RFI is a part of the Electromagnetic Compatibility (EMC) discipline that includes Electromagnetic emissions and Electromagnetic immunity. Based on correspondence received from SARAO, it was determined that the Klipkraal 4 WEF represents a low risk of interference to the SKA radio telescope with a compliance surplus of 9.84 dBm/Hz for the project site within the KCAAA1. SARAO therefore did not require an EMC Control Plan and had no objection to the development.

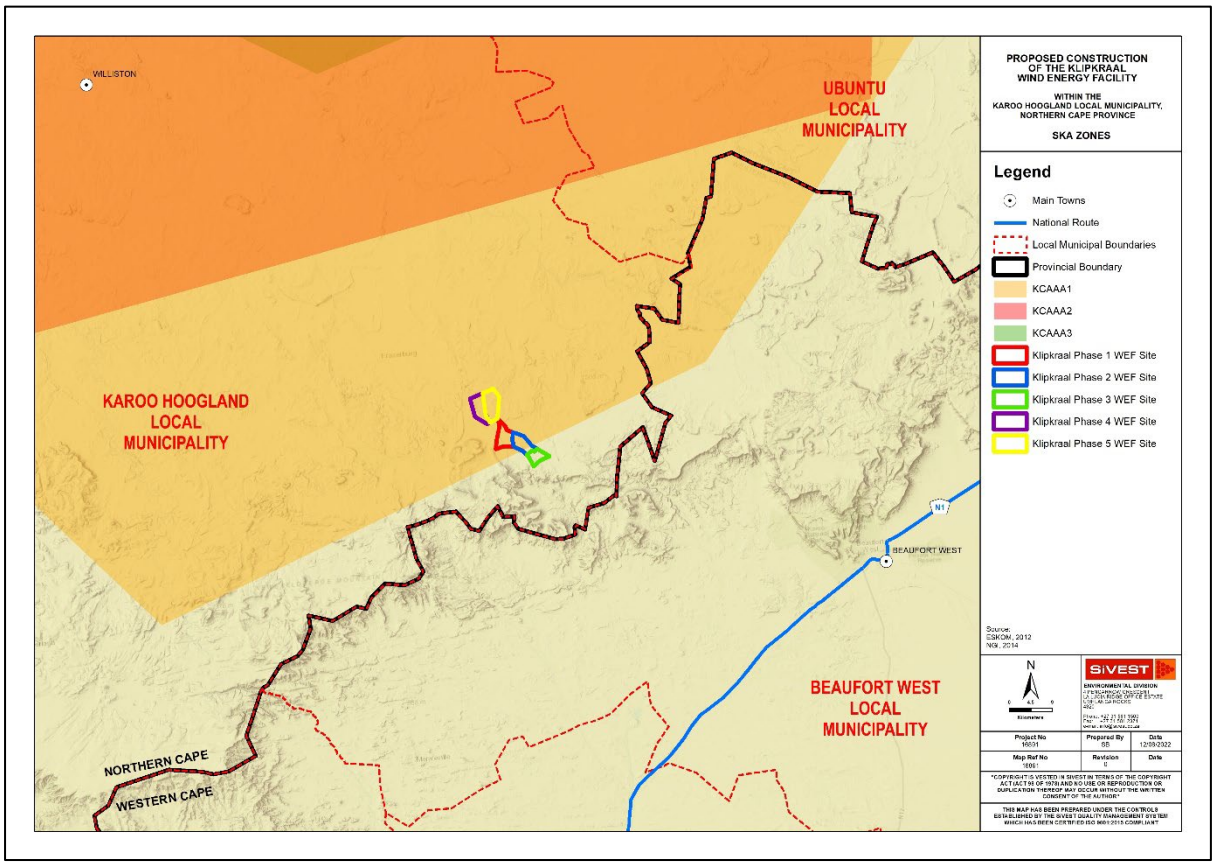

Figure 28: SKA

10.14 National Energy Act (Act No. 34 of 2008)

South Africa has two (2) acts that direct the planning and development of the country's electricity sector, namely:

i. The National Energy Act of 2008 (Act No. 34 of 2008); and
ii. The Electricity Regulation Act (ERA) of 2006 (Act No. 4 of 2006).

The National Energy Act (Act No. 34 of 2008), promulgated in 2008, has, as one (1) of its key objectives, the promotion of diversity of supply of energy and its sources. From this standpoint, the Act directly references the importance of the renewable energy (RE) sector, with a mention of the solar energy sector included. The aim is to ensure that the South African economy is able to grow and develop, fast-tracking poverty alleviation, through the availability of a sustainable, diverse energy mix. Moreover, the goal is to provide for the increased generation and consumption of RE (Republic of South Africa, 2008).

10.15 Electricity Regulation Act (Act No. 4 of 2006)

In 2011, the electricity regulation on new generation capacity was published under Section 35(4) of the Electricity Regulation Act (ERA) (Act No. 4 of 2006). These regulations apply to the procurement of new generation capacity by organs of state.

The objectives of the regulations include:

- To facilitate planning for the establishment of new generation capacity;
- The regulation of entry by a buyer and a generator into a Power Purchase Agreement (PPA);
- To set minimum standards or requirements for PPAs;
- The facilitation of the full recovery by the buyer of all costs efficiently incurred by it under, or in connection with, a PPA including a reasonable return based on the risks assumed by the buyer thereunder and to ensure transparency and cost reflectivity in the determination of electricity tariffs; and
- The provision of a framework for implementation of an Independent Power Producer (IPP) procurement programme and the relevant agreements concluded.

The Act establishes a National Energy Regulator as the custodian and enforcer of the National Electricity Regulatory Framework. The Act also provides for licenses and registration as the manner in which generation, transmission, distribution, trading and the import and export of electricity are regulated.

10.16 Protection of Public Information Act (Act No. 4 of 2013)

The Protection of Public Information Act (Act No. 4 of 2013) (POPIA) recognises the Constitutional requirement that everyone has a right to privacy.

Ultimately the Act promotes “the protection of personal information processed by public and private bodies; to introduce certain conditions so as to establish minimum requirements for the processing of personal information; to provide for the establishment of an Information Regulator to exercise certain powers and to perform certain duties and functions in terms of this Act and the Promotion of Access to Information Act, 2000 (PAIA); to provide for the issuing of codes of conduct; to provide for the rights of persons regarding unsolicited electronic communications and automated decision making; to regulate the flow of personal information across the borders of the Republic; and to provide for matters connected therewith”.

Due to the requirements around the Public Participation Process, SIVEST will process and capture information aligned to the POPIA and always obtain consent for I&APs information to be gathered, stored and distributed for the purpose of this project.

10.17 Renewable Energy Development Zones (REDZs) and Strategic Transmission Corridors

The Strategic Environmental Assessment (SEA) for Wind and Solar PV Energy in South Africa (CSIR, 2015) originally identified eight (8) formally gazetted Renewable Energy Development Zones (REDZs) that are of strategic importance for large-scale wind and solar PV development in terms of Strategic Integrated Project 8: Green Energy in Support of the South African Economy, as well as associated strategic transmission corridors, including the rollout of its supporting transmission and distribution infrastructure, in terms of Strategic Integrated Project 10: Electricity Transmission and Distribution.

- REDZs for large-scale wind and solar photovoltaic development;
- associated Strategic Transmission Corridors which support areas where long-term electricity grid will be developed;
- process of basic assessment to be followed and reduced decision-making timeframe for processing of applications for environmental authorisation in terms of the NEMA; and
- acceptance of routes which have been pre-negotiated with all landowners as part of applications for environmental authorisations for power lines and substations.

In addition to the eight (8) formally gazetted REDZs mentioned above, the Phase 2 SEA for Wind and Solar Photovoltaic Energy in South Africa (2019) identified three (3) additional REDZs (namely REDZ 9, REDZ 10 and REDZ 11) that are of strategic importance for large scale wind and solar photovoltaic energy development. These REDZs were published under Government Notice No. 786, Government Gazette No. 43528 of 17 July of 2020, and were officially gazetted under Government Notice No. 144, Government Gazette No. 44191 of 26 February 2021.

Table 14: The SEA for Wind and Solar PV Energy in South Africa (Phase 1 and Phase 2) (CSIR, 2015; CSIR, 2019) identified the following eleven (11) geographic areas for REDZs

REDZ Number	Name	Applicability of REDZ
REDZ 1	Overberg	Large-scale wind and solar photovoltaic energy facilities
REDZ 2	Komsberg	Large-scale wind and solar photovoltaic energy facilities
REDZ 3	Cookhouse	Large-scale wind and solar photovoltaic energy facilities
REDZ 4	Stormberg	Large-scale wind and solar photovoltaic energy facilities
REDZ 5	Kimberley	Large-scale solar photovoltaic energy facilities
REDZ 6	Vryburg	Large-scale solar photovoltaic energy facilities
REDZ 7	Upington	Large-scale solar photovoltaic energy facilities
REDZ 8	Springbok	Large-scale wind and solar photovoltaic energy facilities
REDZ 9	Emalahieni	Large scale solar photovoltaic energy facilities
REDZ 10	Klerksdorp	Large scale solar photovoltaic energy facilities
REDZ 11	Beaufort West	Large scale wind and solar photovoltaic energy facilities

The Klipkraal WEF 4 site does not fall within a REDZ and is located approximately 31 km west of the Beaufort West Renewable Energy Development Zone (RED Z) 11.

10.18 Additional Relevant Legislation

- White Paper on the Energy Policy of the Republic of South Africa (1998)
- Occupational Health and Safety Act (Act No. 85 of 1993) [OHSA];

- Environment Conservation Act (Act 73 of 1989) [ECA]
- Road Safety Act (Act No. 93 of 1996) [RSA];
- National Environmental Management: Air Quality Act (Act No. 39 of 2004) [NEM:AQA];
- National Environmental Management: Waste Act (Act No. 59 of 2008, as amended) [NEM;WA];
- Development Facilitation Act (Act No. 67 of 1995) [DFA];
- Promotion of Access to Information Act, (Act No. 2 of 2000); [PAIA]
- The Hazardous Substances Act (Act No. 15 of 1973) [HSA];
- Water Services Act (Act No. 108 of 1998) [WSA];
- Municipal Systems Act (Act No. 32 of 2000) [MSA];
- Subdivision of Agricultural Land Act, 70 of 1970, and
- Mineral and Petroleum Resource Development Act (Act No. 28 of 2002, as amended) [MPRDA].

11. KEY DEVELOPMENT STRATEGIES AND GUIDELINES

In his 2021 State of the Nation Address, President Cyril Rhamaposa announced government are taking the following measures to rapidly and significantly increase generation capacity outside of Eskom:

- *One of the priority investment areas is to rapidly expand energy generation capacity.*
- *Restoring Eskom to operational and financial health and accelerating its restructuring process is central to achieving this objective. Eskom has been restructured into three separate entities for generation, transmission and distribution.*
- *A Section 34 Ministerial Determination will be issued shortly to give effect to the Integrated Resource Plan 2019, enabling the development of additional grid capacity from renewable energy, natural gas, hydro power, battery storage and coal.*
- *We will initiate the procurement of emergency power from projects that can deliver electricity into the grid within 3 to 12 months from approval.*
- *The Department of Mineral Resources and Energy gazetted the Amended Schedule 2 of the Electricity Regulation Act 4 of 2006 on 12 August 2021, for 100 Megawatts of embedded electricity generation as approved by Minister Gwede Mantashe.*
- *We will negotiate supplementary power purchase agreements to acquire additional capacity from existing wind and solar plants.*
- *We will also put in place measures to enable municipalities in good financial standing to procure their own power from independent power producers.*

Policy decisions taken in the next decade will largely determine the dimension of the impact of climate change. Local government is in the front line of implementation and service delivery, and thus needs to pursue adequate mitigation and adaptation strategies which should include participation from the public sector, the private sector and NGOs.

The DoE gazetted its White Paper on Renewable Energy in 2003 and introduced it as a 'policy that envisages a range of measures to bring about integration of renewable energies into the mainstream energy economy.' At that time, the national target was fixed at 10 000 GWh (0.8 Mtoe) renewable energy contribution to final energy consumption by 2013. The White Paper proposed that this would be produced mainly from biomass, wind, solar and small-scale hydropower. It went on to recommend that this renewable energy should be utilised for power generation and non-electric technologies such as solar water heating and biofuels. Since the White Paper was gazetted, South Africa's primary and secondary energy requirements have remained heavily fossil-fuel dependent, both in terms of indigenous coal production and use, as well as the use of imported oil resources. Alongside this, the projected electricity demand of the country has led the National utility Eskom, to embark upon an

intensive build programme to secure South Africa's longer-term energy needs, together with an adequate reserve margin.

The National Development Plan (NDP), 2011 – 2030, aims to address parts of the South African triple development challenges of poverty and inequality by 2030. In order to achieve this, numerous enabling milestones and critical actions have been formulated. One (1) of the critical actions is the formulation and implementation of interventions that aim to ensure environmental sustainability and resilience to future shocks.

The emphasis is on South African investment and assistance in the exploitation of various opportunities for low-carbon energy in the clean energy sources of Southern Africa (National Planning Commission, 2011).

A more efficient and competitive infrastructure is envisaged, particularly infrastructure that facilitates economic activity and is conducive to growth and job creation. The plan identifies key services that need strengthening; namely commercial transport, energy, telecommunications and water, while ensuring their long-term affordability and sustainability. The National Planning Commission maintains that South Africa has missed a generation of capital investment in many infrastructure opportunities including electricity. Therefore, one (1) infrastructure investment priority is in the procurement of at least 20,000 MW of renewable energy-efficiency (National Planning Commission, 2011).

