Appendix H-8

SOCIAL STUDY

SOCIAL IMPACT ASSESSMENT

REPORT

IMPUMELELO WIND ENERGY FACILITY

MPUMALANGA PROVINCE

DECEMBER 2022

Prepared

By

Tony Barbour and Schalk van der Merwe

Tony Barbour
ENVIRONMENTAL CONSULTING

10 Firs Avenue, Claremont, 7708, South Africa
(Cell) 082 600 8266
(E-Mail) tony@tonybarbour.co.za, tbarbour@telkomsa.net

EXECUTIVE SUMMARY

INTRODUCTION AND LOCATION

WSP was appointed by ENERTAG South Africa to manage the Environmental Impact Assessment (EIA) process for the proposed up to 200 MW Impumelelo Wind Energy Facility (WEF) located approximately 19 km north-east of the town of Greylingstad within the Dipaleseng Municipality (DM).

Tony Barbour Environmental Consulting was appointed to undertake a specialist Social Impact Assessment (SIA) as part of an EIA process.

SUMMARY OF KEY FINDINGS

KEY FINDINGS

The key findings of the study are summarised under the following sections:

- Fit with policy and planning.
- Construction phase impacts.
- Operational phase impacts.
- Cumulative impacts.
- Decommissioning phase impacts.
- No-development option.

POLICY AND PLANNING ISSUES

The development of renewable energy is strongly supported at a national, provincial, and local level. The development of and investment in renewable energy is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all refer to and support renewable energy. Development of renewable energy is also supported at a provincial and local level. The development of the proposed WEF is therefore supported by key policy and planning documents.

CONSTRUCTION PHASE

The key social issues associated with the construction phase include:

Potential positive impacts

- Creation of employment and business opportunities, and the opportunity for skills development and on-site training.

The construction phase will extend over a period of approximately 36 months and create in the region of 250-300 employment opportunities. Members from the local communities in the DM would qualify for the majority of low skilled and semi-skilled employment opportunities and a number of skilled opportunities. The Most of these employment opportunities will accrue to Historically Disadvantaged (HD) members from the local community. Given relatively high local unemployment levels and limited job opportunities in the area, this will represent a significant, if localised, social benefit. The total wage bill will be in the region of R 30 million (2022 Rand values). A percentage of the wage bill will be spent in the local economy which will also create opportunities for local businesses in the DM. The capital expenditure

associated with the construction phase will be approximately R 2.5-3 billion (2022 Rand value). This will create opportunities for local companies and the regional and local economy. Due to the presence of the mining and energy sector, there are likely to suitably qualified companies in the DM that can provide the required services and products. The local service sector will also benefit from the construction phase. The potential opportunities would be linked to accommodation, catering, cleaning, transport, and security, etc. associated with the construction workers on the site.

Potential negative impacts

- Impacts associated with the presence of construction workers on local communities.
- Impacts related to the potential influx of jobseekers.
- Increased risks to livestock and farming infrastructure associated with the construction related activities and presence of construction workers on the site.
- Increased risk of grass fires associated with construction related activities.
- Nuisance impacts, such as noise, dust, and safety, associated with construction related activities and vehicles.
- Impact on productive farmland.

The findings of the SIA indicate that the significance of the potential negative impacts with mitigation will be **Low Negative**. The potential negative impacts associated with the proposed construction phase can therefore be effectively mitigated if the recommended mitigation measures are implemented. Table 1 summarises the significance of the impacts associated with the construction phase.

Table 1: Summary of social impacts during construction phase

Impact	Significance No Mitigation/Enhancement	Significance With Mitigation/Enhancement
Creation of employment and business opportunities	Medium (Positive)	Medium (Positive)
Presence of construction workers and potential impacts on family structures and social networks	Low (Negative)	Low (Negative)
Influx of job seekers	Low (Negative)	Low (Negative)
Safety risk, stock theft and damage to farm infrastructure associated with presence of construction workers	Medium (Negative)	Low (Negative)
Increased risk of grass fires	Medium (Negative)	Low (Negative)
Impact of heavy vehicles and construction activities	Medium (Negative)	Low (Negative)
Loss of farmland	Medium (Negative)	Low (Negative)

OPERATIONAL PHASE

The following key social issues are of relevance to the operational phase:

Potential positive impacts

- Generate renewable energy to produce green hydrogen and ammonia.

- Creation of employment opportunities.
- Benefits associated with establishment of community trust.
- Benefits for local landowners.

The proposed project will supplement South Africa's energy and assist to improve energy security. In addition, it will also reduce the country's reliance on coal as an energy source. This represents a positive social benefit.

Potential negative impacts
- Visual impacts and associated impacts on sense of place.
- Potential impact on property values.
- Potential impact on tourism.

The findings of the SIA indicate that the significance of all the potential negative impacts with mitigation will be **Low Negative**. The potential negative impacts can therefore be effectively mitigated. The significance of the impacts associated with the operational phase are summarised in Table 2.

Table 2: Summary of social impacts during operational phase

Impact	Significance No Mitigation/Enhancement	Significance With Mitigation/Enhancement
Generate renewable energy to produce green hydrogen and ammonia	Moderate (Positive)	High (Positive)
Creation of employment and business opportunities during maintenance	Low (Positive)	Medium (Positive)
Benefit associated with community trust	Moderate (Positive)	High (Positive)
Benefits for landowners	Low (Positive)	Medium (Positive)
Visual impact and impact on sense of place	Low (Negative)	Low (Negative)
Impact on property values	Low (Negative)	Low (Negative)
Impact on tourism	Low (Negative)	Low (Negative)

CUMULATIVE IMPACTS

Cumulative impact on sense of place
The establishment of the proposed WEF and other renewable energy facilities in the area will create the potential for combined and sequential visibility impacts. However, the impact on the areas sense of place should be viewed within the context of the impact of the adjacent mining activities and the Secunda industrial complex on areas sense of place. The potential visual impact on the areas sense place is therefore likely to be limited.

Cumulative impact on local services and accommodation
The potential cumulative impact on local services and accommodation will depend on the timing construction phases for the different renewable energy projects in the area. With effective planning the significance of the potential impact was rated as **Low Negative**.

Cumulative impact on local economy
The significance of this impact with enhancement was rated as **Moderate Positive**.

DECOMMISSIONING

Given the relatively small number of people employed during the operational phase (~ 20), the potential negative social impact on the local economy associated with decommissioning will be limited. In addition, the potential impacts associated with the decommissioning phase can also be effectively managed with the implementation of a retrenchment and downscaling programme. With mitigation, the impacts are assessed to be Low (negative). Decommissioning will also create temporary employment opportunities. The significance was assessed to be Low (positive).

NO-DEVELOPMENT OPTION

The No-Development option would represent a lost opportunity for South Africa to generate renewable energy. This would represent a significant negative social cost.

CONCLUSION

Conclusion

The findings of the SIA study indicate that the proposed Impumelelo WEF project will create a number of social and socio-economic benefits, including creation of employment and business opportunities during both the construction and operational phase. In addition, the WEF will generate renewable energy for use by mines and industrial operations in the area.

The findings of the SIA also indicate that the potential negative impacts associated with both the construction and operational phase are likely to be **Low Negative** with mitigation. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. The Impumelelo WEF and associated infrastructure is therefore supported by the findings of the SIA.

Recommendations

- Substation Alternative 1 and 2 are both acceptable.
- The developer should liaise with Mr Botha to address the potential impact of certain turbines on professional hunting operations in the area.

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CONTENTS OF THE SPECIALIST REPORT – CHECKLIST

Regulation GNR 326 of 4 December 2014, as amended 7 April 2017, Appendix 6	**Section of Report**
(a) details of the specialist who prepared the report; and the expertise of that specialist to compile a specialist report including a *curriculum vitae*;	Section 1.6, Annexure C
(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Section 1.7, Annexure D
(c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 1.1, Section 1.2
(cA) an indication of the quality and age of base data used for the specialist report;	Section 1.2, Section 3
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 4
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	N/A for SIA
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 1.2, Annexure B
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 4, Section 5
(g) an identification of any areas to be avoided, including buffers;	N/A
(h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Section 3
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1.5
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment, or activities;	Section 4, Section 5,
(k) any mitigation measures for inclusion in the EMPr;	Section 4
(l) any conditions for inclusion in the environmental authorisation;	Section 4, Section 5
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	N/A
(n) a reasoned opinion— i. as to whether the proposed activity, activities or portions thereof should be authorised; iA. Regarding the acceptability of the proposed activity or activities; and ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr or Environmental Authorization, and where applicable, the closure plan;	Section 5.3
(o) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Annexure A lists stakeholders interviewed
(p) any other information requested by the competent authority	N/A
Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	

ACRONYMS

BESS	Battery Energy Storage System
DEA	Department of Environmental Affairs
DEA&DP	Department of Environmental Affairs and Development Planning
DM	Dipaleseng Municipality
EIA	Environmental Impact Assessment
DM	Govan Mbeki Municipality
GSDM	Gert Sibanye District Municipality
HD	Historically Disadvantaged
IDP	Integrated Development Plan
IPP	Independent Power Producer
LED	Local Economic Development
LM	Local Municipality
MW	Megawatt
PGDS	Provincial Growth and Development Strategy
SDF	Spatial Development Framework
SIA	Social Impact Assessment
SIA	Social Impact Assessment
WEF	Wind Energy Facility

SECTION 1: INTRODUCTION

1.1 INTRODUCTION

WSP was appointed by ENERTAG South Africa to manage the Environmental Impact Assessment (EIA) process for the proposed up to 200 MW Impumelelo Wind Energy Facility (WEF) located approximately 19 km north-east of the town of Greylingstad within the Dipaleseng Municipality (DM) (Figure 1.1).

Tony Barbour Environmental Consulting was appointed to undertake a specialist Social Impact Assessment (SIA) as part of an EIA process. This report contains the findings of the SIA for the proposed WEF.

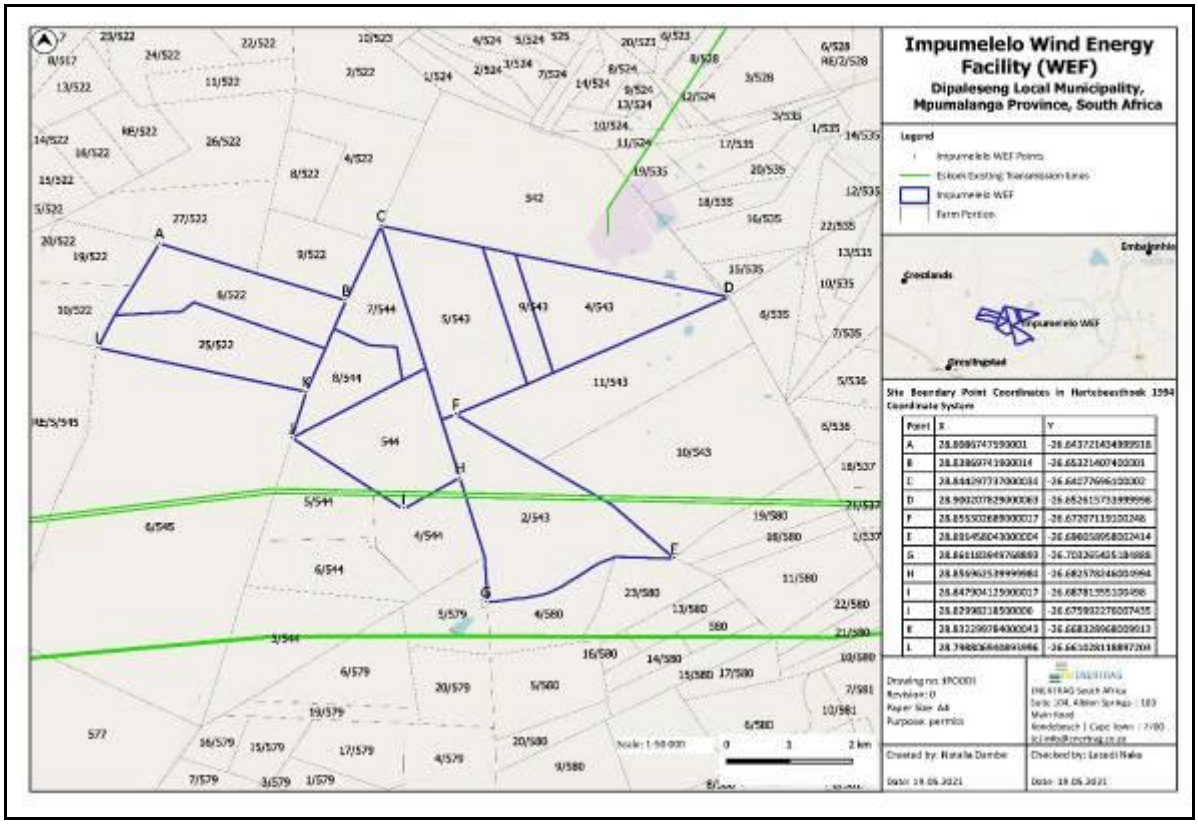


Figure 3.2: Regional location of Impumelelo WEF site

1.2 TERMS OF REFERENCE AND APPROACH

The approach to the SIA study is based on the Western Cape Department of Environmental Affairs and Development Planning Guidelines for Social Impact Assessment (February 2007). These guidelines are based on international best practice. The key activities in the SIA process embodied in the guidelines include:

- Describing and obtaining an understanding of the proposed intervention (type, scale, and location), the settlements, and communities likely to be affected by the proposed project.

- Collecting baseline data on the current social and economic environment.
- Identifying the key potential social issues associated with the proposed project. This requires a site visit to the area and consultation with affected individuals and communities. As part of the process a basic information document was prepared and made available to key interested and affected parties. The aim of the document was to inform the affected parties of the nature and activities associated with the construction and operation of the proposed development to enable them to better understand and comment on the potential social issues and impacts.
- Assessing and documenting the significance of social impacts associated with the proposed intervention.
- Identifying alternatives and mitigation measures.

In this regard the study involved:

- Review of socio-economic data for the study area.
- Review of relevant planning and policy frameworks for the area.
- Review of information from similar studies, including the SIAs undertaken for other renewable energy projects.
- Site visit and interviews with key stakeholders.
- Identifying the key potential social issues associated with the proposed project.
- Assessing and assessing the significance of social impacts associated with the proposed project.
- Identification of enhancement and mitigation measures aimed at maximizing opportunities and avoiding and or reducing negative impacts.

Annexure A contains a list of the secondary information reviewed and interviews conducted. Annexure B summarises the assessment methodology used to assign significance ratings to the assessment process.

1.3 PROJECT DESCRIPTION

Impumelelo Wind (Pty) Ltd is proposing to develop the Impumelelo Wind Energy Facility (WEF), with a maximum capacity of up to 200 MW, located in the Dipaleseng Municipality (DM) in the Mpumalanga Province of South Africa. The energy generated from the facility will used to meet the energy requirements of nearby mining and industrial operations.

