

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED NAMAS WIND FARM NEAR KLEINSEE IN THE NORTHERN CAPE

**Socio-Economic Basic Assessment
September 2018**

Prepared for:



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SPECIALISTS DETAILS

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ABBREVIATIONS

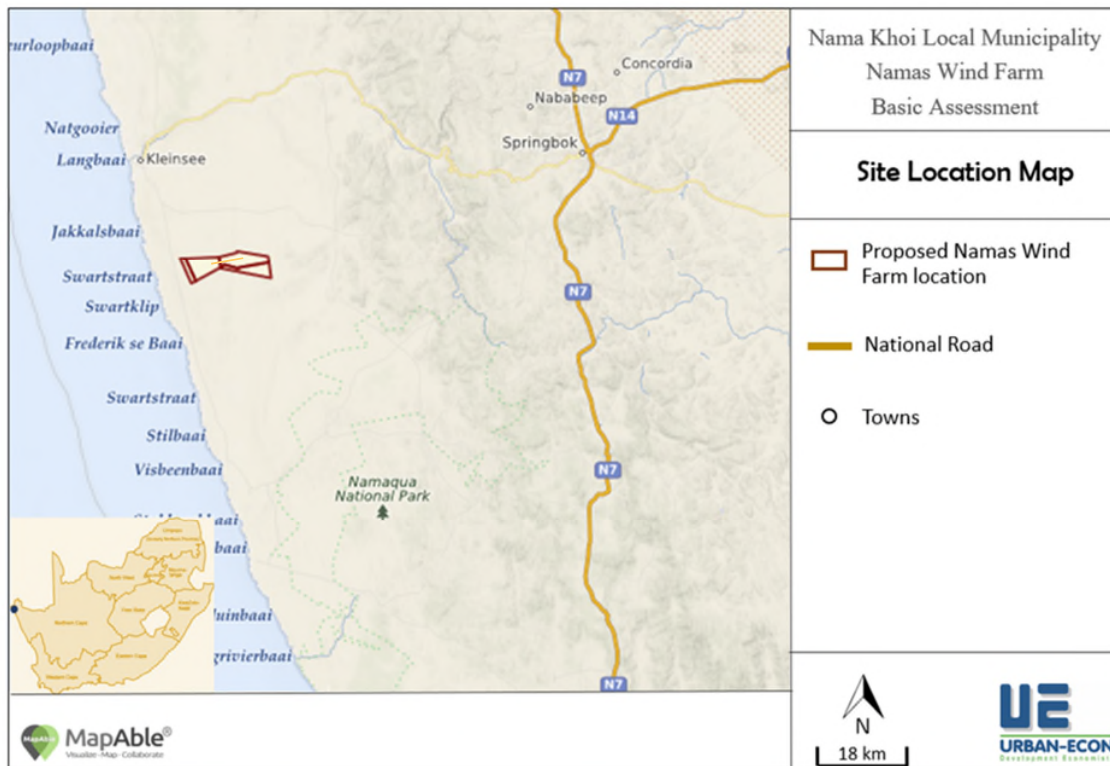
CAGR	Compounded Average Growth Rate
CFB	Circulating Fluidised Bed
DM	District Municipality
DoE	Department of Energy
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
ESP	Electrostatic Precipitator
GDP	Gross Domestic Product
GDP-R	Gross Domestic Product per Region
Ha	Hectare
I&AP	Interested and Affected Parties
IDZ	Industrial Development Zone
IPP	Independent Power Producer
IPAP	Industrial Policy Action Plan
IRP	Integrated Resource Plan
LM	Local Municipality
MW	Mega Watt
NDP	National Development Plan
NEA	Not Economically Active
NGPF	New Growth Path Framework
PC	Pulverised Coal
SDF	Spatial Development Framework

1. INTRODUCTION

This document is prepared by **Urban-Econ Development Economists** (Urban-Econ) in response to a request by **Savannah Environmental (Pty) Ltd** (Savannah Environmental) to undertake a Basic Assessment for the proposed Namas Wind Farm, near Kleinsee, in the Northern Cape.

1.1 Brief description of the project

Genesis Namas Wind (Pty) Ltd is proposing the development of a commercial wind farm on a site located approximately 20 km south-east of Kleinsee within the Nama Khoi Local Municipality and the Namakwa District Municipality in the Northern Cape Province.



Map 0-1: Contextual Map (Mapable, 2017)

A preferred project site with an extent of ~5092ha has been identified by Genesis Namas Wind (Pty) Ltd as a technically suitable area for the development of the Namas Wind Farm with a contracted capacity of up to 140MW that can accommodate up to 43 turbines. The entire project site is located within the Springbok Renewable Energy Development Zone (REDZ).

The project site comprises the following portions:

- » Portion 3 of the Farm Zonnekwa 328
- » Portion 4 of the Farm Zonnekwa 328
- » Remaining Extent of the Farm Rooivlei 327
- » Portion 3 of the Farm Rooivlei 327

The Namas Wind Farm project site is proposed to accommodate the following infrastructure, which will enable the wind farm to supply a contracted capacity of up to 140MW:

- » Up to 43 wind turbines with a maximum hub height of up to 130m. The tip height of the turbines will be up to 205m;
- » Concrete turbine foundations and turbine hardstands;
- » Temporary laydown areas which will accommodate the boom erection, storage and assembly area;
- » Cabling between the turbines, to be laid underground where practical;
- » An on-site substation of up to 100m x 100m (1ha) in extent to facilitate the connection between the wind farm and the electricity grid;
- » Access roads to the site (with a width of up to 10m) and between project components (with a width of approximately 8m);
- » A temporary concrete batching plant; and
- » Operation and Maintenance buildings including a gate house, security building, control centre, offices, warehouses, a workshop and visitors centre.

The power generated from the project will be sold to Eskom and will feed into the national electricity grid. Ultimately, the project is intended to be a part of the renewable energy portfolio of South Africa, as contemplated in the Integrated Resource Plan.

It is important to note that the entire project site is located within Focus Area 8 of the Renewable Energy Development Zones (REDZ), which is known as the Springbok REDZ. Due to the location of the project site within the REDZ, the Basic Assessment (BA) procedure is undertaken in accordance with GN114 as formally gazetted on 16 February 2018.

1.2 Scope and purpose of the study

The purpose of the socio-economic basic assessment is to determine the potential socio-economic implications of the proposed project activities. The basic assessment report addresses the impacts as set out in the guidelines in terms of the Environmental Impact Assessment Regulations of 2014 as amended. The purpose of the socio-economic basic assessment is as follows:

- » Undertake a policy review and assess the alignment of the proposed project with the national, provincial and local socio-economic policies, with a focus on the compatibility of the project with the spatial planning, development objectives and land use management plans of the respective authorities.
- » Create a socio-economic profile for the study area using secondary data. The guidelines for the Basic Assessment procedure specifically call for information on the level of unemployment and skills available in the local community, as well as the socio-economic profile of the local municipality.
- » Identify and analyse the potential socio-economic value of the proposed project.
- » Undertake an impact and risk assessment process focusing on sensitivities of the site and location from a socio-economic perspective and the impacts that may ensue as a result of the change in the status quo of the affected and benefiting communities and economies.

- » Compile a socio-economic impact assessment statement outlining the key findings of the process, summarising the key impacts, providing a reasoned opinion on the proposed development, and outlining mitigation measures.

1.3 Methodology

The methodology employed in conducting the study comprises three steps, as illustrated in **Error! Reference source not found..**



Figure 0-1: Methodology and Purpose

The following paragraphs briefly describe each step.

- » **Step 1: Data gathering**

In order to create a comprehensive understanding of the socio-economic environment that might be affected by the proposed development, policy-related and socio-economic data was gathered.

- » **Step 2: Data analysis**

A description of the study area and the zone of influence is given in terms of selected socio-economic variables. The developed profile is used to interpret the impacts and measure the extent of socio-economic impacts that could be created from the proposed activities in the context of the local, provincial and national economies. It includes the analysis of parameters such as population size and household numbers, structure and growth of the economy, and the labour force and the employment situation.

- » **Step 3: Impact identification and evaluation**

This step included the description and evaluation of socio-economic impacts that could be expected during the construction, operation, and decommissioning phases of the proposed wind farm. Anticipated impacts associated with the project were analysed and evaluated following the methodology prescribed by the environmental consultant (refer to Annexure A). Mitigation measures were proposed.

- » **Step 4: Impact statement**

Considering the identified positive and negative impacts, a socio-economic impact statement was developed containing the reasoned opinion about the proposed project's development and aspects to be considered during the implementation of the project.

1.4 Data gathering and consultation process

The project made use of both primary and secondary data in order to assess the impacts and desirability of the project.

1.4.1 Secondary data analysed

- » Stats SA Census, 2011
- » Quantec Research Standardised Regional Data, 1995-2017
- » National, provincial, and local government strategic documents and policies
- » Mapable

1.4.2 Primary data collected

The primary data gathering for this project was done in the form of telephonic interviews. It should be noted that the landowners who may be directly or indirectly impacted by the project were given an option to meet in person or to participate in a telephonic interview or respond over an e-mail. A telephonic conversation was opted for by everyone in connection with the proposed project.

The interviews with key respondents took place in May and September 2018 and were conducted over the phone or e-mail, depending on the preference of the respondent. The following Interested and Affected Parties (I&APs) were engaged with:

Table 0-1: Key respondents interviewed and interview dates in connection to Namas Wind Energy Facility

Farm Portions	Relation to the project	Contacted party	Date/s of engagement
	Wind farm		
Rooivlei 327/1	A	Landowner – private individual	03 May 2018
Rooivlei 327/3	D		4 September 2018
Rooivlei 327/RE	D	Landowner – private individual	03 May 2018 11 May 2018 4 September 2018
Zonnekwa 328/4	D		
KapVley 315/4	A		
Zonnekwa 328/3	D		
Zonnekwa 326/1	A		
Zonnekwa 328/2	A		
Gra-Water 331/RE	A	Landowner – private individual	14 May 2018
Pienaars Bult 317/1	A	De Beers Consolidated Mines	4 September 2018
Zonnekwa 328/1	A	Landowner – private individual	4 September 2018
Kap Vley 315/2	A	Landowner – private individual	4 September 2018
Kap Vley 315/3	A		
Kannabieduin RE/324	A	Eskom Holdings	4 September 2018
Honde Vlei RE/325			
Rooivlei 327/2			
Brazil 329/RE			
Samsons 330/RE	A	West Coat Resources	4 September 2018

1.5 Assumptions, limitations and gaps in knowledge

- » Project-related information supplied by the environmental practitioner and the client for the purpose of the analysis is assumed to be reasonably accurate.
- » The secondary data sources used to compile the socio-economic baseline (demographics, dynamics of the economy) although not exhaustive, can be viewed as being indicative of broad trends within the study area.
- » The focus on the primary data collection was on those parties that were perceived to be most sensitive to the proposed project. As such, it is believed that the study was able to identify the most significant impacts and assess the most pertinent issues.
- » It is assumed that questions asked during the interviews were answered accurately and truthfully by respondents and to the best of their abilities and knowledge. The

attitudes of the respondents towards the project is assumed to remain reasonably stable over the short- to medium-term.

2. POLICY REVIEW

A policy review plays an integral role in the initial stages of a project. The review provides an indication of whether a project is aligned with the goals and aspirations of the developmental vision across the three spheres of government. Furthermore, the analysis signposts any red-flags or developmental concerns that could jeopardise the development of the project and assists in amending it, preventing costly and unnecessary delays.