The proposed project is thus well aligned with the aims of the NDP which is further detailed in the following national and provincial plans:

- National Integrated Resource Plan for Electricity (2010-2030);
- Integrated Resource Plan (IRP 2019)
- National Infrastructure Plan 2012, as amended;
- Northern Cape Provincial Spatial Development Framework;
- Northern Cape Province Strategic Plan 2020-2025 (refer section11)

11.1 Northern Cape Province Strategic Plan 2020 - 2025

The Northern Cape Province Strategic Plan 2020-2025, highlights the need for energy security and the finalization of the draft Northern Cape Renewable Energy Strategy was identified as a key focus area. The Northern Cape province not only supports this sector but are identifying wats to tap into and draw benefit from the endless opportunities that the renewable energy sector holds for the economic development of the Province.

11.2 Namakwa District Municipality Integrated Development Plan, 2021 – 2022

The Namakwa District Municipality IDP contains thirteen strategic objectives namely:

- Monitor and support local municipalities to deliver basic services which include water, sanitation, housing, electricity and waste management
- Support vulnerable groups
- Improve administrative and financial viability and capability
- Promote and facilitate Local Economic development
- Enhance good governance
- Promote and facilitate spatial transformation and sustainable urban development

- Improve communication and communication systems
- Establish a customer care system
- Invest in the improvement of ICT systems
- To render a municipal health service
- To coordinate the disaster management and fire management services in the district
- Implement the climate change response plan
- Caring for the environment

The IDP includes sectoral plans which are intended to ensure alignment between the different organs of state while providing input in the overall strategic objectives of the municipality. Sectoral plans include the Rural Development Plan, Climate Change Response Plan, Tourism Sector Plan, Air Quality Plan and the Housing Sector Plan.

The Rural Development Plan notes that the NDM has a competitive advantage in the energy sector with solar, wind, nuclear, wave and natural gas energy plants identified for the area. Of note is the potential for an Eskom nuclear power plant to be constructed at Klienzee. RE has recently become one of the cornerstones of NDM's economy of the District and there needs to be engagement on a National level to ensure that the district profits from this resource. The plan notes unemployment as one of the main reasons for poverty and highlights the importance of productive employment opportunities for reducing poverty and poverty and achieving sustainable economic and social development. Economic diversification is important in rural areas is crucial for bringing about rural development.

The Tourism Sector Plan is of relevance to the proposed development as it identifies existing and priority tourism clusters based on destinations and distribution points. Five such clusters have been identified. The clusters include the diamond and history cluster, the river and grapes cluster, outdoor action cluster, the Kalahari adventure cluster and the Ocean, desert and flower cluster, which the proposed power line would pass by.

11.3 Karoo Hoogland Local Municipality Integrated Development Plan (2020/21 Revised)

The KH IDP (2017-2022) identifies four Key Performance Areas (KPAs). The following categories of importance for the Municipality is as follows for the KPA's: KPA 1, Basic Service Delivery and KPA 2, Local Economic Development, are the most relevant to the proposed project.

In terms of KPA 2, Local Economic Development (LED), the IDP highlights the importance of private public partnerships for achieving economic development in the KH. The LED policy framework identifies a number of LED Policy Pillars/Thrusts. Of relevance to the Needs Assessment these include building a diverse economic base, developing learning and skilful economies, and enterprise development and support. The IDP identifies a number of projects associated with the LED Pillar/Thrusts. Of relevance these include:

<u>Building a diverse economic base</u>

- Investigate possible opportunities for development of renewable energy.

<u>Developing learning and skilful local economies</u>

- Identify skill gaps and implements skills development and training programmes

Developing inclusive economies

- Support the informal and rural economy.
- Support development of women and the youth.
- Establish community gardens.

The IDP also highlights the need to support for the rural economy, with specific reference to the One House Hold One Hectare (1HH1HA) Programme. The Objectives of the 1HH1HA Programme include reducing poverty in rural areas, creating opportunities for Black Commercial Smallholding Farmers, improving security of tenure for HD rural communities and develop farming skills. The benefits for the 1HH1HA Programme include job creating, poverty alleviation, food security, skills development, security of tenure and restoration of dignity to marginalised HD rural communities.

KPA 2, Local Economic Development (LED) identifies the need to address the challenges facing vulnerable groups in the KH, including the youth and physically and mentally challenged members of the community.

The high unemployment levels and the lack of meaningful employment opportunities represents a key challenge faced by the youth in the KH. There are also inadequate educational facilities/institutions such as Technikons, FET colleges and Universities in the KH and ND.

The IDP also refers to the need to interact with National and Provincial and District agencies aimed at youth development. The provision of quality education at Early Child Development (ECD) is also a key need. The challenges facing ECDs include lack of proper facilities and support material at learning centres, lack of funding, and food security.

The IDP also highlights the threat posed by climate change, noting it threatens food security, poverty alleviation and sustainable socio-economic growth. Vulnerable households are at most risk. A combination of increasing temperatures and reduced and/or more variable rainfall could have severe negative impacts for the Namakwa District, including the KHM. In this regard the KHM is characterised by high levels of poverty and inequality, isolated communities, and a large geographical area, which results in a vulnerable population. Large numbers of people, both private and communal, are also directly dependent on agriculture, and therefore on functioning ecosystems and water regimes, for their livelihoods. These communities and households are therefore directly affected by the risks posed by climate change.

The IDP notes that the KHM is likely to be one of the most affected municipalities in terms of the impact of climate change on water quality and availability. Addressing these threats and the needs associated with the threat posed by climate change is therefore a key challenge.

11.4 Additional Relevant Strategies and Guidelines

- Northern Cape Provincial Growth and Development Strategy (2004 -2014)
- Northern Cape Provincial Spatial Development Framework
- Northern Cape Climate Change Response Strategy
- Northern Cape Province Green Document
- Karoo Hoogland Spatial Development Framework (SDF) (2019)

12. NEED AND DESIRABILITY

12.1 National Renewable Energy Requirement

In 2010, South Africa had 44,157 MW of power generation capacity installed. Current forecasts indicate that by 2025, the expected growth in demand will require the current installed power generation capacity to be almost doubled to approximately 74,000 MW (SAWEA, 2010).

This growing demand, fuelled by increasing economic growth and social development within Southern Africa, is placing increasing pressure on South Africa's existing power generation capacity. Coupled with this, is the growing awareness of environmental impact, climate change and the need for sustainable development. Despite the worldwide concern regarding Greenhouse Gas (GHG) emissions and climate change, South Africa continues to rely heavily on coal as its primary source of energy, while most of the countries renewable energy resources remain largely untapped (DME, 2003). There is therefore an increasing need to establish a new source of generating power in SA within the next decade.

The use of renewable energy technologies, as one (1)10 of a mix of technologies needed to meet future energy consumption requirements is being investigated as part of Eskom's long-term strategic planning and research process. It must be remembered that wind energy is plentiful, renewable, widely distributed, clean and reduces GHG emissions when it displaces fossil-fuel derived from electricity. In this light, renewable wind energy can be seen as desirable.

The REIPPP programme and the competitive nature of the bidding process has resulted in significant lowering of solar and wind tariff prices since 2011. Further projects will increase the competitive nature of the REIPPP program and further result in cost savings to South African consumers.

12.2 National Renewable Energy Commitment

In support of the need to find solutions for the current electricity shortages, the increasing demand for energy, as well as the need to find more sustainable and environmentally friendly energy resources, South Africa has embarked on an infrastructure growth programme supported by various government initiatives. These include the National Development Plan (NDP), the Presidential Infrastructure Coordinating Commission (PICC), the DoE's IRP, the National Strategy for Sustainable Development, the National Climate Change Response White Paper, the Presidency of the Republic of South Africa's Medium-Term Framework, and the National Treasury's Carbon Tax Policy Paper.

The Government's commitment to growing the renewable energy industry in South Africa is also supported by the White Paper on Renewable Energy (2003) which sets out the Government's principals, goals and objectives for promoting and implementing renewable energy in South Africa. In order to achieve the long term goal of achieving a sustainable renewable energy industry, the DoE has set a target of contributing 17,8GW of renewable energy to the final energy consumption by 2030. This target is to be produced mainly through, wind and solar; but also through biomass and small scale hydro (DME, 2003; IRP, 2010). Further renewable energy targets have been proposed within the latest IRP, which was gazetted in 2019.

The 2019 Integrated Resource Plan (2019) (IRP2019) was released on 18 October 2019 and includes the following capacity allocation:

- 1 500 MW of new coal power (noting that there will be decommissioning of coal capacity over the period);

- 2 50 0MW of hydro power;
- 6 000 MW solar;
- 14 400 MW wind;
- 2 000 MW of storage;
- 3 000 MW from gas.

12.3 Wind Power Potential in South Africa and Internationally

Onshore wind energy technology is the most commonly used and commercially developed renewable energy technology in South Africa as wind is abundant and inexhaustible (DEA Guideline for Renewable Energy, 2015). Wind energy is one (1) of the lowest-priced renewable energy sources and is economically competitive (www.wasaproject.info).

12.4 Site Suitability

The location of the proposed Klipkraal WEF 4 (this application) and proposed on-site Switching / Collector Substation included several key aspects including wind resource, grid connection suitability/infrastructure as well as environmental and social constraints, proximity to various planning units and strategic areas and topography and access.

12.4.1 Wind Resource

The applicant installed a met mast on the project site in October 2022. Wind speed trends have been monitored and data has been collected and analysed. The analysis of this data has confirmed that the proposed site is deemed suitable in terms of wind resource.

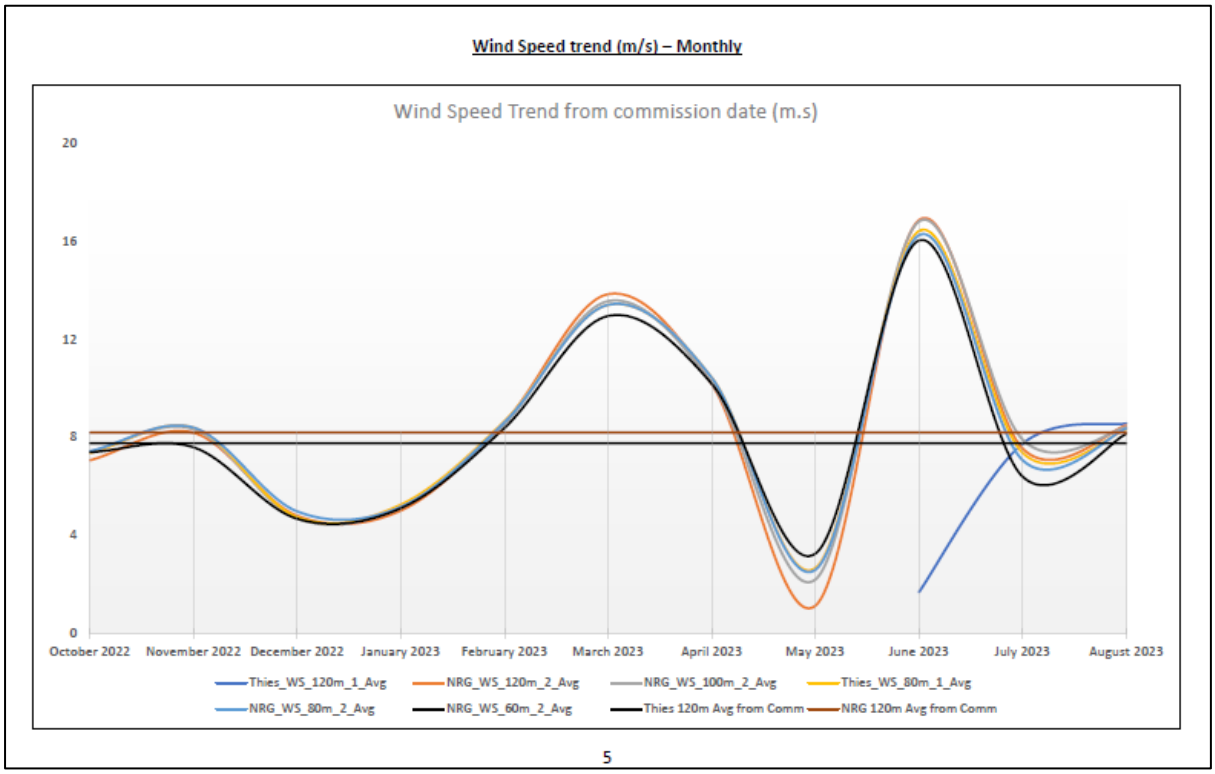

Figure 29: Wind Data from the Met Mast

12.4.2 Site Access

The Klipkraal WEF 4 development access point is from Road DR02312, bisecting the southern quadrant of Farm Matjes Fontein No. 411 and PTN 3 of the Farm Rattelfontein No. 394. Road DR02312 is classified as a Class R4 in the RCAM Classification – Rural Collector Road with an average road reserve width of 20m, a gravel surface of ±6m wide, and an average speed of 80 km/h. PTN 3 of the Farm Rattelfontein No. 394 has two (2) existing access points emanating from Road DR02312 at Km 87.82 and Km 88.81. Both access points are located on Road DR02312.

12.4.3 Topography and Land Use

The project site is located immediately north of the border between the Western Cape and the Northern Cape Provinces. The Klipkraal se Berg (altitude of 1 907m) and the Skurwekop (altitude 1 599m) are the two dominant topographical features in the area and are located to the south of the project site with an unnamed ridge line is located at the northern extremity of the site which reaches a height of approximately 1 400m. The areas between these two high lying is relatively flat falling in a northerly direction.

The proposed project site has topography which is suitable for the development of a WEF.

12.4.4 Policy

From a strategic renewable energy development perspective, the Klipkraal WEF 4 site is located approximately 34 km west of the Beaufort West Renewable Energy Development Zone (REDZ) 11. The proposed project site is therefore linked to the national planning vision for wind and solar development in South Africa.

