

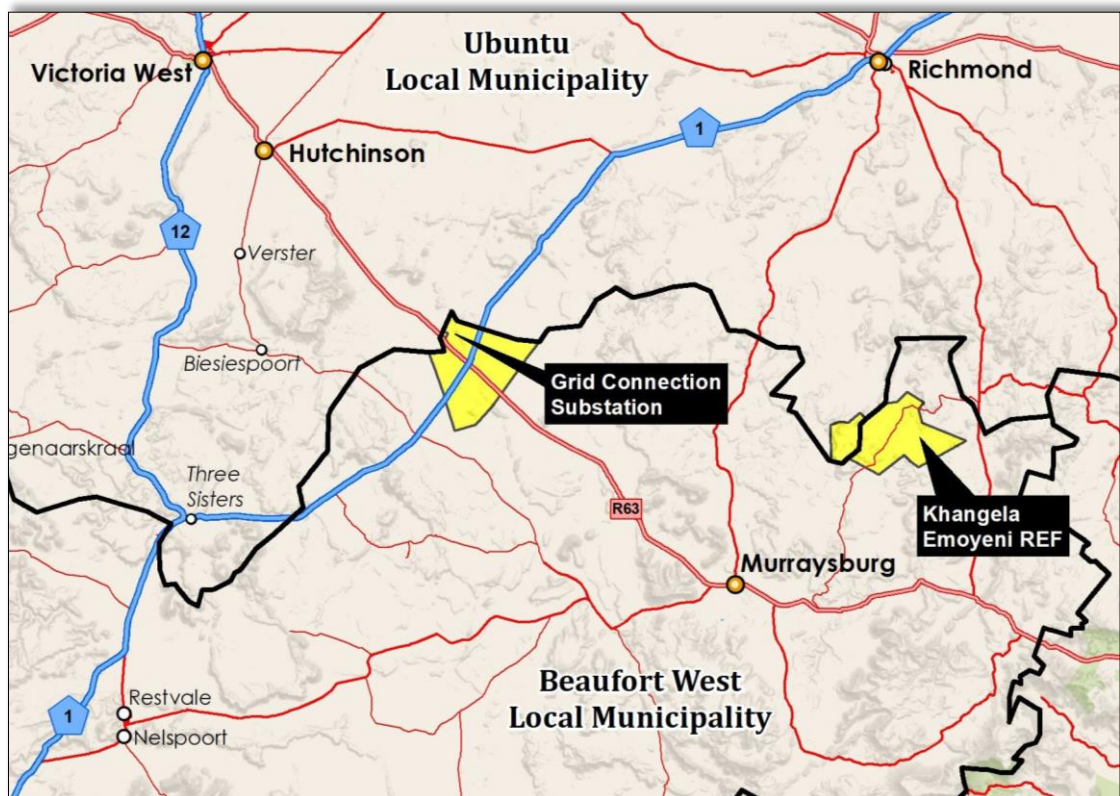
Khangela Emoyeni Renewable Energy Facility :

Application for :

- Rezoning

of :

- Portion 6 of Farm Klipplaar No. 109, Richmond Division



Report Number : 1755E/01

July 2021

Prepared By :

Johan van der Westhuysen



P O Box 27757, Greenacres, Port Elizabeth, 6057

117 Cape Road, Mill Park, Port Elizabeth, 6001

Tel: 041 374 3980 - Fax: 041 374 3984

Email: info@udec.co.za

Report Title :	Khangela Emoyeni Renewable Energy Facility : Application for : <ul style="list-style-type: none"> • Rezoning of : <ul style="list-style-type: none"> • Portion 6 of Farm Klipplaat No. 109
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Prepared By :	Johan van der Westhuysen (Pr. Plan A/923/1996)
Contact Number :	041 374 3980 083 321 2299
Email Address :	info@udec.co.za johan@udec.co.za

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8. Final Amendment Report (2020)
9. Environmental Authorisation & Amendments
10. Department of Mineral Resources & Energy Approval
11. SA Civil Aviation Authority Approval
12. Soil, Land Use, Land Capability and Agricultural Potential Survey (2015)

NOTE : Copies of Specialist Studies can be made available on request

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Chapter 1 : Background

1.1 The Applicant

Urban Dynamics Eastern Cape (UDEC) has been commissioned by Emoyeni Wind Farm Project (Pty) Ltd, on behalf of the owners of various farms, 21 km north-west of Murraysburg to prepare and submit an application to obtain the necessary development rights to develop a wind farm for the generation of renewable energy, known as Khangela Emoyeni Renewable Energy Facility (REF).

Refer to Annexure 2 : Powers of Attorney

Urban Dynamics forms part of a professional consultant team that conducted various specialist studies, supplied supporting documentation and undertook detailed site analysis and design. The detailed professional work done will enable the Municipality to take an informed decision and grant the required development rights to implement this renewable energy project.

1.2 The Project & Location

The Khangela Emoyeni Renewable Energy Facility (REF) is situated in the Beaufort West (Western Cape) and Ubuntu (Northern Cape) Municipalities. This will require 2 separate applications in terms of the relevant By-laws of the Municipalities. The Khangela Emoyeni Renewable Energy Facility (REF), although situated in 2 municipal areas, will be managed as a single wind farm.

Khangela Emoyeni Renewable Energy Facility (REF), comprising of 5 farm portions, is situated approximately 21 km north-west of Murraysburg. One farm portion is situated in the Ubuntu municipal area (Northern Cape) and 4 farm portions are situated in the Beaufort West municipal area (Western Cape).

The total REF facility comprises of ±7813,8210 ha with potentially up to 33 wind turbines, access roads, power lines, support infrastructure, substation and buildings (appurtenant structures). The facility will have an export capacity of up to 140 MW and electricity will be evacuated to the Eskom Grid.

The REF will connect to the ESKOM grid via a substation on Remainder of the farm Schietkuil No. 3, situated in the Western Cape.

Refer to Map 1 : Regional Locality

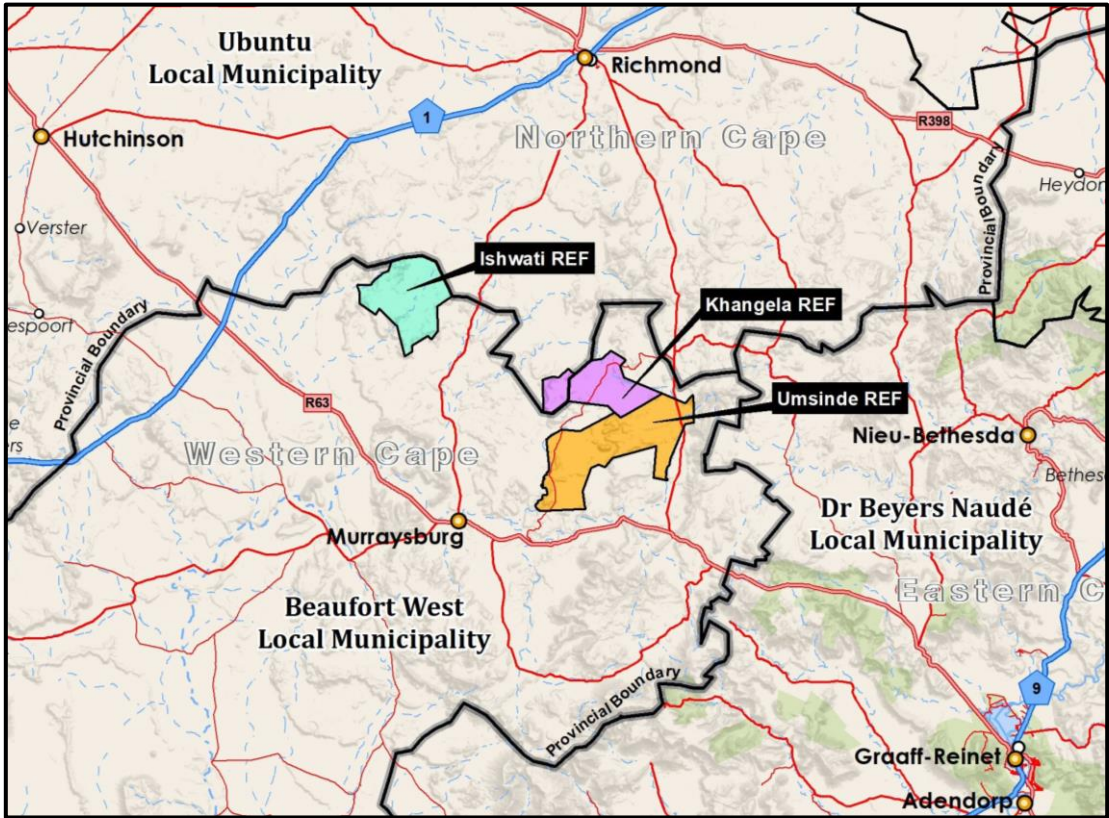
Refer to Map 2 & 3 : Property Description & Cadastral Information

The Khangela Emoyeni REF is part of a cluster of three Renewable Energy Facilities that is proposed by Windlab (South Africa) in the Western and Northern Cape, between Murraysburg in the south and Richmond in the north.

The developments are :

- Ishwati Emoyeni REF
- Khangela Emoyeni REF (this application)
- Umsinde Emoyeni REF.

Separate applications will be submitted for these developments to ensure SPLUMA compliance.

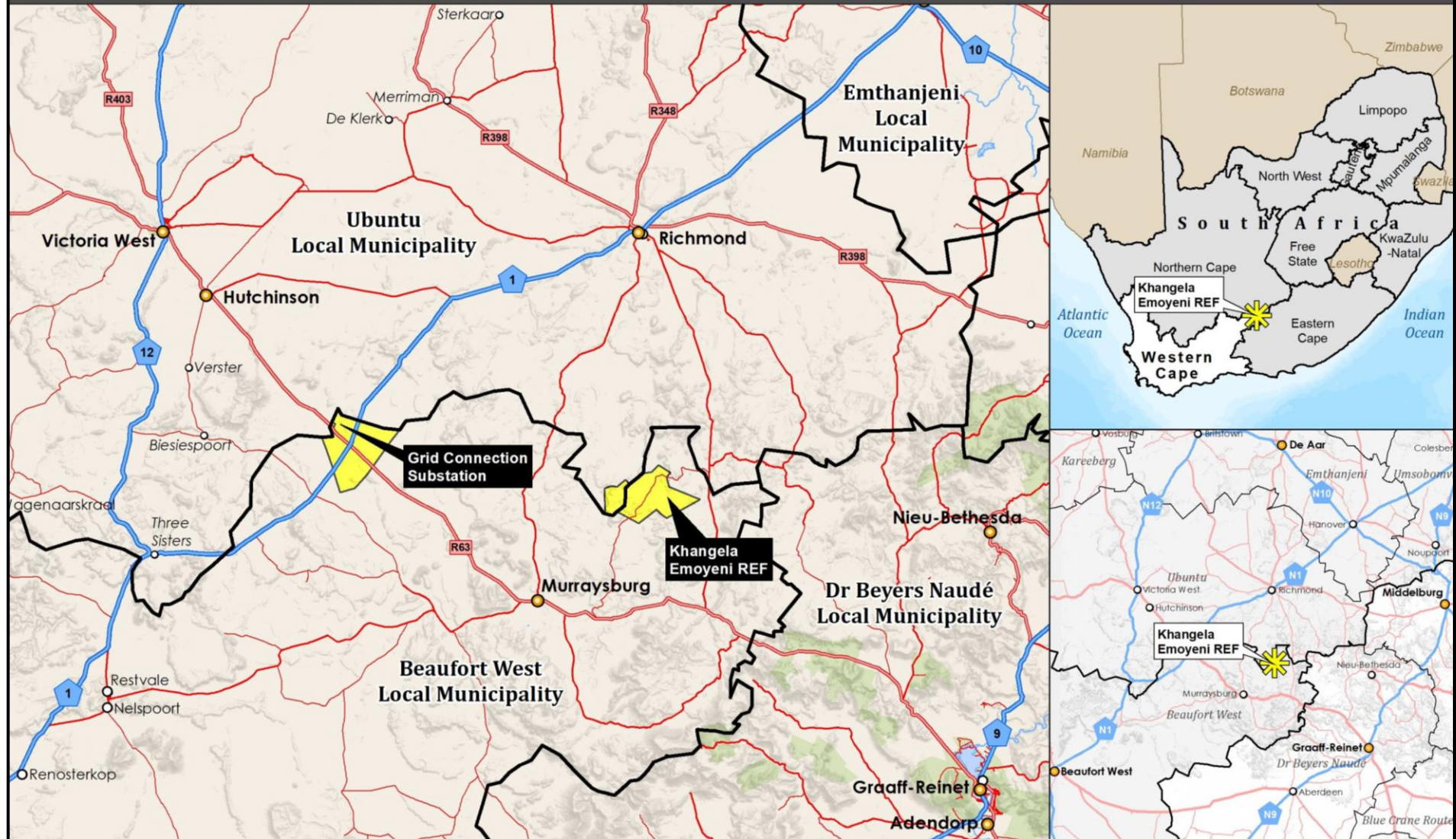


KHANGELA EMOYENI RENEWABLE ENERGY FACILITY

1

REGIONAL LOCALITY

Map No.:



Map 1 : Regional Locality

1.3 Property Descriptions, Ownership, Title Conditions & Bonds

The table below lists the affected property, in the Ubuntu Municipality, including property ownership, Title Deed number, area and deed search results.

Khangela Emoyeni REF :

Property Description	Owner	Title Deed No.	Area (ha)	Restrictive Conditions
Portion 6 of Farm Klipplaat No. 109	Alwyn Petrus van der Merwe Trustees	T4917/1964	1476,3785	None

The following properties are situated in the Beaufort West municipal area (Western Cape) :

- Portion 2 of Farm Swavel Kranse No. 28
- Portion 4 of Farm No. 26
- Portion 2 of Farm De Hoop No. 30
- Remainder of Farm Swavel Kranse No. 28
- Remainder of Farm Schietkuil No. 3

An application for Consent Use : Renewable Energy Facility and Consent Use : Utility Service (Substation) for these properties has been submitted to the Beaufort West Municipality.