The following government strategic documents applicable to the delineated study area were examined:

- * **National (South Africa):**
 - » Integrated Energy Plan 2016
 - » Integrated Resource Plan for Electricity 2016
 - » National Development Plan 2011
 - » New Growth Path Framework 2011
 - » National Climate Change Response Policy White Paper 2011
 - » Renewable Energy White Paper 2003
 - » White Paper on Energy Policy 1998
- * **Regional (Northern Cape):**
 - » Northern Cape Provincial Spatial Development Framework (PSDF) 2014
- * **District (Namakwa District Municipality):**
 - » Namakwa District Municipality Rural Development Plan (RDP) 2017
 - » Namakwa District Municipality Integrated Development Plan 2017 – 2022
- * **Local (Nama Khoi Municipality):**
 - » Nama Khoi Municipality Draft Integrated Development Plan 2018/2019

Table 2-1: Policy alignment

Policy	Policy alignment to proposed project
National Policy: South Africa	
Integrated Energy Plan (2016)	IEP's goal is to guide future energy infrastructure investments, determine and recommend policy development to frame the future energy landscape of the country (Department of Energy, 2016).
Integrated Resource Plan for Electricity (2016)	The IRP focuses on the following government objectives: "affordable electricity; carbon mitigation; reduced water consumption; localisation and regional development; producing a balanced strategy toward diversified electricity generation sources and gradual decarbonisation of the electricity sector in South Africa" (Department of Energy, 2016b).
National Development Plan (NDP) (2011)	<ul style="list-style-type: none"> * The NDP seeks to lessen carbon emissions per unit of power by approximately one-third, while ensuring access to electricity for poor households as it is counted as an element of decent standards of living * The plan attempts to boost investments in energy-efficiency. * Solar and wind are amongst the notable renewable energy resources, that South Africa has, and the efficient usage of these natural

Policy	Policy alignment to proposed project
	resources is essential for the move towards the decarbonisation of the economy (National Planning Commission, 2011).
New Growth Path Framework (2011)	Boosting investments within the renewable energy sector will help create thousands of jobs, especially in manufacturing new energy technologies as well as in construction (Department of Economic Development, 2011).
National Climate Change Response Policy White Paper (2011)	South Africa's response to climate change has two objectives: <ul style="list-style-type: none"> * To regulate inescapable climate change impacts through interventions that strengthen and sustain South Africa's social, economic and environmental resilience and emergency response capacity, and * To contribute to the global attempt to sustain greenhouse gas concentrations within a timeframe that allows for economic, social and environmental development (Department of Environmental Affairs, 2011).
Renewable Energy White Paper (REWP) (2003)	REWP seeks to: <ul style="list-style-type: none"> * ensure effective and efficient administration of financial support systems for renewable energy; * promote renewable energy technology and advance its implementation; and * enhance capacity building and education on renewable energy (Department of Energy, 2015).
White Paper on Energy Policy (1998)	The White Paper policy seeks to: <ul style="list-style-type: none"> * increase access to affordable energy services; * improve energy governance; * stimulate economic development; and * promote the development of renewable energy resources (Department of Energy, 2015).
Renewable Energy Development Zones (REDZs) (2016)	REDZs aim to: <ul style="list-style-type: none"> * minimise negative environmental consequences; * align authorisation and approval processes; * attract incentives; and * produce focused expansion of the South African electricity grid (EUCCISA, 2018).
Provincial Policy: Northern Cape	
Northern Cape Provincial Spatial Development Framework (PSDF) (2012)	<ul style="list-style-type: none"> * Seeks to advance the establishment of renewable energy supply schemes. * The PSDF further posits that the Northern Cape holds a potential comparative advantage because of the regular occurrence of strong winds which could be a source of renewable energy, more specifically for sustainable electricity production. * Renewable energy sources are to constitute 25% of the province's energy production capacity by 2020 (Office of the Premier of the Northern Cape, 2012).
District Policy: Namakwa District Municipality	
Namakwa District Municipality Rural Development Plan (RDP) (2017)	<ul style="list-style-type: none"> * Renewable energy developments are amongst the district development priorities within the RDP. * The plan emphasises the need to evaluate localisation possibilities for all renewable energy technologies and identify the relevant localisation roadmaps in consultation with the broader stakeholder

Policy	Policy alignment to proposed project
	community (Department of Rural Development and Local Reform, 2017).
Namakwa District Municipality Integrated Development Plan 2017 – 2022	<ul style="list-style-type: none"> * One of IDP’s objectives is to oversee and support local municipalities to deliver basic services (water, sanitation, housing, electricity and waste management). * The IDP also seeks to establish good governance by enforcing the climate change response plan (Namakwa District Municipality, 2017).
Local: Nama Khoi Municipality	
Nama Khoi Municipality Draft Integrated Development Plan 2018/2019	<ul style="list-style-type: none"> * Amongst its basic services and infrastructure objectives, the plan emphasises the need to support the linkage between the Kannikwa Vlake wind farm to the north of Kleinsee. * The plan seeks to provide sustainable delivery of services such as water and sanitation, electricity, and solid waste management amongst others. * The plan also identified possible high wind energy generation zones to the south of Violsdrift, and around Springbok and Koingnaas and proposes an analysis of the areas for the development of wind farms (Nama Khoi Municipality, 2018).

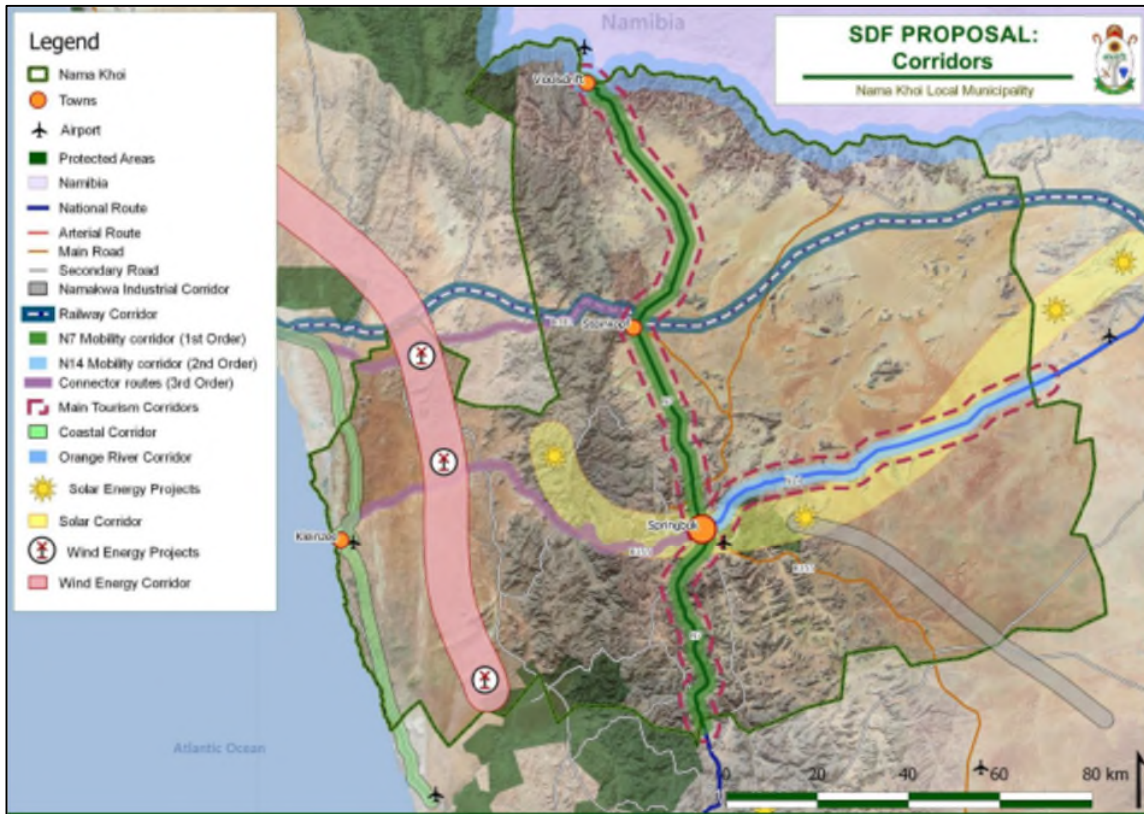
The reviewed documents demonstrate government’s support for initiatives that promote sustainable renewable energy use. Moreover, the initiation of renewable energy into the country’s electricity production is grounded in the Constitution and effectuated in the following three policy documents:

- » White Paper on Energy Policy (1998)
- » Renewable Energy White Paper (2003)
- » National Climate Change Response Policy White Paper (2011)

National policy indicates a need to advance energy infrastructure, increase and improve access to electricity while reducing carbon emissions, and emphasises the use of natural resources, all of which lead to economic, social and environmental development. All these objectives are pursued within the provincial, district and local levels. Therefore, there has been a growing need to change the mix of energy sources in the country and to ensure that renewables play a greater role in the mix.

As illustrated in the above table, wind is one such source and the Northern Cape province demonstrates a potential comparative advantage in wind. Therefore, the establishment of wind farms within the province would be beneficial for the economy and the citizens therein. It is partially due to these reasons why the province also holds the Springbok REDZ.

District policy seeks to ensure the delivery of basic services, such as electricity, and ensure good governance with regard to implementing these strategies and plans. Furthermore, the Nama Khoi Municipality (2018) emphasises the need to promote wind energy projects and to support the linkage with the Kannikwa Vlake wind farm to the north of Kleinsee.



Map 2-1: Nama Khoi Local Municipality Spatial Development Framework Corridors (University of Pretoria Business Enterprises, 2014)

The Spatial Development Framework (SDF) for Nama Khoi Local Municipality offers the following highlights:

- * The proposed project is located partially within the proposed Wind Energy Corridor, coinciding with the spatial vision for the area.
- * Kleinsee is categorised as a functional rural region.
- * There is an aim to explore new economic and development opportunities and ventures and to encourage and support Local Economic Development and job creation strategies (University of Pretoria Business Enterprises, 2014).

To conclude, the review of strategic documents and policies did not identify any potential red flags from a socio-economic perspective. On the contrary, the project is to be located within the Springbok REDZ and partially within the Wind Energy Corridor delineated in the Nama Khoi SDF. Development of wind farms in the area is therefore supported at various government levels and is not expected to result in any spatial development conflicts given the proposed project's location.

3. BASELINE PROFILE

This chapter examines key socio-economic characteristics of the study area. This is essential, as it provides both qualitative and quantitative data relevant to the communities and economies under observation, creating a baseline that will assist in identifying the sensitive receptors and potential impacts.

3.1 Study area's composition and locational factors

a) Spatial context and regional linkages

The proposed Namas Wind Farm is planned to be located in the Nama Khoi Local Municipality within the Namakwa District Municipality in the Northern Cape Province. The province is situated in the north-western corner of South Africa and has a land area of 372,889 km², therefore occupying approximately 30% of South Africa's land area and making it the largest province in South Africa even though it has the smallest population.

The Namakwa District Municipality is a Category C municipality, which denotes that the municipality has a municipal executive and legislative authority in an area that includes more than one municipality (Statutes of Republic of South Africa, 1996). Namakwa is the largest of the five district municipalities in the Northern Cape. It is comprised of six local municipalities, namely Nama Khoi, Hantam, Khâi-Ma, Kamiesberg, Karoo Hoogland, and Richtersveld. The Nama Khoi local Municipality is a Category B municipality, which means it shares a municipal executive and legislative authority with a Category C municipality, within whose area it falls (Statutes of Republic of South Africa, 1996).

b) Major towns and settlements

The proposed project will be located near a town called Kleinsee (also known as Kleinzee), which is situated on the west coast in the Northern Cape and was previously a diamond mining town. Kleinsee is situated about 105 km (by road) west of Springbok, and is located between two coastal towns:

- » Port Nolloth, which it connects with via the R355 and R382, and
- » Koingnaas, which it connects with via the Checkpoint drive (part of the coastal corridor).