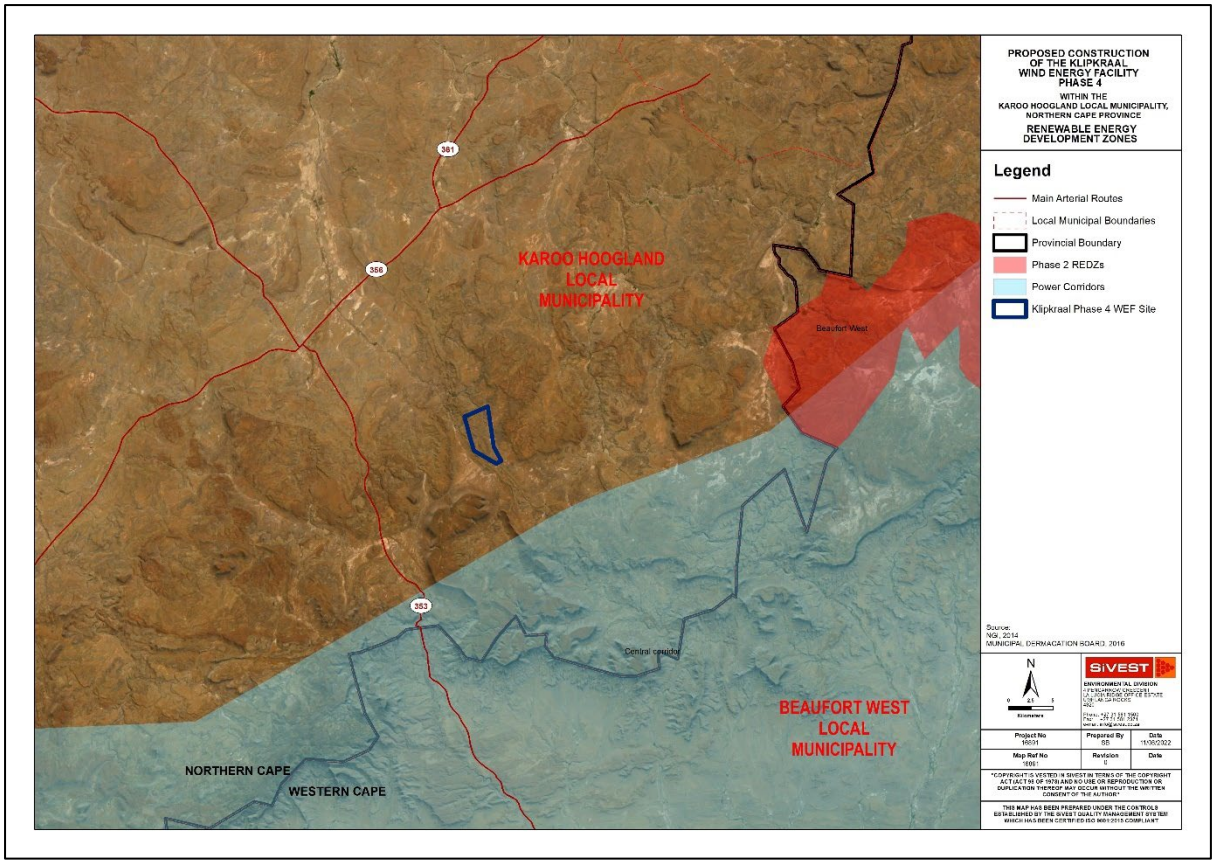

Figure 30: Location of the Klipkraal WEF 4 in relation to the REDZ and Power corridors

12.4.5 Environmental

The applicant conducted an extensive environmental screening process (including avifaunal and terrestrial ecological) using various available desktop data and tools to determine the suitability of the site. The National Department of Forestry, Fisheries and the Environmental (DFFE) screening tool was also utilized to generate a site sensitivity report for the proposed Klipkraal WEF cluster. The outcome of the site selection process was the identification of a ±3,314 ha potentially developable area on which five (5) wind farm projects are being proposed, one of which it the Klipkraal WEF 4. In addition to the screening tool, the pre-application environmental screening process also involved the following:

Avifaunal

An avifaunal specialist was appointed to conduct a site sensitivity screening visit to identify key priority species nesting within the project or neighbouring properties which may require buffering out of large portions of the proposed project site. Numerous Verreaux's eagle nests were identified on the southern portion of the greater Klipkraal WEF project site (Refer Figure 33 below). A 3.7 km no-go buffer (red layer in figure below) and a 5.2 km medium sensitivity buffer (orange layer in figure below) were applied to each nest identified. This resulted in the site boundaries and layouts for the individual WEF projects being amended to accommodate the buffers prescribed. The Klipraal WEF has therefore avoided these buffers.

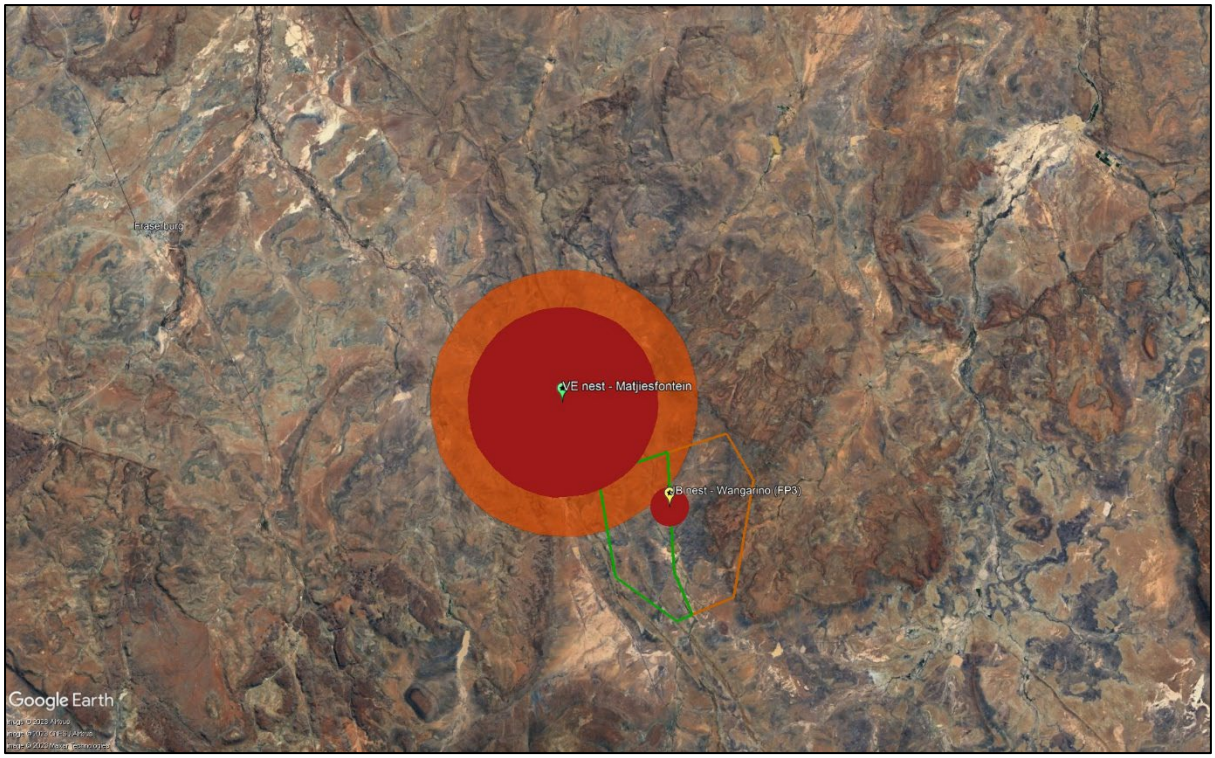

Figure 31: Verreaux's Eagle nests identified and buffers in relation to the Klipkraal WEF 4 & WEF 5 sites

Aquatic

An aquatic specialist was appointed to undertake a pre-application screening to identify the presence of aquatic features on the project. The specialist delineated the aquatic features and prescribed buffers which the applicant took into consideration when amending the individual site boundaries and for the development of the preliminary layout.

Terrestrial Ecological

The Klipkraal cluster site was visited on two occasions for the current study, from 22-28 June 2021 and 05 September 2021. The initial site visit included putting camera traps out across the Klipkraal site (a total of 30 cameras) with the aim of verifying the presence of the Riverine Rabbit but also other fauna more generally. During the site visits, the wind farm site was extensively investigated in the field. 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.

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 the possible presence of species of conservation concern (SCC) as well as other species which are considered to be of ecological significance. In terms of fauna, active searches were conducted for reptiles and amphibians across the site, within habitats where such species are likely to be encountered. In addition, all reptiles and amphibians encountered while doing other field work were recorded. The camera traps were

concentrated within riparian and floodplain areas identified as the most favourable potential habitat for this species. This amounted to approximately two-thirds of the cameras and the remainder were located in other habitats. In order to increase the number of fauna captured, the cameras were placed along paths, fences etc. where fauna are likely to pass and be captured by the cameras. The cameras were placed in the field in June 2021 and retrieved in September 2021, giving rise to nine weeks of camera trapping to inform the current study.

The specialist delineated the sensitivities on site and prescribed buffers based on the above, which the applicant took into consideration when amending the individual site boundaries. The layouts are being further refined following scoping phase specialist findings to ensure that no turbines are places in no-go areas.

12.4.6 Land Availability

Availability of land is a key feasibility criterion in the site selection process. The identified project site for the Klipkraal WEF 4 is of a suitable land size for the proposed development. Klipkraal Wind Energy Facility 4 (Pty) Ltd has entered into an option to lease agreements with the respective landowners of the properties within the project site. All affected landowners have given their consent and have signed letters of consent for the undertaking of the Scoping and EIA Process and the subsequent development of the proposed Klipkraal WEF 4 should EA be granted.

12.4.7 Access to Grid

The cost estimate letter has been applied for with Eskom. The applicant has engaged with Eskom on numerous occasions and is dealing with their distribution and transmission network planners. The proposed WEF will connect to the Droerivier MTS (approximately 70km from the application site). Eskom has been fully engaged on the full development of the Klipkraal project and the capacity required to be evacuated from the entire development.

The site is considered suitable for the reasons provided above. The investigation of an alternative site is not currently proposed within this Scoping Report. There is therefore no site alternative for the Klipkraal WEF.

12.5 Reduce dependency on fossil fuels

At present, more than 90% of South Africa's energy is generated by coal-fired power stations. Apart from the fact that these are finite resources that will eventually run out, fossil fuels are also harmful to the environment when used to produce electricity. During combustion, fossil fuels such as coal emit many by-products into the atmosphere, two (2) of which are carbon dioxide (CO_2) and sulphur dioxide (SO_2). Both these gases have been shown to contribute to the worsening climate crisis. Wind is a free and infinite resource that occurs naturally in the environment. Converting wind energy into electricity releases no harmful by-products into the environment and will reduce the dependency on fossil fuels.

12.6 Stimulate the economy

The proposed development has the potential to stimulate the demand for other industries, among others construction services, engineering service, transport services, steel structures, cement and other aggregates, and electrical equipment. At the local level, increase in demand for accommodation, personal services, perishable and non-perishable goods is expected, which will stimulate the local

economies of the towns and settlements, where labour will be procured from or where migrant workers will be temporarily located.

Some of the local businesses could benefit from sub-contracting opportunities, if the construction companies appointed by the developer implement a local community procurement policy, and consumer expenditure of the construction crew. Furthermore, the demand for hospitality services (including accommodation and catering in the towns Fraserburg and other nearby towns) is expected to increase and provide for much-needed stimulus for the local economy.

According to the Social Impact Assessment, any project which contributes positively towards the objectives mentioned within national policies could be considered strategically important for the country. A review of the national policy environment suggests that the increased utilisation of Renewable Energy (RE) sources is considered integral to reducing South Africa's carbon footprint, diversifying the national economy, and contributing towards social upliftment and economic development. As the project comprises a RE project and would contribute RE supply to provincial and national targets set out and supported within these national policies, it is considered that the project fits within the national policy framework.

12.7 Job opportunities

Given the local unemployment rate and limited job opportunities, this development will bring job opportunities in the area, that will represent a localized, social benefit. Even more the sector of the local economy most likely to benefit from the proposed development.

12.8 Skills development

In addition to the job creation, there is valuable opportunities for skills enhancement/development/training and knowledge transfer as quite often input from experts are required in this field. Therefore, opportunities for guiding and training of local workers is created. A variation of skill sets is required ranging from semi-skilled construction workers to highly skilled engineers. The skill set of the majority of the municipality's residents comprises of low-skills, which means that with proper planning and recruitment strategies, many of the local unemployed residents could be hired as temporary construction workers on site provided they satisfy any other recruitment criteria.

Those employed will either develop new skills or enhance current skills. This insinuates that inexperienced workers will have the opportunity to attain and develop new skills, while experienced workers will further improve their existing skills. Albeit the employment is temporary, the skills attained will be of long-term benefit to employees. However, as any skills set it will need to be supported and practised on a regular basis to maintain its currency.

13. DETAILS OF PROCESS FOLLOWED TO REACH THE PREFERRED OPTION

13.1 Details of alternatives

As per Chapter 1 of the EIA regulations (2014), as amended, feasible and reasonable alternatives are required to be considered during the EIA process. Alternatives are defined as "*different means of meeting the general purpose and requirements of the activity*". These alternatives may include:

(a) The property on which or location where it is proposed to undertake the activity;
(b) The type of activity to be undertaken;
(c) The design or layout of the activity;
(d) The technology to be used in the activity;
(e) The operational aspects of the activity; and
(f) The option of not implementing the activity.