The proposed Impumelelo WEF and associated infrastructure include the following components:

- Up to 30 wind turbine generators (WTGs) with a maximum capacity of up to 200 MW (Photograph 1.1).
- Turbines with a hub height of up to 200 m and a rotor diameter of up to 200 m.
- Hardstand areas of approximately 1 500 m^2 per turbine.
- A solid-state Lithium-ion Battery Energy Storage System (BESS) comprising of several utility scale battery modules within shipping containers or an applicable housing structure on a concrete foundation (Photograph 1.2).
- Internal roads with a width of up to 10 m providing access to each turbine, the BESS, on-site substation (SS), step-down SS and laydown area. The roads will accommodate cable trenches and stormwater channels (as required) and will include turning circle/bypass areas of up to 20 m at some sections during the construction phase. As such, the roads and cables will be positioned within a 20 m wide corridor. Existing roads will be upgraded wherever possible, although new roads will be constructed where necessary.

- A temporary construction laydown/staging area of approximately 5 hectares (ha) which will also accommodate the operation and maintenance (O&M) buildings.

Figure 1.2 indicates the provisional layout of the turbines. The key project details for the Impumelelo WEF and associated infrastructure are summarised in Table 1.1. The anticipated timeframe for construction is a minimum of 36 months.

The Proposed project also comprises of a 33/132 kV on-site Substation with the following Grid Connection solutions:

- A loop-in-loop-out connection close to Carmona Sasol substation with an approximate 5km overhead line from the IPP substation.
- Alternatively, constructing a ~30km overhead line from the onsite switching station to Zandfontein substation and constructing a feeder bay at Zandfontein substation.

Photograph 1.1: Typical example of wind turbine

Photograph 1.2: Example of BESS located in storage containers

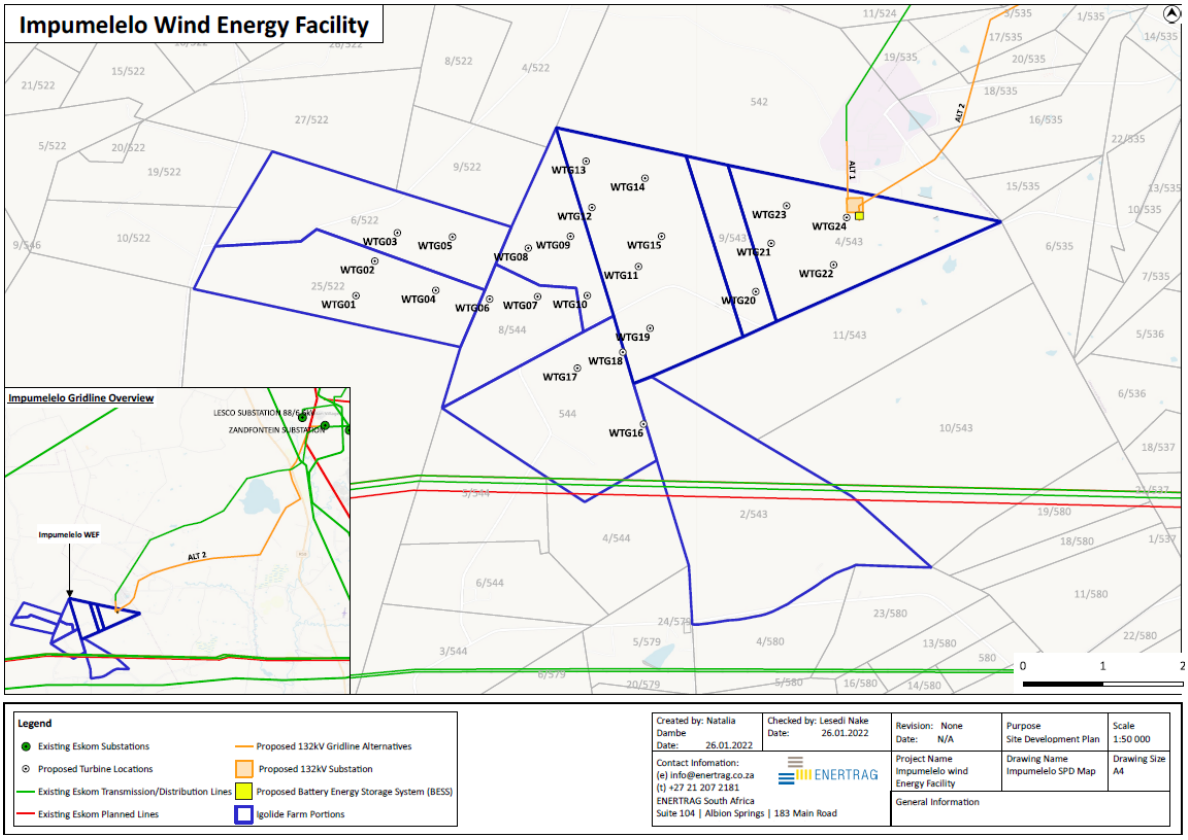


Figure 3.2: Provisional layout of wind turbines for Impumelelo WEF

Table 1.1: Details of WEF

Facility Name	Impumelelo Wind Energy Facility
Applicant	Impumelelo Wind (Pty) Ltd (Registration Number: 2022/601923/07
Municipalities	The project is located in the Dipaleseng local Municipality of the Gert Sibande District Municipality
Affected Farms[1]	Portions 6 & 25 of the Farm 522 Hartbeesfontein; Portions 2, 4, 5 and 9 of the Farm 543 Platkop; Portions 0, 7 and 8 of the Farm 544 Mahemsfontei
Extent	2800 ha
Buildable area	Approximately 680 ha, subject to finalization based on technical and environmental requirements
Capacity	Up to 200MW
Number of turbines	~30
Turbine hub height:	Up to 200m
Rotor Diameter:	Up to 200m
Foundation	Approximately 25m^2 diameter x 3m deep – 500 – 650m^3 concrete. Excavation approximately 1000m^2, in sandy soils due to access requirements and safe slop stability requirements.
Operations and Maintenance (O&M) building footprint:	Located in close proximity to the substation. Septic tanks with portable toilets Typical areas include: - Operations building – 20m x 10m = 200m^2 - Workshop – 15m x 10m = 150m^2 Stores - 15m x 10m = 150m^2
Construction camp laydown	Typical area 100m x 50m = 5000m^2. Sewage: Septic tanks and portable toilets
Temporary laydown or staging area:	Typical area 220m x 100m = 22000m². Laydown area could increase to 30000m² for concrete towers, should they be required.
Batching plant (temporary):	Gravel and sand will be stored in separate heaps whilst the cement will be contained in a silo.
Internal Roads:	Width of internal road – Between 5m and 6m. Length of internal road – Approximately 60km. Where required for turning circle/bypass areas, access or internal roads may be up to 20m to allow for larger component transport.
Cables:	The medium voltage collector system will comprise of cables up to and including 33kV that run underground, except where a technical assessment suggest that overhead lines are required, within the facility connecting the turbines to the onsite substation.
Independent Power Producer (IPP) site substation and battery energy storage system (BESS):	Total footprint will be up to 6.5ha in extent (5ha for the BESS and 1.5ha for the IPP portion of the substation). The substation will consist of a high voltage substation yard to allow for multiple (up to) 132kV feeder bays and transformers, control building, telecommunication infrastructure, access roads, and other substation components as required. The associated BESS storage capacity will be up to 200MW/800MWh with up to four hours of storage. It is proposed that Lithium Battery Technologies, such as Lithium Iron Phosphate, Lithium Nickel Manganese Cobalt oxides or Vanadium Redox flow technologies

[1] Based on the current conceptual layout.

	will be considered as the preferred battery technology however the specific technology will only be determined following EPC procurement. The main components of the BESS include the batteries, power conversion system and transformer which will all be stored in various rows of containers.
Site access	R547 and R23
Height of substation fencing	Up to 3 m high Galvanised steel

1.4 ASSUMPTIONS AND LIMITATIONS

1.4.1 Assumptions

Technical suitability
It is assumed that the development site represents a technically suitable site for the establishment of the proposed WEF and associated infrastructure.

Strategic importance of the project
The strategic importance of promoting renewable and other forms of energy is supported by the national and provincial energy policies.

Fit with planning and policy requirements
Legislation and policies reflect societal norms and values. The legislative and policy context therefore plays an important role in identifying and assessing the potential social impacts associated with a proposed development. In this regard, a key component of the SIA process is to assess the proposed development in terms of its fit with key planning and policy documents. As such, if the findings of the study indicate that the proposed development in its current format does not conform to the spatial principles and guidelines contained in the relevant legislation and planning documents, and there are no significant or unique opportunities created by the development, the development cannot be supported.

1.4.2 Limitations

Demographic data
Some of the provincial documents do not contain data from the 2011 Census and or 2016 Household Community Survey. However, where required the relevant 2011 and 2016 data has been provided.

1.5 SPECIALIST DETAILS

Tony Barbour, the lead author of this report, is an independent specialist with 28 years' experience in the field of environmental management. In terms of SIA experience Tony Barbour has undertaken in the region of 260 SIAs and is the author of the Guidelines for Social Impact Assessments for EIA's adopted by the Department of Environmental Affairs and Development Planning (DEA&DP) in the Western Cape in 2007. Annexure C contains a copy of Tony Barbour's CV.

Schalk van der Merwe, the co-author of this report, has an MPhil in Environmental Management from the University of Cape Town and has worked closely with Tony Barbour over the last seventeen years.

1.6 DECLARATION OF INDEPENDENCE

This confirms that Tony Barbour and Schalk van der Merwe, the specialist consultants responsible for undertaking the study and preparing the SIA Report, are independent and do not have any vested or financial interests in the proposed power line being either approved or rejected. Annexure D contains a signed declaration of independence.

1.7 REPORT STUCTURE

The report is divided into five sections, namely:

- Section 1: Introduction
- Section 2: Summary of key policy and planning documents relating to renewable energy and the area in question
- Section 3: Overview of the study area
- Section 4: Identification and assessment of key social issues
- Section 5: Summary of key findings and recommendations.

SECTION 2: POLICY AND PLANNING ENVIRONMENT

2.1 INTRODUCTION

Legislation and policy embody and reflect key societal norms, values, and developmental goals. The legislative and policy context therefore plays an important role in identifying, assessing, and evaluating the significance of potential social impacts associated with any given proposed development. An assessment of the "policy and planning fit[2]" of the proposed development therefore constitutes a key aspect of the Social Impact Assessment (SIA). In this regard, assessment of "planning fit" conforms to international best practice for conducting SIAs.

Section 2 provides an overview of the policy and planning environment affecting the proposed project. For the purposes of meeting the objectives of the SIA the following policy and planning documents were reviewed:

- National Energy Act (2008).
- White Paper on the Energy Policy of the Republic of South Africa (December 1998).
- White Paper on Renewable Energy (November 2003).
- Integrated Resource Plan (IRP) for South Africa (2019).
- National Infrastructure Plan (NIP) (2012 and 2021).
- National Development Plan (2011).
- Mpumalanga Vision 2030 Strategic Implementation Framework (2013-2030)
- Mpumalanga Economic Growth and Development Path (2011).
- Mpumalanga Spatial Development Framework (2019).
- Dipaleseng Integrated Development Plan (2020-2021).
- Dipaleseng Spatial Development Framework (2020).
- Dipaleseng Local Economic Development Strategy (2011).

2.2 NATIONAL POLICY ENVIRONMENT

2.2.1 National Energy Act (Act No 34 of 2008)

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

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

[2] Planning fit" can simply be described as the extent to which any relevant development satisfies the core criteria of appropriateness, need, and desirability, as defined or circumscribed by the relevant applicable legislation and policy documents at a given time.

2.2.2 White Paper on the Energy Policy of the Republic of South Africa

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

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

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

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

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

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

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

2.2.3 White Paper on Renewable Energy

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

The White Paper notes that while South Africa is well endowed with renewable energy resources that have the potential to become sustainable alternatives to fossil fuels, these have thus far remained largely untapped. As signatory to the Kyoto Protocol[3], Government is determined to make good the country's commitment to reducing greenhouse gas emissions. To this purpose, Government has committed itself to the development of a framework in which a national renewable energy framework can be established and operate.

[3] The Kyoto Protocol is a protocol to the United Nations Framework Convention on Climate Change (UNFCCC), aimed at fighting global warming. The UNFCCC is an international environmental treaty with the goal of achieving "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system". The Protocol was initially adopted on 11 December 1997 in Kyoto, Japan and entered into force on 16 February 2005. As of November 2009, 187 states have signed and ratified the protocol (Wikipedia).

South Africa is also a signatory of the Copenhagen Accord, a document that delegates at the 15th session of the Conference of Parties (COP 15) to the United Nations Framework Convention on Climate Change agreed to "take note of" at the final plenary on 18 December 2009. The accord endorses the continuation of the Kyoto Protocol and confirms that climate change is one of the greatest challenges facing the world. In terms of the accord South Africa committed itself to a reduction target of 34% compared to business as usual. In this regard, the IRP 2010 aims to allocate 43% of new energy generation facilities in South Africa to renewables.

Apart from the reduction of greenhouse gas emissions, the promotion of renewable energy sources is aimed at ensuring energy security through the diversification of supply (in this regard, also refer to the objectives of the National Energy Act).

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

2.2.4 Integrated Resource Plan (2019)

The South Africa's National Development Plan (NDP) 2030 offers a long-term plan for the country. It defines a desired destination where inequality and unemployment are reduced, and poverty is eliminated so that all South Africans can attain a decent standard of living. Electricity is one of the core elements of a decent standard of living. In formulating its vision for the energy sector, the NDP took as a point of departure the Integrated Resource Plan (IRP) 2010–2030 promulgated in March 2011. The IRP is an electricity infrastructure development plan based on least-cost electricity supply and demand balance, taking into account security of supply and the environment (minimize negative emissions and water usage).

On 27 August 2018, the then Minister of Energy published a draft IRP which was issued for public comment (Draft IRP). Following a lengthy public participation and consultation process the Integrated Resource Plan 2019 (IRP 2019) was gazetted by the Minister of Mineral Resources and Energy, Gwede Mantashe, on 18 October 2019, updating the energy forecast for South Africa from the current period to the year 2030. The IRP is an electricity capacity plan which aims to provide an indication of the country's electricity demand, how this demand will be supplied and what it will cost.

The IRP notes that South Africa is a signatory to the Paris Agreement on Climate Change and has ratified the agreement. The energy sector contributes close to 80% towards the country's total Green House Gas (GHG) emissions of which 50% are from electricity generation and liquid fuel production alone. A transmission from a fossil fuel-based energy sources is therefore critical to reducing GHG emissions. In September 2021 South Africa released its latest emission targets, indicating that it intended to limit Green House Gas (GHG) emissions to 398-510 MrCo2e by 2025, and 350-420 MrCo2e by 2030. These emissions are significantly lower than 2016 emission targets and will see South Africa's emissions decline in absolute terms from 2025, a decade earlier than planned (World Resource Institute, 2021).

The IRP (2019) notes that 39 730 MW of new generation capacity must be developed. Of the 39 730 MW determined, about 18 000 MW has been committed to date. This new capacity is made up of 6 422 MW under the REIPPP with a total of 3 876 MW operational on the grid. Under the Eskom build programme, the following capacity has been commissioned: 1 332MW of Ingula pumped storage, 1 588MW of Medupi, 800MW of Kusile and 100MW of Sere Wind Farm. In addition, IPPs have commissioned 1

005MW from two Open Cycle Gas Turbine (OCGT) peaking plants.1 005 MW from OCGT for peaking has also been commissioned (IRP 2019, page 14).