Komaggas and Nigramoep are also nearby towns, both of which are about 65-70 km (by road) inland from Kleinsee. Kleinsee was previously occupied by thousands of residents and was a flourishing town supported by active diamond mining operations in the Namaqualand; however, since the closure and downscaling of the De Beers mines in the area, the population size decreased drastically post-2009.

c) Locational factors and major tourism attractions

Kleinsee was previously visited often by tourists as a part of the diamond route; now it is included in the 'shipwreck and daisies route'. The town holds and is located near various tourist attractions such as the Buffels River estuary, which has an abundant bird life, and the Seal colony, which is the largest on-land colony in South Africa with more than 450 000 animals on the beach (SA Venues, n.d.). Kleinsee also has a museum, which "covers the

together. Some of these activities included fashion shows, ox braais, wine tastings, and beer fests and sports competitions (Stilwell, 2011).

The town, however, experienced a sharp decline in population between 2007 and 2009; by 2007, the diamond production decreased, which led to retrenchment of workers in the same year. By 2008 mining operations ceased completely, leading to the sale of the mines and leaving the future of many uncertain. The population of the town began decreasing as people sought employment in other places within and outside the province, and foreigners employed in the area returned to their homes. To avoid total loss, the mining town was proclaimed as a public town in 2012 under the Nama Khoi municipality to allow people to continue living in the area (Dolley, 2012).

While Kleinsee is believed to have lost its significance, the Nama Khoi municipality plans to revive the town and create employment opportunities through the construction of roads and electricity networks, removing illegal waste dumps, advancing tourism attractions and multipurpose centres, and launching solar water-heating and renewable energy projects (Manoko, 2016).

3.2 Demographic profile

a) Population demographics

The Nama Khoi Local Municipality (LM) has a population of approximately 48 681, with a total of 13 515 households (Stats SA, 2017). This is indicative of an average household size of 3.6 in the municipality. The Nama Khoi LM constitutes 4% of the provincial population and 9% of the Namakwa District Municipality (DM) population. Furthermore, only 10% of the total households in the Namakwa DM are located in the Nama Khoi LM. The population has continuously declined in the past ten years, attributed to the mine closures and limited other job opportunities, which resulted in net out-immigration of people.

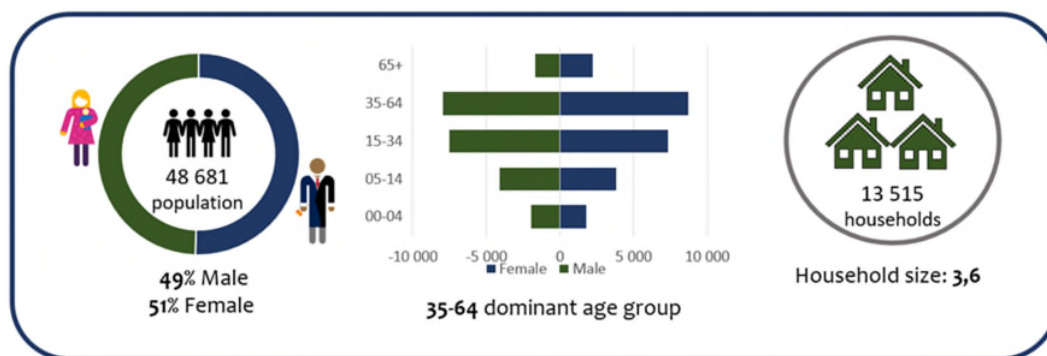


Figure 3-1: Overview of demographics in Nama Khoi Local Municipality

A greater proportion of the population is comprised of females. Furthermore, the majority of the population are aged between 35 and 64, and the minority of the population are aged below four years (Quantec Easy Data, 2017). This is indicative of a predominantly adult population with a relatively small youth population. This insinuates the migration of young adults. The working age population (15-64) constitutes just over 67% of the

population. Numerous push factors are at play in the region, therefore leading to migration, however, the upsurge in renewable energy projects in the province will most likely attract job seekers and slightly shift the demographics in the next coming years.

b) Income levels

Overall, 46% of the households within the local municipality earned up to R3 200 per month. In Kleinsee, 4% of the households had no income and 38% earned up to R3 200 per month (Stats SA, 2017).

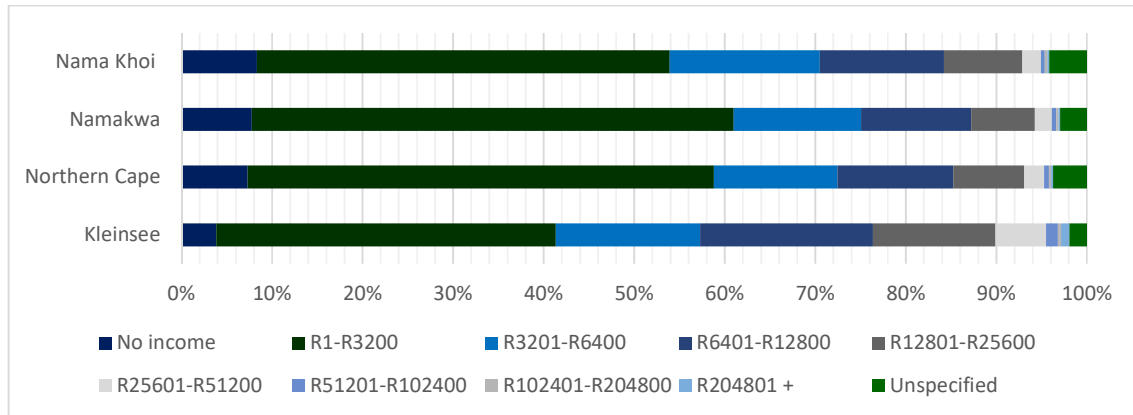


Figure 3-2: Income Levels from provincial to local scale

The largest range of income earned in the Northern Cape is between R1 and R3 200 per month. The household income in the area signals the stringent manner in which residents meet their needs and the dependence on government. In contrast, a minority of the population can be classified as middle-income earners and high-income earners, who therefore have relatively increased purchasing power, which implies improved access to health facilities and socio-economic well-being. The local communities are in dire need of job opportunities that will enable them a similar improvement in livelihood.

c) Education levels and Skills

In the Namakwa DM, Nama Khoi LM and the town of Kleinsee, the adult population with no schooling constitutes 11%, 6% and 2%, respectively (Quantec, 2017). The majority of residents have some secondary schooling and 7% have acquired higher education qualifications. The education levels are therefore moderate to poor and seek addressing.

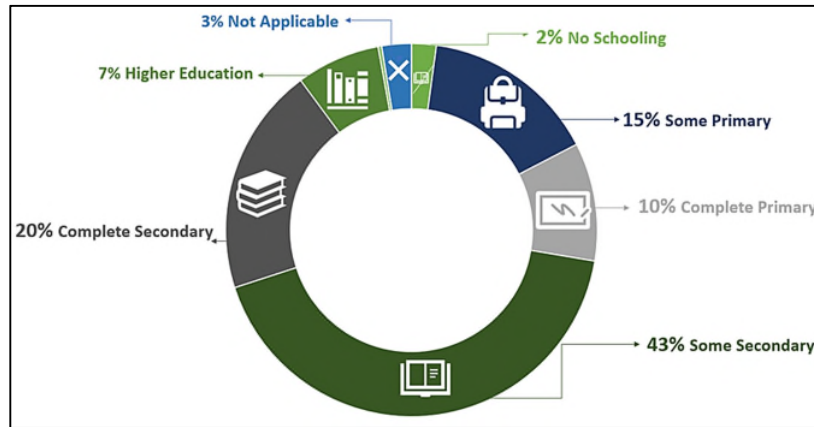


Figure 3-3: Levels of Education in Nama Khoi Local Municipality

With regard to skills, close to half the labour force in the formal sector are semi-skilled. In both the district and local municipality, only a fifth of the labour force are skilled. The low-skilled labour force is 36% and 33% in the district and local municipality, respectively. Therefore, the supply of skilled labour in the local area is highly limited.

3.3 The economy

The following diagram provides a snapshot of the composition and trends observed in the local economy.

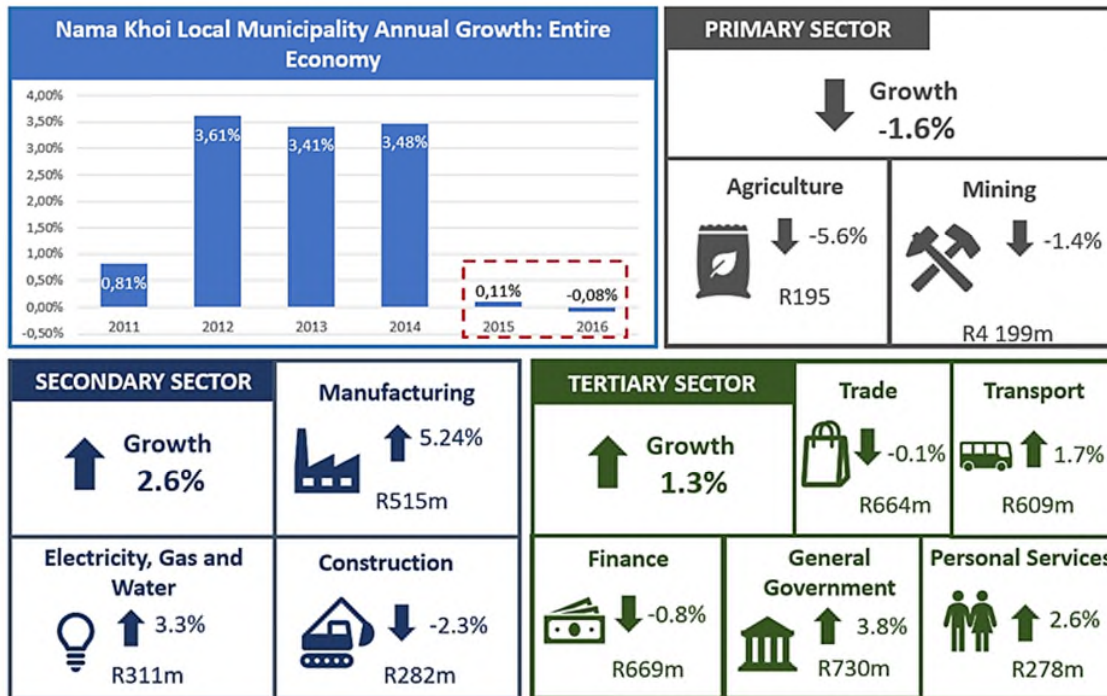


Figure 3-4: Economic Performance of Nama Khoi Local Municipality between 2015 and 2016 (Urban-Econ calculations based on Quantec data, 2017)

In 2016, The Nama Khoi LM economy was valued at R8 504 million in constant prices. The LM contributes 55% to the economy of the Namakwa District Municipality and 7% to the economy of the Northern Cape (Quantec, 2017). Over a period of six years (2010-2016),

the municipality's economy grew at a positive compounded annual growth rate (CAGR) of 2% per year. This is identical to the district growth of 2%. However, from 2015 to 2016 the GDP-R slightly decreased by 0.08% in Nama Khoi LM. As demonstrated in Figure 3-4 above, the decline in GDP between 2015 and 2016 is attributed to the shrinkage of numerous sectors including agriculture, mining, construction, trade and finance.