Refer to Annexure 3 : Deeds Office Enquiry

Refer to Annexure 4 : Title Deed

Refer to Annexure 5 : Conveyancing Certificate

Refer to Annexure 6 : Cadastral Diagram

2

Map No.:

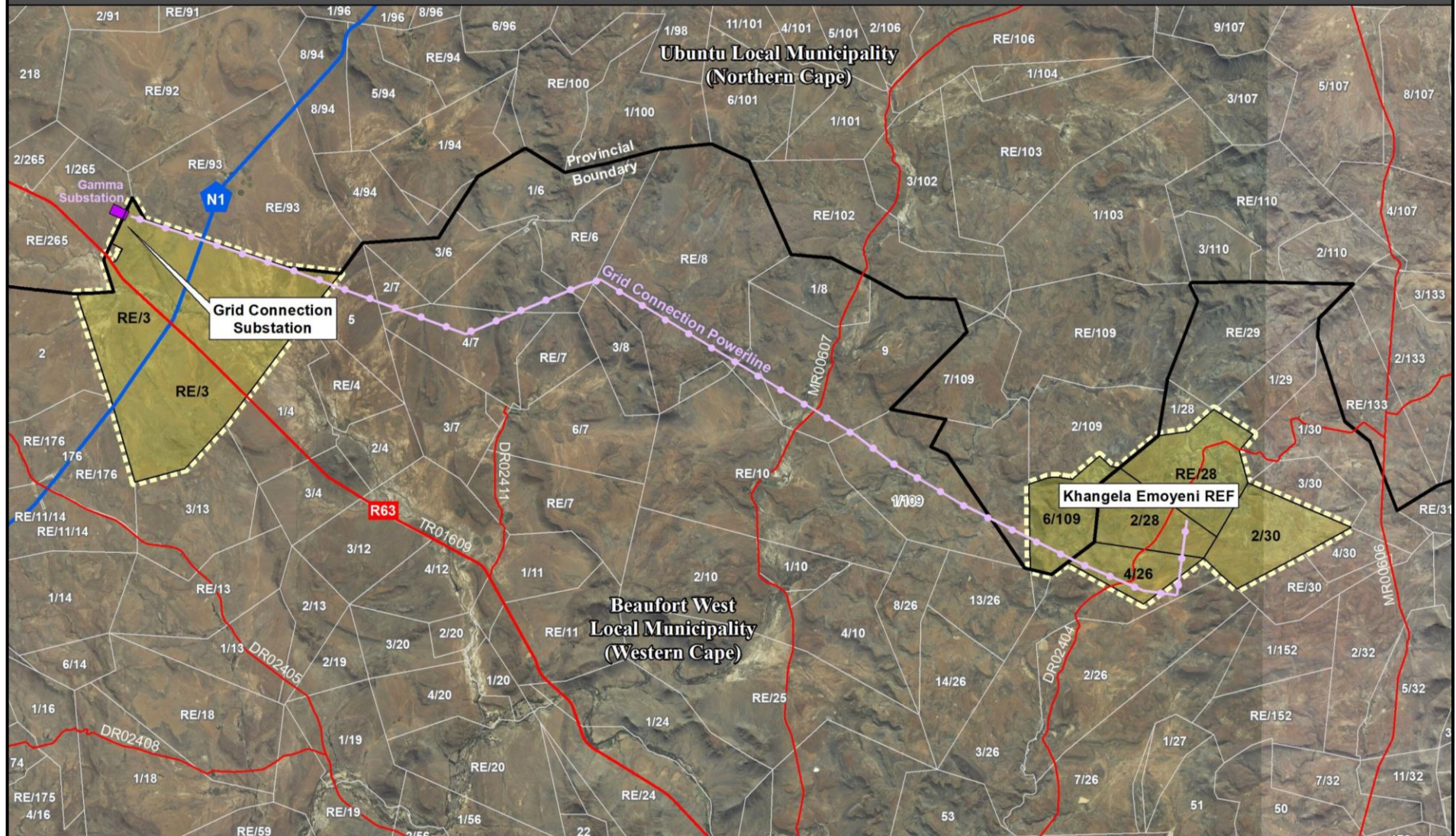


KHANGELA EMOYENI RENEWABLE ENERGY FACILITY

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GRID CONNECTION PROPERTIES AND SERVITUDE

Map No.:



Map 3 : Property Description and Cadastral Information : Aerial

1.4 The Application

1.4.1 Objective

The objective of this application is to obtain the necessary development rights in terms of the Spatial Planning and Land Use Management By-Law for Ubuntu Municipality to implement, construct, operate and maintain a wind energy facility and associated infrastructure on the subject land portions.

The location of the wind farm site has been identified through a detailed wind data capturing and assessment process, which indicates that the site has an exceptional wind regime. The layout and siting of wind turbines was refined through an iterative process with input from various environmental and technical specialists as part of the design and Environmental Impact Assessment processes.

1.4.2 Legislation

Land use rights within the Ubuntu Municipality are managed through the :

- Spatial Planning & Land Use Management Act, 2013 (Act 16 of 2013) (SPLUMA)
- Spatial Planning and Land Use Management By-Law for Ubuntu Municipality (2015)
- Scheme Regulations for Ubuntu Municipality (2009)

The relevant legislation, as indicated above, outlines the application procedures and processes, basis for decision making and various administrative arrangements through the application cycle, i.e. pre-application consultation, application, public participation, Municipal Planning Tribunal (MPT) decision making and conditions of implementation.

In order to construct, operate and maintain the Khangela Emoyeni Renewable Energy Facility, development approval is required for the following :

The relevant legislation as indicated above, outlines application procedures and processes, basis for decision making and various administrative arrangements through the application cycle, i.e. pre-application consultation, application, public participation, Municipal Planning Tribunal (MPT) decision making and conditions of implementation.

In order to construct, operate and maintain the Khangela Emoyeni REF, development approval for the following are required :

▣ Rezoning of the farm

A renewable energy facility, by its nature and location in the rural area, functions in harmony with the surrounding agriculture land uses. The agricultural and renewable energy facilities are therefore compatible land uses, in support of each other.

Based on the Table : Primary & Consent Uses (Zoning Scheme Regulations for the Ubuntu Municipality, 2009), Renewable Energy Facilities are not specifically catered for and in these cases, the regulations make provision for a Special Zone : Special Use which is defined as :

"a use which is such, or of which the land use restrictions are such that it is not catered for in these regulations, and of which the uses and land use parameters are fully described by means of the conditions as contained in the special zone".

In order to maintain this interaction between the functioning of the wind farm and the agricultural activity, this application entails rezoning of the farm from Agriculture Zone I (existing zoning) to Special Zone (Agriculture and Renewable Energy Structure). The Rezoning of the farm will further ensure permanent land use rights in support of the construction process, ongoing maintenance and lifecycle of the facility.

Application is not made for Subdivision of individual wind turbine footprint areas.

▣ **Endorsement of Servitudes (Grid Connection Powerlines)**

Servitudes will be registered in favour of ESKOM for the grid connection power line. The Ubuntu Municipality Spatial Planning and Land Use By-laws (2015) makes provision in terms of Section 9 (1) (c) for exemption of infrastructure by a service provider.

A separate request in terms of Section 9 for registering a servitude over various farm portions for the grid connection lines and substation will be submitted to the Ubuntu Municipality.

▣ **Approval of the Site Development Plan**

The relevant Environmental Guidelines, Environmental Authorisation, final IPP Agreements and Government Departments might require final micro-siting and placement of turbines, roads, infrastructure and servitudes. It is anticipated that amendments will be made to the Site Development Plan, prior to construction and this will again be submitted to the Municipality for endorsement.

Refer to Map 4 : Site Development Plan : Khangela Emoyeni REF

1.4.3 Application

Application is submitted for the following :

- ▣ **Rezoning**, in terms of Section 5 of the Ubuntu Municipality Spatial Planning & Land Use Management By-laws (2015), of the following farm from Agriculture Zone I to Special Zone (Agriculture & Renewable Energy Structures) :

- Portion 6 of Farm Klipplaat No. 109, Richmond Division

with development parameters as indicated in **Table 1** and as indicated on the Site Development Plan No. 1755E/SDP dated 07/2021, below.

- ▣ **Endorsement of the Site Development Plan (Plan No. 1755E/SDP dated 07/2021)**, in terms of the Spatial Planning & Land Use Management Act (SPLUMA) and the Municipal Spatial Planning and Land Use Management By-Law (official municipal stamp and signature).

■ **Table 1 : Development Parameters of Khangela Emoyeni REF**, as indicated on the Site Development Plan (SDP) (1755E/SDP dated 07/2021) :

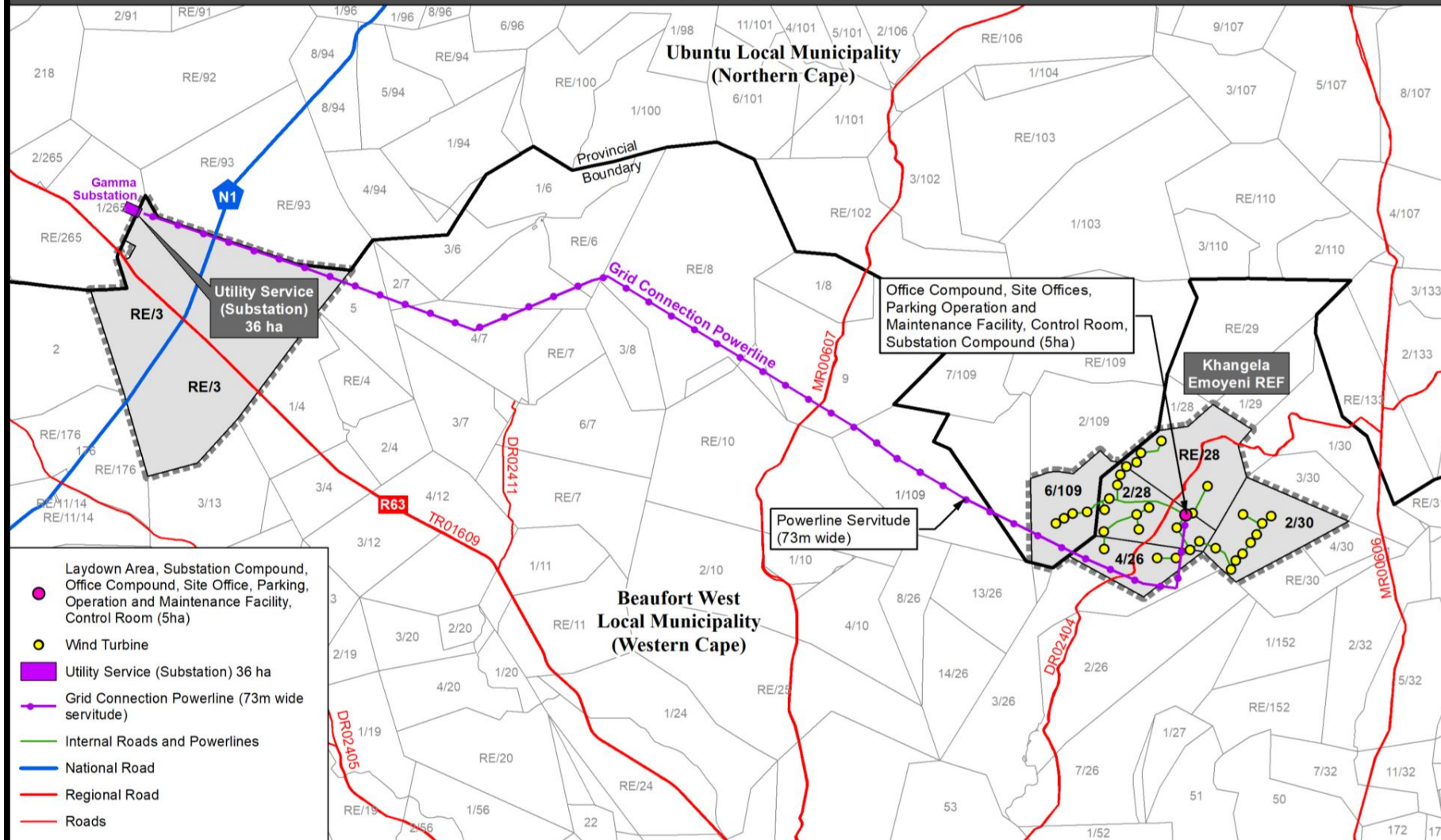
Zoning	Special Purpose	
Permitted Uses	Primary Use : Agriculture Secondary Use : Renewable Energy Structures	
Definitions	<p>Agriculture means the cultivation of crops and plants and/or the breeding of animals, as well as the operation of a game farm on an extensive basis on natural land or veld, stock- or auction pens and at most one residential house and other buildings, and it includes residential units for bona fide labourers, which are reasonably connected with the main agricultural activity on the farm.</p> <p>Renewable Energy Structure means any facility that captures and converts wind into energy for commercial gain irrespective of whether it feeds onto an electricity grid or not and includes administration facilities and any associated infrastructure. Such infrastructure includes, but is not limited to : workshops and stores, offices, site canteen, medical station, laydown areas, batching plants, substations, fire station, access roads, power lines, water supply infrastructure, storage, construction vehicles and equipment, research facilities and guard houses.</p>	
Total Farm Area	1 476,3785 ha	
Appurtenant structures	Office compound, site offices, parking operation and maintenance facility, control room, substation compound (Beaufort West Mun.)	5 ha
	Permanent and construction laydown areas (Beaufort West Mun.)	0,9 ha
Turbines	Ubuntu Mun : 4 turbines Beaufort West Mun. : 29 turbines	
Setback lines	Internal cadastral setback for REF : 0 m External cadastral setback for REF : 100 m	
Height	Hub height : up to 160 m Total height : up to 250m	
Internal Roads	Construction : Up to approximately 9m wide Permanent : Approximately 4m – 6m wide	
Site Access	Access from DR02404	
Grid Connection	Servitude width : 73 m Powerline : 132kV	

KHANGELA EMOYENI RENEWABLE ENERGY FACILITY

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SITE DEVELOPMENT PLAN

Map No.:



Map 4 : Site Development Plan : Khangela Emoyeni Renewable Energy Facility

1.4.4 Cross Boundary Operation

The Khangela Emoyeni REF, although situated in 2 municipal areas, will be managed as a single wind farm. Separate applications and approvals are requested from Beaufort West and Ubuntu Municipalities. The land use management legislation application process and content are basically the same for both Municipalities.