In terms of IRP (2019) provision has been made for the following new additional capacity by 2030:

- 1 500MW of coal.
- 2 500MW of hydro.
- 6 000MW of solar PV.
- 14 400MW of wind.
- 1 860MW of nuclear.
- 2 088MW for storage.
- 3 000MW of gas/diesel.
- 4 000MW from other distributed generation, co-generation, biomass and landfill technologies.

Figure 2.1 provides a summary of the allocations and commitments between the various energy sectors.

	Coal	Coal (Decommis-sioning)	Nuclear	Hydro	Storage	PV	Wind	CSP	Gas & Diesel	Other (Distributed Generation, CoGen, Biomass, Landfill)
Current Base	37,149		1 860	2,100	2 912	1 474	1 980	300	3 830	499
2019	2,155	-2,373					244	300		Allocation to the extent of the short term capacity and energy gap.
2020	1,433	-557				114	300			
2021	1,433	-1403				300	818			
2022	711	-844			513	400 1,000	1,600			
2023	750	-555				1000	1,600			500
2024			1,860				1,600		1000	500
2025						1000	1,600			500
2026		-1,219					1,600			500
2027	750	-847					1,600		2000	500
2028		-475				1000	1,600			500
2029		-1,694			1575	1000	1,600			500
2030		-1,050		2,500		1000	1,600			500
TOTAL INSTALLED CAPACITY by 2030 (MW)	33,364		1,860	4,600	5,000	8,288	17,742	600	6,380	
% Total Installed Capacity (% of MW)	43		2.36	5.84	6.35	10.52	22.53	0.76	8.1	
% Annual Energy Contribution (% of MWh)	58.8		4.5	8.4	1.2*	6.3	17.8	0.6	1.3	

Installed Capacity
Committed/Already Contracted Capacity
Capacity Decommissioned
New Additional Capacity
Extension of Koeberg Plant Design Life
Includes Distributed Generation Capacity for own use

- 2030 Coal Installed Capacity is less capacity decommissioned between years 2020 and 2030.
- Koeberg power station rated/installed capacity will revert to 1,926MW (original design capacity) following design life extension work.
- Other/ Distributed generation includes all generation facilities in circumstances in which the facility is operated solely to supply electricity to an end-use customer within the same property with the facility.
- Short term capacity gap is estimated at 2,000MW.

Figure 2.1: Summary of energy allocations and commitments based on the 2019 IRP

As indicated above, the changes from the Draft IRP capacity allocations see an increase in solar PV and wind, and a significant decrease in gas and diesel; and new inclusions include nuclear and storage.

In terms of renewable energy five bidding rounds have been completed for renewable energy projects under the RE IPP Procurement Programme. The most dominant

technology in the IRP2019 is renewable energy from wind and solar PV technologies, with wind being identified as the stronger of the two technologies. There is a consistent annual allocation of 1 600MW for wind technology commencing in the year 2022 up to 2030. The solar PV allocation of 1 000MWs per year is incremental over the period 2022 to 2030, with no allocation in the years 2024 (being the year the Koeberg nuclear extension is expected to be commissioned) and the years 2026 and 2027 (presumably since 2 000MW of gas is expected in the year 2027). The IRP 2019 states that although there are annual build limits, in the long run such limits will be reviewed to take into account demand and supply requirements.

2.2.5 National Development Plan

The National Development Plan (NDP) contains a plan aimed at eliminating poverty and reducing inequality by 2030. The NDP identifies 9 key challenges and associated remedial plans. Managing the transition towards a low carbon national economy is identified as one of the 9 key national challenges. Expansion and acceleration of commercial renewable energy is identified as a key intervention strategy.

2.2.6 The New Growth Path Framework

Government released the New Economic Growth Path Framework on 23 November 2010. The aim of the framework is to enhance growth, employment creation and equity. The policy's principal target is to create five million jobs over the next 10 years and reflects government's commitment to prioritising employment creation in all economic policies. The framework identifies strategies that will enable South Africa to grow in a more equitable and inclusive manner while attaining South Africa's developmental agenda. Central to the New Growth Path is a massive investment in infrastructure as a critical driver of jobs across the economy. In this regard the framework identifies investments in five key areas namely: ***energy***, transport, communication, water, and housing.

The New Growth Path also identifies five other priority areas as part of the programme to create jobs, through a series of partnerships between the State and the private sector. The Green Economy is one of the five priority areas, including expansions in construction and the production of technologies for solar, wind and biofuels. In this regard clean manufacturing and environmental services are projected to create 300 000 jobs over the next decade.

2.2.7 National Infrastructure Plan

Government adopted a National Infrastructure Plan (NIP) in 2012. The aim of the plan is to transform the economic landscape while simultaneously creating significant numbers of new jobs and strengthening the delivery of basic services. The aim of the NIP is support investments is to improve access by South Africans to healthcare facilities, schools, water, sanitation, housing and electrification. The plan also notes that investment in the construction of ports, roads, railway systems, ***electricity plants***, hospitals, schools, and dams will contribute to improved economic growth.

As part of the National Infrastructure Plan, Cabinet established the Presidential Infrastructure Coordinating Committee (PICC). The Committee identified and developed 18 strategic integrated projects (SIPS). The SIPs cover social and economic infrastructure across all nine provinces (with an emphasis on lagging regions) and included three energy SIPs, namely SIP 8, 9 and 10.

- SIP 8: Green energy in support of the South African economy.

- SIP 9: Electricity generation to support socio-economic development.
- SIP 10: Electricity transmission and distribution for all.

The NIP 2050 was gazetted for public comment on 10 August 2021[4]. The first phase of the NIP 2050 focuses on four critical network sectors that provide a platform, namely, energy, freight transport, water, and digital infrastructure. In line with the NDP, the vision for the energy sector is to promote:

- Economic growth and development through adequate investment in energy infrastructure" (generation, transmission, and distribution) and reliable and efficient energy service at competitive rates, while supporting economic growth through job creation by stimulating supply chains.
- Social equity through expanded access to energy at affordable tariffs and through targeted, sustainable subsidies for needy households.
- Environmental sustainability through efforts to reduce pollution, reduce water usage and mitigate the effects of climate change.

The NIP 2050 notes that by 2030, the NDP set a target that more than 90% of the population should enjoy access to grid connected or off-grid electricity by 2030. To realise this vision, South Africa's energy system will be supported by effective policies, institutions, governance systems, regulation and, where appropriate, competitive markets. In terms of energy mix, NIP 2050 notes that coal will contribute significantly less to primary-energy needs in the future, while gas will have an important enabling role, energy supply will be ***increasingly dominated by renewable energy resources– especially wind and solar which are least cost and where South Africa has a comparative advantage.***

NIP 2050 also notes that South Africa is signatory of the Paris Agreement which aims to achieve Net Zero greenhouse gas emissions by 2050. To achieve this will require a shift to a least cost energy path that is increasingly reliant on renewables. For South Africa this is imperative for the following reasons:

- SA cannot afford to overspend while dramatically expanding capacity
- Renewables can be built quickly and in modular form thereby avoiding many of the challenges associated with mega projects.
- Trade partners are expected to increasingly impose border carbon taxes harming SA exports.
- SA will need to commit to emission reductions as a global citizen.

2.3 PROVINCIAL AND LOCAL LEVEL POLICY AND PLANNING

2.3.1 Mpumalanga Vision 2030

The Mpumalanga Vision Mpumalanga Vision 2030 Strategic Implementation Framework (2013-2030) provides a provincial expression of the key priorities, objectives and targets outlined in the National Development Plan 2030. In line with the objectives of the NDP the Mpumalanga Vision focusses on the following key socio-economic outcomes.

- Employment and Economic Growth
- Education and Training
- Health Care for all

[4] Gazette No. 44951

- Social Protection

The Mpumalanga Vision 2030 also identifies nine key drivers that have a bearing on the spatial development of the province. Key Drivers 1 to 6 are focused towards promoting economic development and job creation, Key Drivers 7 and 8 are focused on human settlement in and around the key priority nodes/areas identified and linked to Key Drivers 1-6, and Key Driver 9 is focused on the conservation and sustainable management of the natural environment. The key relevant Key Drivers are summarised below.

Key Driver 1: Nodal Development. Key Driver 1 identifies corridors linked to key roads where investment should be focussed. Of relevance to the project the N17 is identified as a key corridor. Five primary nodes for development are also identified, including Secunda.

Key Driver 2: Business, Commercial and Industrial Development. Key driver 2 focuses on development of business and commercial sectors on the primary, secondary and rural nodes in Mpumalanga and the potential for these activities to generate employment job opportunities. Of relevance to the study the vision notes that the bulk of industrial investment in Mpumalanga Province should be clustered around the existing industrial strongholds, including Secunda (Petrochemical Industry).

Key Driver 9: Environmental Management and Conservation. The vision notes that in terms of mining it is important to establish proper environmental management systems during the operational phase of the mines to prevent large scale water and air pollution. While the section does not specifically refer to renewable energy, much of the mining in Mpumalanga is linked to coal mining and power generation, both of which are large consumers of water. The water demands associated with renewable energy are significantly lower than those associated with traditional coal power stations.

2.3.2 Mpumalanga Growth and Development Path

The Mpumalanga Economic Growth and Development Path (MEGDP)(2011) is informed by the National Economic Growth Path. The MEGDP notes that Mpumalanga is committed to increasing local economic development and job creation in the agricultural, industrial, manufacturing, ***green economy***, tourism, and mining sectors. The (MEGDP) is informed by six key pillars, namely:

- Job creation
- Inclusive and shared growth of a diversified economy
- Spatial distribution
- Integration of regional economies
- Sustainable human development
- Environmental sustainability

The pillars of job creation, the development of a diversified economy, and sustainable environmental development are all relevant to the proposed development.

The MEGDP also identifies a number of key employment drivers aimed at realising the MEGDP objectives and securing strong and sustainable growth for the next decade. Of relevance these include the creation of employment of economic sectors including energy and the development of new economies including green industries.

2.3.3 Mpumalanga Spatial Development Framework (2019)

The spatial vision for Mpumalanga Province is "A sustainable, vibrant and inclusive economy, Mpumalanga". The SDF identifies a number of opportunities and challenges facing the province. The opportunities are linked to the province's natural resources, well developed economy, and established economies.

Natural Environment: The natural environment is diversified and is associated with the Highveld and the Lowveld areas in the province. Five major rivers systems in the flow through Mpumalanga and it is an important catchment area.

Connectivity and Infrastructure: The province is well connected in terms of infrastructure and is connected to Maputo and Richards Bay ports by both rail and road.

Economy: The province's rich biodiversity and scenic beauty support the tourism industry, while at the same time mining, specifically coal mining, plays a key role in the province's economy. The availability of high potential soil and diverse climatic condition also support a range of crops.

Urban settlements: The key urban centres are well established economic centres and offer the opportunity for further economic development by leveraging on the towns' economic bases.

In terms of challenges, climate change is identified as a key challenge. In this regard the activities in the province, specifically the generation of coal powered energy, account for 90% of South Africa's scheduled emissions. The province is also home to 50% of the most polluted towns in the country. The predicted impacts associated with climate change include decreased rainfall in the province and increase temperatures. This will increase the risk of natural disasters, including droughts, flooding, and fires.

The SDF identifies five spatial objectives, namely:

Connectivity and corridor functionality: The aim is to ensure connectivity between nodes, secondary towns, marginalised areas, the surrounding area, and to green open space systems.

Sustainable concentration and agglomeration: The aim is to promote the creation of an agglomeration economy that will encourage people and economic activities to locate near one another in urban centres and industrial clusters.

Conservation and resource utilisation: The aim is to promote the maximisation, protection and maintenance of ecosystems, scarce natural resources, high-potential agricultural land, and integrated open space systems.

Liveability and sense of place: The aim is to create settlements that contribute to people's sense of personal and collective wellbeing and to their sense of satisfaction in being residents of a settlements.

Rural diversity and transformation: The aim is to create Urban-Rural anchors and choices for residents within the rural economy linked to access to markets, food security and security of land tenure.

Connectivity and corridor functionality, Sustainable concentration and agglomeration, and Conservation and resource utilisation are of specific relevance the proposed development.

Connectivity and corridor functionality
The strategic objectives (SOs) that are relevant the study area and the proposed development include:

- Strategic Objective 2: Development of the existing corridors and building new linkages to increase capacity and economic opportunities and ensure connectivity to the surrounding areas
- Strategic Objective 5: Decongestion of the coal haul roads and Improvement of Freight Network

In terms of SO 2, the spatial linkages identified for development and upgrading include the upgrade of N17, N17/N2 Corridor and the N12 and N11 corridor. The N17 is located to the north of the site.

Sustainable concentration and agglomeration
Of specific relevance, Strategic Objective 4, Diversify Economy, focusses on the need to diversify the economy. The SDF notes that mining sector contributes 25% to Mpumalanga's GVA. In addition, there are a number of other sectors directly or indirectly dependent on mining such as manufacturing (specifically metal processing) and utilities (specifically power generation). The combined GVA of these three sectors makes up more than 40% of the provincial GVA.

However, the SDF recognises that mining is not a sustainable industry and resources are finite. There is therefore a need for a gradual shift from mining-oriented sectors to the sustainable economic sectors to maintain sustained growth of the provincial economy. Mpumalanga's Coal Mining and Coal Fired Power Plant region (located mainly in the Highveld area) will be come under increasing pressure due to environmental considerations. As a result, the region is likely to experience a decline in demand for coal and with it a decline in the associated employment it creates. There is therefore a need to diversify the regional economy and facilitate the gradual transition of economic activities in the region. The proposed development supports the objective of diversifying the provinces economy.

Conservation and resource utilisation
The strategic objectives (SOs) that are relevant the study area and the proposed development include:

- Strategic Objective 2: Ensure conservation of all water resources and catchment Areas.
- Strategic Objective 4: Promote a low carbon and climate resilient economy.
- Strategic Objective 6: To optimally utilise the mining potential without compromising the long-term sustainability of the natural environment.