The economic sector with the greatest contribution to the GDP-R of the Northern Cape is mining and quarrying, which makes its decline even more concerning. Similarly, mining is the highest contributing economic sector in the Nama Khoi LM despite it being amongst the sectors experiencing decline (Quantec, 2017). The agriculture sector is the economic sector with the least contribution to the GDP-R of the municipality (Quantec, 2017).

3.4 Labour force and employment structure

Employment is the primary means by which individuals who are of working age may earn an income that will enable them to provide for their basic needs and improve their standard of living. As such, employment and unemployment rates are important indicators of socio-economic well-being. The following paragraphs examine the study area's labour market from a number of perspectives, including the employment rate and sectoral employment patterns.

a) Labour force composition

According to Census 2011 data, the working age population of Nama Khoi LM was about 35 344, which constitutes 67% of the population. Among these, 16 334 were economically active. Not economically active (NEA) persons are those who were neither employed nor unemployed, including discouraged job seekers. The Municipality had 19 009 NEA persons in 2011. The employed labour in the municipality was estimated at 12 615 (36%), whilst the unemployed labour was about 3 720.



Figure 3-5: Labour Force Breakdown for the Nama Khoi LM

This results in an unemployment rate of 17%, which is much lower than the national unemployment rate. However, this is largely attributed to the increasing decline in the population in the area, which has likely lead to the out-migration of economically active people and subsequent reduction in the unemployment rate. Therefore, while the unemployment rate is considerably lower than that observed in the rest of the province or in the country, the low-income levels of the households suggest that the existing employment opportunities are not able to assure and provide for good standard of living.

b) Employment structure

Over three-quarters of the employed individuals in the Nama Khoi LM and Namakwa DM were employed in the formal sector and less than a quarter were employed in the informal sector (Quantec Easy Data, 2017). In both the Namakwa DM and the Nama Khoi LM, the

wholesale and retail trade, catering and accommodation economic sector employs the largest number of people, whereas the electricity, gas and water economic sector have the lowest number of employed people. The electricity, gas and water and community services sectors are the sole sectors that have had gradual growth of employment figures in the past five years. On the contrary, the other sectors have experienced a decline in figures at some point in the past five years.

3.5 Status of infrastructure and basic service delivery

Access to basic service delivery and infrastructure such as shelter, and transport are indicators that assist in understanding the standard of living of the households residing in the study area. Comprehension of the extent to which households in the area have access to water, sanitation, and electricity assists in the understanding of communities' living standards and their needs. The availability of service infrastructure such as roads, educational and health facilities, etc., further indicates the nature of the study area, which is valuable in developing a complete profile of the circumstances in which communities are living.

a) Basic service delivery

A large portion of over 90% of the population resides in urban areas, while the remaining percentage resides on farm land. Approximately 90% of these **houses** are brick structured dwellings; 0.9% are informal settlements; just over 1% are traditional dwellings; and the remaining 8% are flats, complexes and backyard dwellings (Quantec, 2017). Nama Khoi has experienced urbanisation over the years as a result of the demand for "better access to basic services such as education, health systems, housing and infrastructure as well as for better living standards and seeking employment opportunities" (Nama Khoi Municipality, 2018). Simultaneously, migration out of the municipality has been much more intense than the urbanisation.

Majority of the households in Nama Khoi LM have access to **electricity** and comprise of almost 94% of the households while approximately 5% of the households use candles and the remaining 1% uses alternative energy sources such as solar, gas, paraffin and other unspecified sources. The municipality is directly responsible for the provision of electricity.

Over half of the Nama Khoi households have piped **water** within their dwellings; 32% have piped water within yards; 20 % has access to piped water on community stands while less than 10% uses other sources such as borehole, rain-water tanks, or wells. Nama Khoi has serious water challenges as does the whole province and Nama Khoi presents a need to conserve the water sources and improve their capacity for sustainability purposes (Nama Khoi Municipality, 2018).

Nama Khoi LM is mainly responsible for the provision of **waste management** services. Approximately 90% of households have their waste removed by local authorities, of which just over 89% is removed at least once a week and 0.4% is removed less often (Quantec, 2017). Just over 7.1% of the households have their own refuse dumps and approximately 3% of the households either have no rubbish disposal or use communal refuse dumps and some have unspecified means of waste removal. Nonetheless, the municipality

demonstrates a failure to comply with requirements for disposers of waste to account for their waste type and volumes in a specified way. This is because the municipality does not have any systems in place to observe waste volumes and types and this hinders the municipality's capacity to design landfill infrastructure and waste reduction programs (Nama Khoi Municipality, 2018).

With regards to **sanitation** approximately 74% of the Nama Khoi households have access to flush toilets or chemical toilets, while 16.6% uses pit latrines, 1.9% uses bucket latrines, and 7.5% of the households use unspecified toilet systems (Quantec, 2017).

The above paragraphs demonstrate that the majority of Nama Khoi households have access to basic services. However, the Nama Khoi municipality (2018) suggests that while this appears as proof of service delivery it does not imply that these services are continually provided. Furthermore, as households increase, backlogs in "electricity provision, housing needs, roads, access to water and sanitation needs" also increase (Nama Khoi Municipality, 2018).

The Nama Khoi LM (2018) presents various objectives which seek to improve the local communities. Among these, the municipality seeks to:

- Improve road infrastructure and ensure the continuous sustenance and protection of current quality roads, for example there is a need to improve roads between Springbok and other towns such as Kleinsee, and Goodhouse and between Port Nolloth and Kleinsee.
- Establish a clearly identified road hierarchy that is beneficial and suitable for various transport capacities and functions, for example, the national roads between Springbok and Upington, and regional roads between Springbok and Kleinsee.
- Explore the viability of direct boat access to the ocean at Kleinsee through a small harbour or port.
- Advance the general quality of the communities through continuous programmes such as the maritime-culture, small scale fishing, biofuels and wind energy projects.

b) Status of social facilities

Even though Nama Khoi has a limited number of hospitals which are not easily accessible to everyone, the development of hospitals and clinics is impractical because of the remoteness and low population threshold in communities such as Bulletrap, Steinkopf, Komaggas, Buffelsrivier and Kotzehoop. Instead, focus should be placed on developing human capital and improving mobile services with competent nurses and doctors to travel to the various remote areas in the municipality (Nama Khoi Municipality, 2018).

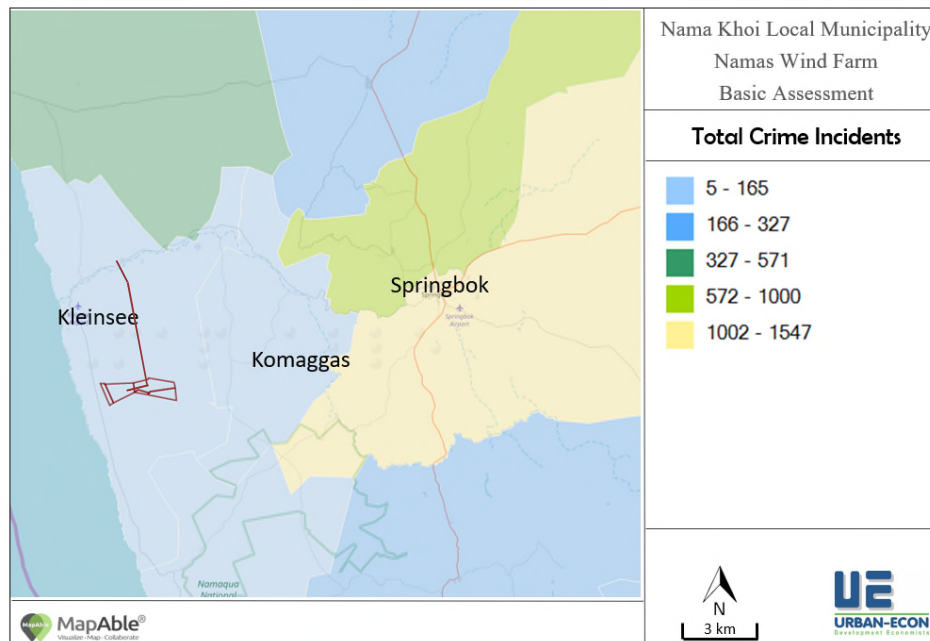
Similar to the case of hospitals, the Nama Khoi municipality considers it impractical to build schools or improve the curricula for grades 10 to 12 in remote areas; as a result, students are encouraged to attend schools in the main economic centres such as Springbok. This means that schools are not easily accessible for those in remote areas as they need to travel longer distances on a daily basis. The municipality further suggests that it would be more feasible to improve the existing schools and curriculum and ensure

the employment of exceptional teachers in the main centres (Nama Khoi Municipality, 2018).

Although Nama Khoi lacks sport and recreational facilities and faces a high rate of drug-related crimes, one of the spatial objectives suggests the need to establish well-furnished youth centres, recreation facilities for both indoor and outdoor activities so as to ensure a healthier alternative to drugs and alcohol abuse (Nama Khoi Municipality, 2018).

c) **Crime Statistics**

The proposed project site and immediate surrounds have the least number of reported crime incidents in the region. The area with the highest reported crime incidents is north of Springbok. The top four reported crime incidents around the proposed project site are assault, theft and burglary at residential premises and drug-related crimes.



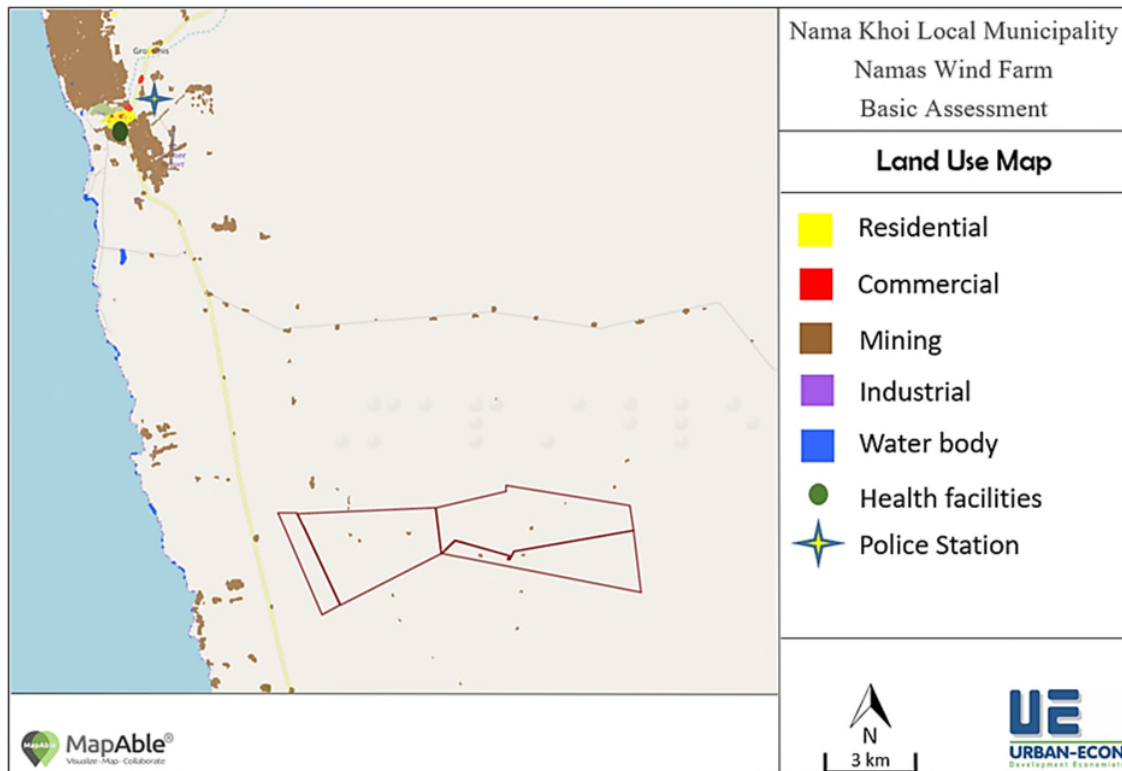
Map 3-2: Spatial representation of total reported crime incidents (Mapable, 2017)

The area, where the proposed project is to be located, was once known to be a flourishing and bustling community. Diamond mining was the key economic driver for the past century, creating not only direct employment opportunities but also supporting various economic activities in the nearby towns of Kleinsee and Koingnaas – the two towns that were originally established as access-controlled towns to supporting diamond mining activities. However, due to the economic downturn and other factors, the production at the mines has significantly reduced between 2007 and 2009, followed by the acquisition of Namaqualand mines by West Coast Resources (Pty) Ltd. Although, the transaction has become effective in 2014, and the operations have notably increased over the past two years, the area is far from recovering. Skills shortages, high outmigration rate, and limited access to educational and health facilities, due to the nature of the settlements and population densities, are all contributing to the deterioration of the once thriving communities.