Each of these alternatives are discussed in relation to the proposed development in the sections below. The EIA Regulations, 2010 guideline document stipulates that the environmental investigation needs to consider feasible alternatives for the proposed development. The developer should be encouraged to consider alternatives that would meet the objective of the original proposal and which could have an acceptable impact on the environment. The role of alternatives in the EIA process is therefore to find the most effective way of meeting the need and purpose of the proposal, either through enhancing the environmental benefits of the proposed activity, and/or through reducing or avoiding potentially significant negative impacts.

13.1.1 Location/Site alternatives

Prior to the initiation of the EIA, alternative properties / sites were considered for the location of the proposed development. As discussed above, the selection of a potential wind farm site includes several key aspects including wind resource, grid connection suitability/infrastructure as well as environmental and social constraints, proximity to various planning units and strategic areas and topography and access. This proposed project site was selected based on the above criteria ahead of other regional properties / sites due to the cumulative assessment of all criteria. This internal process takes several weeks to complete and ensures that the least environmentally sensitive property / site is selected in the specific region of development.

Based on the reasons above no site alternatives have been considered during the EIA process for this proposed development. The placement of wind energy facilities is dependent on the factors discussed above, all of which are favourable at the proposed site location. Two met masts were installed on the project site and the proposed site has been deemed suitable in terms of wind resource. The proposed project site has topography which is suitable for the development of a WEF. In addition, the proposed project site also has a limited agricultural potential and is easily accessible off Road DR02312. The site is therefore considered highly suitable for the proposed development of a WEF, and no other locations have been considered.

13.1.2 The type of activity to be undertaken

No other activity alternatives have been considered. Renewable Energy developments in South Africa are highly desirable from a social, environmental and development perspectives respectively. The importance of renewable energy has been outlined in **Section 11** and **12** above highlighting national, district and local support. Wind energy installations are also more suitable for the proposed site because of the high wind resource.

South Africa is under immense pressure to provide clean sources of electricity generating capacity in order to reduce the current electricity demand from aging and polluting coal-fired power stations. With the global focus on climate change, the government is under severe pressure to explore alternative energy sources in addition to coal-fired power stations. Although wind energy is not the only solution to solving the energy crisis in South Africa, it is a suitable sustainable solution to the energy crisis and this project could contribute to addressing the problem. This project will thus aid in achieving South Africa's

goals in terms of sustainability, energy security, mitigating energy cost risks, local economic development and national job creation.

13.1.3 The technology to be used in the activity

The importance of renewable energy has been outlined in **Section 11** and **12** above highlighting national, district and local support. Wind energy installations are also more suitable for the proposed site because of the high wind resource.

Wind turbine technology is developing at a rapid pace and could evolve by the time the project reached the construction phase. Therefore, various wind turbine designs and layouts will be considered for the site in order to maximise the electricity generation capacity and efficiency, whilst taking into account the environmental constraints. The turbine manufacturer and turbine model has not yet been determined and will not be decided upon until the completion of further wind analysis and competitive tendering.

Furthermore, from a policy perspective the 2019 IRP indicated a higher allocation target to wind energy compared to solar energy for new additional capacity from 2022 to 2030 (i.e. 14 400 MW as opposed to 6 000 MW) which further supports the development of a WEF at this location. Based on the above, a WEF at the proposed location is considered to be reasonable and feasible and therefore is selected as the preferred technology alternative as it would be able to generate sufficient energy to support an economically viable wind energy project.

13.1.4 Design or layout of the activity

The alternatives strategy was discussed in detail with DFFE during the two pre-application meetings held (30th of September 2021 and 6th of May 2022). As agreed with the department, site layout alternatives will not be comparatively assessed, but rather a single layout will be refined as additional information becomes available throughout the EIA process (e.g., specialist input, additional site surveys, and ongoing stakeholder engagement). All constraints identified by the respective specialists are being considered and the layout is being refined to avoid all no-go areas.

The development area presented in the Scoping Report has been selected as a practicable option for the Klipkraal WEF 4 considering technical preference and constraints, as well as initial No-Go layers informed by the relevant specialist during the initial screening studies.

13.1.5 No – go option

The option of not implementing the activity, or the “no-go” alternative, has been considered in the EIA process. South Africa is under immense pressure to provide clean sources of electricity generating capacity in order to reduce the current electricity demand from aging and polluting coal-fired power stations. With the global focus on climate change, the government is under severe pressure to explore alternative energy sources in addition to coal-fired power stations. Although wind energy is not the only solution to solving the energy crisis in South Africa, not establishing the proposed WEF and associated infrastructure would be detrimental to the mandate that the government has set to promote the implementation of renewable energy. It is a suitable sustainable solution to the energy crisis and this project could contribute to addressing the problem. This project will thus aid in achieving South Africa’s goals in terms of sustainability, energy security, mitigating energy cost risks, local economic development and national job creation.

The no-go alternative assumes that the proposed project will not go ahead i.e., it is the option of not developing the proposed Klipkraal WEF 4. This alternative would result in no environmental, social or economic impacts (positive or negative) from the proposed project on the site or surrounding local area.

The following implications will occur if the no-go alternative is implemented (i.e., the proposed project does not proceed):

- Aquatic - Should the project not proceed, then the current status quo with regards to the aquatic environmental would remain unchanged. Overall, the catchment and subsequent watercourses are largely in a natural state. However, impacts are present in localised areas and include the following:
  - Erosion as a result of road crossings;
  - Several farm dams; and
  - Undersized culverts within present day road crossings.

  These impacts have resulted in a slow degradation within the aquatic systems.
- Agricultural - The one identified potential impact is that due to non-regular rainfall in the area, which is likely to be exacerbated by climate change, agriculture in the area will come under increased pressure in terms of economic viability. The development compliments agriculture by providing an additional income source, without excluding agriculture from the land, or decreasing production.
- Terrestrial Ecology - Under the 'no-go' alternative, the current land use, consisting of extensive livestock grazing, would continue. When applied correctly, such livestock grazing is considered to be largely compatible with long-term biodiversity conservation, although in practice there are some negative effects associated with such land use, such as predator control and negative impacts on habitat availability for the larger ungulates that would historically have utilised the area. Under the current circumstances, the 'no-go' alternative is considered to represent a low long-term negative impact on the environment.
- Social - On a social basis, the no-go alternative will have a significant negative effect in that a less efficient, reliable and consistent supply of electricity will have economic, health and safety and nuisance consequences. Economic in that disruptive electricity supply seriously undermine business confidence. Health and safety risks in respect of disrupted medical/surgical procedures and treatment and increased safety risk to motorists, pedestrian and the general public due to road traffic signalling outages and other public safety issues. Nuisance factor can range from disrupted entertainment, inability to use power tools and computers to missed appointments due to traffic congestion. All of this will have negative social impacts and could result in increased stress levels as well as, increased public health, and safety risks.

Contrary to the above, the following benefits could occur if the no-go alternative is implemented, as identified in the specialist assessment:

- Avifaunal - The no-go alternative will result in the current status quo being maintained as far as the avifauna is concerned. The low human population in the area is definitely advantageous to sensitive avifauna, especially Red Data species. The no-go option would eliminate any additional impact on the ecological integrity of the proposed site as far as avifauna is concerned.
- Social - The option of not having this project go ahead means that the social environment is not affected as the status quo remains.

13.2 Details of Public Participation Process undertaken

Public participation is the cornerstone of any EIA. The principles of the National Environmental Management Act (NEMA) as well as the EIA Regulations (as amended 2017) govern the EIA process, including public participation. These include provision of sufficient and transparent information on an

ongoing basis to stakeholders to allow them to comment, and ensuring the participation of previously disadvantaged people, women and the youth. All documents relating to the PP process have been included in **Appendix 5**.

The aim of the Scoping phase is to collect the issues, concerns and queries of interested and affected parties (I&APs) and determine the scope of the following phase of the EIA. The main objective of the Scoping phase is to:

- Inform the stakeholders about the proposed project and the environmental assessment process to be followed;
- Provide opportunity to all parties to exchange information and express their views and concerns;
- Obtain contributions from stakeholders (including the client, consultants, relevant authorities and the public) and ensure that all issues, concerns and queries raised are fully documented;
- Evaluate the issues raised and identify the significant issues; and
- Provide comment on how these issues are to be assessed as part of the Environmental Impact Assessment Process.

The public scoping processes undertaken are in accordance with the required EIA procedures prescribed within national legislation.

13.2.1 Identification of Key Stakeholder and I&AP's

Liaison with the relevant authorities plays a crucial role in the successful completion of any environmental assessment process. In addition to the competent authority, DFFE, key stakeholders, the local municipality as well as other potentially affected I&APs, including adjacent property owners and dwellers, are identified.

This list will be updated as the project progresses and based on responses received.

13.2.2 Responsibilities of interested and affected parties (I&AP's)

Members of the public who want to participate in the assessment process need to register and are referred as I&AP's. Registered I&AP's are entitled to comment, in writing, on all written submissions to the authority and to raise any issues that they believe may be significant, provided that:

- Comments are submitted within the timeframes set by the competent authority or extensions of timeframes agreed to by the applicant, Environmental Assessment Practitioner (EAP) and competent authority.
- A copy of the comments submitted directly to the competent authority is served on the applicant or EAP.
- The I&AP discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.

13.2.3 Steps taken to notify key stakeholders and potential I&APs

The comment periods during the scoping phase were implemented according to the EIA Regulations, 2014 (as amended). The comment periods which have been implemented at this stage of the scoping phase (as set out by the EIA Regulations, 2014) were as follows:

- Comment and review period for the Draft Scoping Report (DSR): 30 days.

As stipulated in the EIA Regulations, 2014 (as amended), the DSR will undergo a 30-day comment and review period from the 22nd of September 2023 until the 23rd of October 2023 (excluding public holidays). Any I&APs and key stakeholders that wished to register on the project's database or comment on the DSR were encouraged to contact SiVEST Environmental Division at the contact details provided.

Notification of EIA process was undertaken as follows:

- An I&AP database was compiled which includes all affected landowners, adjacent landowners, occupiers of affected and adjacent land, other I&APs, key stakeholders (such as OoS) and other surrounding project developers. The I&AP database is included in **Appendix 5**.
- Issuing of the notifications and initial landowner consultation will be circulated to all I&APs on the 22nd of September 2023 respectively as part of the Draft Scoping Report (proof to be included in Final Scoping Report).
- Placement of site notices in English and Afrikaans (as per regulations) were placed along the entrance road to the application site and around the site itself on the 29th of August 2022 (proof included in the Scoping Report).
- Notification letters were sent via E-mail or sms (if cellphone number / email is available, it is assumed that the I&AP have an email or cellphone).
- Public notification of the EIA process was advertised in a local newspaper (namely Noordwester) as required according to Regulation 41(2) (c) of the EIA Regulations (2014), as amended. Proof included in **Appendix 5** of the Draft Scoping Report.

Availability of Draft Scoping report for review:

- The draft Scoping report will be made available on SiVESTs website for download.
- Electronic copies will be made available to parties upon request for the documentation.
- The Draft Scoping Report will be available for review at the following location:
  - Fraserburg Library, 35 Voortrekker Street, Northern Cape, South Africa

13.2.4 Details of notification of landowners

Regulation 39 (1) of the EIA Regulations, 2014 (as amended), states that "if the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land".

Regulation 39 (2) of the 2014 NEMA EIA Regulations, 2014 (as amended), further states that "sub-regulation (1) does not apply in respect of: (a) linear activities; (b) activities constituting, or activities directly related to prospecting or exploration of a mineral and petroleum resource or extraction and primary processing of a mineral or petroleum resource; and (c) strategic integrated projects as contemplated in the Infrastructure Development Act, 2014".

The proposed development does not constitute a linear development or SIP project and landowner consent is therefore required from the following land portions:

Table 15: Properties for Affected Landowners

SG CODE	DESCRIPTION
C02600000000039400003	PORTION 3 OF THE FARM RATELFONTEIN NO 394
C02600000000041100000	REMAINDER OF THE FARM MATJES FONTEIN NO 411

The landowners and/or occupants of the above-mentioned farm portions have been notified accordingly. The notification has been included as **Appendix 5** and has been submitted to the DFFE for consideration together with the DSR for comment (this document).

In terms of the Chapter 6, Section 39 of the EIA Regulations, 2014 (as amended), notification of directly adjacent landowners and occupiers is required. As a result, the affected and adjacent landowners were notified of the proposed development accordingly. Please refer to **Appendix 5** for proof of notification.

13.2.5 Summary of issues raised

Issues, comments and concerns raised during the public participation process to date will be captured in the Comments and Response Report (C&RR). The C&RR will provide a summary of the comments received and issues raised by I&APs and key stakeholders, as well as the responses provided. This information will be used to feed into the evaluation of environmental and social impacts and will be taken into consideration when compiling the FSR.

13.3 Impact Assessment

The potential impacts for the identified environmental aspects have been assessed and mitigation measures identified below (refer **Appendix 6**).

13.3.1 Planning

Environmental Aspect	Potential Impact during Construction	Mitigation
Heritage - Unidentified heritage resources	• Due to the size of the area assessed, there's a possibility of encountering heritage features in un-surveyed areas does exist.	• A management plan, after a walkdown of the final layout, for the heritage resources needs then to be compiled and approved for implementation during construction and operations.