Strategic Objective 2: Ensure Conservation of all Water Resources and Catchment Areas

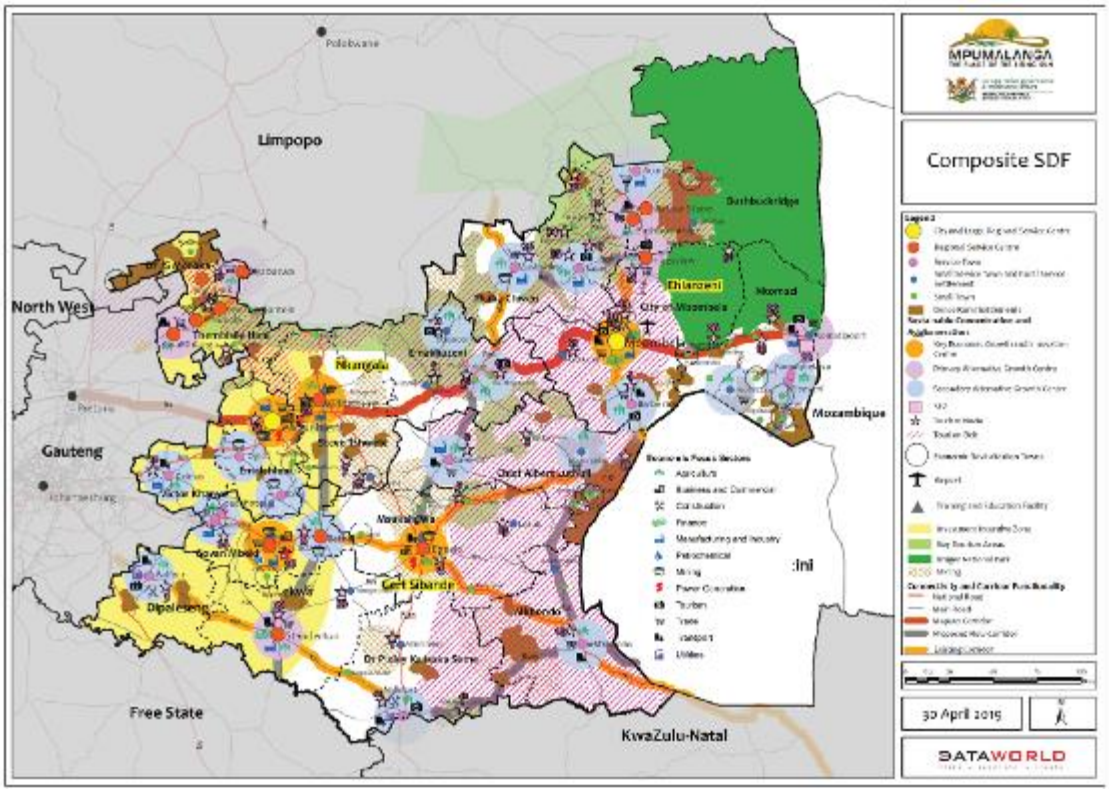
Achieving Strategic Objective 2, Ensure Conservation of all Water Resources and Catchment Areas is closely linked to diversifying the economy. The SDF notes that the provinces water resources are under pressure from high demand activities, including Eskom's power stations, mining, and industrial uses. The proposed development represents a low consumer of water.

Strategic Objective 4: Promote a Low Carbon and Climate Resilient Economy

Mpumalanga is home to 12 of Eskom's 15 coal-fired power stations; petrochemical plants including Sasol's refinery in Secunda; metal smelters; coal and other mines; brick and stone works; fertiliser and chemical producers; explosives producers; and other smaller industrial operations, making the Highveld one of South Africa's industrial heartlands (CER, 2017). As a result, the air quality within the Mpumalanga Province, especially within the Highveld area, is the poorest in South Africa. The Highveld region accounts for approximately 90 % of South Africa's scheduled emissions of industrial dust, sulphur dioxide and nitrogen oxides (Wells et al. 1996, as cited in Josipovic et al. 2009). Achieving Strategic 4, Promote a low carbon and climate resilient economy, is closely linked to diversifying the economy. The proposed development supports the development of a low carbon, climate resistant economy.

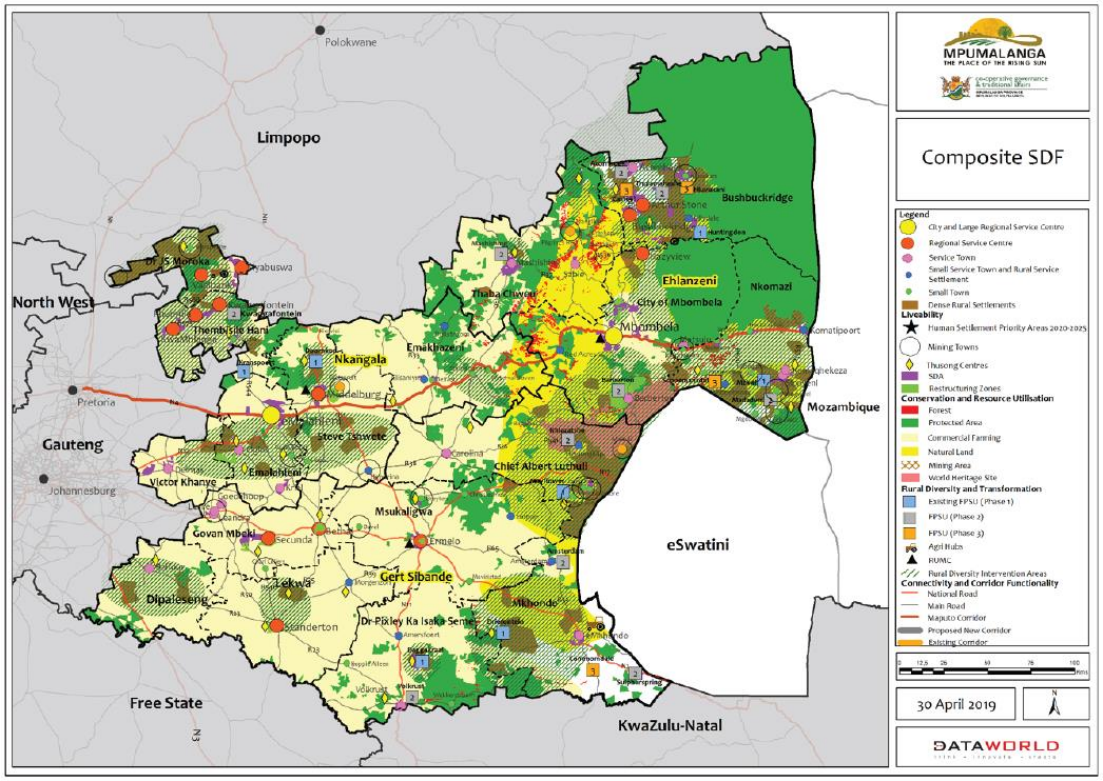
Strategic Objective 6: To optimally utilise the mining potential without compromising the long-term sustainability of the natural environment

Mining contributes R 49.6 billion (approximately 25%) to the provincial economy. The key mining sector is coal, which represents 83% of South Africa's coal production. The mining sector, specifically coal mining, creates employment opportunities and supports the manufacturing and power generation sector. However, mining is also associated with many issues including water and soil contamination, air pollution and environmental degradation. Achieving Strategic 6, To optimally utilise the mining potential without compromising the long-term sustainability of the natural environment is closely linked to diversifying and developing a low carbon climate resistant economy. The proposed development supports the objective of diversifying and developing a low carbon, climate resistant economy. In terms of the high-level composite spatial development framework, economic sectors in the area include mining and power generation. The dominant land use in the area is commercial agriculture (yellow, Figure 2.3).



Source: Mpumalanga SDF

Figure 2.2: Mpumalanga Composite SDF-Economic Activities



Source: Mpumalanga SDF

Figure 2.3: Mpumalanga Composite SDF-Land Uses

2.3.4 Dipaleseng Integrated Development Plan

The vision of the Dipaleseng Local Municipality as set out in the DM Integrated Development Plan (IDP) (2020/21) is to be "a centre of quality, affordable, good governance and sustainable economic opportunities". The associated mission statement is "is to provide sustainable services to communities and ensure that they are served by accountable and effective Municipality."

The IDP identifies five Key Performance Areas (KPAs) namely:

- KPA 1: Municipal transformation and organisational development
- KPA 2: Service delivery and infrastructure development
- KPA 3: Local economic development
- KPA 4: Municipal financial viability and management
- KPA 5: intergovernmental relations and public participation

KPA 2 and 3 are relevant to the proposed development.

KPA 2: Service Delivery and Infrastructure Development

In terms of KPA the IDP identifies youth development and upgrading of community services and facilities as key objectives. Sports and recreation are identified as a key component of the strategy for youth development. In this regard
inadequate and run-down sports and recreational facilities represent a key challenge. To address this the IDP identifies the need to:

- Create accessible spaces in a form of recreational parks and spaces in each ward to promote sports.
- Establishing outdoor gyms to promote healthy lifestyle
- Refurbishing and maintaining existing sports facilities
- Support all sporting activities within the municipality including schools' sports

Likewise, the IDP also highlights the importance of arts and culture and the need to support and provide accessible space for arts and cultural activities. The importance of working and accessible libraries is also identified in the IDP.

KPA 3: Local Economic Development

The IDP highlights the importance of the tourism, agricultural, mining and manufacturing sectors.

2.3.5 Dipaleseng Local Economic Development Strategy

The Dipaleseng Local Economic Development Strategy (LED) was developed in 2011 and does not appear to have been updated. The aim of the LED strategy is to create opportunities for accelerated economic development, increased job creation and improved standards of living in the Municipal area.

The LED vision is "to create a conclusive environment for economic growth, stability and development within Dipaleseng LM".

The LED strategy underpinned by four pillars namely:

- Pillar 1: Rural Development
- Pillar 2: Human Resource Development
- Pillar 3: Institutional Development
- Pillar 4: Tourism Development

The LED strategy also identifies a set of Strategic Goals to support the vision, namely:

- The Protection of Natural Capital: Ensuring sustainable long-term local economic development through the protection and maintenance of natural capital.
- The Reduction in Income Disparity: Reducing the income disparity by focusing on skills training, capacity-building initiatives, local competitive advantages and development of the informal sector.
- Improvement of Institutional Capacity: Ensuring sustainable local economic development by improving the capacity of the Municipality through the establishment of an Economic Development Agency.
- The Promotion of the Retention of Local Wealth: Retaining wealth and increasing the circulation of the wealth in the Municipality by promoting local savings, investment, and entrepreneurship.
- Promotion of Public, Private Partnerships: Ensuring that relations between the public and private sector are improved in an effort to better leverage LED support and resources at a local level by engaging all the sectors about their roles in LED.
- The Promotion of Business/Investment Attraction and Job-Creation: Ensuring effective job-creation strategies by focusing on specific occupations and industry sectors.
- Innovation: Creative and inclusive Rural Development and the application of Information Communication Technologies (ICT) in LED (e.g. Knowledge Economy).

2.3.6 Dipaleseng Spatial Development Framework

The Spatial Vision set out in the DM Spatial Development Framework (SDF) (2020) for the Dipaleseng Local Municipality is "*Providing quality affordable services, good governance, rural development and sustainable economic opportunities, while protecting the natural environment".* The SDF lists six spatial objectives, namely:

- Strategic Objective 1: Movement and Transportation Corridors.
- Strategic Objective 2: Sustainable Economic Development and Concentration.
- Strategic Objective 3: Environmental Conservation and Utilisation.
- Strategic Objective 4: Sustainable Human Settlement Development.
- Strategic Objective 5: Infrastructure Investment.
- Strategic Objective 6: Rural Development and Transformation.

Strategic Objective (SO) 2, 3 and 4 are relevant to the proposed development.

SO2: Sustainable Economic Development and Concentration
A number of sub spatial development strategies are associated with each SO. Spatial Development Strategy 2, Economic Infrastructure Restructuring, identifies the importance of creating incentives for investment in the DM, noting that the municipality must adopt a pro-economic development policy and consider providing incentives to investors who are willing to invest in the municipality. The SDF also identifies the need for skills development and capacity building. The proposed development will create opportunity for private investment and skills development.

SO3: Environmental Conservation and Utilisation
The objective of this strategy is to ensure that land use and settlement growth does not impact unnecessarily on the areas environmental services and systems and well as addressing the risks posed by climate change. The relevant spatial development strategies include:

- Spatial Development Strategy 1: Protection of the Municipal Biodiversity & Ecosystem Services.
- Spatial Development Strategy 2: Conservation of Water Resources and Catchment Areas.
- Spatial Development Strategy 3: Sustainable Agriculture.
- Spatial Development Strategy 4: Climate Change Adaptation

The SDF notes that the DM, like all Municipalities, is extremely vulnerable to impacts of climate change.

SO4: Infrastructure Investment

The SDF notes that the provision of water, electricity, sanitation and refuse disposal etc, should be fashioned toward achieving the objectives of sustainable development. Spatial Development Strategy 3: Upgrading and maintenance of existing infrastructure: Renewable Energy and Electricity, highlights the importance of supporting renewable energy initiatives combined with improved energy efficiency.

The SDF also notes that the existing power stations impact on health and environment, specifically for communities living near coal power stations like Grootvlei.

The SDF also identifies the potential socio-economic opportunities and challenges associated with the DM. The following are relevant to the proposed development.

Opportunities

- Rich biodiversity and landscapes create opportunities for eco-tourism.
- Strategically located between industrial hubs, mining areas and urban centres.
- The municipality can establish itself as a mineral beneficiation hub as it strategically located within close proximity to industrial hubs and mineral-rich areas.
- Manufacturing and utility sectors can be promoted as the municipality is within close proximity to industrial bases, water, and mineral resources.

Challenges

- low skills base and high unemployment rates.
- Lack of economic diversification.
- Lack of beneficiation facilities.
- ESKOM has a plan to shutdown Grootvlei power station in 2020. The closure will hurt the municipality's economic prospects.
- Lack of skilled human resources

SECTION 3: OVERVIEW OF STUDY AREA

3.1 INTRODUCTION

Section 3 provides a baseline description of the study area with regard to:

- The administrative context.
- Provincial context.
- Overview of district and local municipalities.
- Site and the surrounding land uses.

3.2 ADMINISTRATIVE CONTEXT

The study area is located within the Dipaleseng Municipality (DM) within the Mpumalanga Province. The DM is one of the seven Local Municipalities that make up the Gert Sibande District Municipality (GSDM)(Figure 3.1). The town of Dipaleseng (Balfour) is the administrative seat of the DM.

Figure 3.1: Location of Dipaleseng Municipality within the Gert Sibande District Municipality.

3.3 DEMOGRAPHIC OVERVIEW

Population
The population of the DM in 2016 was 45 231 (Community Household Survey 2016). Of this total, 32.7% were under the age of 18, 61% were between 18 and 64, and the remaining 6.2% were 65 and older. The figures or the percentage of the population falling within the economically active age category of 18-64 were higher than the figures for the GSDM and Mpumalanga (57.7% and 56.6% respectively). This is likely to be due to the employment opportunities associated with the mining and manufacturing activities in the DM.

The dependency ratio is the ratio of non-economically active dependents (usually people younger than 15 or older than 64) to the working age population group (15-64). The higher the dependency ratio the larger the percentage of the population dependent on the economically active age group. This in turn translates to reduced revenue for local authorities to meet the growing demand for services. The traditional approach is based people younger than 15 or older than 64. The information provided provides information for the age group under 18. The total number of people falling within this age group will therefore be higher than the 0-15 age group. However, most people between the age of 15 and 17 are not economically active (i.e., they are likely to be at school).

Using information on people under the age of 18 is therefore likely to represent a more accurate reflection of the dependency ratio. Based on these figures, the dependency ratios for the DM, the GSDM and Mpumalanga in 2016 were 64%, 73.5% and 77% respectively. The lower dependency ratios in the DM reflect the employment and economic opportunities in mining and power sector.