1.4.5 Independent Operation

Paragraph 1.2 indicates that the Khangela Emoyeni REF is part of a cluster of 3 REFs. The 3 REFs will use and share a number of support facilities and infrastructure (i.e. Substation, access roads, connecting power lines, etc.). However, the SPLUMA applications for the 3 REF are structured to function as independent stand-alone applications and approvals. This will create duplicate approvals in some cases, but at the same time, allow individual REFs to operate independently. It is unclear at this stage which of the facilities will be developed.

1.5 Existing Zoning & Land Use

1.5.1 Zoning

In terms of the Zoning Scheme and the Ubuntu Municipality Zoning Register, the property is zoned Agricultural Zone I, permitting development parameters in the Table below:

	Agricultural Zone I
Primary Use	Agriculture
Definition	<i>Agriculture means the cultivation of crops and plants and/or the breeding of animals, as well as the operation of a game farm on an extensive basis on natural land or veld, stock- or auction pens and at most one residential house and other buildings, and it includes residential units for bona fide labourers, which are reasonably connected with the main agricultural activity on the farm.</i>
Building Lines	30 m

1.5.2 Existing Land Use

The Khangela Emoyeni Renewable Energy Facility comprises of 5 farm portions with a total area of 7 813,8210 ha.

The population density of the region is less than 1 person per km², and therefore the site is located in a sparsely populated region of the Western Cape. The environment has remained in a natural state with little or no large-scale development on the subject property. Sheep and goat farming is the predominant land use activity with supporting agricultural infrastructure and homesteads. The study area has a harsh, rugged character with vast expanses of natural and undeveloped landscape. The proposed development area is located at the foot of the Komsberg Mountains on the border of the Western and Northern Cape Provinces in the Moordenaars Karoo.

▣ Climate

Murraysburg like much of the Karoo has a dry arid to semi-arid climate meaning that precipitation is less than the rate of evaporation. Murraysburg experiences hot dry summers with temperatures rarely below 30°C; and mild wet winters with occasional snowfalls.

▣ **Topography**

The landscape of the site is diverse and has a rugged topography with hills, drainage features and more flat areas repeatedly interspersed across the site. The majority of the turbines are located on the flatter open plains of the site which is considered least sensitive habitat.

The overall project area comprise of a varied topography: from high dolerite plateaus and ridges to canyons and plains.

▣ **Soils and agricultural potential**

The entire development site is dominated by shallow and rocky soils as well as extensive rock outcrops. The only areas of significant soil profile development are drainage depressions where eroded soil material accumulates. These areas are also prone to severe erosion.

All the turbine positions are on rocky soil areas in the higher lying parts of the landscape, situated on rocky outcrops. The position of turbines are outside of drainage depressions and therefore areas with deeper and sensitive soils.

The agricultural potential of the site is directly linked to the soils. The shallow and rocky soils are of very low potential and the deeper sandy soils are of medium potential. The latter soils are very sensitive to erosion and due to the rainfall in the area these are only suited to extensive grazing. In very limited areas the deeper drainage depression soils could be suitable for irrigation purposes.

▣ **Vegetation**

According to the national vegetation map (Mucina & Rutherford 2006), only three different vegetation types occur within the study area, Upper Karoo Hardeveld, Eastern Upper Karoo and Southern Karoo Riviere. The site is dominated by Eastern Upper Karoo, which is the most extensive vegetation type in South Africa and forms a large proportion of the central and eastern Nama Karoo Biome. This vegetation type is classified as Least Threatened, and about 2 % of the original extent has been transformed largely for intensive agriculture.

The landscape of the site is diverse and has a rugged topography with hills, drainage features and more flat areas repeatedly interspersed across the site. The majority of the turbines are located on the flatter open plains of the site which is considered least sensitive habitat. However, there are also a number of turbines located on steeper slopes especially within dolerite outcrops. On the steeper slopes access roads and turbines will generate a significant erosion risk and have sensitive features present which include localised habitats such as rock fields and densely-vegetated south-facing slopes. The dolerite outcrops are considered sensitive as these habitats contain high diversity of fauna and flora.

The abundance of plant species of conservation concern is fairly low. Only five such species are known from the area, however *Gethyllis longistyla* which is classified as Rare was observed in the rock fields near one of the wind measuring masts near the eastern margin of the site.

▣ **Wetlands and freshwater**

The development site is located approximately 35 km north-west of the Murraysburg, with the REF site falling within three quaternary catchments of the Gamtoos Water Management area. Several main stem rivers are found within these catchments which form part of the Brak River. Water bodies and aquatic systems are found at the site. Most of the indicated wetlands are man-made systems. Based on this and field observations no natural wetlands would be affected by the proposed REF.

The proposed development from an aquatic vegetation point of view is dominated by species associated with the Nama Karoo vegetation ecosystem. These systems are thus usually devoid of any trees with strict riparian or wetland affiliations and this is due to the largely ephemeral nature of the rivers / water courses within the region.

2

Chapter 2 :

Development Concept and Informants

2.1 Professional Team

The process to obtain the necessary development rights and environmental authorisation are managed and implemented by a team of highly skilled professionals.

Environmental	<i>Argus Consultancy Services and Zutari (Pty) Ltd for amendments</i>
Visual Impact Assessment	<i>Bernard Oberholzer Landscape Architects Meirelles Lawson Burger Architects</i>
Aquatic Ecology	<i>EnviroSci (Pty) Ltd</i>
Terrestrial Ecology	<i>3Foxes Biodiversity Solutions (Pty) Ltd</i>
General Heritage and Archaeology	<i>ACO Associates</i>
Palaeontology Assessment	<i>Natura Viva cc</i>
Avifauna (Bird) Assessment	<i>Arcus Consulting</i>
Bat Assessment	<i>NSS Environmental</i>
Noise Assessment	<i>Enviro-Acoustic Research</i>
Town Planning	<i>Urban Dynamics EC</i>

The professional team conducted various specialist studies that form part of the Environmental Impact Assessment process, application for Rezoning to the Ubuntu Municipality and applications to the various Government Departments and institutions for comments / approvals.

The Revised Final Environmental Impact Assessment Report for the Proposed Umsinde Emoyeni Wind Energy Facility Phase Two : Executive Summary (February 2018) should be consulted and read in conjunction with this application.

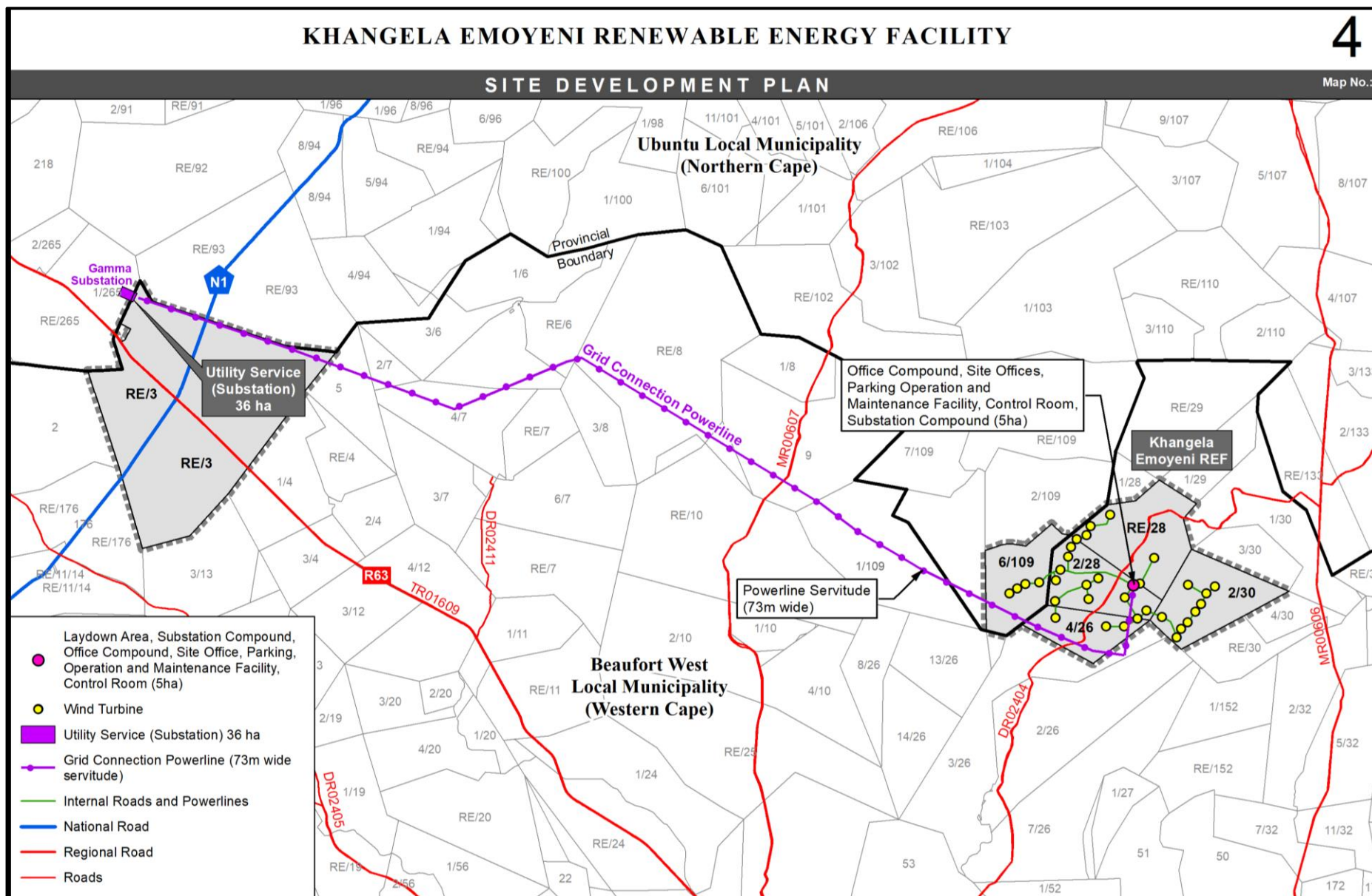
Refer to Annexure 7 : Revised Final Environmental Impact Assessment Report for the Proposed Umsinde Emoyeni Wind Energy Facility Phase Two : Executive Summary (February 2018)

Copies of the Specialist Studies can be made available on request.

2.2 Activity Description & Parameters

The following table indicated the development parameters for the **Khangela Renewable Energy Facility**:

Zoning	Special Purpose	
Permitted Uses	Primary Use : Agriculture Secondary Use : Renewable Energy Structures	
Definitions	<p>Agriculture means the cultivation of crops and plants and/or the breeding of animals, as well as the operation of a game farm on an extensive basis on natural land or veld, stock- or auction pens and at most one residential house and other buildings, and it includes residential units for bona fide labourers, which are reasonably connected with the main agricultural activity on the farm.</p> <p>Renewable Energy Structure means any facility that captures and converts wind into energy for commercial gain irrespective of whether it feeds onto an electricity grid or not and includes administration facilities and any associated infrastructure. Such infrastructure includes, but is not limited to : workshops and stores, offices, site canteen, medical station, laydown areas, batching plants, substations, fire station, access roads, power lines, water supply infrastructure, storage, construction vehicles and equipment, research facilities and guard houses.</p>	
Total Farm Area	1476,3785 ha	
Appurtenant structures	Office compound, site offices, parking operation and maintenance facility, control room, substation compound (Beaufort West Mun.)	5 ha
	Permanent and construction laydown areas (Beaufort West Mun.)	0,9 ha
Turbines	Ubuntu Mun : 4 turbines Beaufort West Mun. : 29 turbines	
Setback lines	Internal cadastral setback for REF : 0 m External cadastral setback for REF : 100 m	
Height	Hub height : up to 160 m Total height : up to 250m	
Internal Roads	Construction : Up to approximately 9m wide Permanent : Approximately 4m – 6m wide	
Site Access	Access from DR02404	
Grid Connection	Servitude width : 73 m Powerline : 132kV	



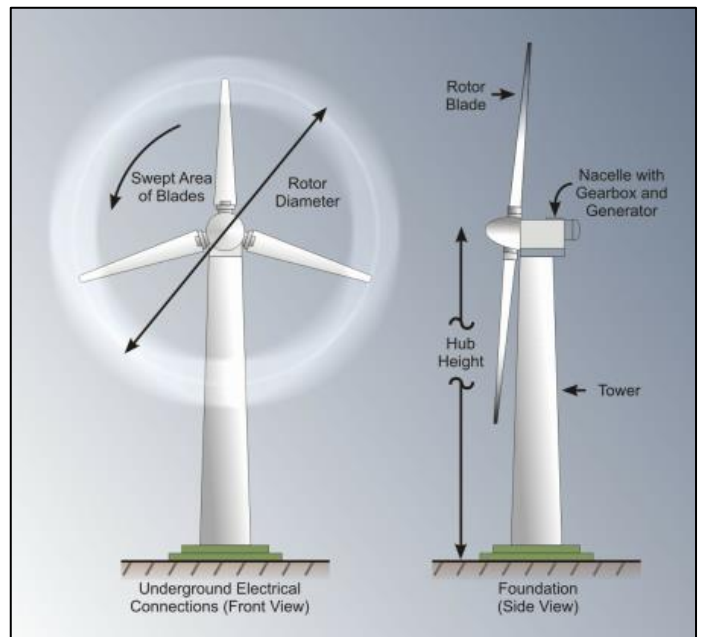
Map 4 : Site Development Plan : Khangela Renewable Energy Facility

2.2.1 Wind Farm Components

A wind farm requires a number of key components to facilitate the generation of electricity at a large scale. This includes wind turbines, powerlines and substation facilities to collect the generated electricity and distribute it to other users. The associated connecting infrastructure such as roads, transformers and cabling etc. are designed to ensure project and energy efficiency.