13.3.2 Construction Phase

Environmental Aspect	Potential Impact during Construction	Mitigation
Avifaunal	• Displacement due to disturbance associated with the construction of the wind turbines and associated infrastructure.	• Construction activity should be restricted to the immediate footprint of the infrastructure as far as possible. Access to the remainder of the area should be strictly controlled to prevent unnecessary disturbance of priority species. • Measures to control noise and dust should be applied according to current best practice
Avifaunal	• Displacement due to habitat transformation associated with the construction of the wind turbines and associated infrastructure.	• Removal of vegetation must be restricted to a minimum and must be rehabilitated to its former state where possible after construction. • Construction of new roads should only be considered if existing roads cannot be upgraded. • The recommendations of biodiversity specialist studies must be strictly implemented, especially as far as limitation of the activity footprint is concerned.
Bat - Loss of foraging habitat	• Bat foraging habitat will be destroyed during construction; however, the relative footprint is small.	• Adhere to the sensitivity map criteria. Rehabilitate cleared vegetation where possible at areas such as laydown yards. The

Environmental Aspect	Potential Impact during Construction	Mitigation
by clearing of vegetation.		ECO on site during construction must ensure that the sensitivity map is adhered to during construction.
Bat - Roost destruction during earthworks.	• Bat roosts in rock crevices may be destroyed during construction, this can cause bat mortalities or permanent disturbances to roosts.	• Avoid No-go areas by adhering to the sensitivity map. The ECO on site during construction must ensure that the sensitivity map is adhered to during construction.
Aquatic - Water quality	• Impact to the water quality in the aquatic feature because of inadequate stormwater management.	• The stormwater outlets associated with the watercourse crossing infrastructure as well as the turbine platforms must make provision for energy dissipators at the mouth of the outlets. This will reduce the risk of erosion and associated siltation which can contaminate the water quality.
Aquatic - Hydrology	• Impact to the hydrological characteristics of the aquatic feature due to changes in the catchment.	• The provision for adequate stormwater management (as described above) as well as the hydraulic structures that have adequate sizes to prevent any damming of water upstream of the structure must be ensured.
Aquatic - Water quality	• Impact to the water quality in the aquatic features because of the leakages from the portable chemical toilets that will be used during construction.	• The following management and mitigation measures must be included into the EMPr Report for the project to limit the potential impacts of leakages from the ablution facilities: o No portable chemical toilets may be placed within 40m of any watercourse or 100m from the edge of any wetland area. o Only portable chemical toilets with a sealed reservoir will be allowed on site. o The capacity of the reservoirs in the portable chemical toilets must be monitored on a daily basis to ensure that they can be serviced timeously. o All removal of the collected sewage waste from the portable chemical toilets must be conducted by a registered service provider for disposal at a municipal wastewater treatment facility.
Aquatic - Water quality	• Impact to the water quality in the aquatic features because of petrochemical spillages from plant and equipment.	• It is assumed that all petrochemical storage facilities will be located within the construction camp, as such, the location of the construction camp may not be located within 40m of the edge of any watercourse or within a 100m of the delineated edge of a

Environmental Aspect	Potential Impact during Construction	Mitigation
		wetland. In addition, the following management and mitigation measures must be included in the EMPr: o All storage containers must be contained in a bunded area that has the capacity of 110% of the total volume of the storage containers. o The bunded area must consist of an impermeable floor as well as walls and be fitted with a valve that can be used to drain any spillages. o If the storage facility will be in use during the rainy season, the bunded area must be rooved to prevent any rainwater entering the bund and reducing its capacity. o The filling of containers, plant, equipment or vehicles from these storage facilities must be done on an impermeable surface to ensure the containment of any possible spillages.
Terrestrial Ecology - Impact on broad-scale ecological processes	• Impacts on broad-scale ecological processes as a result of construction phase activities, including disturbance and habitat loss.	• Locate temporary-use areas such as construction camps and lay-down areas in low sensitivity or previously disturbed areas. • Minimise the development footprint in areas mapped as high sensitivity (i.e. near watercourses and other ecologically significant features). • Clearly demarcate riparian areas near to the development footprint as No-Go areas with appropriate signage and barriers. • Appropriate design of roads and other infrastructure to minimise faunal impacts and allow fauna to pass over, through or underneath these features as appropriate. • 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. • Appropriate design of roads and other infrastructure to minimise faunal impacts and allow fauna to pass over, through or underneath these features as appropriate.

Environmental Aspect	Potential Impact during Construction	Mitigation
		• Monitoring of construction activities to ensure that the development footprint within sensitive areas is restricted to the authorised development footprint.
Terrestrial Ecology - Construction Phase impact on FEPA Subcatchments	• Impacts on ecosystem services within FEPA Priority Subcatchments as a result of construction phase activities, including disturbance and soil erosion.	• 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. • 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.
Terrestrial Ecology - Construction Phase impact on CBAs and ESAs	• Impacts on CBAs and ESAs as a result of construction phase activities, including disturbance and habitat loss.	• The development footprint within the CBAs and ESAs should be minimized as far as possible. • Should access roads, internal cables and overhead lines traverse drainage lines and riparian areas mapped as CBAs these should be microsited by a suitably qualified ecological and aquatic specialist before construction in that area starts to ensure any potential impacts are minimised • Minimise the development footprint as far as possible, which includes locating temporary-use areas such as construction camps and lay-down areas in low sensitivity or previously disturbed areas. The current layout depicts that the substations, camps and lay-down areas are in low sensivity areas, and this is therefore acceptable. • Avoid impact to restricted and specialised habitats such as pans, wetlands and rock pavements. The final development footprint to be authorised should be checked for such sensitive features in the field, such that there is a high degree of confidence that the final layout avoids such features so that significant changes to turbines or roads are not required at the preconstruction phase.
Terrestrial Ecology – Riverine Rabbit - Construction Phase impact on	• Impacts on Riverine Rabbit as a result of construction phase activities, including vehicle collisions, disturbance and habitat loss.	• 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.

Environmental Aspect	Potential Impact during Construction	Mitigation
the Riverine Rabbit		• During construction, driving between sunset and sunrise should be reduced as far possible as this is when Riverine Rabbits are most active and the risk of collisions is highest. • No dogs should be allowed on site and precautions to ensure that there is poaching or other direct faunal disturbance on site should be implemented. • Where any new roads, cabling and/or overhead lines traverse areas mapped as High Riverine Rabbit habitat sensitivity, the route should be microsited by a suitably qualified ecological specialist before construction commences to ensure any potential impacts are minimised. Existing tracks through these areas should be used where present. • There should be a monitoring programme for Riverine Rabbit roadkill during construction that should be used to inform any additional mitigation and avoidance that should be implemented. Should rabbits be killed by traffic, then the traffic management to and from the site should be reviewed in collaboration with the EWT Drylands Programme, to identify additional mitigation and avoidance that should be implemented to further reduce roadkill. • Ensure that riparian areas near to the development footprint are clearly demarcated as no-go areas with appropriate signage and barriers.
Terrestrial Ecology - Karoo Dwarf Tortoise disturbance and habitat loss	• Impacts on Karoo Dwarf Tortoise as a result of construction phase activities, including vehicle collisions, disturbance and habitat loss.	• No turbines to be placed in areas mapped as being of high SEI for the Karoo Dwarf Tortoise. • Any overhead grid lines with associated pylons required within the facility should be of a design that discourages the use of the pylons for nesting by crows. • 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. • Construction staff should remain within the construction footprint and access routes and should not be allowed to wander into the veld.

Environmental Aspect	Potential Impact during Construction	Mitigation
		• No fauna including tortoises should be disturbed or removed from the veld. • No holes or trenches should be left open for extended periods as tortoises may fall in and become trapped. Trenches should have soils ramps present that allow for tortoises and other fauna to escape. Holes should also be checked regularly for tortoises and other fauna that may have fallen in. • Search and Rescue before construction clearing of areas of high-quality habitat withing the development footprint as identified and mapped during a preconstruction walk-through of the development footprint.
Noise	• Potential noise impacts of the proposed development on the identified NSA's during construction.	• Conduct Noise Sensitivity Training for all construction staff where construction takes place close to sensitive receptors. No construction should occur during night-time hours (22:00-06:00). • If possible, piling activities should occur during the hottest part of the day to take advantage of the unstable atmospheric conditions. • Residual Noise Monitoring should be conducted during the construction phase at sensitive NSAs.
Transport - Additional Traffic Generation	• Increase in Traffic	• Ensure staff transport is done in the 'off peak' periods and by bus, if possible. • Stagger material, component, and abnormal loads delivery. • Construction of an on-site batching plant and tower construction to reduce trips.
Transport - Additional Traffic Generation	• Increase of Incidents with pedestrians and livestock	• Upgrade of existing / new access points. • Reduction in the speed of vehicles. • Adequate enforcement of the law. • Implementation of pedestrian safety initiatives. • Regular maintenance of farm fences & access cattle grids. • Construction of an on-site batching plant and tower construction to reduce trips.

Environmental Aspect	Potential Impact during Construction	Mitigation
Transport - Additional Traffic Generation	• Increase in dust from gravel roads	• Upgrade of existing / new access point. • Reduction in the speed of the vehicles. • Construction of gravel roads in terms of TRH20. • Implement a road maintenance program under the auspices of the respective transport department. • Possible use of approved dust suppressant techniques. • Construction of an on-site batching plant and tower construction to reduce trips.
Transport - Additional Traffic Generation	• Increase in Road Maintenance	• Implement a road maintenance program under the auspices of the respective transport department. • Construction of an on-site batching plant to reduce trips.
Transport - Abnormal Loads	• Additional Abnormal Loads	• Ensure abnormal vehicles travel to and from the proposed development in the 'off peak' periods or stagger delivery. • Adequate enforcement of the law.
Transport - Internal Access Roads	• Increase in dust from gravel roads	• Enforce a maximum speed limit on the development. • Appropriate, timely and high-quality maintenance required in terms of TRH20. • Possible use of approved dust suppressant techniques.
Transport - Internal Access Roads	• New / Larger Access points	• Adequate road signage according to the SARTSM. • Approval from the respective roads department.
Visual	• Visual intrusion and potential flicker effect by wind turbines and associated structures and infrastructure on visual receptors.	• Site turbines at least 2 km from any occupied homestead or hospitality/tourism facility, where possible.
Visual	• Visual intrusion by wind turbines and associated structures and infrastructure on visual and landscape receptors.	• Limit area of disturbance for turbine footprint, access roads and construction camp or sites • Suppress dust during construction. • Site turbines at least 2 km from any occupied homestead hospitality/tourism facility, where possible. • Mitigation will already have been implemented by the placement of turbines according to distance from visual receptors. • Limit area of disturbance for access roads, substations and construction camp sites.

Environmental Aspect	Potential Impact during Construction	Mitigation
		• Locate construction camps and all related facilities such as stockpiles, lay-down areas, batching plants in areas already impacted such as existing farmyards or in unobtrusive locations away from the main visual receptors. • Limit access tracks for construction and maintenance vehicles to existing roads where possible. Once established do not allow random access through the veld. • Blend edges of road and platforms with surrounding landscape. • Rehabilitate exposed disturbed areas. • Avoid vegetation stripping in straight lines but rather non-geometric shapes that blend with the landscape. • Limit need for security lighting. • Use non-reflective materials. • Paint all other project infrastructure elements such as operational buildings, support poles etc. a dark colour. • Avoid bright colour/patterns and logos.
Visual	• Visual intrusion by Access Road, Substations and associated structures and infrastructure on visual and landscape receptors.	• Limit area of disturbance for access roads, substations and construction camp sites. • Locate construction camps and all related facilities such as stockpiles, lay-down areas, batching plants in areas already impacted such as existing farmyards or in unobtrusive locations away from the main visual receptors. • Limit access tracks for construction and maintenance vehicles to existing roads where possible. Once established do not allow random access through the veld • Suppress dust during construction. • Blend edges of road and platforms with surrounding landscape • Rehabilitate exposed disturbed areas • Avoid vegetation stripping in straight lines but rather non-geometric shapes that blend with the landscape • Limit need for security lighting • Use non-reflective materials

Environmental Aspect	Potential Impact during Construction	Mitigation
		• Paint all other project infrastructure elements such as operational buildings, support poles etc. a dark colour • Avoid bright colour/patterns and logos
Socio-Economic	• Noise	• Refer to mitigation measures suggested by noise specialist.
Socio-Economic	• Increase in crime	• Ensure that construction workers are clearly identifiable. All workers should carry identification cards and wear identifiable clothing. • Fence off the construction sites and control access to these sites. • Appoint an independent security company to monitor the site. • Encourage local people to report any suspicious activity associated with the construction site through the establishment of a community liaison forum. • Prevent loitering within the vicinity of the construction camp as well as construction sites
Socio-Economic	• Increased risk of HIV infections	• Ensure that an onsite HIV Policy is in place and that construction workers have access to condoms. • Expose workers to health and HIV/AIDS awareness programmes. • Extend the HIV/AIDS programme into the community with a specific focus on schools and youth clubs.
Socio-Economic	• Influx of construction workers	• Communicate the limitation of opportunities created by the project through community leaders and ward councillors. Draw up a recruitment policy in consultation with local leadership and ensure compliance with this policy.
Socio-Economic	• Hazard exposure	• Ensure that all construction equipment and vehicles are maintained. • Ensure that operators and drivers are properly trained and make them aware, through regular toolbox talks, of any risk they may pose to the community. Place specific emphasis on the vulnerable sector of the population such as children and the elderly. • Ensure that fires are lit only in designated areas and that the appropriate safety precautions, such as not lighting fires in strong

Environmental Aspect	Potential Impact during Construction	Mitigation
		winds and completely extinguishing fires before leaving them unattended, are strictly adhered to. • Make staff aware of the dangers of fire during regular toolbox talks.
Socio-Economic – Quality of living	• Disruption of daily living patterns. • Disruptions to social and community infrastructure.	• Ensure that people have access to their properties as well as to social facilities. • Regularly monitor the effect that construction is having on infrastructure and immediately report any damage to infrastructure to the appropriate authority. • Ensure that where communities' access is obstructed that this access is restored to an acceptable state.
Socio-Economic – Economic	• Job creation and skills development	• Wherever feasible, local residents should be recruited to fill semi- and unskilled jobs. • Women should be given opportunities and encouraged to apply for positions. • A skills transfer plan should be put in place at an early stage and workers should be given the opportunity to develop skills which they can use to secure jobs elsewhere post construction.
Socio-Economic – Economic	• Socio-economic stimulation	• A procurement policy promoting the use of local businesses should be put in place and adhered to throughout the construction phase.