In terms of race groups, Black Africans made up 85.5% of the population on the DM, followed by Whites, 13% and Indian or Asian (1.2%). The main first language spoken in the DM was isizulu, 56.6%, followed by Sesotho (22.7%) and Afrikaans (12.9%).

Households and house types
The total number of households in the DM in 2016 was 14 880, which constituted less than 10% of the total number of households in the GSDM. Of these 59.8% were formal houses, 25.8% were shacks, and 12.7% were flats in backyards. The figures for the GSDM were 67.2%, 13.4%, 6.7% and 8.3% respectively. While the majority of dwellings in the DM are formal structures there are a high percentage of informal structures which reflects the migration of jobseekers to the area and the pressure this in turn places on housing.

In terms of ownership, 41.9% of the dwellings in the DM were owned and fully paid off, while 5.2% were in the process of being paid off. 18.8% were occupied rent free and 12.2% of the dwellings were rented from private individuals. A relatively large percentage of the properties in the DM (47.1%) were owned and or in the process of being paid off. This reflects a relatively stable and established community.

In terms of household heads, approximately 35.8% of the households in the DM and 39.1% of the households in the GSDM were headed by women. These figures similar to the provincial figure of 39.71%. The high percentage of households headed by women in the DM reflects the likelihood that the men have left the area in search of employment opportunities in Gauteng. This is despite the well-developed mining and

energy sector in the DM and around Secunda. Women headed households tend to be more vulnerable.

Household income
Based on the data from the 2011 Census, 13.2% of the population of the DM had no formal income, 4.4% earned less than R 4 800, 6.9% earned between R 5 000 and R 10 000 per annum, 19.9% between R 10 000 and R 20 000 per annum and 22.8% between R 20 000 and 40 000 per annum (2016). The poverty gap indicator produced by the World Bank Development Research Group measures poverty using information from household per capita income/consumption. This indicator illustrates the average shortfall of the total population from the poverty line. This measurement is used to reflect the intensity of poverty, which is based on living on less than R3 200 per month for an average sized household (~ 40 000 per annum). Based on this measure, in the region of 67.2% of the households in the DM and 65.2% in the GSDM live close to or below the poverty line.

The low-income levels in the DM and GSDM reflect the limited formal employment opportunities outside the urban areas. This is also reflected in the high unemployment rates. The low-income levels are a major concern given that an increasing number of individuals and households are likely to be dependent on social grants. The low-income levels also result in reduced spending in the local economy and less tax and rates revenue for the DM. This in turn impacts on the ability of the DM to maintain and provide services.

Household income levels are likely to have been impacted by the COVID-19 pandemic. The number of households in the DM and GSDM that live close to or below the poverty line is likely to have increased over the last 18 months. This, coupled with the high dependency ratio, is a major cause of concern for the area.

Employment
The official unemployment rate in the DM in 2016 was 22.3%, while 37.7% were employed, and 35.3% were regarded as not economically active. However, the COVID-19 pandemic is likely to have resulted in an increase in unemployment rates in the DM. Recent figures released by Stats South Africa also indicate that South Africa's unemployment rate is in the region of 36%, the highest formal unemployment rate in the world.

Education
In terms of education levels, the percentage of the population over 20 years of age in the DM with no schooling was 6.6% in 2016, compared to 10.8% and 11.3% for the GSDM and Mpumalanga Province respectively. The percentage of the population over the age of 20 with matric in the DM (2016) was 30.7%, compared to 34.3% and 36.1% for the GSDM and Mpumalanga. The education levels in the DM are therefore lower than the GSDM and Provincial figures.

3.4 MUNICIPAL SERVICES

Electricity
Based on 2016 survey, 84.7% of households in the DM had access to electricity, compared to 90% for the GSDM and 93% for Mpumalanga. 15.3% therefore had not access to electricity compared to 9.6% and 6.8% for the GSDM and Mpumalanga respectively.

Access to water
Based on the 2016 survey information, 86.3% of households in the DM were supplied by a regional or local service provider. This compares to 88.4% and 86.85% for the GSDM and Mpumalanga respectively. Of this total 48.1% had piped water in the yard, and 29.7% had piped water in the house. The relatively high percentage that relied on piped water in their yards reflects the relatively high percentage of shacks (25.8%) in the DM.

Sanitation
76.4% of the households in the DM had access to flush toilets (2016), while 15.8% relied on pit toilets and 1.6% on bucket toilets. The relatively high percentage that relied on pit toilets reflects the relatively high percentage of shacks (25.8%) in the DM. The figure for flush toilets compares to 65.3% and 42.1% for the GSDM and Mpumalanga respectively. 4.4% of the households in the DM reported that they had no access to formal sanitation, compared to 2.6% and 2.8% for the GSDM and Mpumalanga respectively.

Refuse collection
76.4% of the households in the DM had access to regular refuse removal service, while for 13.6% relied on their own dump. The relatively high percentage that relied on their own dump reflects the relatively high percentage of shacks (25.8%) in the DM. The figure for regular service compares to 52.2% for the GSDM.

3.5 OVERVIEW OF STUDY AREA

3.5.1 Introduction

The study area is located approximately 12km to the north-east of the town of Greylingstad in the DM (Figure 3.2). The large industrial town of Secunda is located in the adjacent Govan Mbeki Municipality (DM), ~ 32 north east of the site. The small town of Dipaleseng (Balfour), the administrative seat of the DM, is located 24 km to the west of the site. The major roads in the area are the N17, located ~ 27 km to the north of the site. The N17 which runs to the north of Secunda and connects the towns of Benoni and Bethal. The R23 is located to the south and south west of the site and links Greylingstad with Dipaleseng (Balfour) to the west. The R50 is located ~ 14 km to the east of the site.

The Impumelelo WEF site is located in the rural western Mpumalanga highveld. The small settlement of Greylingstad (including Willemsdal and Nthorwane), located ~9.5 km (linear) south west of the site, is the nearest urban area. The nearest large towns are Secunda and Standerton, located ~18.5 km NE (Embalenhle) and ~40 km south east of the site, respectively. The small town of Balfour is located ~20 km west of the site (Figure 3.3).

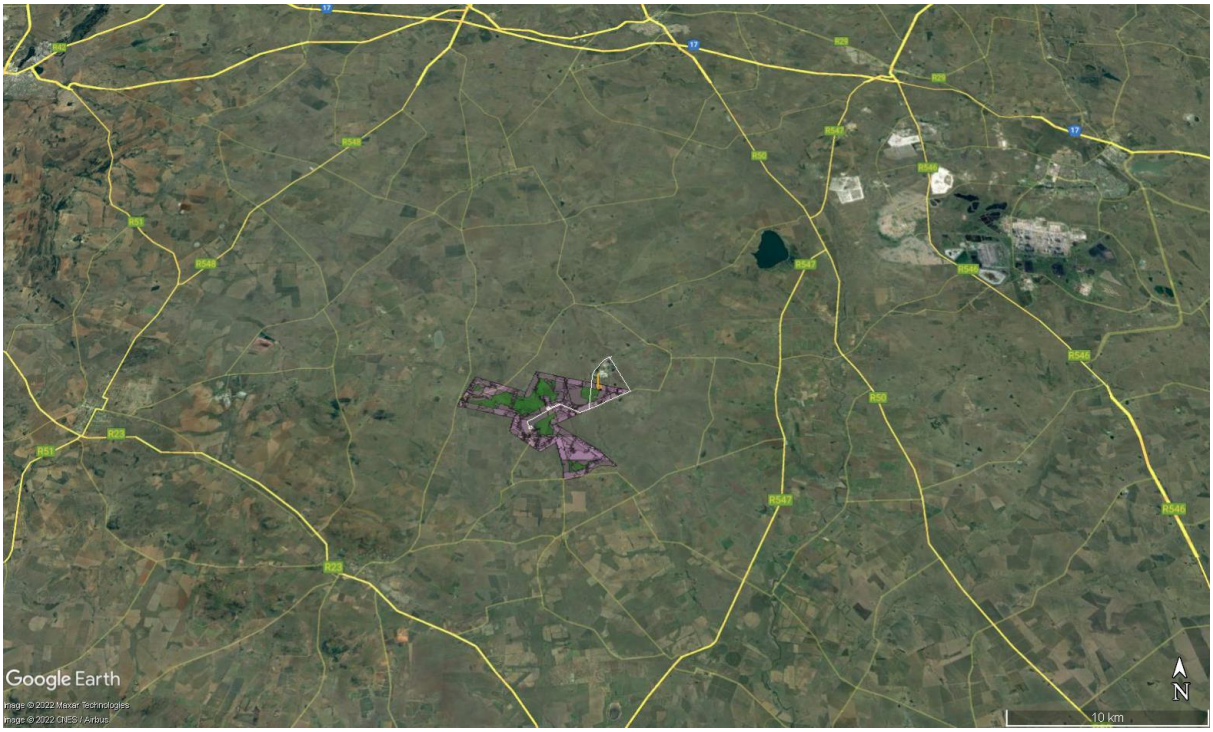


Figure 3.2: Regional location of Impumelelo WEF (pink area) with Secunda and Sasol facility to the north east

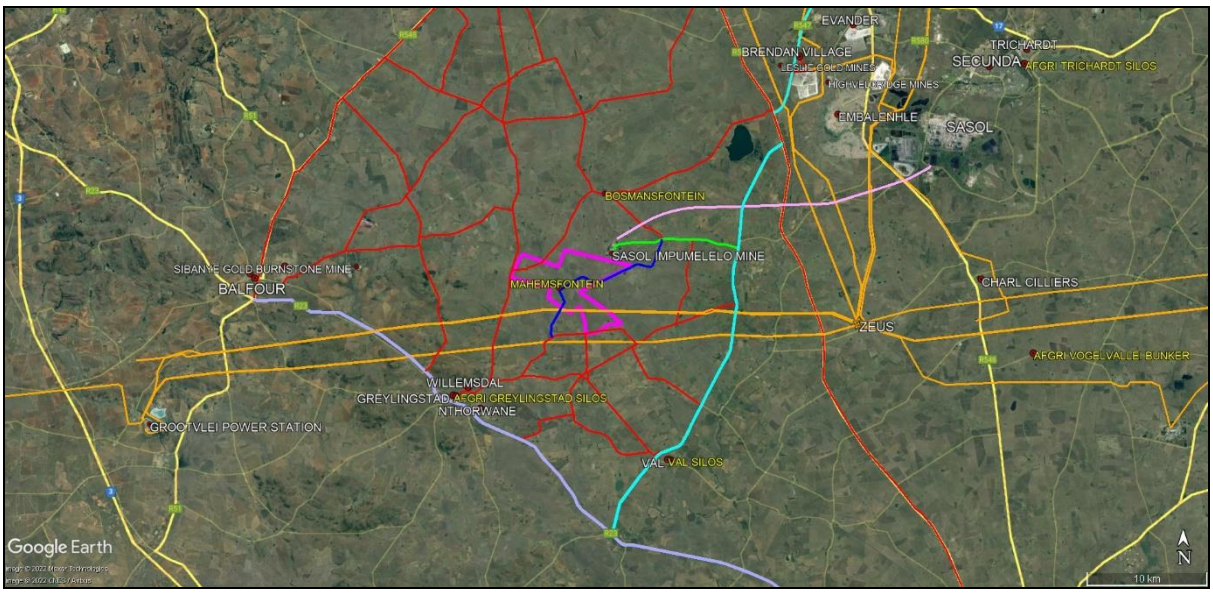


Figure 3.3: Impumelelo WEF site (pink) in relation to local settlements, mines and silo complexes. Also indicated are existing Eskom transmission lines (orange), the Balfour-Standerton railway line (black), SASOL Impumelelo mine coal conveyor belt (light pink), the R23 (grey), R547 (blue), and Boschmansfontein/ Impumelelo tar road (green), 'Mahemsfontein public gravel road' (dark blue), and remaining study area gravel road network (red).

The immediate study area is accessed via a network of public gravel roads off the R23 (Balfour-Standerton Road) via Greylingstad, and/ or the R547 (N17 corridor to R23). The only other tarred road of relevance is that linking the R547 to SASOL's Impumelelo mine north of the site (Photograph 3.1). The easternmost portion of the road is a public road (portion of Boschmansdam Rd), and the westernmost a private road (SASOL Impumelelo mine). The central portion of the site is accessed via a gravel road ('Mahemsfontein road') which intersects with the Boschmansfontein/ Impumelelo tar road NE of the site (Photograph 3.2).

Photograph 3.1: Intersection of R547 (foreground) and Boschmansfontein/ Impumelelo mine access road

Photograph 3.2: Intersection of Impumelelo mine access road (foreground) and gravel road providing access to Platfontein and Mahemsfontein ('Mahemsfontein gravel road')

Land use in the study area is dominated by mixed farming operations (Photograph 3.3). Soy and maize grown under dryland conditions are the key crops, but sunflower is also grown. The nearest silo complex is located at Val (adjacent to the R547), and in Greylingstad. In the broader study area, silos are also located in Leandra, Balfour, and Trichardt. Land comprised of heavier turf soils is considered unsuitable for cropping and is used as rangeland. Beef cattle predominate. The veld carrying capacity is relatively high, 1 head of cattle to 5 ha (2018).[5] Harvest residue is utilized as grazing on many properties. Many operations also manage areas of pasture (typically Oulandsgras – *Eragrostis curvula*) for hay production.

[5] https://gis.elsenburg.com/apps/cfm/#

Photograph 3.3: Cattle and cultivated fields on Hartbeestfontein 522/25

The sense of place in the broader study area is characterized by historic and ongoing mining activities and associated industrial land uses. Both gold and coal are mined. SASOL's Impumelelo coal mine is located directly to the north of the WEF site (Photograph 3.4). A coal conveyor belt links the mine to SASOL's large Secunda plant south of Secunda (Photograph 3.5). Sibanye's Burnstone gold mine is located approximately 13 km west of the site.

Two existing Eskom transmission corridors (2 400 kV lines each) are located in the study area (Photograph 3.6). The two corridors are aligned near-parallel W-E, approximately 2.6 km apart. The northernmost corridor traverses the southern portion of the Impumelelo WEF site, and the other is located 650 m south of the site. The nearest major Eskom substation, Juno, is located approximately 20 km east of the site. No tourism receptors are located in the immediate study area.

Photograph 3.4: SASOL's Impumelelo coal mine seen from Platkop (543/4) farm yard to the south

Photograph 3.5: Coal conveyor belt from Impumelelo mine to SASOL Secunda, located from 2 km to the north of the site.

Photograph 3.6: Eskom 400kV lines traversing the southern portion of the WEF site, looking east from the Mahemsfontein gravel road; uninhabited dwelling on Mahemsfontein 544/RE in the background

3.5.2 Site properties

The Impumelelo WEF site is comprised of 9 properties (Figure 3.4). The relevant properties belong to 5 land owners (Table 3.1).