4. SITE RELATED INFORMATION: ZONE OF INFLUENCE

4.1 Land Use in Zone of Influence

The site-related information section investigates the various dynamics of the proposed site. Map 4-1 indicates the current land uses of the proposed project site and its surroundings. Evidently, minimal activity is taking place in the zone of influence. Land use activities are concentrated in the town of Kleinsee, with residential, commercial and minimal industrial activities taking place. The dominant land use is mining, concentrated north and south of the town of Kleinsee with pockets of mining activity within and surrounding the proposed project site. However, this is inclusive of inactive and closed mines.



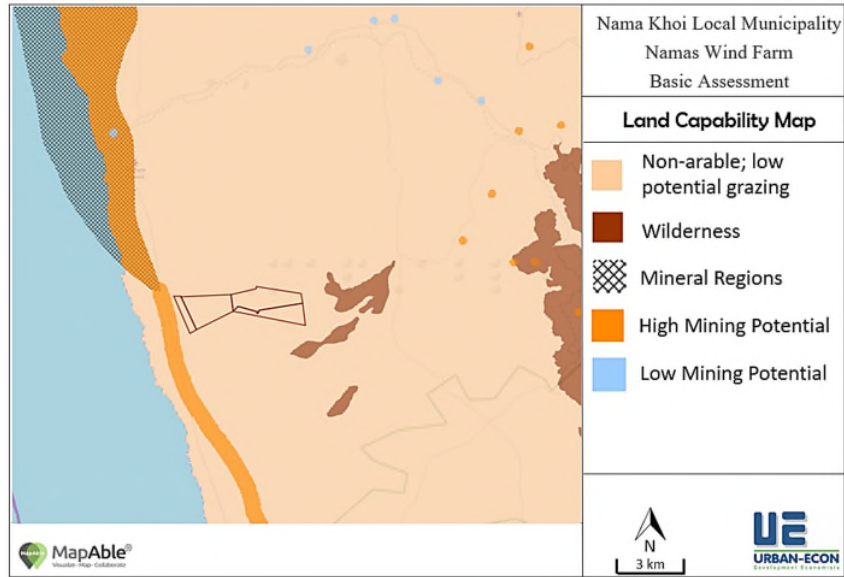
Map 4-1: Land Use and Social Facilities Map in Zone of Influence (Mapable, 2017)

A scarcity of social facilities is prevalent in the zone of influence. One public hospital and police station are situated in Kleinsee. The closest school is less than 20km from the project site in the area of Komaggas, to the east of the proposed project site. Additional schools and clinics are situated in the town of Springbok, over 70km to the east of the project site. On the proposed project site, agricultural activity and permanent residence is taking place.

4.2 Land potential and capability

The area is not suitable for crop farming as it is non-arable land. The low grazing potential of the site is evident in the current economic activities asserted by the landowners and land-users. Sheep farming is the economic activity taking place on the farms of the proposed project site and the adjacent farms. To the west of the project site is land categorised as wilderness, which denotes that the land is not suitable for crop farming and

grazing and can be rather utilised for wildlife, recreation or wasteland (refer to the map below).



Map 4-2: Land Capability Map in Zone of Influence (Mapable, 2017)

Having noted that the mining sector is one of the key economic sectors in the municipality, the mining potential in the zone of influence is notable. High mining potential is prevalent to the west of the proposed project site and pockets of it to the east. Importantly, though the proposed project is not located in the area of high mining potential and will unlikely sterilise the mineral reserves.

4.3 Key data with regard to the immediate zone of influence

The engagement with the landowners directly to be affected by the proposed project and those located in the adjacent farm portions revealed that the area is predominantly used for commercial sheep farming.

Table 4-1 below provides the key data of the proposed project site and selected adjacent farm portions.

Table 4-1: Land use activities on the proposed project site and adjacent area

Farm Portion and size	Agricultural/Economic activity	Yield/ Number	Number of employees
Directly Affected Portions			
Portion 3 and 4 of Farm Zonnekwa 328	<u>Commercial Farming</u> Livestock Farming: Sheep	200ha/sheep	2 temporary employees * Work 60 days a year (15 days in four months)
Portion 3 and Remaining Extent of Farm Rooivlei 327	<u>Commercial Farming</u> Livestock Farming: Sheep	10ha/sheep	3 permanent but part-time employees: * 1 employee works 1 week per month * 2 employees work one week every three months

Farm Portion and size	Agricultural/Economic activity	Yield/ Number	Number of employees
Adjacent Farm Portions			
Portion 4 of Farm Kapvley 315	Livestock Farming: Sheep	2 000ha sheep farming 500ha meat production	No employees
Remaining Extent of Farm Gra-Water 331	Livestock Farming: Sheep	4000ha sheep breeding 161ha meat production	40 temporary employees * Each 3-6 weeks new employees are hired.

The engagement with the **potentially directly affected landowners** revealed the following:

- » Private landowners of Portion 3 and 4 of Farm Zonnekwa 328 and Remaining Extent of Farm Rooivlei 327 raised no concerns and conveyed their support to of the proposed wind farm. No loss of economic activity (sheep farming) will occur as a result of the project's development; therefore, no loss of employment and income are expected. Land has been identified for the temporary movement of sheep during the construction phase. It was requested, though, that the construction crew makes use of an alternative road that is located about 1km away from residences on the farm and would be the preferred access route to the project site.
- » Private landowners of Portion 3 of Farm Rooivlei 327 were also enthusiastic about the proposed project. Sheep farming will discontinue due to old age and retirement of the landowner and not as a result of the proposed project. Employees will not lose employment and will be employed to maintain the farm. Drought has had a negative impact on the farming activities on these sites; the wind farm therefore provides an alternative source of income for the landowner and the workers.

Engagement with the **landowners of the farms adjacent to the properties**, where the wind farm is to be developed, revealed some concerns related to the potential increase in incidence of livestock theft, security issues at the farms, and violence from the nearby community associated with the service delivery and jobs.

Apart from the above, the landowners of the directly affected and adjacent farm portions did not have any additional concerns with respect to the proposed development.

5 POTENTIAL SOCIO-ECONOMIC IMPACTS

5.1 Introduction

This chapter presents the analysis of the socio-economic impacts that are expected to ensue as a result of the development of the proposed project and an evaluation of these impacts is according to the predefined criteria in

ANNEXURE A: METHODOLOGY AND CRITERIA. The culmination of all data gathered and analysed, as well as the past experience with similar projects, assisted in the identification of the following impacts that are to be assessed:

- » Construction Phase
 - * Stimulation of the economy
 - * Temporary employment creation due to construction activities
 - * Household income attainment due to employment opportunities
 - * Skills development and enhancement due to construction activities
 - * Change in sense of place due to construction activities
 - * Potential increase in theft related crimes
 - * Increase in government revenue due to rates and taxes
- » Operation Phase
 - * Stimulation of the economy
 - * Long-term employment creation due to operation and maintenance activities
 - * Household income attainment due to employment opportunities
 - * Skills development and enhancement due to operation activities
 - * Change in sense of place due to visual impact of wind turbines
 - * Renewable energy security
 - * Increase in local government revenue due to rates and taxes
- » Decommissioning Phase
 - * Temporary increase in production in the economy and reuse of recovered metallic and non-metallic materials
- » Cumulative impacts
 - * Change in demographics due to influx of workers and jobs seekers

5.2 Impacts ensued during construction

5.2.1 Increase in production and GDP-R

The establishment of the proposed Namas Wind Farm will be associated with numerous capital expenses. Expenses would usually include expenditure on transport and installation of wind turbines, electrical and grid connection, foundation, civil works, and construction of supporting structures. If goods and services are procured locally, i.e. within South Africa, it increases the production of the respective industries. This has a positive impact on the national economy and economies of the municipalities where inputs are procured. The construction sector in Nama Khoi experienced a 2.4% decline in 2016. The proposed project can stimulate this particular sector among other sectors such as the manufacturing sector.

The capital investment of about R1.82 billion in current prices, is required for the development and construction of the proposed project. Some of this is expected to be spent in South Africa, which will resultantly stimulate the national economy, although for a temporary period of about 18-24 months.

The size of the Nama Khoi LM's economy was estimated at R8 504 million in current prices and primarily comprises mining and general government. Considering the small economic

base of the municipality, the opportunities for the procurement of goods and services within the local economy will be very limited. Having said this, it is likely that some of the local businesses could benefit from sub-contracting opportunities, if the construction companies appointed by the developer implement a local community procurement policy, and consumer expenditure of the construction crew. Furthermore, the demand for hospitality services including accommodation and catering in the town of Klenisee and other nearby towns is expected to increase and provide for much needed stimulus for the local economy.

Nature: Expenditure associated with the construction of the proposed development will impact on the production of the local and national economies directly and indirectly		
	Without enhancement	With enhancement
Extent	National (5)	National (5)
Duration	Short-term (2)	Short-term (2)
Magnitude	High (8)	High (8)
Probability	Definite (5)	Definite (5)
Significance	High (75)	High (75)
Status (positive or negative)	Positive	Positive
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes (enhance)	Yes
Mitigation/Enhancement:		
<ul style="list-style-type: none"> » The project developer should procure goods and services, as far as practically possible, from the local municipality. » Local Small and Medium Enterprises should be approached to investigate the opportunities for supplying inputs required for the construction of the facility, as far as feasible. <p>The above mitigation (enhancement) measures are meant to increase the positive impact on the local municipality, but it will not change the rating of the impact on the "national" scale.</p>		
Residual impacts		
Production in the economy will continue.		

5.2.2 Creation of temporary employment

The construction of the wind farm will require temporary employment of construction workers, foremen, and engineers on site. About 300-400 employment opportunities will be created for a period of 18 to 24 months. The review of the local skills set though, suggests that it is unlikely that the local area will be able to supply skilled and highly skilled workers for the project. Having said this, unskilled and semi-skilled workers will also be required for some of the work involved on site. Therefore, some improvement in the employment situation in the local municipality could be expected, albeit for a temporary period. Employment of the individuals, albeit temporary, will increase their household income, improve their standard of living and benefit their families.