13.3.3 Operational Phase

Environmental Aspect	Potential Impact during Construction	Mitigation
Avifaunal	• Mortality of priority species due to collisions with the wind turbines.	• No turbines should be located in the buffer zones around major drainage lines, waterpoints and dams. • Live-bird monitoring and carcass searches should be implemented in the operational phase, as per the most recent edition of the Best Practice Guidelines at the time (Jenkins et al. 2015) to assess collision rates.

Environmental Aspect	Potential Impact during Construction	Mitigation
		• If at any time estimated collision rates indicate unacceptable mortality levels of priority species, i.e., if it exceeds the mortality threshold determined by the avifaunal specialist after consultation with other avifaunal specialists and BirdLife South Africa, additional measures will have to be implemented which could include shut down on demand or other proven measures.
Avifaunal	• Mortality of priority species due to electrocutions on the overhead sections of the internal 33kV cables.	• Underground cabling should be used as much as is practically possible. • If the use of overhead lines is unavoidable due to technical reasons, the Avifaunal Specialist must be consulted timeously to ensure that a raptor friendly pole design is used, and that appropriate mitigation is implemented pro-actively for complicated pole structures e.g., insulation of live components to prevent electrocutions on terminal structures and pole transformers. • Regular inspections of the overhead sections of the internal reticulation network must be conducted during the operational phase to look for carcasses, as per the most recent edition of the Best Practice Guidelines at the time.
Avifaunal	• Mortality due to collisions with the overhead sections of the internal 33kV cables	• Bird flight diverters should be installed on all the overhead line sections for the full span length according to the applicable Eskom standard at the time.
Bat - Bat mortalities during foraging.	• Foraging bats can be killed by colliding with turbine blades, or by suffering barotrauma.	• Avoid No-go areas by adhering to the sensitivity map. Where needed, if indicated through operational monitoring, reducing blade movement at selected turbines and high-risk bat activity times/weather conditions. Acoustic deterrents are developed well enough to be trialled and may be recommended during operational monitoring.
Bat - Bat mortalities during migration.	• Migrating bats influence several ecosystems since they are cave dwelling species, also over a larger area due to the distances that may be travelled. If turbines are placed within a migration path, a larger area and higher diversity of ecosystems may be impacted.	• Avoid No-go areas by adhering to the sensitivity map. Where needed, if indicated through operational monitoring, reducing blade movement at selected turbines and high-risk bat activity times/weather conditions. Acoustic deterrents are developed well enough to be trialled and may be recommended during operational monitoring. Each WEF in a migration path should

Environmental Aspect	Potential Impact during Construction	Mitigation
		apply appropriate mitigation measures to ensure that each facility's bat mortalities are below a sustainable threshold.
Bat - Increased bat mortalities due to light attraction and habitat creation.	• Floodlights and other lights at turbine bases or nearby buildings, will attract insect eating bats and therefore significantly increase the likelihood of these bats being impacted on by moving turbine blades. Habitat creation in the roofs of nearby buildings can cause a similar increased risk factor.	• During the planning phase for wind farm it must become mandatory to only use lights with low sensitivity motion sensors that switch off automatically when no persons are nearby, to prevent the creation of regular insect gathering pools. This applies to the turbine bases (if applicable) and other infrastructure/buildings. Aviation lights should remain as required by aviation regulations. Floodlights should be down-hooded and where possible, lights with a colour (lighting temperature) that attract less insects should be used. • Bi-annual visits to the facility at night must be conducted for the operational lifetime of the facility, to assess the lighting setup and whether the passive motion sensors are functioning correctly. The bat specialist conducting the operational bat mortality monitoring must conduct these visits to site during night-time to assess the placement and setup of outside lights on the facility. When lights are replaced and maintenance on lights is conducted, these mitigation measures must be consulted.
Aquatic - Hydrology	• Impact to the hydrological characteristics of the aquatic feature due to changes in the catchment	• The stormwater outlets associated with the infrastructure associated with the Klipkraal WEF must make provision for energy dissipators at the mouth of the outlets. This will reduce the risk of erosion and associated siltation which can contaminate the water quality. • In addition, provision must be made for adequate stormwater management (as described above) as well as the adequate sizing of the hydraulic structures that will be used for the watercourse crossings to prevent any upstream damming by the structure. These hydraulic structures will also need to be monitored on a regular basis to ensure that they are free draining and have no blockages that can cause damming on the upstream side.
Aquatic - Water quality	• Impact to the water quality in the aquatic features because of inadequate stormwater management.	• The stormwater outlets associated with the infrastructure associated with the Klipkraal WEF must make provision for energy dissipators at the mouth of the outlets. This will reduce

Environmental Aspect	Potential Impact during Construction	Mitigation
		the risk of erosion and associated siltation which can contaminate the water quality. • In addition, provision must be made for adequate stormwater management (as described above) as well as the adequate sizing of the hydraulic structures that will be used for the watercourse crossings to prevent any upstream damming by the structure. These hydraulic structures will also need to be monitored on a regular basis to ensure that they are free draining and have no blockages that can cause damming on the upstream side.
Aquatic - Water quality	• Impact to the water quality in the aquatic features as a result of leakages from vehicles and plant moving on the site.	• As the majority of the vehicles, plant and equipment that will travel within the site will be associated with the Klipkraal WEF, the regular management and maintenance of these vehicles, plant and equipment must be ensured to limit the risk of any leakages.
Aquatic - Water quality	• Impact to the water quality in the aquatic features because of petrochemical spillages from petrochemical storage areas within the site.	• It is assumed that all petrochemical storage facilities will be located within the operational facility, as such, the location of this facility may not be located within 40m of the edge of any watercourse or within a 100m of the delineated edge of a wetland. In addition, the following management and mitigation measures must be included in the EMPr: ○ All storage containers must be contained in a bunded area that has the capacity of 110% of the total volume of the storage containers. ○ The bunded area must consist of an impermeable floor as well as walls and be fitted with a valve that can be used to drain any spillages. ○ If the storage facility will be in use during the rainy season, the bunded area must be rooved to prevent any rainwater entering the bund and reducing its capacity. ○ The filling of containers, plant, equipment or vehicles from these storage facilities must be done on an impermeable surface to ensure the containment of any possible spillages.

Environmental Aspect	Potential Impact during Construction	Mitigation
Aquatic - Water quality	• Impact to the water quality in the aquatic features as a result of leakages from the sanitation infrastructure servicing the operations.	• It is understood that provision has been made in the project design for a septic tank or soak-away-system. It is suggested that the design should be finalised with a septic tank system that is serviced on a regular basis by a registered service provider which will significantly limit the risk of contamination on the site. The septic tank must be monitored on a regular basis to ensure that it is cleared before it spills into the environment. • The collected sewage must be disposed of at a municipal sewage treatment facility.
Terrestrial Ecological - Operational Phase impact on CBAs and ESAs	• Impacts on CBAs and ESAs during operation as a result of maintenance activities and turbine noise.	• Adhere to the open space management plan which makes provision for the favourable management of the facility and the surrounding area for fauna. • A log should be kept detailing and fauna-related incidences or mortalities that occur on site, including roadkill, electrocutions etc. These should be reviewed annually and used to inform operational management and mitigation measures.
Terrestrial Ecological - Operational Phase impact on FEPA Subcatchments	• Impacts on ecosystem services within FEPA Priority Subcatchments as a result of presence and operation of the WEF.	• 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. • All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. • There should be follow-up rehabilitation and revegetation of any remaining bare areas with indigenous perennial shrubs, grasses and trees from the local area. • Alien management at the site should take place according to the Alien Invasive Management Plan. • 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. • Woody aliens should be controlled on at least an annual basis using the appropriate best-practice alien control techniques as determined by the species present.

Environmental Aspect	Potential Impact during Construction	Mitigation
Terrestrial Ecological - Operational Phase impact on broad-scale ecological processes	• Impacts on broad-scale ecological processes as a result of operational phase activities, including disturbance turbine noise.	• All service vehicles on site should adhere to a low speed limit on site. Heavy vehicles should be restricted to 30km/h and light vehicles to 40km/h. • Service staff should remain within the wind farm footprint areas and access routes and should not be allowed to wander into the veld. • No fauna including tortoises should be disturbed or removed from the veld. • A log should be kept detailing and fauna-related incidences or mortalities that occur on site, including roadkill, electrocutions etc. These should be reviewed annually by the Environmental Officer and used to inform operational management and mitigation measures.
Terrestrial Ecology - Operational Phase impact on the Riverine Rabbit	• There would potentially be impact on Riverine Rabbits at the site during operation due to operational activities (vehicles/disturbance) as well as turbine noise.	• A Riverine Rabbit Monitoring Programme should be implemented at the site to evaluate the post-construction impact of the development on the Riverine Rabbit as well as other key fauna at the site. As there is some potential for noise and disturbance-related impacts on Riverine Rabbits, the development presents a clear opportunity to evaluate the degree to which wind farms are compatible with the maintenance and conservation of Riverine Rabbit populations within their boundaries. The monitoring programme should be conducted with input from EWT and should include preconstruction monitoring to establish a reliable baseline of Riverine Rabbit abundance and distribution at the site. This should be followed by matched post-construction monitoring to evaluate the potential negative impacts on the Riverine Rabbit population. The exact duration and frequency of monitoring would need to be determined based on the number of cameras to be used and the desired precision and statistical power to be obtained. • The monitoring should include a feedback mechanism to use these findings to improve future wind energy development in Riverine Rabbit areas should be developed.

Environmental Aspect	Potential Impact during Construction	Mitigation
		• All incidents involving Riverine Rabbits should be documented and reported to the local EWT field office in Loxton. If Rabbits are killed, the carcases should be collected and provided to EWT for the collection of DNA and other samples.
Terrestrial Ecological - Impact on the Karoo Dwarf Tortoise	• There would potentially be impact on Karoo Dwarf Tortoises at the site during operation due to operational activities (vehicles/disturbance) as well as predation by crows.	• Crow nests along any overhead lines within the site, identified during annual surveys and located within 1km of suitable Karoo Dwarf Tortoise habitat should be removed. • Apply additional mitigation in consultation with a terrestrial ecologist to prevent roadkill mortalities and / or discourage predation of Karoo Dwarf Tortoise by crows if monitoring demonstrates these aspects to be the cause of persistent impacts on this species. • Conduct annual surveys along any overhead lines within the site to census crow nesting sites, and log tortoise carcasses observed along the powerline and especially under any crow nests if present. • If any Dwarf Tortoise mortalities within the site are confirmed it is recommended that structured monitoring of the local Dwarf Tortoise population within the site is initiated using mark-recapture and similar techniques to monitor population stability and structure. Should further declines become evident, then the wind farm should contribute towards active conservation of this species within the site and in the broader area.
Noise	• Potential noise impacts of the proposed development on the identified NSA's during the operational phase.	• Wind Turbine Generators (WTGs) should not be placed within 500m of any occupied Noise Sensitive Area (NSA). • If the night-time noise rating limit for rural areas (35dB(A)) is exceeded, the WTGs could be operated in a lower power mode at certain wind speeds or be relocated further away from an NSA.
Transport - Additional Traffic Generation	• Increase in Traffic	• The increase in traffic for this phase of the development is negligible and will not have a significant impact.
Transport - Additional Traffic Generation	• Increase of Incidents with pedestrians and livestock	• The increase in traffic for this phase of the development is negligible and will not have a significant impact.

Environmental Aspect	Potential Impact during Construction	Mitigation
Transport - Additional Traffic Generation	• Increase in dust from gravel roads	• The increase in traffic for this phase of the development is negligible and will not have a significant impact.
Transport - Additional Traffic Generation	• Increase in Road Maintenance	• The increase in traffic for this phase of the development is negligible and will not have a significant impact.
Transport - Abnormal Loads	• Additional Abnormal Loads	• The increase in traffic for this phase of the development is negligible and will not have a significant impact.
Transport - Internal Access Roads	• New / Larger Access points	• Adequate road signage according to the SARTSM. • Approval from the respective roads department.
Visual	• Visual intrusion and potential flicker effect by wind turbines and associated structures and infrastructure on visual receptors.	• Mitigation will already have been implemented by the placement of turbines according to distance from visual receptors. • Manage need for top of turbine red hazard lighting to only when a plane enters the affected airspace rather than be permanently lit. • Limit need for security lighting.
Visual	• Visual intrusion by wind turbines and associated structures and infrastructure on landscape receptors.	• Mitigation will already have been implemented by the placement of turbines according to distance from visual receptors. • Limit need for security lighting. • Use non-reflective materials. • Paint all other project infrastructure elements such as operational buildings, support poles etc. a dark colour. • Avoid bright colour/patterns and logos.
Visual	• Visual intrusion by Access Road, Substations and Associated structures and infrastructure on visual and landscape receptors.	• Maintain rehabilitated disturbed areas.
Socio-Economic	• Shadow flicker WEF only.	• Refer to mitigation measures suggested by visual specialist.
Socio-Economic	• Electromagnetic field and RF interference.	• Wind turbine mechanisms will be elevated and the risk of EMFs will be minimal. Notwithstanding this, it would be pertinent to regularly monitor the levels of EMFs emitted by the turbines and, if necessary, make the appropriate adjustments to ensure that these levels remain within acceptable parameters.