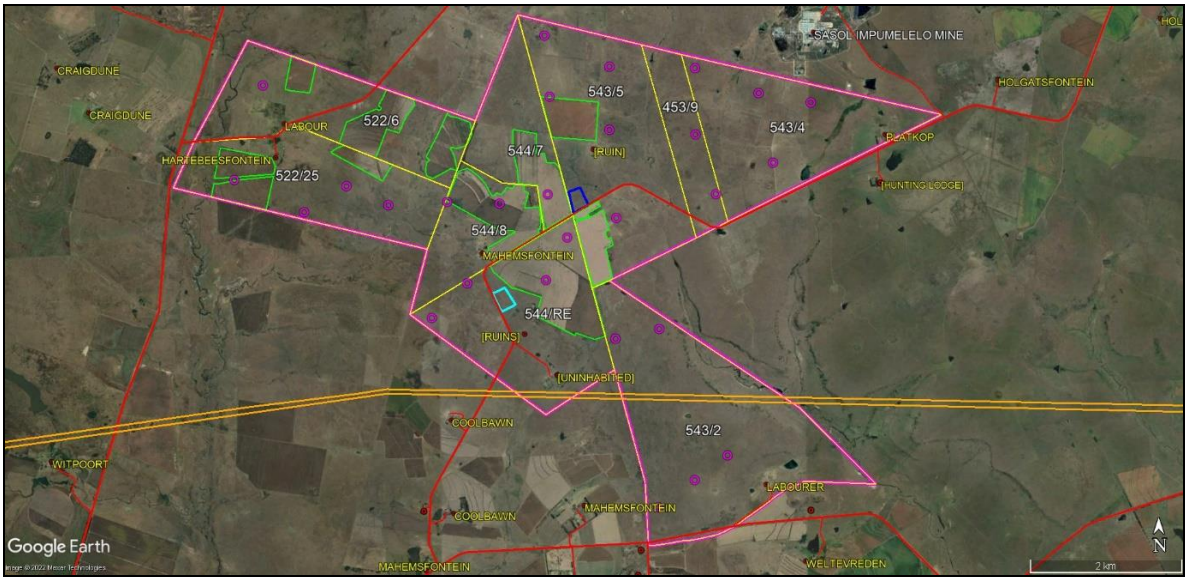


Figure 3.4: Impumelelo WEF site (pink), proposed turbines (pink circles) and substation sites Alts 1 (dark blue) and 2 (light blue) in relation to dwellings, site-constituent properties (yellow) and cropped areas on these properties (green), existing Eskom transmission lines (orange), and roads (red)

Table 3.1: Overview of directly affected properties

OWNER	PROPERTY	RES	USE
Bierman, Mr Gerhard	Platkop 543/2	Labourer	Cattle farming; Property farmed jointly by owner and Mr Gideon Horn; Part of larger farming operation based off-site; One caretaker labourer resident
Du Plessis, Mr Kobus	Hartbeestfontein 522/6	Labourers	Mixed dryland cropping and beef cattle; Part of larger farming operation based off-site (Delmas); Two caretaker labourers resident
Kense, Mr Johan	Hartbeestfontein 522/25	Labourer, Farmstead uninhabited	Mixed dryland cropping and beef cattle; Part of larger farming operation based off-site (between site and Leandra); Two caretaker labourers resident
Klopper, Mr Lucas	Platkop 543/4	Labourer	Mixed dryland cropping and beef cattle; Part of larger farming operation based off-site (R547); One caretaker labourer resident (Platkop 543/4)
	Platkop 543/5	N.a.	
	Platkop 543/9	N.a.	
Van Jaarsveld, Ms Hester	Mahemsfontein 544/RE	Farmstead uninhabited	Mixed dryland cropping and beef cattle; Farmed by owner's son, Mr Dawie van Jaarsveld; Part of larger farming operation based off-site (outside Greylingstad); Farmstead leased out, no labour resident
	Mahemsfontein 544/7	N.a.	
	Mahemsfontein 544/8	Farmstead (Tenant)	

None of the site properties are inhabited by their owners. All properties form part of larger farming operations based on other farms in the broader study area. Farm labour is typically resident on the base farms and deployed to the study area properties only when needed (e.g., planting and harvesting). Small contingents (1-2) caretaker staff

reside on the properties of four (4) of the land owners (Bierman, du Plessis, Kense, Klopper), while the farmstead on that of the fifth (Mahemsfontein 544/5) is leased out for residential purposes. Uninhabited farmsteads are located on Hartbeestfontein 522/25 (Kense) and Mahemsfontein 544/RE (van Jaarsveld). The caretaker labourer resides in the farmstead on Platkop 543/4 ((Photographs 3.7-3-10).

Photograph 3.7: Labourers' dwellings on Hartbeestfontein 522/6

Photograph 3.8: Uninhabited farmstead, labourers' dwelling, and sheds on Hartbeestfontein 522/25

Photograph 3.9: Farmstead and outbuildings on Mahemsfontein 544/8. The dwelling is leased out for residential purposes

Photograph 3.10: Farmstead and outbuildings on Platkop 543/4, seen from the Mahemsfontein gravel road. The farmstead is inhabited by a caretaker labourer. Note the baled hay in the foreground

The properties are all used for commercial farming. As indicated, all properties form part of larger farming operations based off-site. The site properties of four owners (du Plessis, Kense, van Jaarsveld and Klopper) are used for mixed operations, namely dryland cropping of annual field crops and raising beef cattle, while the that of the fifth (Bierman) used only for raising beef cattle. Due to the prevalence of turf soils, cropping areas on the site properties are confined, and essentially restricted to the central and western portions of the site. The bulk of the site is therefore used as grazing. Rangeland is also used for hay production (Photographs 3.11 and 3.12). No commercial (paying) hunting takes place on any of the study area properties.

Photograph 3.11: Sunflower stubble on Mahemsfontein 544/8

Photograph 3.12: Beef cattle on Platkop 543/5

3.5.3 Potentially sensitive receptors

The up to 30 turbines (200 m hub height) are largely proposed on rangeland unsuitable for cultivation. Four turbines on Mahemsfontein (544/RE, 544/8, 544/9) are however proposed within cropped fields, while one in Hartbeestfontein 522/25 is proposed in a drainage furrow between fields. Both proposed substation Alt sites are located on rangeland unsuitable for cultivation, and adjacent to existing road infrastructure (namely the Mahemsfontein gravel road) (Photographs 3.13 and 3.14).

Photograph 3.13: Looking NE across the area on Platkop 543/5 north of the Mahemsfontein gravel road proposed as substation Alternative 1

Photograph 3.13: Looking NW across the area on Mahemsfontein 544/RE proposed as substation Alternative 2; Mahemsfontein gravel road to the left.

The study area settlement pattern is relatively sparse, and essentially concentrated on base farms to the south (e.g., Coolbawn, Grootvlei) and west (e.g., Craigdune) of the site. As indicated, few residential receptors are located on the site properties themselves, and inhabitation is mainly associated with caretaker staff. Dwellings on adjacent properties to the west and south are located at distances ranging from 600 m to 2.1 km to the nearest turbines. These properties are used for commercial farming. The properties to the south of the site are already affected by 2 400 kV Eskom corridors.

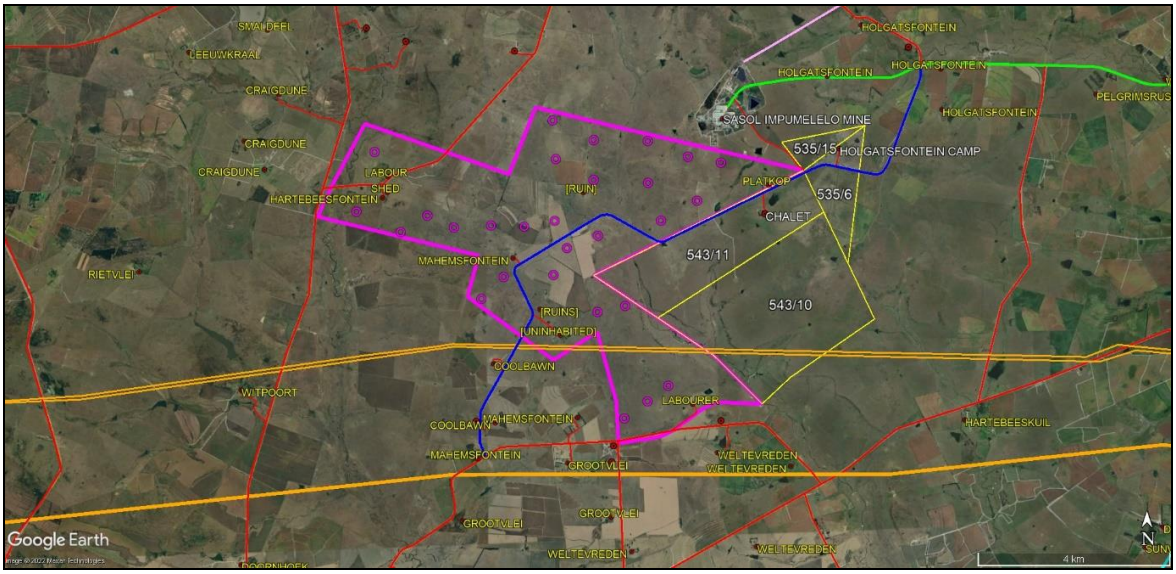


Figure 3.5: Impumelelo WEF site (pink), proposed turbines (pink circles) and substation sites Alts 1 (dark blue) and 2 light blue) in relation to local settlement pattern, existing Eskom transmission lines (orange), the SASOL Impumelelo mine coal conveyor belt (light pink), the Botha properties (yellow), the Mahemsfontein public gravel road, other gravel roads (red), and the tarred Impumelelo mine access road (green)

Only one inhabited dwelling is located in significant proximity to the two alternative substation sites, namely that on Mahemsfontein 544/8 (van Jaarsveld), located ~1.3 km from Alternative 1 substation, and ~550 m from Alternative 2 substation. The dwelling is leased out for residential purposes. The dwelling would be screened from the Alternative 2 site by topography. The owner has raised no issues (van Jaarsveld, pers. comm).

No tourism receptors are located within significant proximity to the proposed infrastructure. The only sensitive land use is associated with a commercial hunting operation located to the south and east of the site. The operation is owned by Mr Janko Botha and consists of Holgatsfontein 535/6 and 535/15, and Platkop 543/10 and 543/11. The properties are contiguous, comprising an area of approximately 1 600 ha. The bulk of the land is located to the south of the Mahemsfontein gravely road. Holgatsfontein 535/15 and a small portion of 535/6 are located north of the road. The properties are accessed off the Mahemsfontein gravel road. Holgatsfontein 535/15 borders onto the Impumelelo mine to the west and north. The southernmost portion of 543/10 is traversed by 2 x 400 kV lines (one corridor) over a distance of 2.5 km.

The operation is comprised of game farming, game harvesting for the commercial meat market, and providing paid hunting opportunities to paying biltong- and trophy hunters. Hunting takes place year-round. The game suite consists of plains game, including Buffalo. The property is enclosed with game proof fencing. Two hunters' accommodation facilities are located on the property, namely a large chalet on 543/11 located approximately 450 m south of the Mahemsfontein gravel road (Photograph 3.14) and a small cluster of chalets on Holgatsfontein 535/6 located 360 m north of the road. Mr Botha is based on a farm located in the broader study area. Labour is based on this main farm. Approximately 27 permanently employed labourers are associated with the game farming operation (albeit as part of larger farming operations).

Photograph 3.14: Chalet and game pens on Platkop 543/11

The hunting operation is sensitive to restrictions imposed by people presence and infrastructure on the Botha property and adjacent ones. As Buffalo is hunted, large calibre rifles with long ranges are used. Current restrictions are associated with the Mahemsfontein gravel road and Impumelelo mine. The surrounding settlement pattern is very sparse. Only two dwellings are located within 1 km of the operation, namely on Platkop 543/4 (Klopper) and Platkop 543/2 (Bierman). Turbines are currently proposed approximately 150 m to the west and 400 m to the north of the Botha property. The turbines proposed to the west would impose a new restriction, while those to the north would reinforce the existing exclusion associated with the Mahemsfontein gravel road. The substations sites are not located in significant proximity to the Botha properties.

3.5.4 Other renewable energy facilities

The Impumelelo WEF project is not located within a Renewable Energy Development Zone (REDZ). The only historic application indicated on the DFF&E's renewable energy applications website[6] located within a 35 km range of the site, is the proposed 75 MW Grootvlei SEF (2012) located 28 km SW of the site. Enertrag is currently also proposing the Mukondelele WEF (separate application) located 23 km to the east of the Impumelelo WEF site, south of SASOL Secunda.

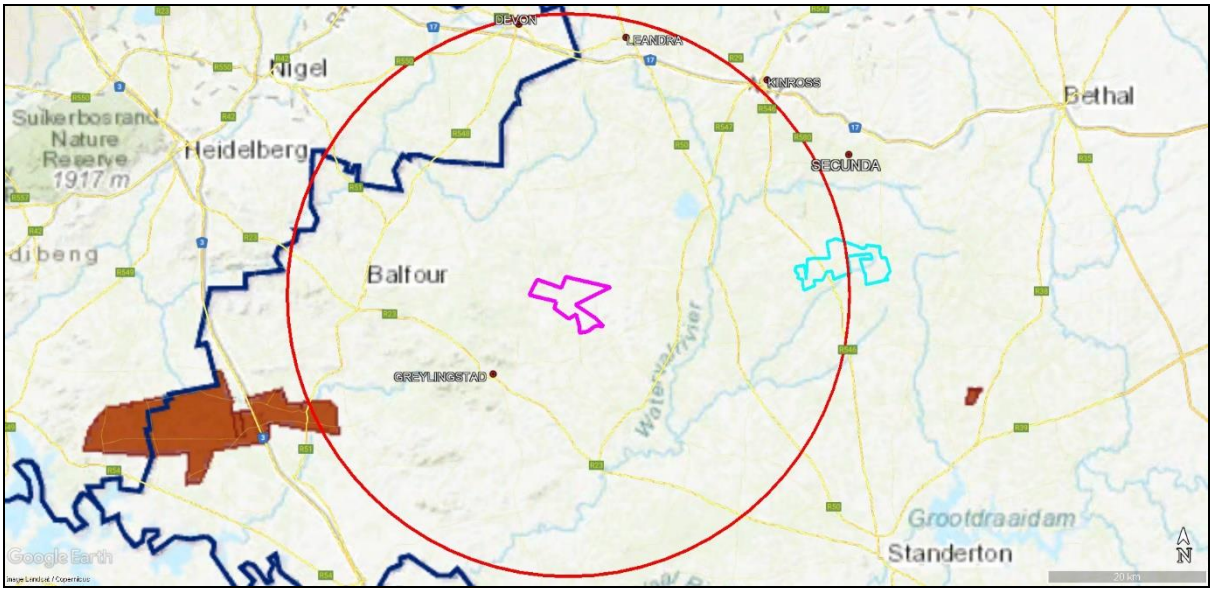


Figure 3.6: Impumelelo WEF site (pink) in relation to proposed REFs located within a 35 km radius of the centre of the site. The proposed Mukondelele WEF outlined in blue (Sources: DFF&E; Barbour and van der Merwe, 2022)

[6] https://egis.environment.gov.za/renewable_energy

SECTION 4: ASSESSMENT OF KEY SOCIAL ISSUES

4.1 INTRODUCTION

Section 4 provides an initial assessment of key social issues identified that will be assessment during the Assessment Phase. The identification of key issues was based on:

- Review of project related information.
- Experience/ familiarity of the author with the area and local conditions.
- Experience with similar projects.