In addition to those benefitting from direct employment created at the project, various multiplier effects will assist in temporarily supporting existing jobs in the businesses

offering services and goods that will be procured during construction activities. The increased temporary income earned by these businesses will in turn stimulate consumption spending, creating another round of multiplier effect. The unemployment rate of 17% will therefore to a certain extent be curbed.

Nature: The construction of the Namas Wind Farm will positively impact on the local and national economies by creating temporary job opportunities directly and indirectly (albeit temporary)		
	Without enhancement	With enhancement
Extent	National (5)	National (5)
Duration	Short-term (2)	Short-term (2)
Magnitude	Moderate (6)	Moderate (6)
Probability	Definite (5)	Definite (5)
Significance	High (65)	High (65)
Status (positive or negative)	Positive	Positive
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes (enhance)	Yes
Mitigation/Enhancement:		
<ul style="list-style-type: none"> » Organise local community meetings to inform the local labour force of the project that is planned to be established and the jobs that can potentially be applied for. » Establish a local skills desk to identify the skills set of the local residents available for the construction and operation phases of the wind farm. 		
Residual impacts:		
No residual impacts are applicable.		

5.2.3 Attainment of household income

Household earnings are linked closely with trends in employment and, as such, will be affected positively by the creation of jobs as discussed above. The creation of 300-400 jobs during the construction period will temporarily increase affected households' income to the value of about R54 million. Some of this income will be earned by workers from the local communities. Given that most local households earn between R1- R3 200 per month, a significant boost in household income will prevail. A temporary increase in living standards based on the additional monthly income will therefore ensue. Employees working for local businesses that will be sub-contracted to supply goods and services to the wind farm during construction are also expected to benefit indirectly.

Nature: Employed individuals will increase the income of their respective households and therefore improve their standard of living.		
	Without enhancement	With enhancement
Extent	National (5)	National (5)
Duration	Short-term (2)	Short-term (2)
Magnitude	Moderate (6)	Moderate (6)

Probability	Definite (5)	Definite (5)
Significance	High (65)	High (65)
Status (positive or negative)	Positive	Positive
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	Yes
Mitigation/Enhancement:		
» Hire majority of local residents, which will boost the local economy through expenditure that empowers local businesses and economy.		
Residual Impacts:		
No residual impacts are applicable.		

5.2.4 Skills development and enhancement

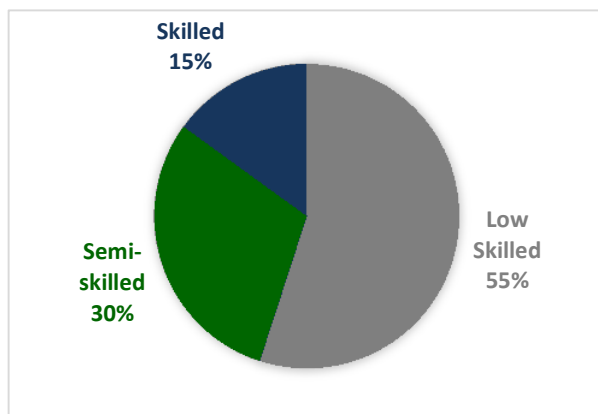


Figure 5-1: Split by skills set during construction

A variation of skill sets is required ranging from semi-skilled construction workers to highly skilled engineers. The majority of the municipality’s residents are semi-skilled, which means that with proper planning and recruitment strategies many of the local unemployed residents could be hired as temporary construction workers on site provided they satisfy any other recruitment criteria. Therefore, it is possible to minimise the size of migrant labour employed at the construction site and

limit it to the skilled and highly skilled individuals only.

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

Nature:		
Employees will develop and enhance skills thereby increasing experience and knowledge.		
	Without enhancement	With enhancement
Extent	Regional (3)	Regional (3)
Duration	Short-term (2)	Short-term (2)
Magnitude	Low (4)	Moderate (6)
Probability	High probably (4)	Definite (5)
Significance	Medium (36)	Medium (55)

Status (positive or negative)	Positive	Positive
Reversibility	Low	Low
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes (enhance)	Yes
Mitigation/Enhancement:		
<ul style="list-style-type: none"> » In order to maximise the positive impact, it is suggested that the project company provide training courses for employees where feasible to ensure that employees notably gain from the work experience. » Facilitation of the transfer of knowledge between experienced employees and lower-skilled staff is recommended. 		
Residual Impacts:		
The skills obtained by the employed labour force are permanent and will therefore be retained.		

5.2.5 Influx of migrant labour and job seekers

The current population size in the Nama Khoi Local Municipality is over 48 000, and the population growth has been declining. The job opportunities will most likely trigger in-migration and, therefore, it can be suggested that a slight positive shift in the demographics will ensue as a result of the proposed project. Resultantly, migrant workers and job seekers will increase the current population size and possibly increase the male population if an expected male-dominated influx occurs. This change in demographics can bring about social ills such as increased alcoholism but can also stimulate the economy due to increased purchasing power from migrant labour. In the event that unemployment increases due to unfulfilled hopes of migrant job seekers, criminal incidents may proliferate. With the implementation of the mitigation measures, it is expected that some of the impact could be reversed. However, it could happen that some of the workers that moved to the area during the construction phase of the project may decide to stay in the area, which means that the demographics in the area will unlikely to be reversed to the pre-project state.

Nature:		
An impact on the demographics of the area will occur as a result of in-migration in response to job opportunities.		
	Without mitigation	With mitigation
Extent	Regional (3)	Regional (3)
Duration	Short-term (2)	Short-term (2)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly probable (4)	Probable (3)
Significance	Medium (44)	Medium (33)
Status (positive or negative)	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	Yes

<p>Mitigation:</p> <ul style="list-style-type: none"> » Where feasible, effort must be made to employ local labour in order to create maximum benefit for the local communities and limit in-migration. » Provide training for unemployed local community members with insufficient skills and therefore increase absorption of local labour thereby decreasing in-migration. » In collaboration with the local municipality, manage recruitment and marketing for vacancies with a preference for residents within the municipality. » Implement health awareness campaigns to curb the potential of spreading disease, use of drugs or alcohol abuse for example; special attention should be paid to drug abuse, which is very common in the area
<p>Residual impacts:</p> <p>A negligible amount of migrant job seekers will not be employed by the proposed project.</p>

5.2.6 Change in sense of place

The current sense of place is rural, with minimal but dominantly primary activities. During construction of the wind farm, numerous construction-related activities will be observed such as digging, assembling, and installation. In addition, vehicular movement and a greater prevalence of people than usual will be present. As a result, the sense of tranquillity will be temporarily disturbed, resulting in a change in the sense of place. Furthermore, noise will be generated, and the visual aesthetic will be altered. Quintessentially, there will be a change in the general sense of place during construction. These changes are likely to be experienced by the people living in the vicinity of the project site, as well as commuters along the coastal corridor (visual impact) and major regional routes (traffic impact). However, much of the tourism routes are located further inland; therefore, the project is unlikely to create any significant negative visual effects.

<p>Nature:</p> <p>A change in the sense of place will take place due to the construction of the wind farm.</p>		
	Without mitigation	With mitigation
Extent	Regional (3)	Regional (3)
Duration	Short term (2)	Short term (2)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly probable (4)	Probable (3)
Significance	Medium (44)	Medium (33)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	Yes
<p>Mitigation:</p> <ul style="list-style-type: none"> » Implement mitigation measures proposed by the various specialists, including traffic, visual, and noise specialists. » The provision of public transport alternatives for workers so as to decrease the number of vehicles on the road during peak hours is recommended. » Partner with local municipal authorities and other prominent users of the local roads to upgrade them if necessary to meet the required capacity and intensity of the vehicles related to the construction of the proposed project. 		

Residual impacts:

Construction activities will change the sense of place; however, if the project requires roads to be upgraded for the purpose of transportation necessary materials to the site then improved road conditions are likely to benefit the local area.

5.2.7 Potential stock theft and security issues

As identified, the most common reported crime incidents in the project area, include theft and burglary. The influx of labour may exacerbate this status if job expectations are not met. The construction phase will create additional movement of people and vehicles to the site, which can also increase the chances of theft particularly on the adjacent land portions. Stock theft and burglaries were also the biggest concerns raised by the direct and indirectly affected landowners, which requires the developer and its contractors to implement the necessary measures to ensure control over access and movement of workers on the site and around the site.

Nature:

Potential security and theft risk due to increased volume of people on site during construction.

	Without mitigation	With mitigation
Extent	Regional (3)	Regional (3)
Duration	Short-term (2)	Short-term (2)
Magnitude	Moderate (6)	Low (4)
Probability	Highly probable (4)	Probable (3)
Significance	Medium (44)	Low (27)
Status (positive or negative)	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	Yes

Mitigation:

- » Engage with the local landowners to understand their security concerns, requirements and rules for accessing their land (if applicable), and consider proposals to address the concerns associated with possible theft of stock and other criminal activities as well as agree on compensation protocols
- » Ensure strict security checks to and from the construction site, as well as proper fencing around the site to deter illegal entry
- » Work with the local landowners on implementing the necessary controls
- » Engage with the landowners of Portion 3 of Farm Rooivlei 327 with regard to the movement to the site across this property

Residual impacts

No residual risks are applicable.

5.2.8 Increase in government revenue

The proposed development will provide a sustainable increased revenue to the local government in the form of property rates and taxes. It will further supplement the revenue derived from national government. Moreover, national government will derive tax-related revenue such as Value-Added Tax (VAT), payroll and income taxes. This is as a result of

the employment that will be created and the resultant income that will be earned, therefore increasing spending power. The local government has stated numerous imperatives including service delivery wherein this revenue can be allocated.

Nature: Government revenue will be derived from the proposed development in the form of rates and taxes.		
	Without enhancement	With enhancement
Extent	National (5)	National (5)
Duration	Short-term (2)	Short-term (2)
Magnitude	Low (4)	Low (4)
Probability	Definite (5)	Definite (5)
Significance	Medium (55)	Medium (55)
Status (positive or negative)	Positive	Positive
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No	No
Mitigation: No mitigation measures are required.		
Residual Risks: No residual risks are applicable.		

5.3 Impacts during Operations Phase

5.3.1 Stimulation of the economy

Wind energy projects by nature are not very resource intensive during operations, particularly when compared to a coal-fired power station. Therefore, the human resource requirements and supply chain requirements created by wind energy projects are quite limited. Having said this, security personnel, land clearing personnel, technical staff, and other jobs will be created to maintain the operation of the wind farm. Many of these are likely to be filled by individuals from the nearby communities, creating a sustainable income for directly and indirectly benefiting households.

Considering the existing stagnating state of the local municipality and the extent to which the project will create the demand for local goods and services during operations, this project is unlikely to be a game changer for the local economy, but it will provide much needed stimulus to revitalise the economy in the long-term. However, many of the inputs to maintain and operate the wind farm are likely to be procured from outside the local area and therefore will be spread over the national level.

Nature: Expenditure associated with the operation of the proposed wind farm will impact on the production of the local economy.		
	Without enhancement	With enhancement
Extent	National (5)	National (5)

Duration	Long-term (4)	Long-term (4)
Magnitude	Low (4)	Low (4)
Probability	Definite (5)	Definite (5)
Significance	High (65)	High (65)
Status (positive or negative)	Positive	Positive
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes (enhance)	Yes
Mitigation/Enhancement:		
<ul style="list-style-type: none"> » The project developer should make effort to use locally sourced inputs where feasible in order to maximise the benefit to the local economy. » Local Small and Medium Enterprises should be approached to investigate the opportunities for supplying inputs required for the maintenance and operation of the facility, as far as feasible; alternatively, creation of new small enterprises to support operations and maintenance of the wind farm should be considered where feasible. 		
Residual Impacts:		
Developed business will continue to operate.		