Environmental Aspect	Potential Impact during Construction	Mitigation
		• Ensure that power lines are not routed in close to (with 300 meters) residential areas to limit the effect off EMFs. • Consult with the appropriate telecommunication authorities to ensure that the telecommunication installations identified within the vicinity of the project are not comprised through RFI.
Socio-Economic	• Hazard exposure.	• Install early detection techniques to avoid or reduce structural damage. • Install lighting protection systems. • Install fire prevention and control measures
Socio-Economic – Quality of living	• Transformation of sense of place.	• Apply the mitigation measures suggested in the Visual Impact Assessment Report. • Communicate the benefits associated with renewable energy to the broader community. • Ensure that all affected landowners and tourist associations are regularly consulted. • A grievance mechanism should be put in place and all grievances should be dealt with transparently. • The mitigation measures recommended in the Heritage and Palaeontology Impact Assessment should be followed.
Socio-Economic – Economic	• Job creation and skills development.	• Implement a training and skills development programme for locals. • Work closely with the appropriate municipal structures regarding establishing a social responsibility programme.
Socio-Economic – Economic	• Socio-economic stimulation.	• Ensure that the procurement policy supports local enterprises. • Establish a social responsibility programme either in line with the REIPPP requirements or equivalent. • Ensure that any trusts or funds are strictly managed in respect of outcomes and funds.

13.3.4 Decommissioning

Environmental Aspect	Potential Impact during Construction	Mitigation
Agricultural	• **Loss of agricultural potential by soil degradation** - Soil can be degraded by impacts in three different ways: erosion; topsoil loss; and contamination. Erosion can occur as a result of the alteration of the land surface run-off characteristics, which can be caused by construction related land surface disturbance, vegetation removal, and the establishment of hard surface areas including roads. Loss of topsoil can result from poor topsoil management during construction related excavations. Hydrocarbon spillages from construction activities can contaminate soil. Soil degradation will reduce the ability of the soil to support vegetation growth. Although the site is susceptible to soil erosion, it can be fairly easily and effectively prevented by standard best practice soil degradation control measures, as recommended and included in the EMPr.	• Apply best practice soil degradation control measures
Avifaunal	• Displacement due to disturbance associated with the dismantling of the wind turbines and associated infrastructure.	• Dismantling activity should be restricted to the immediate footprint of the infrastructure as far as possible. Access to the remainder of the area should be strictly controlled to prevent unnecessary disturbance of priority species. • Measures to control noise and dust should be applied according to current best practice in the industry.
Aquatic - Water quality	• Impact to the water quality in the aquatic features because of the leakages from the portable chemical toilets that will be used during decommissioning.	• The following management and mitigation measures must be included into the EMPr Report for the project to limit the potential impacts of leakages from the ablution facilities: ○ No portable chemical toilets may be placed within 40m of any watercourse or 100m from the edge of any wetland area. ○ Only portable chemical toilets with a sealed reservoir will be allowed on site.

Environmental Aspect	Potential Impact during Construction	Mitigation
		○ The capacity of the reservoirs in the portable chemical toilets must be monitored on a daily basis to ensure that they can be serviced timeously. ○ All removal of the collected sewage waste from the portable chemical toilets must be conducted by a registered service provider for disposal at a municipal wastewater treatment facility.
Aquatic - Water quality	• Impact to the water quality in the aquatic features because of petrochemical spillages from plant and equipment.	• The following management and mitigation measures must be included into the EMPr for the project: ○ All plant and equipment that make use of petrochemical substances must be checked leakages daily before operations commence. ○ All plant and equipment that are found to be leaking must be removed from the property and only returned once the leakages have been addressed. ○ All refuelling of plant and equipment must be conducted over a drip-tray. ○ If any plant or equipment is to be parked on the site, these must be parked at a designated parking area that is 40m away from any watercourse and 100m away from the delineated edge of a wetland. ○ If any spillages from plant or equipment occur, the spill must be immediately contained, the contaminated soils must be collected and bagged in impermeable bags and stored on site to be removed and disposed of by a registered service provider. For this purpose, the presence of spill-kits on site for the duration of the decommissioning phase is imperative.
Aquatic - Water quality	• Impact to the water quality in the aquatic features as a result of leaking petrochemical storage facilities.	• It is assumed that all petrochemical storage facilities will be located within the construction camp, as such, the location of the construction camp may not be located within 40m of the edge of any watercourse or within a 100m of the delineated edge of a wetland. In addition, the following management and mitigation measures must be included in the EMPr:

Environmental Aspect	Potential Impact during Construction	Mitigation
		○ All storage containers must be contained in a bunded area that has the capacity of 110% of the total volume of the storage containers. ○ The bunded area must consist of an impermeable floor as well as walls and be fitted with a valve that can be used to drain any spillages. ○ If the storage facility will be in use during the rainy season, the bunded area must be rooved to prevent any rainwater entering the bund and reducing its capacity. ○ The filling of containers, plant, equipment or vehicles from these storage facilities must be done on an impermeable surface to ensure the containment of any possible spillages.
Terrestrial Ecological – Decommissioning Phase impact on the Riverine Rabbit	• Impacts on Riverine Rabbit as a result of decommissioning phase activities, including vehicle collisions, disturbance	• 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. • During decommissioning, driving between sunset and sunrise should be reduced as far possible as this is when Riverine Rabbits are most active and the risk of collisions is highest. • No dogs should be allowed on site and precautions to ensure that there is poaching or other direct faunal disturbance on site should be implemented. • Where any roads, cabling and/or overhead lines traverse areas mapped as High Riverine Rabbit habitat sensitivity, any remaining open and disturbed areas after decommissioning should be rehabilitated with local plant species appropriate for the affected habitat. • Should rabbits be killed by traffic, then the traffic management to and from the site should be reviewed in collaboration with the EWT Drylands Programme, to identify additional mitigation and avoidance that should be implemented to further reduce roadkill. • Ensure that riparian areas near to the development footprint are clearly demarcated as no-go areas with appropriate signage and barriers.

Environmental Aspect	Potential Impact during Construction	Mitigation
Terrestrial Ecological – Decommissioning Phase impact on the Karoo Dwarf Tortoise	• Impacts on Karoo Dwarf Tortoise as a result of decommissioning phase activities, including vehicle collisions, disturbance.	• 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. • Decommissioning staff should remain within the power line footprint areas and access routes and should not be allowed to wander into the veld. • No fauna including tortoises should be disturbed or removed from the veld. • No holes or trenches should be left open for extended periods as tortoises may fall in and become trapped. Trenches should have soils ramps present that allow for tortoises and other fauna to escape. Holes should also be checked regularly for tortoises and other fauna that may have fallen in. • No litter or other material from the power line or decommissioning activity should be left lying around as tortoises and other fauna may become trapped in fibres, plastic and other waste material.
Transport - Additional Traffic Generation	• Increase in Traffic	• Ensure staff transport is done in the 'off peak' periods and by bus. • Stagger material, component, and abnormal loads removal. • Construction of an on-site sorter and pressing machine to reduce trips.
Transport - Additional Traffic Generation	• Increase of Incidents with pedestrians and livestock	• Reduction in the speed of vehicles. • Adequate enforcement of the law. • Implementation of pedestrian safety initiatives • Regular maintenance of farm fences & access cattle grids.
Transport - Additional Traffic Generation	• Increase in dust from gravel roads	• Reduction in the speed of the vehicles. • Appropriate, timely and high-quality maintenance required in terms of TRH20. • Possible use of approved dust suppressant techniques. • Implement a road maintenance program under the auspices of the respective transport department.

Environmental Aspect	Potential Impact during Construction	Mitigation
		• Construction of an on-site sorter and pressing machine to reduce trips.
Transport - Additional Traffic Generation	• Increase in Road Maintenance	• Implement a road maintenance program under the auspices of the respective transport department.
Transport - Abnormal Loads	• Additional Abnormal Loads	• Ensure abnormal vehicles travel to and from the proposed development in the 'off peak' periods or stagger delivery. • Adequate enforcement of the law.
Transport - Internal Access Roads	• Increase in dust from gravel roads	• Enforce a maximum speed limit on the development. • Appropriate, timely and high-quality maintenance required in terms of TRH20. • Possible use of approved dust suppressant techniques.
Transport - Internal Access Roads	• New / Larger Access points	• Adequate road signage according to the SARTSM. • Approval from the respective roads department.
Visual	• Visual intrusion and potential flicker effect by wind turbines and associated structures and infrastructure on visual receptors • Visual intrusion by wind turbines and associated structures and infrastructure on visual and landscape receptors • Visual intrusion by Access Road, Substations and Associated structures and infrastructure on visual and landscape receptors	• Remove all project components from site. • Rip all compacted hard surfaces such as platforms, words areas, access and service roads etc. and reshape to blend with the surrounding landscape. • Rehabilitate/revegetate all disturbed areas to visually the original state by shaping and planting.
Social-Economic	• Job loss	• Major social impacts associated with decommissioning phase are linked to the loss of jobs and associated income. As part of the decommissioning phase, it would likely involve the disassembly and replacement of existing components with more modern technology therefore creation of additional construction type jobs although limited. It is recommended that the implementation of a reskilling, job placement, retrenchment and downscaling programme be implemented.

13.3.5 Cumulative

There are no other WEF projects located within a 35km radius of the Klipkraal WEF 4 Project besides the other Klipkraal projects that are part of the Klipkraal cluster. Cumulative impacts will be assessed accordingly in the EIA phase.

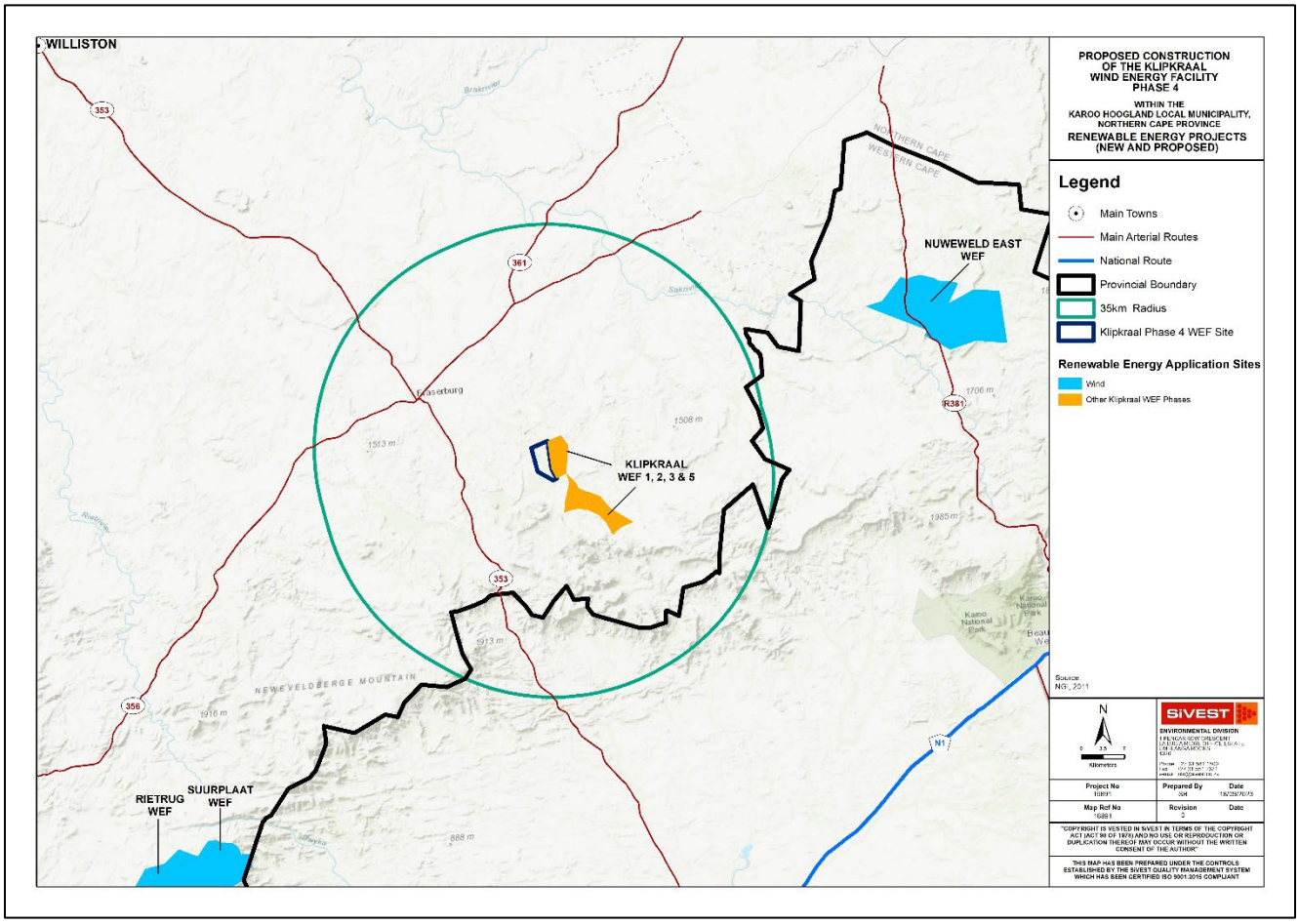

Figure 32: Renewable Energy Projects within 35km of the Klipkraal WEF 4

13.3.6 Comparative Assessment of Alternatives

Site layout alternatives will not be comparatively assessed, but rather a single layout will be refined as additional information becomes available throughout the EIA process (e.g. specialist input, additional site surveys, and ongoing stakeholder engagement). All constraints identified by the respective specialists are being considered and the layout is being refined to avoid all no-go areas.