The section is divided into the following sections:

- Compatibility with relevant policy and planning context ("planning fit");
- Social issues associated with the construction phase.
- Social issues associated with the operational phase.
- Social issues associated with the decommissioning phase.
- Social implications of "no development" alternative.
- Social implications associated with cumulative impacts.

The key issues and significance ratings will be confirmed during the assessment phase.

4.2 ASSESSMENT OF POLICY AND PLANNING FIT

The development of and investment in renewable energy is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all refer to and support renewable energy. The development of renewable energy is also supported at a provincial and local level. The development of the proposed WEF is therefore supported by key policy and planning documents.

4.3 CONSTRUCTION PHASE SOCIAL IMPACTS

Potential positive impacts

- Creation of employment and business opportunities, and opportunity for skills development and on-site training.

Potential negative impacts

- Impacts associated with the presence of construction workers on local communities.
- Impacts related to the potential influx of job-seekers.
- Increased risks to livestock and farming infrastructure associated with the construction related activities and presence of construction workers on the site.
- Increased risk of grass fires associated with construction related activities.
- Nuisance impacts, such as noise, dust, and safety, associated with construction related activities and vehicles.
- Impact on productive farmland.

4.3.1 Creation of local employment, training, and business opportunities

The construction phase of the WEF will extend over a period of approximately 36 months and create in the region of 220 employment opportunities (43% skilled, 45% semi-skilled and 36% low-skilled). Members from the local communities in the area, specifically Secunda, would be in a position to qualify for most of the low skilled and semi-skilled employment opportunities. Most of these employment opportunities will accrue to Historically Disadvantaged (HD) members of the community. Based on information from similar projects the total wage bill will be in the region of R 50 million (2022 Rand values). A percentage of the wage bill will be spent in the local economy which will also create opportunities for local businesses in the local towns in the area.

Given relatively high local unemployment levels and limited job opportunities in the area, this will represent a significant, if localised, social benefit. The capital expenditure associated with the construction phase will be approximately R 2.5-3 billion (2022 Rand value). Due the lack of diversification in the local economy the potential for local companies is likely to be limited. The majority of benefits are therefore likely to accrue to contractors and engineering companies based outside the DM. The local service sector will also benefit from the construction phase. The potential opportunities would be linked to accommodation, catering, cleaning, transport, and security, etc. associated with the construction workers on the site.

The hospitality industry in the area will also benefit from the provision of accommodation and meals for professionals (engineers, quantity surveyors, project managers, product representatives etc.) and other (non-construction) personnel involved on the project. Experience from other construction projects indicates that the potential opportunities are not limited to on-site construction workers but also to consultants and product representatives associated with the project.

Table 4.1: Impact assessment of employment and business creation opportunities during the construction phase

Nature: Creation of employment and business opportunities during the construction phase		
	Without Mitigation	**With Enhancement**
Extent	Local (2)	Local (3)
Duration	Short term (2)	Short term (2)
Magnitude	Medium (3)	Medium (3)
Reversibility	N/A	N/A
Probability	Probable (3)	Highly probable (4)
Significance	Low (21)	Moderate (32)
Status	Positive	Positive
Can impact be enhanced?	Yes	
Enhancement: See below		
Residual impacts: Opportunity to up-grade and improve skills levels in the area.		

Assessment of No-Go option
There is no impact as the current status quo would be maintained.

Recommended enhancement measures
In order to enhance local employment and business opportunities associated with the construction phase the following measures should be implemented:

Employment
- Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.
- Where reasonable and practical, the proponent should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories. However, due to the low skills levels in the area, the majority of skilled posts are likely to be filled by people from outside the area.
- Where feasible, efforts should be made to employ local contactors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria.
- Before the construction phase commences the proponent should meet with representatives from the DM to establish the existence of a skills database for the area. If such as database exists, it should be made available to the contractors appointed for the construction phase.
- The local authorities, community representatives, and organisations on the interested and affected party database should be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that the proponent intends following for the construction phase of the project.
- Where feasible, training and skills development programmes for locals should be initiated prior to the initiation of the construction phase.
- The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.

Business
- The proponent should liaise with the DM with regards the establishment of a database of local companies, specifically BBBEE companies, which qualify as potential service providers (e.g., construction companies, catering companies, waste collection companies, security companies etc.) prior to the commencement of the tender process for construction service providers. These companies should be notified of the tender process and invited to bid for project-related work.

Note that while preference to local employees and companies is recommended, it is recognised that a competitive tender process may not guarantee the employment of local labour for the construction phase.

4.3.2 Impact of construction workers on local communities

The presence of construction workers poses a potential risk to family structures and social networks. While the presence of construction workers does not in itself constitute a social impact, the manner in which construction workers conduct themselves can impact on local communities. The most significant negative impact is associated with the disruption of existing family structures and social networks. This risk is linked to potentially risky behaviour, mainly of male construction workers, including:

- An increase in alcohol and drug use.
- An increase in crime levels.
- The loss of girlfriends and/or wives to construction workers.
- An increase in teenage and unwanted pregnancies.
- An increase in prostitution.
- An increase in sexually transmitted diseases (STDs), including HIV.

The objective will be to source as many of the low and semi-skilled workers locally. These workers will be from the local community and form part of the local family and social networks. This will reduce the risk and mitigate the potential impacts on the local community. The potential impact on the local community will therefore be negligible. The balance of semi-skilled and skilled workers are likely to be accommodated in the nearby towns of Dipaleseng (Balfour) and Secunda.

Table 4.2: Assessment of impact of the presence of construction workers in the area on local communities

Nature: Potential impacts on family structures and social networks associated with the presence of construction workers		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (1)
Duration	Short term (2)	Short term (2)
Magnitude	Low (2)	Low (2)
Reversibility	With rehabilitation/mitigation (3)	With rehabilitation/mitigation (3)
Probability	Probable (3)	Probable (3)
Significance	Moderate (27)	Low (24)
Status	Negative	Negative
Can impact be mitigated?	Yes, to some degree. However, the risk cannot be entirely eliminated	
Mitigation: See below		
Residual impacts: Impacts on family and community relations that may, in some cases, persist for a long period of time. Also, in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent residual/cumulative impacts on the affected individuals and/or their families and the community.		

Assessment of No-Go option
There is no impact as the current status quo would be maintained.

Recommended enhancement measures
- Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.
- Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.
- The SEP and CHSSP should include a Grievance Mechanism that enables stakeholders to report resolve incidents.
- Where possible, the proponent should make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically for semi and low-skilled job categories.
- The proponent should consider the option of establishing a Monitoring Committee (MC) for the construction phase that representatives from local landowners, farming associations, and the local municipality. This MC should be established prior to commencement of the construction phase and form part of the SEP.
- The proponent and contractor should develop a Code of Conduct (CoC) for construction workers. The code should identify which types of behaviour and activities are not acceptable. Construction workers in breach of the code should be

subject to appropriate disciplinary action and/or dismissed. All dismissals must comply with the South African labour legislation. The CoC should be signed by the proponent and the contractors before the contractors move onto site. The CoC should form part of the CHSSP.
- The proponent and the contractor should implement an HIV/AIDS, COVID-19 and Tuberculosis (TB) awareness programme for all construction workers at the outset of the construction phase. The programmes should form part of the CHSSP.
- The contractor should provide transport for workers to and from the site on a daily basis. This will enable the contactor to effectively manage and monitor the movement of construction workers on and off the site.
- The contractor must ensure that all construction workers from outside the area are transported back to their place of residence within 2 days for their contract coming to an end.
- No construction workers, with the exception of security personnel, should be permitted to stay over-night on the site.

4.3.3 Influx of job seekers

Large construction projects tend to attract people to the area in the hope that they will secure a job, even if it is a temporary job. These job seekers can in turn become "economically stranded" in the area or decide to stay on irrespective of finding a job or not. While the proposed project on its own does not constitute a large construction project, the establishment of a number of renewable energy projects in the area may attract job seekers to the area. As in the case of construction workers employed on the project, the actual presence of job seekers in the area does not in itself constitute a social impact. However, the way in which they conduct themselves can impact on the local community. The main areas of concern associated with the influx of job seekers include:

- Impacts on existing social networks and community structures.
- Competition for housing, specifically low-cost housing.
- Competition for scarce jobs.
- Increase in incidences of crime.

These issues are similar to the concerns associated with the presence of construction workers and are discussed in Section 4.3.1. Based on experience from the construction of other renewable energy facilities the potential for economically motivated in-migration and subsequent labour stranding is likely to limited. This is due to the relatively limited number of employment opportunities and short duration of the construction phase.

Table 4.3: Assessment of impact of job seekers on local communities

Nature: Potential impacts on family structures, social networks and community services associated with the influx of job seekers		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (1)
Duration	Short term (2)	Short term (2)
Magnitude	Low (2)	Low (2)
Reversibility	With rehabilitation/mitigation (3)	With rehabilitation/mitigation (3)
Probability	Probable (3)	Probable (3)
Significance	Low (27)	Low (24)
Status	Negative	Negative
Can impact be mitigated?	Yes, to some degree. However, the risk cannot be entirely eliminated	
Mitigation: See below		
Residual impacts: Impacts on family and community relations that may, in some cases, persist for a long period of time. Also, in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community.		

Assessment of No-Go option
There is no impact as the current status quo would be maintained.

Recommended mitigation measures
It is impossible to stop people from coming to the area in search of employment. However, as indicated above, the proponent should ensure that the employment criteria favour residents from the area. In addition:

- Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.
- Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.
- The proponent, in consultation with the DM, should investigate the option of establishing a MC to monitor and identify potential problems that may arise due to the influx of job seekers to the area.
- The proponent should implement a "locals first" policy, specifically with regard to unskilled and low skilled opportunities.
- The proponent should implement a policy that no employment will be available at the gate.

4.3.4 Risk to safety, livestock, and farm infrastructure

The presence on and movement of construction workers on and off the site poses a potential safety threat to local famers and farm workers in the vicinity of the site. In addition, farm infrastructure, such as fences and gates, may be damaged and stock losses may also result from gates being left open and/or fences being damaged, or stock theft linked either directly or indirectly to the presence of construction workers on the site. The potential risks (safety, livestock, and farm infrastructure) can be

effectively mitigated by careful planning and managing the movement of construction workers and construction related activities during the construction phase.

Table 4.4: Assessment of risk to safety, livestock, and damage to farm infrastructure

Nature: Potential risk to safety of farmers and farm workers, livestock and damage to farm infrastructure associated with the presence of construction workers on site		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (1)
Duration	Short term (2)	Short term (2)
Magnitude	Medium (3)	Low (2)
Reversibility	Reversible with compensation (3)	Reversible with compensation (3)
Probability	Probable (3)	Probable (3)
Significance	Moderate (30)	Low (24)
Status	Negative	Negative
Can impact be mitigated?	Yes	
Mitigation: See below		
Residual impacts: No**,** provided losses are compensated for.		

Assessment of No-Go option
There is no impact as the current status quo would be maintained.

Recommended mitigation measures
- Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.
- Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.
- The proponent should enter into an agreement with the local farmers in the area whereby damages to farm property etc. during the construction phase will be compensated for. The agreement should be signed before the construction phase commences.
- All farm gates must be closed after passing through.
- Contractors appointed by the proponent should provide daily transport for low and semi-skilled workers to and from the site.
- The proponent should establish a MC and CoC for workers (see above).
- The proponent should hold contractors liable for compensating farmers and communities in full for any stock losses and/or damage to farm infrastructure that can be linked to construction workers. This should be contained in the Code of Conduct to be signed between the proponent, the contractors, and neighbouring landowners. The agreement should also cover loses and costs associated with fires caused by construction workers or construction related activities (see below).
- The proponent should implement a Grievance Mechanism that provides local farmers with an effective and efficient mechanism to address issues related to report issues related to damage to farm infrastructure, stock theft and poaching etc.

- The Environmental Management Program (EMPr) must outline procedures for managing and storing waste on site, specifically plastic waste that poses a threat to livestock if ingested.
- Contractors appointed by the proponent must ensure that all workers are informed at the outset of the construction phase of the conditions contained in the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms.
- Contractors appointed by the proponent must ensure that construction workers who are found guilty of stealing livestock and/or damaging farm infrastructure are dismissed and charged. This should be contained in the CoC. All dismissals must be in accordance with South African labour legislation.
- It is recommended that no construction workers, with the exception of security personnel, should be permitted to stay over-night on the site.

4.3.5 Increased risk of grass fires

The presence of construction workers and construction-related activities on the site poses an increased risk of grass fires that could, in turn pose, a threat to livestock, crops, wildlife and farm infrastructure. The potential risk of grass fires will be higher during the dry, windy winter months from May to October. The impacts will be largely local and can be effectively mitigated.

Table 4.5: Assessment of impact of increased risk of grass fires

Nature: Potential noise, dust and safety impacts associated with movement of construction related activities and movement of traffic to and from the site		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (1)
Duration	Short term (2)	Short term (2)
Magnitude	Medium (3)	Low (2)
Reversibility	Reversible with compensation (3)	Reversible with compensation (3)
Probability	Probable (3)	Low Probability (2)
Significance	Moderate (30)	Low (12)
Status	Negative	Negative
Can impact be mitigated?	Yes	
Mitigation: See below		
Residual impacts: If damage to local roads is not repaired then this will affect the other road users and result in higher maintenance costs. The costs will be borne by road users who were no responsible for the damage.		

Assessment of No-Go option
There is no impact as it maintains the current status quo.

Recommended mitigation measures
The mitigation measures include:

- Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.

- Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.
- The proponent should enter into an agreement with the local farmers in the area whereby damages to farm property etc., during the construction phase will be compensated for. The agreement should be signed before the construction phase commences.
- Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas.
- Smoking on site should be confined to designated areas.
- Contractor should ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high-risk dry, windy winter months.
- Contractor should provide adequate fire-fighting equipment on-site, including a fire fighting vehicle.
- Contractor should provide fire-fighting training to selected construction staff. As per the conditions of the Code of Conduct, in the advent of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor should also compensate the fire-fighting costs borne by farmers and local authorities.
- No construction staff, with the exception of security staff, to be accommodated on site overnight.

4.3.6 Nuisance impacts associated with construction related activities

Construction related activities, including the movement of heavy construction vehicles of and on the site, has the potential to create dust, noise and safety impacts and damage to local roads. The impacts will be largely local and can be effectively mitigated.

Table 4.6: **Assessment of the impacts associated with construction related activities**

Nature: Potential loss of livestock and grazing and damage to farm infrastructure associated with increased incidence of grass fires		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (1)
Duration	Short term (2)	Short term (2)
Magnitude	Medium (3)	Low (2)
Reversibility	Reversible with compensation (3)	Reversible with compensation (3)
Probability	Probable (3)	Low Probability (2)
Significance	Moderate (30)	Low (16)
Status	Negative	Negative
Can impact be mitigated?	Yes	
Mitigation: See below		
Residual impacts: No**,** provided losses are compensated for.		