5.3.2 Creation of long-term employment

The energy sector currently employs the least number of people in the Nama Khoi LM. The operation of the Namas Wind Farm will improve this situation as about 20-30 jobs may be created for a long-term period (i.e. 20-25 years). Further, employment opportunities will be created within the local municipality and across South Africa as a result of the project's multipliers and the additional electricity supply to the national grid.

Considering that there are currently about 3 720 unemployed people in the municipality, the created sustainable employment opportunities may reduce this number and improve the employment situation (however, only to a limited extent). The demand for supporting services and other goods and services to be created as a result of multiplier effects will also lead to the creation of additional indirect jobs, increasing the positive effect on employment in the region.

Nature:		
The operation of the Namas Wind Farm will positively impact on the community by creating a number of job opportunities.		
	Without enhancement	With enhancement
Extent	Regional (3)	Regional (3)
Duration	Long-term (4)	Long-term (4)
Magnitude	Minor (2)	Low (4)
Probability	Definite (5)	Definite (5)
Significance	Medium (45)	Medium (55)
Status (positive or negative)	Positive	Positive
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes (enhance)	Yes

<p>Mitigation/ Enhancement:</p> <p>» Where feasible, effort must be made to employ locally in order to create maximum benefit for the local communities in the surrounding areas</p>
<p>Residual Impacts:</p> <p>The indirect and induced employment created will possibly continue post the project's operations period.</p>

5.3.3 Increase in Household Income

The new jobs that will be created as a result of the operation of the wind farm will result in increased household income for benefitting individuals. Employed individuals will increase the income of their respective households and therefore improve their standards of living. It is likely that most households benefitting from the increased income as a result of the multiplier effects, which will be spread across South Africa, will also experience improved standards of living. The sustainable attainment of household income will improve the livelihoods for benefitting households.

<p>Nature: Employed individuals will increase the income of their respective households and therefore improve their standard of living.</p>		
	Without enhancement	With enhancement
Extent	Regional (3)	Regional (3)
Duration	Long-term (4)	Long-term (4)
Magnitude	Minor (2)	Low (4)
Probability	Definite (5)	Definite (5)
Significance	Medium (45)	Medium (55)
Status (positive or negative)	Positive	Positive
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes (enhance)	Yes
<p>Mitigation/Enhancement:</p> <p>» Employing locally will increase the benefit to local households and inadvertently the local economy.</p>		
<p>Residual impacts:</p> <p>The economy will be stimulated.</p>		

5.3.4 Positive impact on skills development

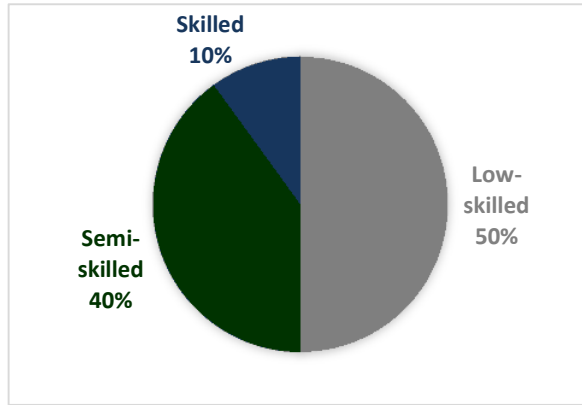


Figure 5-2: Skill levels and proportion thereof required during operations

The employment opportunities are for a long-term period and are therefore sustainable and will have a positive impact on skills for benefitting employees. Furthermore, as production and consumption effects filter through the economy creating a demand for additional labour, human resources will be trained and skilled within aligned industries.

Ultimately, the wind farm's operation will lead to enhanced skills through training and experience in the wider national economy. Given the ratios of skill levels in the Nama Khoi LM, the required skill levels of the proposed project can be met by the local labour force.

Nature: Employees will develop and enhance skills thereby increasing experience and knowledge.		
	Without enhancement	With enhancement
Extent	Regional (3)	Regional (3)
Duration	Medium-term (3)	Medium-term (3)
Magnitude	Low (4)	Moderate (6)
Probability	Highly probable (4)	Highly probable (4)
Significance	Medium (40)	Medium (48)
Status (positive or negative)	Positive	Positive
Reversibility	Low	Low
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes (enhance)	Yes
Mitigation/Enhancement:		
<ul style="list-style-type: none"> » In order to maximise the positive impact, it is suggested that the project company provide training courses for employees where feasible to ensure that employees gain as much as possible from the work experience. » The transfer of knowledge between experienced employees and the local staff should be facilitated. » A skills audit to determine the potential skills that could be sourced in the area for the operation of the wind farm should be undertaken during the planning phase. 		
Residual Impacts:		
The beneficiaries will retain the skills for periods beyond the project life.		

5.3.5 Increase in government revenue

A significant amount of government revenue will be derived from rates, payments of income taxes, payroll taxes and VAT amongst others as a result of the operations of the wind farm. This is a positive impact and will sustainably assist government in the

improvement of socio-economic conditions for residents, albeit the exact allocations cannot be determined.

Nature: Government revenue will be derived from the proposed development.		
	Without enhancement	With enhancement
Extent	National (5)	National (5)
Duration	Long-term (4)	Long-term (4)
Magnitude	Minor (2)	Minor (2)
Probability	Definite (5)	Definite (5)
Significance	Medium (55)	Medium (55)
Status (positive or negative)	Positive	Positive
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No	No
Mitigation: No mitigation measures are required.		
Residual Risks: No residual risks are applicable.		

5.4 Decommissioning phase

During the decommissioning, the project will create a number of temporary employment opportunities and will stimulate demand for services of transport and construction companies. In addition, the decommissioning will result in the extraction of metallic and non-metallic materials from the site that could be re-used in other project, contributing to the efficient production in the economy.

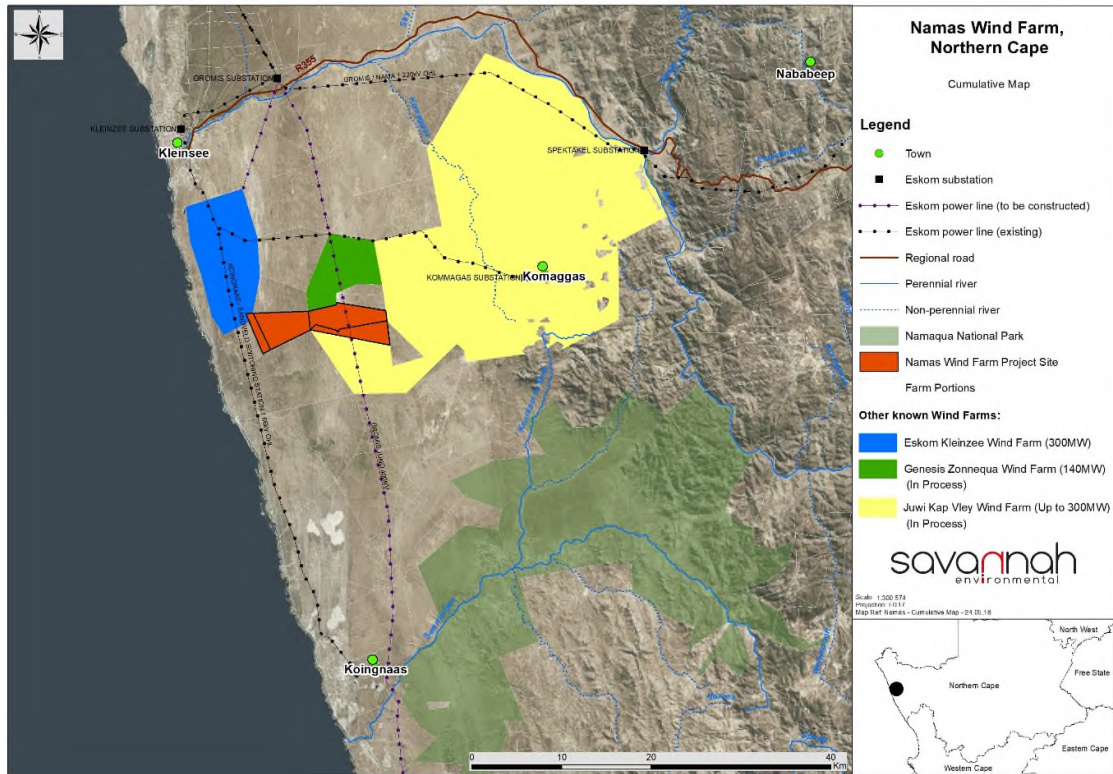
Nature: Increased production in the economy and reuse of recovered metallic and non-metallic materials		
	Without enhancement	With enhancement
Extent	National (5)	National (5)
Duration	Short-term (2)	Short-term (2)
Magnitude	Low (4)	Low (4)
Probability	Highly probable (4)	Highly probable (4)
Significance	Medium (44)	Medium (44)
Status (positive or negative)	Positive	Positive
Reversibility	Reversible	Reversible
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes (enhance)	Yes
Mitigation/Enhancement: Develop and implement a material recovery strategy to optimise the use of valuable metallic materials and, where applicable, recycle non-metallic materials comprising various components of the Wind Farm		

Residual Risks:

No residual risks are applicable.

5.5 Cumulative Impact

The extent to which a proposed project will influence the zone of influence is based on the baseline conditions of that environment, which includes other constructed and proposed projects in the zone. Such projects, depending on their timing in relation to the project that is the subject of this impact study, may influence the manifestation and significance of socio-economic impacts that could result from the current project. As such, knowledge of such projects is required in order to accurately predict and rate socio-economic impacts.



Map 5-1: Cumulative assessment map

Three renewable energy developments have been identified in the Springbok REDZ that are close to the project site which might contribute to the accumulation of impacts in the region. These are summarised below:

Table 5-1: Other renewable energy projects proposed to be developed in the area

Project Name	Project Type	Capacity	Status
Eskom Kleinzee Wind Farm	Windfarm	300MW	-
Kap Vley Wind Energy Facility	Windfarm	-	Proposal stage
Genesis Zonnequa Wind Farm	Windfarm	140MW	Proposal stage

In addition, it should be noted that the area has seen some recovery of the diamond mining activities with the West Coast Resources increasing its operations and employment to a reported 230 people at the end of December 2017. The company plans to increase operation to accommodate 430 jobs in the next year or two.

Considering the above, the expected cumulative impacts are:

- » Negative:
 - * Potential increase in crime
 - * Influx of migrant labour and job seekers
- » Positive:
 - * Job creation
 - * Economic stimulus and GDP growth

The Department of Environmental Affairs and Tourism's guidelines (DEAT, 2004) suggest that the identification of cumulative effects should focus on important and meaningful issues as "it is not practical to analyse the cumulative effects of an action on every environmental receptor". Furthermore, it is advised that the analysis should focus on "what is needed to ensure long-term productivity or sustainability of the resource" (DEAT, 2004).

In light of the above and considering the type of socio-economic impacts expected from the proposed wind farm, the only impact of concern is the potential influx of migrant labour and job seekers to the area if the various renewable energy projects are to be developed at the same time. This may likely result in an influx of people that the local communities will not be able to absorb or the local government would not be able to manage adequately, considering the potential increase in demand for various services (accommodation, utilities, etc.), as well as the potential increase in social ills that are generally associated with an influx of male-dominated workers located far away from their families.