The development area presented in the Scoping Report has been selected as a practicable option for the Klipkraal WEF 4 considering technical preference and constraints, as well as initial no-go layers informed by the relevant specialist during the screening studies.

13.4 Concluding statement for preferred alternative

No activity alternatives are being considered. Renewable Energy development in South Africa is highly desirable from a social, environmental and development point of view. Wind energy installations are more suitable for the site because of the high wind resource. The choice of technology selected for the Klipkraal WEF 4 was based on environmental constraints as well as technical and economic considerations.

The preliminary layout has been assessed by the specialists in their respective specialist studies. All constraints identified to date as indicated in the sensitivity mapping (**Figure 39**) were taken into account and the turbines shifted where necessary to inform the proposed turbine layout for the Klipkraal WEF 4 (**Figure 40** below). This layout will be taken forward for assessment in the DEIR phase.

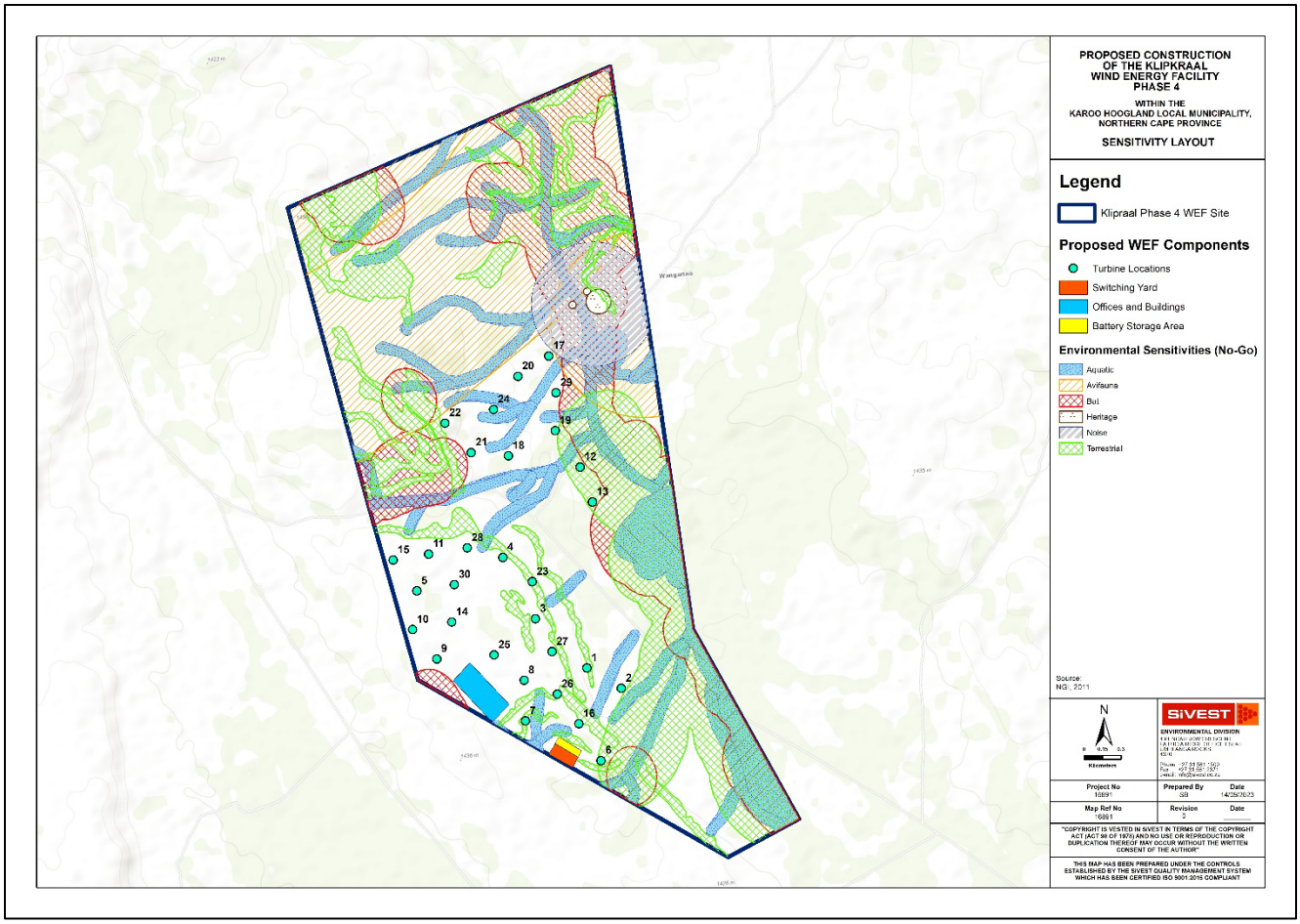

Figure 33: Preliminary Layout with sensitivities

All recommended buffers provided by the specialists in their respective assessments (described in **Section 8**) are incorporated into the environmental sensitivity layers included in the layout above. The sensitivity layers are made up of the buffers prescribed by the specialists.

14. PLAN OF STUDY FOR EIA

This Plan of Study, which explains the approach to be adopted to conduct the EIA for the proposed Klipkraal WEF 4 Project was prepared in accordance with Appendix 2 of GN No. 326 (7 April 2017).

The purpose of the EIA Phase is to:

- *determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;*
- *describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the development footprint on the approved site as contemplated in the accepted scoping report;*

- *identify the location of the development footprint within the approved site as contemplated in the accepted scoping report based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;*
- *determine the—*
    - *(i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and*
    - *(ii) degree to which these impacts—*
        - *(aa) can be reversed;*
        - *(bb) may cause irreplaceable loss of resources, and*
        - *(cc) can be avoided, managed or mitigated;*
- *identify the most ideal location for the activity within the development footprint of the approved site as contemplated in the accepted scoping report based on the lowest level of environmental sensitivity identified during the assessment;*
- *identify, assess, and rank the impacts the activity will impose on the development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity;*
- *identify suitable measures to avoid, manage or mitigate identified impacts; and*
- *identify residual risks that need to be managed and monitored.*

The EIA Phase consists of the following processes:

- Undertaking of specialist studies that provide additional information/assessments required to address the issues raised in the Scoping Phase.
- Undertaking of a PPP process where findings of the EIA Phase are communicated and discussed with I&APs and responses are documented.
- An assessment process whereby inputs are presented in an EIA Report that is submitted for approval to DFFE and other authorities.

14.1 Tasks to be undertaken

The EIA report will be informed by the scoping phase. The following steps will be undertaken as part of the EIA phase:

- The proposed final layout will be further investigated in order to avoid or minimize negative impacts and maximize potential benefits;
- Environmental impact statements regarding the potential significance of residual impacts, taking into account proposed mitigation measures will be provided in the EIA;
- An Environmental Management Programme (EMPr) covering construction and decommissioning phases of the proposed development will be prepared. The EMPr will include input from specialists and will incorporate recommendations for mitigation and monitoring.

14.2 Description of alternatives to be considered and assessed

The EIA phase will include a detailed analysis of the proposed layout for the project which will include environmental (with specialist input) and technical evaluations. Any additional alternatives identified through this process will be reported on in the EIA report.

14.2.1 Location Alternatives

As mentioned in Section 12.1.1, no location alternatives are being considered for the Klipkraal WEF 4 as these sites were selected prior to the commencement of the EIA Process.

14.2.2 Layout Alternatives

The preliminary layout that was prepared for the Klipkraal WEF 4 has been assessed by specialists to identify potential impacts that may arise from the development. Based on the findings of the specialists to date and the potential impacts identified, the preliminary layout has been updated to include constraints and the layout has been amended accordingly. The layout will also be further refined based on the outcomes of the public participation process of the Scoping phase and thereafter further assessed in the DEIR phase.

14.2.3 Technology Alternatives

No technology alternatives will be considered. The choice of turbine to be used will ultimately be determined by technological and economic factors at a later stage.

14.2.4 No-go Alternatives

The option of not implementing the activity, or the “no-go” alternative and associated potential impacts, have been discussed in **Section 13**. Based on the specialist’s assessment, no significant impacts have been identified from an ecological/bat/avifaunal perspective should the development of the WEF not proceed. There is however a significant negative impact from a social perspective for the no-go alternative.

14.3 Specialist Studies

The following specialist studies have been undertaken for the project and the significant environmental aspects identified will be further assessed in the EIA Phase:

- Agricultural Assessment;
- Avifaunal Assessment;
- Bat Assessment;
- Aquatic/Freshwater Assessment;
- Terrestrial Ecological Assessment;
- Heritage Assessment;
- Noise Assessment;
- Transport Assessment;
- Visual Assessment;
- Social Impact Assessment;

The findings of the specialist studies have been included in the Scoping Phase of this project. The associated Impact Assessment tables will be included in the draft EIA report. Should the need for additional specialist studies be identified through the consultation process, these studies will be commissioned in the EIA Phase to further advise on the potential impacts that may arise from the proposed development. The specialist studies may identify further opportunities and constraints as associated with the site and the proposed development.

The specialists have undertaken the following scope of work:

Table 16: Specialist Scope of Work

Scope of Work
Specialists are requested to provide one (1) scoping phase report and / or compliance statement that provides an assessment of the proposed Klipkraal WEF 4 and a separate report for the Grid connection infrastructure. During the EIA phase, specialists will be required to update the scoping phase specialist report to provide a review of their findings in accordance with revised site layouts, to assess and rate significant impacts with mitigation measures and to address any comments or concerns arising from the public participation process. The specialist report must include an explanation of the terms of reference (TOR) applicable to the specialist study. The gazetted Environmental Assessment Protocols of the NEMA EIA Regulations (2014, as amended), prescribes Procedures for the Assessment and Minimum Criteria for Reporting on the Identified Environmental Themes in terms of Sections 24(5)(A) and (H) and 44 of the National Environmental Management Act, 1998. These procedures must be considered. Where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations; and any relevant legislation and guidelines deemed necessary Where relevant, a table must be provided at the beginning of the specialist report, listing the requirements for specialist reports in accordance with Appendix 6 of the EIA Regulations, 2014 (as amended) and cross referencing these requirements with the relevant sections in the report.

14.4 EIA methodology

The Environmental Impact Assessment (EIA) Methodology assists in evaluating the overall effect of a proposed activity on the environment. Determining of the significance of an environmental impact on an environmental parameter is determined through a systematic analysis. Refer to **Appendix 7** for the EIA methodology to be adopted.

14.5 Consultation with Competent Authority

SiVEST will consult with DFFE as follows:

- The Final Scoping Report will be submitted to DFFE for approval.
- Notify I&Aps and key stakeholders of acceptance of Final Scoping Report

- The Draft EIA report will be made available for comment to I&Aps, key stakeholders and the authorizing authority.
- After the Draft EIA report has been made available for comment within the public domain, comments will be incorporated into the Issues and Response Report and Final EIA Report for submission to DFFE.
- Notify I&APs of the decision.
- Apart from the above-mentioned occasions, further consultation with authorities will occur whenever necessary.

14.6 Public Participation Process to be undertaken for the EIA Phase

Public participation forms a critical component of the EIA process, as it provides all interested and affected parties with an opportunity to learn about a project, but more importantly to understand how a project will impact on them. The following will be undertaken during the EIA Phase.

14.6.1 Updating of IAP Database

The I&AP database will be updated as and when necessary during the execution of the EIA.

14.6.2 Review of Draft EIA Report

A 30-day period will be provided to IAPs to review the Draft EIA Report. Copies of the Draft EIA Report will be provided to the regulatory and commenting authorities as well. The Draft EIA Report will also be available for download on a link to be provided.

All parties on the IA&P database will be notified via email, sms or fax of the opportunity to review the Draft EIA Report, the review period and the process for submitting comments on the report.

All comments received from I&APs and the responses thereto will be included in the final EIA Report, which will be submitted to DFFE.

14.6.3 Public meetings/consultation

No public meetings are proposed. Virtual meetings if required will be conducted using an appropriate platform agreeable to all parties (such as Zoom, Skype or Microsoft Teams).

14.6.4 Inclusion of comments into the Final EIA

A Comments and Responses Report will be compiled and included in the EIA Report, which will record the date that issues were raised, a summary of each issue, and the response of the team to address the issue. The Final EIA report with all comments included will be submitted to DFFE for review and approval.

14.6.5 Notification of Environmental Authorisation

All I&APs will be notified via email, sms or fax after having received written notice from DFFE on the final decision on the application. These notifications will include the process required to lodge an appeal, as well as the prescribed timeframes in which documentation should be submitted.

15. EAP DECLARATION

The EAP declarations, CV's and qualifications for the EAP's responsible for the preparation of this report have been attached in **Appendix 1**.

16. INFORMATION REQUIRED BY CA (IF APPLICABLE)

Currently n/a.

17. CONCLUSION

This Scoping Report was compiled to meet the requirements of NEMA, with the primary aim of informing I&APs of the proposed project and allowing for an opportunity to comment on the project and the plan of study for the EIA Phase.

This Scoping Report has covered activities and findings related to the scoping process for the proposed Klipkraal WEF 4 Project. Professional experience, specialist knowledge, relevant literature and local knowledge of the area have all been used to identify the potential issues associated with the proposed project. There is no guarantee that all the potential impacts arising from the proposed WEF project have been identified within the scoping phase, however the report provides an outline of the established measures that were taken to best identify all the potential impacts.

Based on the findings of the specialists and the potential impacts identified, the preliminary layout has been updated to include constraints. This layout will be further refined based on the outcomes of the public participation process of the Scoping phase. The final layout will then be assessed by all specialists in the EIA Phase. At this stage based on specialist findings and recommendations, no fatal flaws have been identified and the project may proceed to the EIA phase.

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