▣ Wind Turbines

Wind turbines generate electricity by converting movement or kinetic energy produced by the wind into electricity. A typical horizontal-axis wind turbine consists of a number of components, which work together to generate electricity as depicted in the figure. In conventional/geared wind turbines the kinetic energy of the wind rotates the rotor blades of the wind turbine around a horizontal hub, which is connected to a shaft, gearbox and generator located in the nacelle (turbine housing).



⇒ Rotor & Blades

The rotor has three blades that typically rotate at 5 – 25 revolutions per minute (rpm) depending on the make and set-up of the turbine, as well as the wind speed on site. The blades are usually coloured white or light grey.

⇒ Nacelle

Larger wind turbines are typically actively controlled to face the wind direction, which is measured by a wind measuring instrument (anemometer) situated on the back of the nacelle. By reducing the misalignment between wind and turbine pointing direction (yaw angle), the power output is maximised and non-symmetrical loads minimised. The nacelle turns the turbine to face into the wind ('yaw control'). The nacelle also contains the generator, control equipment, gearbox and wind speed instrument (anemometer) to monitor the wind speed and direction. The turbine controls the angle of the blades ('pitch control') to make optimal use of the available wind and avoid damage at high wind speeds.

⇒ Generator

The generator converts the turning motion of the blades into electricity. A gear box is commonly used for stepping up the speed of the generator. Each turbine has a transformer that steps up the voltage to match the powerline frequency and voltage for electricity evacuation / distribution. The transformer may be located inside the turbine tower, or within a small housing at the base of the tower.

⇒ Tower

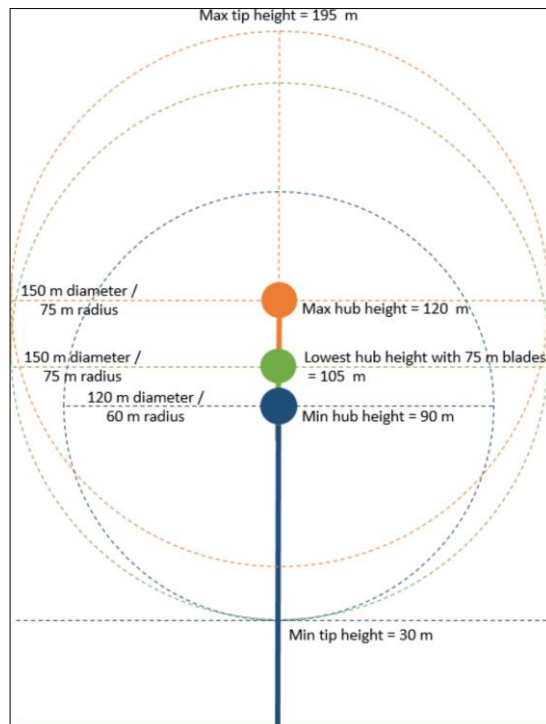
The tower is constructed from tubular steel and/or cast concrete and supports the rotor and nacelle. Towers can vary in height and are dependent on the selected turbine model. This height is referred to as "*hub height*." Wind has greater velocity at higher altitudes, therefore increasing the height of a turbine increases the expected wind speeds and electricity output.

⇒ Foundation

Foundations are designed to factor in both weight (vertical load) and lateral wind pressure (horizontal load). Considerable attention is given when designing the footings to ensure that the turbines are adequately grounded to operate safely and efficiently. The final foundation design of the proposed turbines is dependent on a geotechnical investigation.

The foundations will be approximately 20 m in diameter and approximately 3 m deep per turbine.

⇒ Rotor Swept Area Envelope



Rotor Swept Area Envelope (example)

⇒ Hardstands

A hard standing area of up to 75 m x 50 m will be established next to each wind turbine. These hard standing areas will be utilised by cranes during the construction (and also possible maintenance) processes. Hard standing areas will be rehabilitated to their previous natural state once construction has been completed. In the event that the turbine technology selected for implementation does not incorporate transformers into the turbine tower or nacelle, each wind turbine may also require that a transformer of up to 5 m x 5 m be installed within the hard standing area.

Laydown areas of approximately 150 m x 60 m will be required during the construction phase. These areas will be compacted and levelled to be used as blade lay down areas and for the initial storage of wind turbine components. These laydown areas will also accommodate cranes required for tower/turbine assembly.

■ Construction

⇒ Preliminary Civil Works

Prior to the commencement of the main construction works, the Contractor may undertake vegetation clearance (if required) and site establishment works. The site establishment works may include the construction of one, or more, temporary construction compounds and laydown areas and the connection of services such as power and water to these compounds.

The construction footprint will include the platforms, or “crane pads” required to construct the wind turbines, new or upgraded access roads, lay-bys, component storage areas, turning heads and a substation to evacuate the electricity generated to the municipal or national grid.

⇒ Electrical Cabling

Electrical and communication cables are normally laid in trenches which run alongside the access roads as much as possible. All previous farming activities can continue unhindered on the ground above the cables during the operational phase.

⇒ Establishment of Hard Standing Surfaces & Laydown Areas

Laydown and storage areas will be required for the contractor's construction equipment and turbine components on site.

⇒ Establishment of Substation & Support Infrastructure

Ancillary infrastructure for the Khangela Emoyeni REF can include batching plants, laydown areas, substations, switch stations, operation and maintenance areas. Electricity will be evacuated to the national grid through the substation next to the Gamma Substation. The Site Development Plan indicates various alternatives for support infrastructure and power line routes.

The establishment of these facilities/buildings will require the clearing of vegetation and levelling of the development site and the excavation of foundations prior to construction.

⇒ Undertake Site Remediation

Once construction is completed and all construction equipment is removed, the site must be rehabilitated. On full commissioning of the facility, any access points to the site which are not required during the operational phase must be closed and rehabilitated.

⇒ Electrical Connections / Grid Connection

Each turbine is fitted with its own transformer that steps up the voltage usually to 33 kV. The entire wind farm is then connected to the “point of interconnection” which is the electrical boundary between the wind farm and the national grid. Most of these works will be carried out by Eskom or an Eskom-approved sub-contractor (line upgrade, connection to the sub-station, burial of the cables etc.).

Grid connection infrastructure is required to connect the proposed wind energy facility with the national electricity grid, thereby allowing for electricity generated by the facility to be fed into and distributed via the national electricity grid which is owned and operated by Eskom.

Grid connection infrastructure required for the proposed Khangela Emoyeni REF project includes the establishment of a 73 m wide servitude to allow for the phased construction of three double circuit 132 kV high voltage distribution powerlines from the Khangela Emoyeni REF onsite substation to Eskom's 400 kV Gamma Substation.

Eskom Holdings SOC Limited obtained Environmental Authorisation from the Department of Environmental Affairs (DEA) for Eskom Transmission and Eskom Distribution Grid Connection Infrastructure projects.

▣ **Operational Phase**

The operational lifespan of the Khangela Emoyeni Wind Energy Facility is expected to be approximately 20 to 30 years; with the option to extend. Wind turbines will be operational for this entire period except under circumstances of mechanical breakdown, extreme weather conditions and/or maintenance activities. Wind turbines will be subject to regular maintenance and inspection to ensure the continued optimal functioning of the turbine components and operational monitoring of bird and bat populations will take place during the first years of operation (as recommended by the specialists).

▣ **Decommissioning of the Wind Farm**

The infrastructure would only be decommissioned once it has reached the end of its economic or technological life. If economically feasible, the decommissioning activities would comprise the disassembly and replacement of the individual components with more appropriate technology/infrastructure available at the time. This operation is referred to as 'facility re-powering'. However, if not deemed so, then the facility would be completely decommissioned.

2.2.1 Timeframes

It is unknown at this stage when construction would commence, as this would be dependent on the REIPPPP programme and other related permit requirements for a wind farm. However it is anticipated that construction would commence within the next five years. The construction period would be an anticipated duration of 18 – 24 months. Should decommissioning occur, this would only be likely after approximately 25 years.

2.3 Environmental Authorisation

- The project includes a number of 'listed activities' in terms of Section 24(5) of the National Environmental Management Act (107 of 1998) (NEMA), 'EIA Regulations' published in Government Notice (GN) No. R982, R983, R984 and R985 in the Government Gazette of 8 December 2014, as amended. Accordingly, the proposed project requires environmental authorisation before any activities can commence.
- An Independent Environmental Assessment Practitioner (EAP) has been commissioned to undertake the applications for environmental authorisation for the project on behalf of the applicant, as required in terms of NEMA. Argus Consultancy Services Ltd is the responsible EAP and has relied on inputs from a selected team of highly experienced specialists and multi-

disciplinary practitioners to execute the project in a professional and unbiased manner. Zutari (Pty) Ltd is managing the amendment applications.

- The National Department of Environmental Affairs granted the original Environmental Authorisation for the development of the Khangela Emoyeni Renewable Energy Facility and associated infrastructure in September 2018.

The following Authorisations pertain to the Khangela Emoyeni REF :

- Environmental Authorisation 14/12/16/3/3/2/687 (dated 06.09.2018)
- Environmental Authorisation Eskom Distribution Grid Connection Infrastructure 14/12/16/3/3/2/685 (dated 06.09.2018)
- Amendments of the Environmental Authorisation 14/12/16/3/3/2/687AM1 (dated 30.03.2021)

Refer to Annexure 8 : Environmental Authorisation & Amendments

2.4 District Roads Engineer (DRE)

Access to the REF is obtained via DR02404 gravel road which connects the town of Murraysburg in the south to the town of Richmond in the north.

Approval will be obtained from the DRE in terms of the applicable legislation.

2.5 Department of Mineral Resources & Energy (DMR)

Approval has been obtained from the Department of Mineral Resources, in terms of Section 53(1) of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002).

Refer to Annexure 9 : Department of Mineral Resources & Energy Approval

2.6 Civil Aviation Authority (CAA)

Approval has been obtained from the Civil Aviation Authority.

Refer to Annexure 10 : Civil Aviation Authority (CAA) Approval

2.7 Public Interest & Participation

Public participation with respect to an application for Rezoning is guided by the Ubuntu Municipality Spatial Planning and Land Use Management By-Law (2015). Urban Dynamics EC, in consultation with the Ubuntu Municipality, will manage the notification and participation process as per the relevant legislation and guidelines.

Urban Dynamics EC, as the applicant, will assist the Municipality with the process. In the unlikely event of any objections received, the professional team will respond and address these objections.

It is noted that a public participation process has been extensively followed through the National Environmental Management Act, its regulations and procedures and all efforts will be made to align the professional responses and inputs for the Environmental Impact Assessment and Rezoning processes.

3.1 Renewable Energy in Context

Due to global concerns such as climate change, and the on-going exploitation of non-renewable resources, there is increasing international pressure on countries to increase their share of renewable energy generation. Renewable energy is recognised internationally as a major contributor in protecting the environment (including biophysical, social and economic), when compared to energy generation that relies on fossil fuels, such as coal fired power stations and the use of oil and gas. Renewable energy projects also provide a wide range of environmental, economic and social benefits that can contribute towards long-term global sustainability.

In South Africa, the national utility company, Eskom, sources up to 86.97% of its electricity needs from fossil fuels (World Atlas, 2016). Eskom recognises that it "is crucial that the private sector plays a role in addressing the future electricity needs of the country as this would reduce the funding burden on Government, relieve the borrowing requirements of Eskom and introduce generation technologies that Eskom may not consider part of its core function which may play a vital role in the future electricity supply options in the country" (Eskom, 2018).

As a result, the South African Government has developed an Integrated Resource Plan (IRP) (2010) in which a target was set to source 17.8 Gigawatts (GW) of the country's electricity supply from renewable energy sources, over a 20-year period from 2010 to 2030 (IPPPP, 2018). An update to the IRP was drafted by the Department of Energy (DoE) and circulated for a 60-day public comment period in August 2018. The updated draft IRP (2018) indicates that the expected electricity demand for South Africa has decreased and that no new nuclear will be planned up until 2030. Of the new build planned by 2030, 52% (18,746 MW) will come from renewable energy, half of which will be wind energy (9,462 MW).

In support of this strategic target, the Department of Energy (DoE) has to date issued three ministerial determinations for the procurement of 13,225 Megawatt (MW) of renewable energy, viz. 3,725 MW by 2016 (1,800 MW of which was allocated for onshore wind technology), 3,200 MW by 2020 (1,470 MW of which will be provided by onshore wind energy) and a further 6,300 MW of renewable energy to be procured by 2025 (3,040 MW of which is allocated to onshore wind power). These renewable energy targets are procured through a competitive tendering process called the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) run by the DoE in conjunction with the National Treasury and the Development Bank of Southern Africa (DBSA) (DoE, 2018a).

The proposed Khangela Emoyeni REF would therefore have global significance as it would contribute to South Africa's national commitment to transition to a low carbon economy. Investments in this technology will not only benefit our generation, but many generations to come.

In South Africa, renewable energy forms an important part of our energy mix. One of the reasons for this is the substantial foreign equity and financing that has been invested in Renewable Energy Independent Power Producer projects by which amounted to R201.8 billion (R75 billion of which has been wind energy) by June 2018 (DoE, 2018b).

Additionally, beyond the foreign investment, localised socio-economic benefits have also been realised through investment in socio-economic development initiatives and enterprise development programmes identified within each project's sphere of influence (R640.3 million socio-economic contribution made to mainly rural communities and R204.6 million contributions to enterprise development and building businesses by June 2018) (DoE, 2018b). In addition, approximately 36,528 direct job years (41,451 Full Time Equivalent jobs)¹ for South African citizens have been created to date, many of which are local to the respective projects. To date (June 2018), a total of 26,840 GWh has been generated by renewable energy, offsetting 27.2 Mton CO₂ emissions and saving 32.2 million kilolitres of water in relation to fossil fuel power generation (DoE, 2018b).