Having said this, the proposed project is only one of the four renewable energy projects that are known to be considered to be developed in the area at the time of the compilation of the report. Considering that the area has been designated as a Renewable Energy Development Zones, it is highly likely that it will see heightened development in the future irrespective whether the proposed Namas Wind Farm is developed or not. This means that **the issue of in-migration into the area will likely be notable, but the proposed project is unlikely to have a significant influence on this trend alone and will not unacceptably increase the impact or result in an unacceptable risk or loss of resources.** The impact is not entirely irreversible but cannot be reversed completely either, as some of the workers may decide to remain in the area in hope to find employment opportunities at other projects that may be developed in the future.

The downscaling of the mining operations within the area and the development of multiple wind farms within the area is considered to be a positive cumulative impact as the development of the wind farms will enable economic and social growth within the area which has experienced challenges due to the mining sector.

Nature:

Influx of migrant labour and job seekers due to job opportunities presented by numerous projects may lead to an increase in social ills.

Positive contribution of the development of various wind farms within the area which will enable social and economic development and growth. This will enable the area to overcome some of the challenges experienced due to the downscaling of the mining operations within the area.

	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Regional (3)	Regional (3)
Duration	Short-term (2)	Medium-term (3)
Magnitude	Moderate (6)	High (8)
Probability	Highly probable (4)	Highly probable (4)
Significance	Medium (44)	Medium (56)
Status (positive or negative)	Negative - influx of job seekers Positive – development and growth	Negative - influx of job seekers Positive – development and growth
Reversibility	Medium	Medium
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	Yes

Mitigation/Enhancement:

- » Engage with other project developers and prominent community members, including West Coast Resources, Local Municipality, etc. to form a forum to discuss the concerns and possible mitigation measures that could be introduced collectively to manage the potential adverse effects of in-migration, to plan and deal with other potential negative consequences, as well as to discuss opportunities to develop the local communities.
- » Engage with the local municipality to set up a skills desk that could be used by all project developers in the area.
- » Engage with the local municipality, the provincial authority, and IPP office to organise a supplier day aimed at informing the community and local businesses of the REDZ, the opportunities that may arise from the development of renewable energy projects, and how these opportunities could be applied for.

Residual Impacts:

Job seekers may remain in search of other opportunities in the area.

6 CONCLUSION AND IMPACT STATEMENT

Genesis Namas Wind (Pty) Ltd proposes the development of a 140MW wind farm near Kleinsee in the Nama Khoi LM, which forms part of the Namakwa District Municipality located in the Northern Cape Province.

The policy review indicates that from national and local levels, renewable energy projects are key to sustainable development of the national economy. A recognition of the potential of renewable energy projects to stimulate the local economy, create new jobs, and contribute to sustainable development, is evident. Approval of bid windows 3.5, 4 and 4.5 projects in the Province signals government support and implementation of the national energy policy as articulated in the Integrated Resource Plan.

The economy and communities of Nama Khoi need an economic injection, particularly considering the limited economic growth, the poor access to basic services, and heavy reliance of the entire economic base of the municipality on the purchasing power of its households. It is clear that the economy of Nama Khoi needs to be diversified and the development of the wind farm in the area will offer such an opportunity. Furthermore, this project could inspire and stimulate the development of similar projects in the area, contributing to the growth of the utilities sector as well as stimulating local economic development further. The project will also have the potential to improve the standard of living of the local communities and slightly decrease unemployment in the area.

The interviews with the potentially directly or indirectly affected landowners indicated no concerns with respect to the project. The proposed wind farm will not sterilise the agricultural land currently used for commercial livestock farming and it will not impact on the production of any impacted farm; therefore, no negative effects on the current economic activities in the area are envisaged. However, potential stock theft and burglaries associated with the presence of construction workers will need to be considered and adequately mitigated.

Overall, the project will require an investment of about R1.82 billion and create between 300 and 400 temporary jobs during various stages of the construction period. A portion of these jobs will be filled by labourers from the local communities, which will be highly beneficial considering the unemployment rate observed in the local municipality.

During operations, the project will employ only 20- 30 people. Although these jobs will increase the overall employment in the municipality, they will not be a game changer for the local community. However, considering that the project is located in the REDZ and there are other wind farms that are already investigated for development in the area, the positive cumulative effect of these developments could be considerable and could set the local community on a different developmental path. Increased presence of construction workers and job seekers, which is likely to follow if the area sees development of various projects will need to be managed as it could lead to an increase in social ills and result in the deterioration of the local standard of living even further. Cooperation, continuous communication, and working towards a common goal of community upliftment among expressed by the local community representatives, landowners, local authorities, and local

developers will be the prerequisite to avoiding and mitigating potential negative effects that could be associated with a sudden increase in development activities in the area.

Overall though, the benefits of the project outweigh the negative socio-economic effects that the development of the proposed wind farm could create; thus, no objections from a socio-economic perspective can be raised with respect to the proposed project. Suggested mitigation measures though will need to be considered and implemented.

Table 6-1: Summary of impacts and expected significance

Impact	Significance without enhancement	Significance with enhancement
Construction Phase		
Increase in production and GDP-R	High (75)	High (75)
Temporary employment creation	High (65)	High (65)
Skill development	Medium (36)	Medium (55)
Increase in household income	High (65)	High (65)
Demographic shifts due to influx of migrant labour	Medium (44)	Medium (33)
Change in sense of place	Medium (44)	Medium (33)
Security risk and stock theft	Medium (44)	Low (27)
Government revenue	Medium (55)	Medium (55)
Operation Phase		
Increase in production and GDP-R	High (65)	High (65)
Long-term employment creation	Medium (45)	Medium (55)
Skill development	Medium (40)	Medium (48)
Increase in household income	Medium (45)	Medium (55)
Increase in government revenue	Medium (55)	Medium (55)
Decommissioning Phase		
Production and earnings due to recycling	Medium (44)	Medium (44)
Cumulative Impact		
Influx of migrant labour and job seekers potentially increasing social ills	Medium (44)	Medium (56)

In conclusion, from a socio-economic perspective the proposed Namas Wind Farm is recommended for authorisation. From a cumulative perspective, the project is also not expected to result in unacceptable risk and will not increase the potential negative impacts to the unacceptable level if the other renewable energy developments in the area were approved and implemented.

The following mitigation measures are suggested to be included in the Environmental Management Programme (EMPr).

Table 6-2: Suggested addition to EMPr

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
A. Design					
A.1 SOCIO-ECONOMIC IMPACTS					
Employment creation for construction, operation and decommissioning activities.	To reduce the unemployment rate in local municipality.	Advise on the set-up of a skills desk and where it will be situated. Provide awareness of skills desk for local communities.	<ul style="list-style-type: none"> ▪ Create a skills requirement profile for both construction and operations ▪ Set-up skills desk at a central accessible location. ▪ Create awareness of skills desk through posters and media announcements. ▪ Skills desk should serve to record local job seeker skills. ▪ Identify potential candidates and fill vacancies 	<ul style="list-style-type: none"> ▪ Once- only during design phase ▪ Once- only during design phase ▪ Once a month during design phase ▪ Daily ▪ Prior to each phase 	Human Resources
B. Construction					
B.1. SOCIO-ECONOMIC IMPACTS					
Increase in production and GDP-R	To maximize economic benefit to the local municipality.	Procure goods and services, as far as practically possible, from the local municipality.	<ul style="list-style-type: none"> ▪ Run a supplier day in Kleinsee and identify prospective companies to engage with during construction ▪ Keep record of companies and businesses supplying goods and services ▪ Calculate split percentage of local and national/international companies 	<ul style="list-style-type: none"> ▪ Once ▪ Bi-annually ▪ Once 	Developer
Increase in theft related crime	To prohibit theft of stock and valuables on directly and adjacent farm portions	Initiate site access control and monitor movement to and from project site.	<ul style="list-style-type: none"> ▪ Each employed personnel ought to have an access card/ apparel for identification purposes 	<ul style="list-style-type: none"> ▪ Once ▪ Beginning and end of shift; beginning and end if lunch break 	<ul style="list-style-type: none"> ▪ Security personnel ▪ Driver

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			<i>Methodology</i>	<i>Frequency</i>	<i>Responsibility</i>
			<ul style="list-style-type: none"> ▪ Security should be located at the entrance to only permit authorised personnel ▪ A pick-up point ought to be established wherein, employees will be transported to and from the site ▪ Develop a local community safety forum to establish monitoring methods for surrounding community 	<ul style="list-style-type: none"> ▪ Once ▪ Once 	

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ANNEXURE A: METHODOLOGY AND CRITERIA

Direct, indirect and cumulative impacts of the issues identified through the scoping study, as well as all other issues identified in the EIA phase must be assessed in terms of the following criteria:

- » The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- » The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high).
- » The **duration**, wherein it will be indicated whether:
 - * The lifetime of the impact will be of a very short duration (0 – 1 years) – assigned a score of 1.
 - * The lifetime of the impact will be of a short duration (2 – 5 years) - assigned a score of 2.
 - * Medium-term (5 – 15 years) – assigned a score of 3.
 - * Long term (> 15 years) - assigned a score of 4.
 - * Permanent - assigned a score of 5.

Example of Impact table summarising the significance of impacts (with and without mitigation)

Nature: [Outline and describe fully the impact anticipated as per the assessment undertaken]		
	Without mitigation	With mitigation
Extent	High (3)	Low (1)
Duration	Medium-term (3)	Medium-term (3)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (36)	Low (24)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	Yes
Mitigation: "Mitigation", means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible. Provide a description of how these mitigation measures will be undertaken keeping the above definition in mind.		
Residual Risks: "Residual Risk", means the risk that will remain after all the recommended measures have been undertaken to mitigate the impact associated with the activity (Green Leaves III, 2014).		

- » The **consequences (magnitude)**, quantified on a scale from 0 – 10, where 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- » The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1 – 5, where 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
- » The **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
- » The **status**, which will be described as either positive, negative or neutral.
- » The degree to which the impact can be reversed.
- » The degree to which the impact may cause irreplaceable loss of resources.
- » The *degree* to which the impact can be *mitigated*.

The **significance** is calculated by combining the criteria in the following formula:

$$S = (E + D + M)P$$

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance weightings** for each potential impact are as follows:

- » < 30 points: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area).
- » 30 – 60 points: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated).
- » > 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area).

Assessment of impacts must be summarised in the following table format. The rating values as per the above criteria must also be included. Complete a table and associated ratings for **each** impact identified during the assessment.

"Cumulative Impact", in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity that in itself may not be significant, but may become significant when added to existing and reasonably foreseeable impacts eventuating from similar or diverse activities'.

The role of the cumulative assessment is to test if such impacts are relevant to the proposed project in the proposed location (i.e. whether the addition of the proposed project in the area will increase the impact). This section should address whether the construction of the proposed development will result in:

- » Unacceptable risk
- » Unacceptable loss
- » Complete or whole-scale changes to the environment or sense of place
- » Unacceptable increase in impact

The specialist is required to conclude if the proposed development will result in any unacceptable loss or impact considering all the projects proposed in the area.

Nature: Complete or whole-scale changes to the environment or sense of place (example)		
	Cumulative Contribution of Proposed Project	Cumulative Impact without Proposed Project
Extent	Low (1)	Low (1)
Duration	Long-term (4)	Medium-term (3)
Magnitude	Low (4)	Minor (2)

Probability	Probable (3)	Improbable (2)
Significance	Low (27)	Low (12)
Status (positive/negative)	Negative	Negative
Reversibility	Low	High
Loss of resources?	No	No
Can impacts be mitigated?	Yes	Unknown
Confidence in findings: High.		
Mitigation: "Mitigation", means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible. Provide a description of how these mitigation measures will be undertaken keeping the above definition in mind.		