The environmental benefits associated with wind energy specifically, are considerable. As an example, 1,000 MW of wind energy (which could be generated by four or five wind farms), if replacing coal, would result in an estimated savings in emissions of 4.3 million CO₂e/MWh/annum, which removes 930,000 cars off the road per year (SAWEA, 2018). It would save 2.3 billion litres of water, which is the equivalent of the entire City of Cape Town's consumption over 5 days (SAWEA, 2018). Benefits are even more significant if extrapolated over time, and scaled in terms of generation.

3.2 Policy Framework & Context

▣ National Policy Framework Governing Renewable Energy in South Africa

- White Paper on the Energy Policy of the Republic of South Africa (December 1998)
- Renewable Energy White Paper (2003)
- National Climate Change Response Policy White Paper (2011)
- National Integrated Resource Plan (IRP) (2010, updated 2019)
- Renewable Energy Independent Power Producer Procurement Programme (REIPPPP)

▣ Planning Context

The renewable energy industry has substantial support in the South African planning context, which is detailed in the following national plans :

- National Spatial Development Framework (2019)
- National Development Plan (2012)
- National Integrated Energy Plan (2016)
- National Integrated Resource Plan for Electricity (2010-2013) and updated Draft IRP (2018 and 2019)
- National Infrastructure Plan (2012)
- Northern Cape Provincial Growth and Development Strategy

More specifically, the proposed Khangela Emoyeni Renewable Energy Facility fall within the jurisdiction of the Ubuntu Local Municipality and the Pixley Ka Seme District Municipality. An evaluation of the “*need and desirability*” of the project considers the strategic context of the project with regards to municipal policy and development strategies.

- SPLUMA Chapter 2 Principles
- LUPA Chapter 6 Principles
- Northern Cape Spatial Development Framework
- Pixley ka Seme District Municipality Spatial Development Framework
- Ubuntu Local Municipality Spatial Development Framework

3.3 Guidelines for Decision Making

Decision making by the Ubuntu Municipality should be based, inter alia, on legislative guidelines and informants :

- Spatial Planning and Land Use Management Act, 2013 (Act 16 of 2013)
- Spatial Planning and Land Use By-Law for Ubuntu Municipality (2015)
- Scheme Regulations for Ubuntu Local Municipality (2009)

Although decision making on land use matters is a holistic and multi-disciplinary process, the above legislated criteria should form the basis for well-informed and sound decision making.

3.4 Spatial Planning & Land Use Management Act

Section 7 of SPLUMA stipulates :

The following principles apply to spatial planning, land development and land use management:

- *The principle of spatial justice*
- *The principle of spatial sustainability*
- *The principle of efficiency*
- *The principle of spatial resilience*
- *The principle of good administration*

Section 42 (1) of SPLUMA stipulates :

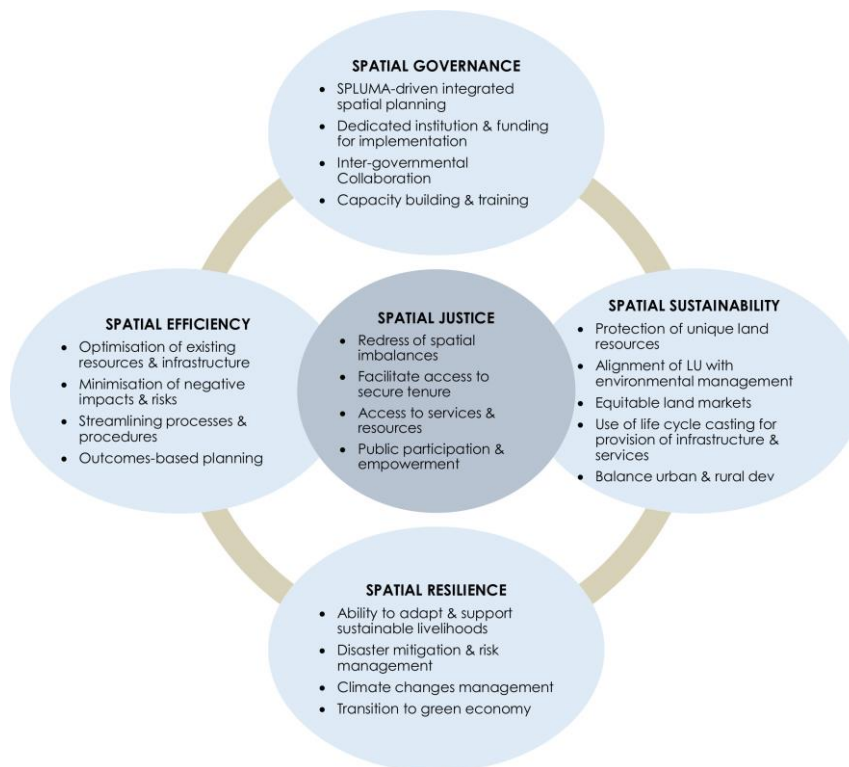
In considering and deciding an application a Municipal Planning Tribunal must –

- *be guided by the development principles set out in Chapter 2*
- *make a decision which is consistent with norms and standards, measures designed to protect and promote the sustainable use of agricultural land, national and provincial government policies and the municipal spatial development framework*
- *take into account –*
 - *the public interest*
 - *the constitutional transformation imperatives and the related duties of the State*
 - *the facts and circumstances relevant to the application*
 - *the respective rights and obligations of all those affected*
 - *the state and impact of engineering services, social infrastructure and open space requirements*
 - *any factors that may be prescribed, including timeframes for making decisions*

3.5 Spatial Planning and Land Use Management Act

In terms of the provisions of Section 6 and Section 7 of the Spatial Planning and Land Use Management Act, the general principles set out in Chapter 2 apply to all organs of state and other authorities responsible for the implementation of legislation regulating the use and development of land.

The following Development Principles are applicable to spatial planning, land development and land use management and have been addressed accordingly :



▣ The Principle of Spatial Justice

- The development is outside an urban area. The closest settlements are Murraysburg and Richmond, approximately 21km to the south and 60 km to the north, respectively.
- The development will ensure significant financial investment in the area.
- The development will help to address unemployment in the area and drive economic development.
- Investment will ensure social upliftment and improve rural livelihood.
- The development of REF's and renewable energy is supported through various National, Provincial and Local policy frameworks.
- The development is consistent with the applicable Spatial Development Frameworks (Northern Cape, Pixley Ka Seme DM and Ubuntu LM).

▣ The Principle of Spatial Sustainability

- The REF will contribute towards the prevention of pollution and unsustainable ecological degradation through the use of non-renewable energy resources.
- It promotes sustainable development and use of renewable energy with a much smaller carbon footprint than coal, which is currently the dominant form of electricity generated in South Africa.
- Wind energy can be considered as an alternative of meeting the need for increased electricity demand over other sources of generation such as fossil fuels. These reasons include:
 - Positive impact on climate change;
 - Overcoming the country's energy constraints;
 - Diversification and decentralisation of supply;
 - Reduced costs of energy; and
 - Positive economic development including job creation.

- With a view to reducing the effects of climate change, South Africa has committed to decreasing its dependence on fossil fuels, and increasing its utilization of renewable energy. The additional power produced by REFs would supplement the national grid with a sustainable form of renewable energy, thus driving regional and national economic development, as well as providing local business opportunities, skills development and employment opportunities.
- Conventional coal fired power stations use large quantities of water during their cooling processes. REFs require limited amounts of water during construction and a minimal amount of water during operation.
- Throughout the EIA process, Critical Biodiversity Areas (CBAs), sensitive areas and no-go areas on the proposed development sites were identified through specialist input. The presented final layout avoids these areas where possible, and if not possible due to wind farm viability, mitigation measures are to be implemented to assist in reducing negative impacts and enhancing positive impacts.
- The employment opportunities associated with the Khangela Emoyeni REF is approximately :
 - 300 during construction and
 - 75 during the operational phases
- It is anticipated that there will be full time security, maintenance and control room staff required on site.
- The spatial principles and strategies of the Northern Cape Provincial Spatial Development Framework are supported.

▣ **The Principle of Efficiency**

- The proposed development will contribute towards lower carbon emission goals to combat climate change and provide cleaner energy than coal which currently makes up the large majority of the national energy mix.
- This project would make use of the area's wind resources to provide cost-effective electricity to the national grid.
- The footprint of the proposed infrastructure would equate to a small percentage of the total land area.

▣ **The Principle of Spatial Resilience**

- The REF has a lifespan of more than 20 years and will contribute significantly to the local economy.
- Extensive research and numerous specialist studies provided input in the design and optimisation of the REF.
- Specialist studies included, but not limited to, noise, agriculture, bat, ecological, avifauna, social and visual impact were conducted.
- The impact assessment process confirmed that negative impacts can be mitigated.
- The Environmental Management Programme will ensure strict implemental guidelines during construction and operation.

▣ **The Principle of Good Administration**

- Prior to implementation, all relevant legislative approval will be obtained to ensure legislative compliance.
- The application for rezoning supports the principles of the relevant policies, guidelines and Spatial Development Frameworks.
- The development obtained a positive Environmental Authorisation and CAA Approval.
- The development will obtain approval from Department of Agriculture, Land Reform & Rural Development.

3.6 National Policy

3.6.1 National Energy Act, 2008 (Act 34 of 2008)

The National Energy Act was promulgated in 2008 (Act No 34 of 2008). One of the objectives of the Act was to promote diversity of supply of energy and its sources. In this regard, the preamble makes direct reference to renewable resources, including wind :

"To ensure that diverse energy resources are available, in sustainable quantities, and at affordable prices, to the South African economy, in support of economic growth and poverty alleviation, taking into account environmental management requirements (...); to provide for (...) increased generation and consumption of renewable energies..."

3.6.2 White Paper on the Energy Policy of the Republic of South Africa, 1998

Investment in renewable energy initiatives, such as the proposed REF, is supported by the White Paper on Energy Policy for South Africa (December 1998). In this regard the document notes :

"Government policy is based on an understanding that renewables are energy sources in their own right, are not limited to small-scale and remote applications, and have significant medium and long-term commercial potential".

"Renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future".

The support for renewable energy policy is guided by a rationale that South Africa has a very attractive range of renewable resources, particularly solar and **wind** and that renewable applications are in fact the least cost energy service in many cases; more so when social and environmental costs are taken into account.

Government policy on renewable energy is thus concerned with meeting the following challenges :

- Ensuring that economically feasible technologies and applications are implemented
- Ensuring that an equitable level of national resources is invested in renewable technologies, given their potential and compared to investments in other energy supply options
- Addressing constraints on the development of the renewable industry

The White Paper also acknowledges that South Africa has neglected the development and implementation of renewable energy applications, despite the fact that the country's renewable energy resource base is extensive and many appropriate applications exist.

The White Paper also notes that renewable energy applications have specific characteristics that need to be considered. Advantages include :

- Minimal environmental impacts in operation in comparison with traditional supply technologies
- Generally lower running costs, and high labour intensities

3.6.3 White Paper on Renewable Energy

The White Paper on Renewable Energy (November, 2003) supplements the *White Paper on Energy Policy*, which recognizes that the medium and long-term potential of renewable energy is significant. This Paper sets out Government's vision, policy principles, strategic goals and objectives for promoting and implementing renewable energy in South Africa.

The White Paper notes that while South Africa is well endowed with renewable energy resources that have the potential to become sustainable alternatives to fossil fuels, these have thus far remained largely untapped.

Government's long-term goal is the establishment of a renewable energy industry producing modern energy carriers that will offer in future years a sustainable, fully non-subsidised alternative to fossil fuels.

3.6.4 Department of Energy Process for Independent Power Producers (IPP)

Globally there is increasing pressure on countries to increase their share of renewable energy generation due to concerns such as exploitation of non-renewable resources. In order to meet the long-term goal of a sustainable renewable energy industry and to diversify the energy-generation mix in South Africa, a goal of 17.8GW of renewables by 2030 has been set by the Department of Energy (DoE) within the Integrated Resource Plan (IRP) 2010. This energy will be produced mainly from wind, solar, biomass, and small-scale hydro (with wind and solar comprising the bulk of the power generation capacity). This amounts to $\pm 42\%$ of all new power generation being derived from renewable energy forms by 2030.

In responding to the growing electricity demand within South Africa, as well as the country's targets for renewable energy, Emoyeni Wind Farm Project (Pty) Ltd, an Independent Power Producer (IPP), proposes the establishment of a renewable energy facility and associated infrastructure in the Western Cape Province to add new capacity to the national electricity grid.

It is anticipated that this project will form part of the 5th round of the Renewable Independent Power Producer Program (REIPPP).

3.7 Spatial Development Frameworks

Section 42 (1) (b) of SPLUMA requires Municipalities and Planning Tribunals (MPT) to take decisions that are consistent with :

"make a decision which is consistent with norms and standards, measures designed to protect and promote the sustainable use of agricultural land, national and provincial government policies and the municipal spatial development framework".

The following sections specifically relate to the applicable Spatial Development Frameworks and confirm that the application is consistent with the SDF's as contemplated in Section 42 (1) (b) of SPLUMA.

3.7.1 National Spatial Development Framework (NSDF)

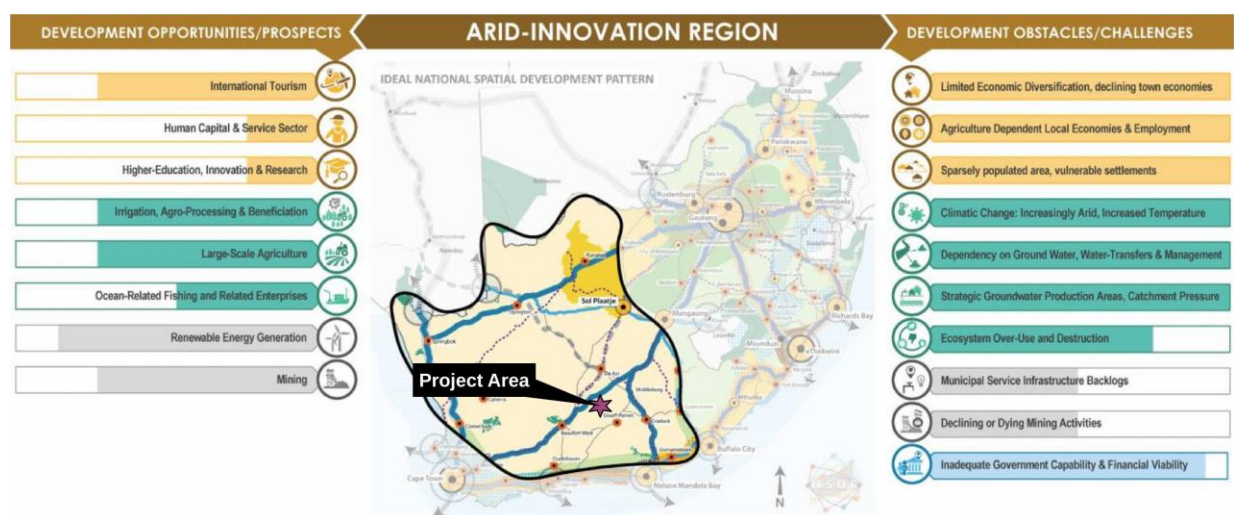
The recently completed National Spatial Development Framework (NSDF) identified, amongst others, National spatial action areas.

In order to create such a “shared, smaller, better connected and more sustainable South Africa”, the NSDF identifies the most urgent short-term, strategic spatial development catalysts to bring about radical spatial transformation at scale, manage and mitigate rising national risks, and move our country at speed towards the Ideal National Spatial Development Pattern. These are called National Spatial Action Areas (NSAAs).

Concerted, focused and sustained intergovernmental collaboration is required in these NSAAs in the short term to :

- Target national spatial development actions and interventions; and
- Kickstart the process of aligning plans, budgets and departmental plans in and between spheres of government around national spatial development priorities.

The Khangela Emoyeni REF falls within the Arid-Innovation Region (NSAA).



The NSDF proposals relevant to this application are :

- Strengthening and expanding alternative energy generation
- Managing land development and economic activities, to ensure the protection of critical natural resources
- Utilised existing regional planning/Regional Spatial Development Framework processes to focus on green energy generation

Renewable energy is therefore one of the catalyst interventions proposed for the area through the NSDF. The Khangela Emoyeni REF project support the principles of the NSDF.

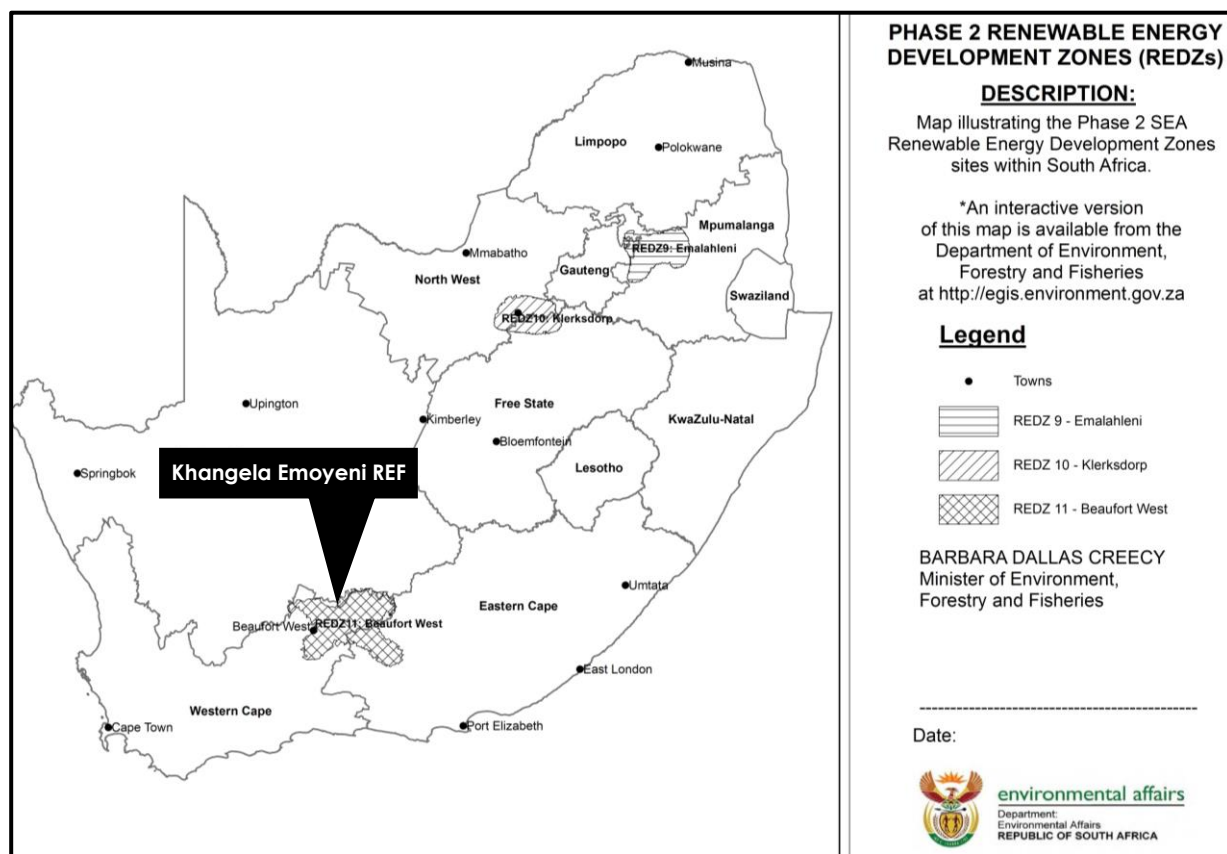
3.7.2 Renewable Energy Development Zones (REDZs)

On 16 February 2018, Minister Edna Molewa published Government Notice No. 114 in Government Gazette No. 41445 which identified 8 Renewable Energy Development Zones important for the development of large-scale wind and solar photovoltaic facilities.

On 26 February 2021, Minister Barbara Dallas Creecy, published Government Notice No. 142, 144 and 145 in Government Gazette No. 44191 which identified 3 additional REDZs for electricity transmission or distribution infrastructure or large-scale wind and solar photovoltaic energy facilities.

The proposed development area is identified for large scale wind and solar photovoltaic energy facilities and earmarked as Renewable Energy Development Zone 11.

The proposed Khangela Emoyeni REF is situated within Renewable Energy Development Zone 11.



Phase 2 REDZ zones

3.7.3 Northern Cape Provincial Spatial Development Framework (NCSDF)

The Northern Cape PSDF provides broad guidelines for sustainable development and incorporates sustainable development as part of its founding goals and development objectives. The goals and objectives of the Provincial Spatial Development Framework as it relates to sustainability and sustainable development are premised upon the national directives put forward in the National Framework on Sustainable Development (2008) and the National Strategy for Sustainable Development and Action Plan (2011-2014). The PSDF identified the following sustainable development objectives :

- Social Sustainability
- Economic Sustainability
- Biophysical Sustainability
- Technical Sustainability

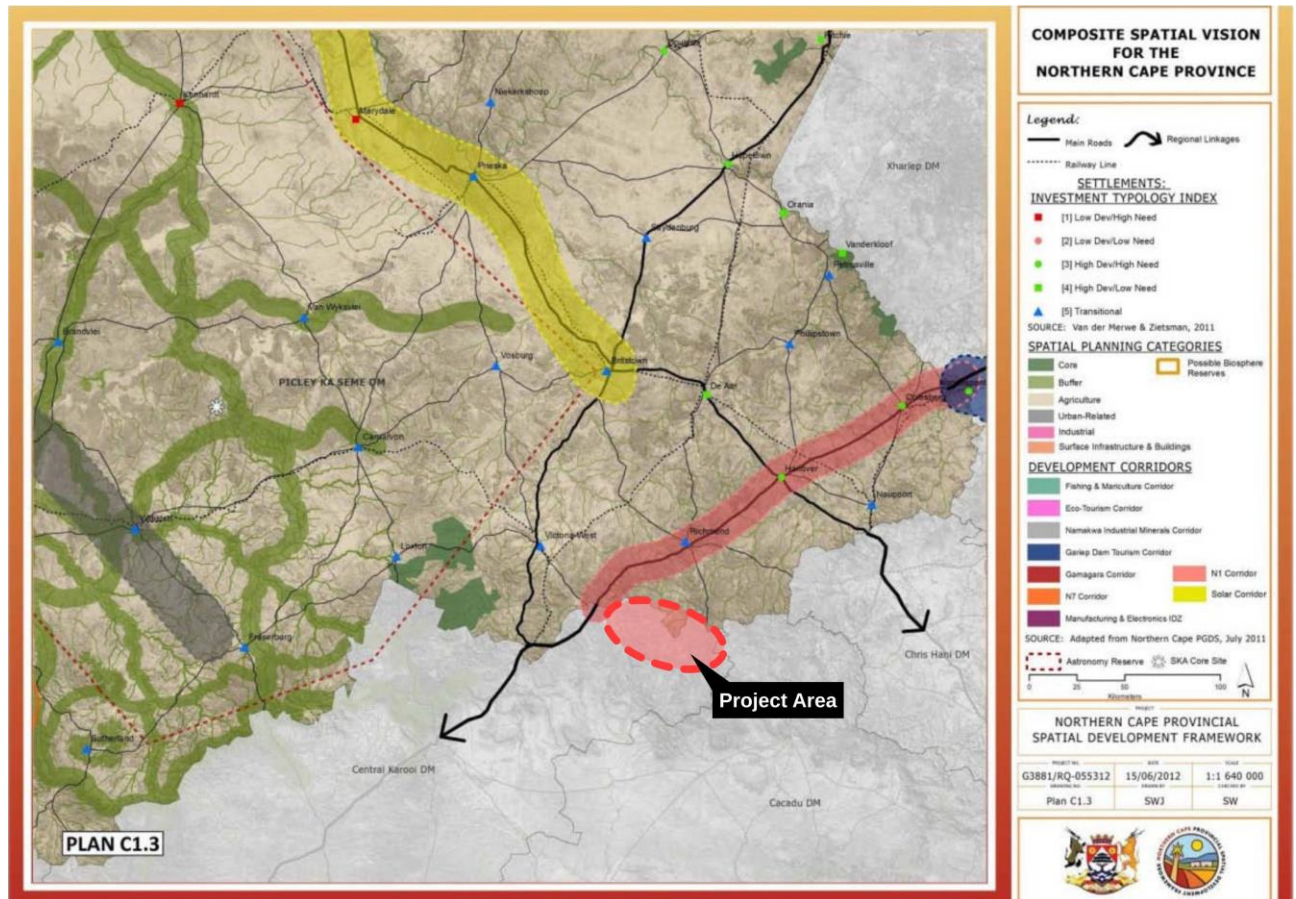
The objective relating to biophysical sustainability relates directly to the utilisation of sustainable resources and the use of renewable sources in preference of non-renewable resources :

- Minimise the use of the four generic resources, namely energy, water, land and materials.
- Maximise the re-use and/or recycling of resources.
- Use renewable resources in preference to non-renewable resources.
- Minimise air, land and water pollution.
- Create a healthy, non-toxic environment.
- Maintain and restore the Earth's vitality and ecological diversity.
- Minimise damage to sensitive landscapes, including scenic, cultural, and historical aspects.

The PSDF further identifies, amongst others, the following energy objectives :

- Promote the development of renewable energy supply schemes. Large-scale renewable energy supply schemes are strategically important for increasing the diversity of domestic energy supplies and avoiding energy imports while minimizing detrimental environmental impacts.
- Develop and institute innovative new energy technologies to improve access to reliable, sustainable and affordable energy services with the objective to realize sustainable economic growth and development. The goals of securing supply, providing energy services, tackling climate change, avoiding air pollution and reaching sustainable development in the province offer both opportunities and synergies which require joint planning between local and provincial government as well as the private sector.
- Develop and institute energy supply schemes with the aim to contribute to the achievement of the targets set by the White Paper on Renewable Energy (2003). This target relates to the delivery of 10 000 GWh of energy from renewable energy sources (mainly biomass, wind, solar, and small-scale hydro) by 2013.

The Khangela Emoyeni REF project supports the principles as contained in the Northern Cape Provincial Spatial Development Framework.



Northern Cape SDF

3.7.4 Pixley Ka Seme District Municipality Spatial Development Framework (2020)

The Ubuntu Local Municipality is situated in the Pixley Ka Seme District Municipal area. The SDFs for these areas present the spatial vision and objectives for development implementation, specifically in relation to the Khangela Emoyeni REF.

The spatial vision for Pixley Ka Seme DM :

"Pixley Ka Seme DM, PIONEERS of DEVELOPMENT, a HOME and FUTURE for all!!!"

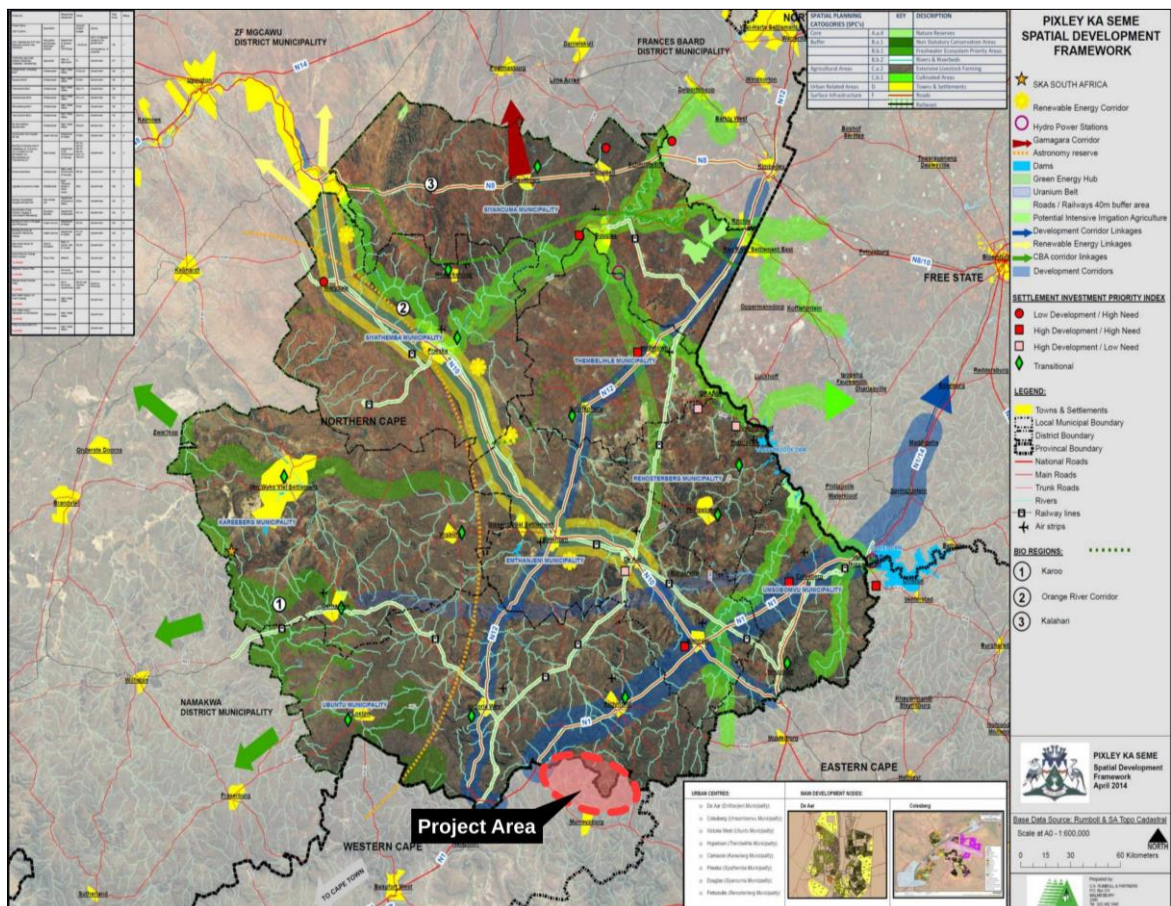
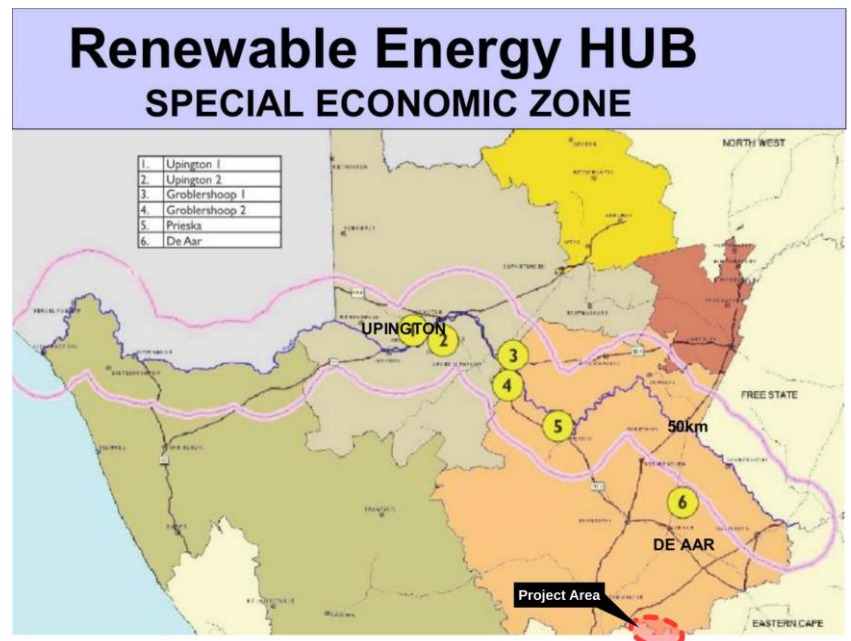
In support of the District vision, the following development opportunities were identified :

- Locality on the main arterial routes between South Africa's major cities.
- Identified renewable energy hub.
- Pristine natural environment.
- Low levels of light pollution and open skylines.
- Ample land available.
- High Solar Index for renewable energy generation.
- Renewable energy generation provides opportunities for job creation.
- Current Northern Cape Development and Resources Management Plan/ Provincial Spatial Development Framework set the stage for strong planning policy guidelines for regional and municipal areas.

To this end, the district, through the Local Municipality's activity, promotes and supported development of renewable energy projects and schemes.

This is further demonstrated through the renewable energy HUB Special Economic Zone prioritised for the area between Upington and De Aar.

The Khangela Emoyeni REF cluster borders onto the southern edge for this corridor.



The Khangela Emoyeni REF project supports the principles as contained in the Pixley Ka Seme DM Spatial Development Framework.

3.8 Ubuntu Municipality

3.8.1 Ubuntu Municipality Integrated Development Plan (2020/2021 draft review)

The vision of the Ubuntu Municipality, as contained in the IDP is :

“By 2030, Ubuntu Municipality shall be the best rural municipality through relentless pursuit of excellence through focused governance, efficient administration, and effective service delivery for inclusive targeted social and economic development against all odds”.

The Ubuntu Municipality 2017-2022 IDP has the following developmental priorities and strategic objectives which are aligned with the National Key Performance Areas (KPA's) :

National KPA 1: Basic Service Delivery and Infrastructure Development

Strategic Objectives:

- Provision of sustainable basic services
- Spatial planning excellence
- Spatial development bulk infrastructure optimisation

National KPA 2: Local Economic Development

Strategic Objectives:

- Investment Acceleration & Attraction

National KPA 3: Municipal Financial Management & Viability

Strategic Objectives:

- Sound Financial Viability and Management

National KPA 4: Municipal Transformation & Institutional Development

Strategic Objectives:

- Municipal transformation
- Institutional development excellence
- Institutional integrity excellence
- Institutional responsiveness excellence
- Institutional performance excellence

National KPA 5: Good Governance & Public Participation

Strategic Objectives:

- Institutional governance excellence

The proposed Khangela Emoyeni REF supports the Municipality's strategic focus areas, insofar as job creation, economic development, sustainability and support for National and Provincial programmes of concern.

3.8.2 **Ubuntu Municipality Spatial Development Framework**

The Ubuntu SDF identified the following broad spatial aims :

- Promote sustainability by ensuring that development takes place within the financial, institutional and administrative capacity of the Ubuntu Municipality.
- Encourage the establishment of sustainable communities.
- Discourage urban sprawl and encourage compact urban settlements through urban compaction.
- Development of urban growth and the acquiring of land for housing development.
- Delivering housing at an efficient rate.
- Equal distribution of public facilities and services
- The conservation of the architectural and cultural-historical character of the settlements
- Integration with the bio-regional principalities within Ubuntu
- Ensure the adherence to the propositions and guidelines taken up in the legislation and policy documents.

Spatial Development Policy Guidelines :

The following guidelines have been identified to guide spatial planning in Ubuntu (applicable to this application) :

- **Rural Guidelines** (*applicable to this application*) :
 - Caring for the environment should be paramount especially in the management of soil.
 - Rural roads need to be upgraded.

The proposed Khangela Emoyeni REF supports the guidelines and vision of the Ubuntu Municipality SDF.

4

Chapter 4 :

Environmental Impact Assessment

The Environmental Impact Assessment process, as required by the National Environmental Management Act, is comprehensive in addressing various impacts, mitigating measures, alternatives and options prior to final approval, implementation and operation of a wind energy facility. Argus Consultancy Services Ltd co-ordinated the Environmental Impact Assessment process and this included various specialist studies.

The following Specialist Studies supported the EIA :

- Land Use, Soil and Agricultural Potential Impact Assessment
- Avifaunal Impact Assessment
- Bat Impact Assessment
- Noise Impact Assessment
- Visual Impact Assessment
- Archaeology Impact Assessment
- Terrestrial Ecology Impact Assessment
- Palaeontology Impact Assessment
- Freshwater Ecology Impact Assessment
- Socio-Economic Impact Assessment

The Environmental Impact Assessment process for the Khangela Emoyeni Wind Energy Facility and the Eskom Grid Infrastructure was conducted in 2014 and received an Environmental Authorisation (EA) for the construction of the Khangela Emoyeni REF and the grid connection infrastructure on 6 September 2018.

There have been advancements to wind turbine technology since the issuing of the EA, and the turbines authorised in the EA will no longer be viable for the project in terms of production and economic viability of the project. Amendment to the authorised turbine specifications have been approved (14/12/16/3/3/2/687AM1, dated 30.03.2021)) and this amended technology will increase the efficiency of the facility consequently the economic feasibility of the project.

The following Environmental authorisations were issued, relevant to the Khangela Emoyeni REF :

- Environmental Authorisation 14/12/16/3/3/2/687 (dated 06.09.2018)
- Environmental Authorisation Eskom Distribution Grid Connection Infrastructure 14/12/16/3/3/2/685 (dated 06.09.2018)
- Amendments of the Environmental Authorisation 14/12/16/3/3/2/687AM1 (dated 30.03.2021)

The Environmental Impact Report should be consulted for detailed assessments.

Refer to Annexure 7 : Revised Final Environmental Impact Assessment Report for the Proposed Umsinde Emoyeni Wind Energy Facility Phase Two : Summary (February 2018)

Refer to Annexure 8 : Final Amendment Report (2020)

Refer to Annexure 9 : Environmental Authorisations and Environmental Amendment

4.1 Revised Final Environmental Impact Assessment Report for Umside Emoyeni Wind Energy Facility – Phase Two (2018)

The following sections from the Revised Final Environmental Impact Assessment Report for Umside Emoyeni Wind Energy Facility – Phase Two (2018) outline a brief summary of the various specialist studies and impact outcomes.

4.1.1 Project Layout Evolution

The original layout consisted of 98 turbines. The applicant, after taking into account the findings and recommendations of the additional avifauna information, agreed to revise the turbine and reduce the number of turbine placements to 55 turbines. This 55 turbine layout was provided to all specialists to review and provide updated impact assessments on. The specialists updated their assessments where necessary and provided revised buffer areas and no go areas of high sensitivity.

Through an iterative process that took into account all the recommendations and conclusions put forward by the specialists (including additional constraints, sensitive areas and no go areas) a Revised Final layout was produced, which consists of 35 turbines for Phase 2 of the development.

4.1.2 Alternative Assessment

Alternatives are different means of meeting the general purpose and need of a proposed development and may include alternative sites, alternative layouts/designs, alternative technologies and/or the no development alternative.

▣ No Development Scenario

The 'No Development' scenario assumes that the proposed development does not proceed.

This result will include the following:

- The land-use remains agricultural with no further benefits derived from the implementation of a complementary land use.
- There is no change in the current landscape or environmental baseline.
- Whilst no REF development will occur on site, other wind energy projects go ahead as planned in the surrounding area.
- No additional electricity will be generated onsite or supplied through means of renewable energy resources. This would have implications for the South African Government in achieving its proposed renewable energy target.
- There is no opportunity for additional employment (albeit temporary) in the local area where job creation is identified as a key priority.
- The local Economic Development benefits associated with the REF development's REIPPPP commitments will not be realised.

The No Development alternative was not considered feasible in the context of the proposed development and the needed power that will be generated from this renewable resource.

▣ **Site Selection Process and Criteria**

The proposed development, Umsinde Emoyeni Phase Two (now referred to as the Khangela Emoyeni REF), was selected out of WDSA's portfolio based on anticipated wind resource (high wind speeds), proximity to existing grid infrastructure, land availability, minimum technical constraints from a construction perspective and absence of high level environmental issues. Numerous alternative sites were discounted at the site selection process on both technical and environmental considerations.

4.1.3 Summary of Impact Assessment

Potential environmental impacts were evaluated according to their extent, duration, intensity and magnitude. Negative impacts of the proposed project on the biophysical environment include clearing of vegetation that leads to habitat fragmentation, potential loss of species of concern, soil erosion, surface water pollution; while social-economic impacts being minimal loss of agricultural land, disruption of social relations within the proposed area by the introduction of contractor workers from different areas, spread of diseases, loss of potential heritage resources and impact on sense of place.

All impacts have been identified and assessed at different stages (design/planning, construction, operation and decommission) and possible mitigation measures assigned to ensure low significance (for negative impacts) or high significance (for positive impacts).

4.1.4 Summary of Findings

From the assessment, it is evident that the construction and the operation of the REF and grid connections will have negative impacts both socially and environmentally but when appropriate mitigation measures applied negative impacts are outweighed by positive impacts.

Overall the project has a positive economic impact regionally and for South Africa through the generation of clean power, the creation of job opportunities in a extremely rural and economically depressed area, and contribute to the local and regional economy. All identified negative impacts can be successfully mitigated and there are no impacts with an assigned significance rating of "High" after mitigation has been implemented.

Throughout the process for Khangela Emoyeni REF sensitive areas and constraints within the REF site boundary were identified by the specialists. This included results from 24 month bird and 12 month bat monitoring programmes. Constraints maps were delivered to the applicant and these were taken into consideration in the development of the proposed turbine layout and grid connections. Therefore the proposed location of Phase One within the REF site boundary takes into consideration these identified constraints and is outside of highly sensitive areas. The applicant has optimised the development layout and produced a layout, which takes into consideration, all environmental and social factors, including potential cumulative impacts.

Through this process, the layout has evolved from 98 turbines to 55 turbines to the now proposed 35 turbines. Based on this assessment and the finding of the updated specialist's assessments, it is the opinion of the Environmental Assessment Practitioner (EAP) that the majority of negative impacts associated with the implementation of the proposed project have been mitigated to acceptable levels and the extent of the benefits associated with the implementation of the projects will benefit a much larger group of people, in terms of a positive local and regional economic impact, job creation, community upliftment and by definition the generation of power for the country

4.1.7 Impact Statement

The proposed Umsinde Emoyeni REF Phase 2 has the potential to provide much needed renewable energy to the country's grid.

The potential positive impacts associated with the proposed project is further recognised through the creation of jobs for the local community, and the positive contributions to the socio-economic development of the surrounding areas and local communities.

Should the Khangela Emoyeni REF be developed, the actual physical footprint of the wind turbines and associated onsite infrastructure will occupy an area of land equivalent to less than 1% of the total project area. Small livestock grazing and other agricultural activities can continue in parallel with the operation of the turbines. The project will have no significant impact in terms of loss of agricultural productivity. Should the mitigation measures identified by specialists and the recommendations of the EMP be effectively implemented the negative impacts associated with the proposed project will be significantly reduced.

Overall the development will have a moderate to low impact after mitigation and with the implementation of the recommended mitigation measures, impacts will be reduced to acceptable level, from an ecological perspective. As the impacts on broad-scale processes in particular have been reduced, the need for some sort of on-site conservation management action as originally recommended is seen as no longer necessary.

The overall conclusion reached with regards to the Umsinde Emoyeni Phase 2 is that *"The ecological impacts associated with the development of the Umsinde Emoyeni Phase 2 will generally be low after mitigation. There are no fatal flaws or high impacts associated with the development that cannot be reduced to a low level. As such, the development of the Umsinde Emoyeni Phase 2 is considered to be ecologically acceptable and there are no ecological considerations that should prevent the projects from being approved."*

Taking into consideration the findings of the EIA process for the proposed development and the fact that recommended mitigation measures have been used to inform the project design, and the layout of the facility has significantly reduced from 98 turbines to 35, it is the opinion of the Environmental Assessment Practitioner (EAP) that the majority of negative impacts associated with the implementation of the proposed project have been mitigated to acceptable levels. While the residual visual impact and the loss of "sense of place" of the project will have an impact on local receptors, the extent of the benefits associated with the implementation of the projects will benefit a much larger group of people, in terms of renewable energy supply and positive local and regional economic impact.

4.2 Final Amendment Report for Khangela Emoyeni Wind Energy Facility (2020)

The following sections from the Final Amendment Report for Khangela Emoyeni Wind Energy Facility (2020) outline a brief summary of the various specialist studies and impact outcomes.

4.2.1 Proposed Amendments

Emoyeni Wind Farm Project (Pty) Ltd received an Environmental Authorisation (EA) for the construction of the Umsinde Emoyeni Wind Energy Facility Phase Two (DEA ref: 14/12/16/3/3/2/685) on 6 September 2018.

Advances in technology and refinement of the design has resulted in a change in scope. The scope changes are namely based on the new, bigger turbines which are more efficient, resulting in a slight change to the environmental footprint. Windlab aims to complete the project in order to supply electricity to the National Government and in turn local and nation-wide communities at the least economical cost per kWh, whilst limiting the impact on the receiving environment as far as possible.

The following amendments to the Environmental Authorisation have been approved :

- Project name and affected properties.
- The turbine specifications ; the upper limit for hub height, blade length and rotor diameter have increased, and each turbine requires a larger permanent hardstand area.
- Reduction in the total number of turbines due to the increased generation capacity per turbine; with associated changes to the layout.
- The road alignments have changed in respect to turbine placement changes, along with the underground cables which follow these. Roads will also be temporarily widened further for construction access roads due to the larger turbine components and vehicles.
- An extension of the validity of the EA.
- Correcting the project location to reflect only the properties associated Umsinde Emoyeni Phase 2 (i.e. currently the authorisation also includes the Umsinde Emoyeni Phase 1 properties).

4.2.2 Summary of changes from the amendments

The amendments are in respect to the turbine specifications being larger, the hub height, blade length and rotor diameter have increased, and each turbine requires a larger permanent hardstand area. There is a reduction in the total number of turbines due to the increased generational capacity per turbine, with associated changes to the layout. In addition, the road alignments have changed in respect to turbine placement changes, along with the underground cables which follow these. Roads will also be temporarily widened further for construction access roads due to the larger turbine components and vehicles.

In summary, the main implications of this are as follows:

- **Terrestrial ecology :**

The overall footprint in natural areas increases slightly from 54.7 ha to 59.4 ha (due to increased temporary and permanent turbine hardstand areas, and wider construction roads). However, in reality it would likely not exceed 54 ha based on the generation capacity.

Permanent infrastructure footprints will also be reduced. The reduced number of turbines means fewer areas of disturbance during construction, the change in which is not significant. Overall, none of the impacts are significant enough to warrant a change in original impact significance ratings.

- **Wetlands and freshwater ecology :**

The amended layout and footprint have little consequence as the most sensitive areas of the delineated aquatic zones are avoided, with the exception of watercourse crossings which remain similar in number. None of the changes are significant enough to warrant a change in original impact significance ratings.

- **Avifauna:**

The Rotor Swept Area (RSA) would increase in the worst-case scenario of 33 large turbines (by 35.8%) and this moderate increase would normally be considered to be significant at this location due to the presence of Verreaux's Eagles in the area. It is however highly unlikely that the proposed amendment would translate into a significantly increased RSA without exceeding the maximum generation capacity as authorised and these scenarios have been demonstrated. The no-go areas have also been revised and expanded based on additional fieldwork, the results of the Verreaux's Eagle Risk Assessment Tool (VERA) model as well as further rocky ridge buffers based on the Verreaux's Eagle guidelines. In summary, the proposed amendment would likely significantly reduce the potential risk of the Verreaux's Eagles and other avifauna compared to the original authorisation post-mitigation, through a vastly improved layout and a potential reduction in the number of turbines.

All significance ratings remain the same except for the cumulative impact rating which is lower post-mitigation for the amendment, and new mitigation has been proposed based on the more recent field work and additional best practice guidelines.

- **Bats:**

As with avifauna, the RSA increases by 35.8% for the amendment and represents a worst case and unlikely scenario given the maximum generation capacity. In terms of bat fatalities from collisions or barotrauma, there is likely to be a reduced fatality as there is zero encroachment of turbines into high sensitive areas (with only seven turbines in medium sensitive habitats / buffers), and the higher reach of the of the lowest blade tip is expected to outweigh the probable increased fatality of bats from the greater total rotor swept area under the worst-case scenario of 33 turbines with a 180 m rotor diameter. Under the same worst-case scenario, there will be a slightly greater impact on the fragmentation of, and displacement of bats from, suitable foraging habitats as demonstrated by the increase in construction footprint. The only impact rating to change is that of operational fatalities and this reduces from very-high to high negative significance without mitigation, remaining low negative significance with mitigation. Revised mitigation relating to design, construction and operational phases is provided which includes monitoring and curtailment.

- **Heritage:**

The potential negative changes from the increased hardstand footprints and construction road widths are offset by the decrease in the number of turbines and the fact that the maximum authorised length of internal roads will reduce. There is a relatively low archaeological potential within the site therefore the slightly increased footprint is not of significance. Furthermore, the infrastructure remains outside the identified areas of heritage sensitivity. The siting of the REF on the more remote and desolate high dolerite hills also goes some way to addressing the issue of landscape and setting.

In terms of palaeontology, the infrastructure will now be situated within paleontologically insensitive areas underlain by Karoo dolerite (compared to the 2015 study). These changes, together with the slightly reduced number of turbines compared to the 2018 authorised layout, tend to reduce the palaeontological impact significance of the REF but are at least partially offset by the anticipated larger volume of bedrock excavations for the turbine footings as well as a slight increase in total area of surface clearance in the case of the 4.5 MW scenario (as demonstrated in Table 4). The impact rating for palaeontology has reduced both with and without mitigation, whilst cumulative palaeontology impacts which were unrated before are rated as very low negative significance with mitigation. Cumulative impacts on the cultural landscape remain significant.

- **Visual:**

The increased hub height, rotor diameter and blade tip height would have a limited effect on the zone of visual influence and the change in turbine size may only be noticeable within a range of 5 km. Therefore there are no changes to the impact ratings and no additional mitigation proposed.

- **Noise:**

The proposed project will have a noise impact of a low significance on all identified NSDs in the area during both construction and operational phase as the proposed layout locates the turbines further than 1,000 m from any identified NSD. The change in wind turbine specifications such as wind turbine hub height and rotor diameter does not relate to sound power emission levels which depends on model and make of a turbine. Therefore, selecting a turbine model with a lower sound power emission will reduce noise emissions. There are no changes to the impact ratings and no additional mitigation proposed.

4.2.3 Cumulative impact

The following cumulative impacts have resulted in a change when compare to what was assessed in 2018:

- Avifauna collisions: very high negative significance with mitigation, reduced to high negative significance with mitigation.
- Bat fatalities due to collision or barotrauma: very high negative significance without mitigation, reduced to high negative significance with mitigation; remaining at low negative significance with mitigation.
- Impact on local paleontological resources: previously unrated, rated as low negative significance with mitigation, to very low negative significance with mitigation.

4.2.4 Advantages and disadvantages

Summary of the advantages and disadvantages of the changes associated with the amendment :

Change :	Advantage :	Disadvantage :
Terrestrial ecology	None identified	None identified
Wetlands and freshwater ecology	None identified	None identified
Heritage	None identified	In terms of archaeological sites and materials, particularly for rock engravings, an expanded physical footprint of development-related ground disturbance (in a worst-case scenario) is a disadvantage but is not deemed to be significant.
Avifauna	The advantages of the proposed amendment relate to the significantly improved layout and increase in the individual generating capacity of the turbines considered allowing for a reduction in the total number of turbines required to achieve the maximum generation capacity of the facility. The layout associated with the proposed amendment has been informed through the use of the latest available information such as the Verreaux's Eagle Risk Assessment Tool (VERA, which was not previously available), resulting in updated expanded buffers, revised turbines positions and an expected reduction in the risk of negative impacts of the facility on avifauna compared to the original authorisation.	The disadvantages of the proposed amendment relate to the increase in the RSA should the maximum number of turbines (33) be constructed. This scenario is unlikely however as the maximum generation capacity of the facility would be exceeded if the maximum number of turbines with the maximum rotor diameter were to be constructed.
Bats	There are a fewer number of turbines. The higher reach of the lowest blade tip is also expected to reduce the fatality risk of clutter and clutter-edge foraging's bat species; and there is a smaller footprint required for the operational road surface area. All of these factors reduce the impacts on bats.	Factors likely to increase the impact on bats include the potentially wider rotor diameter and greater rotor swept area of individual turbines, and potentially for all turbines combined in a worst-case scenario; the potentially larger permanent handstand area of individual turbines and potentially for all turbines combined in a worst-case scenario; the larger temporary construction handstand area of individual turbines and potentially for all turbines combined in a worst-case scenario; and the greater widening of internal roads at certain places during construction.
Visual	None identified	None identified
Noise	None identified	None identified

4.2.5 Conclusion

In conclusion, there are both advantages and disadvantages to the proposed amendments and these appear to be balanced. Developing all 33 turbines at the maximum turbine specification is not possible since the total capacity (in MW), as authorised, would be exceeded. This worst-case scenario has been considered by the specialists, but they have also considered several more realistic scenarios relating to turbine size and number that demonstrate less significant impacts.

The amended layout avoids all the no-go areas, which includes additional sensitive areas as a result of the amendment studies. Therefore, risks have been further avoided through the application of the mitigation hierarchy.

As a whole the environmental impacts due to the amendments are not considered to differ significantly from the project as originally assessed and authorised. In some cases, impact ratings have been reduced to be of lesser significance.

A number of additional mitigation measures, many of which have come to light through new information, guidelines and field work have been recommended to further ensure unavoidable impacts are at least mitigated. These have been updated in the EMPr.

It is clear from the unique nature and scale of the proposed Khangela Emoyeni Renewable Energy Facility, that it will have significant benefits to the communities of the greater Victoria West and Pixley Ka Seme Districts and will contribute significantly to the provision of renewable energy in South Africa. The importance of renewable energy, as part of the electricity generating mix in South Africa, cannot be over emphasized. The construction of the Khangela Emoyeni Renewable Energy Facility in the vicinity of Murraysburg demonstrates this commitment towards renewable energy and green efficiencies.

The development of Khangela Emoyeni Renewable Energy Facility has been assessed by a team of professionals and based on the outcome of the Environmental Assessment Report and specialist studies, it was recommended for approval and implementation.

The importance of development of renewable energy projects on a global basis is undisputed. Globally, the renewable energy industry is investing billions of dollars and the role of this industry to be driver of economic growth within South Africa is seen as significant. In South Africa, the ancillary benefits of grazing and prevention of agricultural loss are essential to the success of the wind farm. The development of the proposed Khangela Emoyeni Renewable Energy Facility will significantly contribute to the electricity supply and economic development of the district. The following are key aspects to be highlighted from this submission :

- Renewable energy and the contribution of Independent Power Producers have been identified as Strategic Important Developments (SID) in South Africa.
- The Environmental Impact Assessment process and Environmental Impact Assessment Report confirms low impacts associated with the proposed development.
- The various specialist studies conducted confirmed minimal impact or impact with mitigating factors.
- The Department of Environmental Affairs issued positive Environmental Authorisations.
- Implementation of the wind generating facility will significantly contribute to local economic development and job creation possibilities.
- The principles of the Spatial Planning and Land Use Management Act are supported.
- Pixley Ka Seme SDF acknowledged the potential for Renewable Energy generation in the area and promotes renewable energy implementation.
- The development proposal is consistent with the applicable policy and National, Provincial, District and Local Spatial Development Frameworks.
- The development proposal is consistent with the relevant SDFs as contemplated in Section 42 of SPLUMA.
- The Agricultural Assessment concluded that the overall impact of the Renewable Energy Facility on the agricultural potential of the area would be small.
- The development obtained Civil Aviation Authority Approval.
- The development is approved by the Department of Mineral Resources and Energy.

- The construction of the project will not result in the unacceptable clearing of threatened or protected plant species (the proposed development is acceptable from an ecological perspective).
- Implementation of the project will support National Governments targets for renewable energy, including targets identified in the White Paper and supporting policy and legislation.

It is therefore recommended from a planning point of view that the application for the Rezoning of the farm as outlined in the application, be supported and approved.