Assessment of No-Go option

There is no impact as it maintains the current status quo.

Recommended mitigation measures
The potential impacts associated with heavy vehicles can be effectively mitigated. The mitigation measures include:

- Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.
- Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.
- Timing of construction activities should be planned to avoid / minimise impact on key farming activities, including planting and harvesting operations.
- The proponent should establish a MC to monitor the construction phase and the implementation of the recommended mitigation measures. The MC should be established before the construction phase commences, and should include key stakeholders, including representatives from local farmers and the contractor(s). The MF should also address issues associated with damage to roads and other construction related impacts.
- Ongoing communication with land owners and road users during construction period. This should be outlined in the SEP.
- The proponent should implement a Grievance Mechanism that provides local farmers and other road users with an effective and efficient mechanism to address issues related to construction related impacts, including damage to local gravel farm roads.
- Implementation of a road maintenance programme throughout the construction phase to ensure that the affected roads maintained in a good condition and repaired once the construction phase is completed.
- Repair of all affected road portions at the end of construction period where required.
- Dust suppression measures must be implemented on un-surfaced roads, such as wetting on a regular basis and ensuring that vehicles used to transport building materials are fitted with tarpaulins or covers.
- All vehicles must be roadworthy, and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits.

4.3.7 Impacts associated with loss of farmland

The activities associated with the construction phase and establishment of the proposed project and associated infrastructure will result in the disturbance and loss of land available for grazing. The impact on farmland associated with the construction phase can be mitigated by minimising the footprint of the construction related activities and ensuring that disturbed areas are fully rehabilitated on completion of the construction phase. In addition, the landowner will be compensated for the loss of land.

As indicated above, only four turbines are proposed within cropped fields on Mahemsfontein. The landowner has indicated that the four turbines, while not ideal, would nevertheless not present an insurmountable obstacle to cropping and aerial crop dusting, and were therefore considered acceptable (van Jaarsveld, pers. comm). Both substation alternatives are located on rangeland adjacent to the Mahemsfontein gravel road and are both regarded as acceptable by the affected landowners (Klopper, van Jaarsveld, pers. comm).

A layout of the proposed internal road network is not available yet. A number of owners indicated that the footprint impact should be restricted to the minimum to avoid the unnecessary loss of rangeland. This is linked to the high carrying capacity of the veld. Mr Bierman requested a copy of the internal road layout once available (Bierman, pers. comm).

Table 4.7: Assessment of impact on farmland due to construction related activities

Nature: The activities associated with the construction phase, such as establishment of access roads and the construction camp, movement of heavy vehicles and preparation of foundations for the project etc. will damage farmlands and result in a loss of farmlands for grazing / crops.		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (1)
Duration	Short term (2)	Short term (2)
Magnitude	Medium (3)	Low (2)
Reversibility	Reversible with compensation and rehabilitation (3)	Reversible with compensation and rehabilitation (3)
Probability	Highly Probable (4)	Probable (3)
Significance	Moderate (40)	Low (24)
Status	Negative	Negative
Can impact be mitigated?	Yes	Yes
Mitigation: See below		
Residual impacts: If damage to and or loss of productive land is not avoided and or minimised can impact on viability of farming operations and livelihoods.		

Assessment of No-Go option
There is no impact as it maintains the current status quo.

Recommended mitigation measures
The potential impacts associated with damage to, and loss of farmland can be effectively mitigated. The aspects that should be covered include:

- The loss of high-quality agricultural land should be avoided and or minimised by careful planning of the final layout of the proposed WEF facilities. The recommendations of the agricultural / soil assessment should be implemented.
- Affected landowners should be consulted about the timing of construction related activities in advance.
- The footprint associated with the construction related activities (access roads, construction platforms, workshop etc.) should be minimised.
- An Environmental Control Officer (ECO) should be appointed to monitor the establishment phase of the construction phase.
- All areas disturbed by construction related activities, such as access roads on the site, construction platforms, workshop area etc., should be rehabilitated at the end of the construction phase.
- The implementation of a rehabilitation programme should be included in the terms of reference for the contractor/s appointed. The specifications for the rehabilitation

programme should be drawn up by the Environmental Consultants appointed to manage the EIA.
- The implementation of the Rehabilitation Programme should be monitored by the ECO.

4.4 OPERATIONAL PHASE SOCIAL IMPACTS

The following key social issues are of relevance to the operational phase:

Potential positive impacts
- Generate renewable energy.
- Creation of employment opportunities.
- Benefits associated with the establishment of a Community Trust.
- Benefits to the affected landowners.

Potential negative impacts
- Visual impacts and associated impacts on sense of place.
- Impact on property values.
- Impact on tourism.

4.4.1 Generate renewable energy

The aim of the project is to generate renewable energy for nearby mining and industrial operations. The proposed project will therefore create opportunities to improve energy security in South Africa by generating alternative energy sources and reduce the carbon footprint associated with current energy generation.

Table 4.8: Generate renewable energy

Nature Development of infrastructure to generate renewable energy		
	Without Mitigation	**With Mitigation**
Extent	Local, Regional and National (4)	Local, Regional and National (4)
Duration	Long term (4)	Long term (4)
Magnitude	High (4)	High (4)
Reversibility	N/A	N/A
Probability	Highly Probable (4)	Definite (5)
Significance	Moderate (48)	High (60)
Status	Negative	Positive
Can impact be enhanced?	Yes	
Enhancement: See below		
Residual impacts: Overall reduction in CO_2 emission, reduction in water consumption for energy generation, contribution to the development of the renewable energy sector in South Africa and benefit for economic development and investment.		

Assessment of No-Go option
There is no impact as it maintains the current status quo.

Recommended mitigation measures

- As a policy level, government should be encouraged to develop and implement economic incentives to support investment in and the development of renewable energy.
- Maximise opportunities for local content and procurement.
- Maximise employment opportunities for local community members.
- Implement training and skills development programs for members from the local community.

4.4.2 Creation of employment opportunities

The proposed development will create in the region of 20-30 full time employment opportunities during the operational phase, of which 70% will be unskilled, 25% semi-skilled 25%, and 5% skilled 5%. Based on similar projects the annual operating budget will be in the region of R 24 million (2022 Rand values), including wages.

Table 4.9: Assessment of employment and business creation opportunities

Nature: Creation of employment, skills development and business opportunities associated with the operational phase		
	Without Mitigation	**With Enhancement**
Extent	Local and Regional (1)	Local and Regional (2)
Duration	Long term (4)	Long term (4)
Magnitude	Low (2)	Medium (3)
Reversibility	N/A	N/A
Probability	Low Probability (2)	Highly Probable (4)
Significance	Low (14)	Moderate (36)
Status	Positive	Positive
Can impact be enhanced?	Yes	
Enhancement: See below		
Residual impacts: Creation of permanent employment and skills and development opportunities for members from the local community and creation of additional business and economic opportunities in the area		

Recommended enhancement measures

The enhancement measures listed in Section 4.4.1, i.e., to enhance local employment and business opportunities during the construction phase, also apply to the operational phase. In addition, the proponent should investigate providing training and skills development to enable locally based service providers to provide the required services for the operational phase.

4.4.3 Generate income for affected landowner

The proponent will enter into rental agreements with the affected landowners for the use of the land for the establishment of the proposed WEF. In terms of the rental agreement the affected landowner will be paid an annual amount dependent upon the area affected. The additional income will reduce the risk to his livelihoods posed by droughts and fluctuating market prices for farm outputs and farming inputs, such as

fuel, feed etc. The additional income represents a significant benefit for the affected landowner.

Table 4.10: Assessment of benefits associated with income generated for the affected farmer(s)

Nature: The generation of additional income represents a significant benefit for the local affected farmer(s) and reduces the risks to their livelihoods posed by droughts and fluctuating market prices for sheep and farming inputs, such as feed etc.		
	Without Mitigation	**With Enhancement**
Extent	Local and Regional (1)	Local and Regional (2)
Duration	Long term (4)	Long term (4)
Magnitude	Low (2)	Medium (3)
Reversibility	N/A	N/A
Probability	Probability (3)	Definite (5)
Significance	Low (21)	Moderate (45)
Status	Positive	Positive
Can impact be enhanced?	Yes	
Enhancement: See below		
Residual impacts: Support for local agricultural sector and farming		

Assessment of No-Go option
There is no impact as it maintains the current status quo.

Recommended enhancement measures
- Implement agreements with affected landowners.
- The loss of high-quality agricultural land should be avoided and or minimised by careful planning in the final layout of the proposed WEF facilities. The recommendations of the agricultural / soil assessment should be implemented.

4.4.4 Visual impact and impact on sense of place

The proposed WEF has the potential to impact on the areas existing rural sense of place. However, given the location of the site next to the existing Impumelelo coal, other mining operations and the Secunda petrochemical facility and associated coal mines the potential impact on the areas sense of place is likely to be limited.

None of the affected landowners raised concerns regarding visual impacts.

Table 4.11: Visual impact and impact on sense of place

Nature: Visual impact associated with the proposed facility and associated infrastructure and the potential impact on the areas rural sense of place.		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Long term (4)	Long term (4)
Magnitude	Low (2)	Low (2)
Reversibility	Reversible with rehabilitation (3)	Reversible with rehabilitation (3)
Probability	Low Probability (2)	Low Probability (2)
Significance	Low (26)	Low (26)
Status	Negative	Negative
Can impact be mitigated?	Yes	
Enhancement: See below		
Residual impacts: Potential impact on current rural sense of place		

Assessment of No-Go option
There is no impact as it maintains the current status quo.

Recommended mitigation measures
The recommendations contained in the VIA should also be implemented.

4.4.5 Potential impact on property values

The potential visual impacts associated with the proposed WEF have the potential to impact on property values. Based on the results of a literature review undertaken for wind farms the potential impact on property values in rural areas is likely to be limited. In this regard a study undertaken in Australia in 2016 (Urbis Pty Ltd) found that:

- Appropriately located wind farms within rural areas, removed from higher density residential areas, are unlikely to have a measurable negative impact on surrounding land values.
- There is limited available sales data to make a conclusive finding relating to value impacts on residential or lifestyle properties located close to wind farm turbines, noting that wind farms in NSW have been constructed in predominantly rural areas.

Based on the findings of the literature review the impact of the proposed WEF on property values is therefore likely to be low, specifically given the location of the site adjacent to the Impumelelo coal, other mining operations and the Secunda petrochemical facility.

Table 4.12: Assessment of potential impact on property values and operations

Nature: Visual impact associated with the proposed facility and associated potential impact on property values.		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (1)
Duration	Long term (4)	Long term (4)
Magnitude	Low (2)	Low (2)
Reversibility	N/A	N/A
Probability	Low Probability (2)	Low Probability (2)
Significance	Low (16)	Low (14)
Status	Negative	Negative
Can impact be mitigated?	Yes	
Enhancement: See below		
Residual impacts: Potential impact on current rural sense of place and property values		

Assessment of No-Go option
There is no impact as it maintains the current status quo.

Recommended mitigation measures
The recommendations contained in the VIA should be implemented.

4.4.6 Potential impact on tourism

The potential visual impacts associated with the proposed WEF have the potential to impact on tourism facilities and tourism in the area. Based on the findings of the literature review there is limited evidence to suggest that the proposed WEF would impact on the tourism in the DM and or GSDM. Based on the findings of the SIA there are no tourist facilities in the area that would be impacted by the proposed WEF.

However, as indicated above commercial hunting operations are undertaken on farms owned by Mr Janko Botha (Holgatsfontein 535/6 and 535/15, and Platkop 543/10 and 543/11). Hunting is currently constrained by Impumelelo mine, the Mahemsfontein gravel road, chalets on the property, and 2-3 dwellings on adjacent properties. The owner raised concerns with regard to the turbines located in proximity to the northern and western boundaries. The presence of people associated with the construction and operation of the turbines may impact on hunting in the area. Likewise, hunting would also pose a risk to the workers. The turbines proposed to the west are of specific concern. Those to the north are less of a concern as they are proposed across a public road. Mr Botha indicated that he was open to discussions with Enertrag in order to identify potentially problematic turbines and potential alternative locations (Botha, pers. comm).

Table 4.13: Impact on tourism in the region

Nature: Potential impact of the WEF on local tourism operations and activities		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Long term (4)	Long term (4)
Magnitude	Very Low (1)	Very Low (1)
Reversibility	N/A	N/A
Probability	Low Probability (2)	Low Probability (2)
Significance	Low (14)	Low (14)
Status	Negative	Negative
Can impact be mitigated?	Yes	
Enhancement: See below		
Residual impacts: Potential impact on current rural sense of place and future tourism opportunities in the area.		

Assessment of No-Go option
There is no impact as it maintains the current status quo.

Recommended mitigation measures
- Enertrag should engage with Mr Botha with regard the wind turbines that may pose a risk to existing hunting operations.
    - The recommendations contained in the VIA should be implemented.

4.5 ASSESSMENT OF DECOMMISSIONING PHASE

Typically, the major social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income. This has implications for the households who are directly affected, the communities within which they live, and the relevant local authorities. However, in the case of the proposed facility the decommissioning phase is likely to involve the disassembly and replacement of the existing components with more modern technology. This is likely to take place in the 20 - 25 years post commissioning. The decommissioning phase is therefore likely to create additional, construction type jobs, as opposed to the jobs losses typically associated with decommissioning.

Given the relatively small number of people employed during the operational phase (~ 20), the social impacts at a community level associated with decommissioning will be limited. In addition, potential impacts associated with the decommissioning phase can be effectively managed with the implementation of a retrenchment and downscaling programme. With mitigation, the impacts are assessed to be Low (negative). Decommissioning will also create temporary employment opportunities, which would represent a positive temporary impact. The significance would be Low with enhancement due to limited opportunities and short duration.

Table 4.14: Social impacts associated with decommissioning

Nature: Social impacts associated with retrenchment including loss of jobs, and source of income. Decommissioning will also create temporary employment opportunities, which would represent a positive temporary impact		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Short term (2)	Short term (2)
Magnitude	Low (2)	Very Low (1)
Reversibility	N/A	N/A
Probability	Probability (3)	Probability (3)
Significance	Low (18)	Moderate (15)
Status	Negative	Negative
Can impact be mitigated?	Yes	
Enhancement: See below		
Residual impacts: Loss of income and work opportunities.		

Assessment of No-Go option
There is no impact as it maintains the current status quo.

Recommended mitigation measures

- The proponent should ensure that retrenchment packages are provided for all staff retrenched when the plant is decommissioned.
- All structures and infrastructure associated with the proposed facility should be dismantled and transported off-site on decommissioning.

4.6 CUMULATIVE IMPACT ON SENSE OF PLACE

The potential cumulative impacts on the areas sense of place will be largely linked to potential visual impacts. In this regard the Scottish Natural Heritage (2005) describes a range of potential cumulative landscape impacts associated with wind farms on landscapes. These issues are also likely to be relevant to solar facilities and associated infrastructure. The relevant issues identified by Scottish Natural Heritage study include:

- Combined visibility (whether two or more wind farms will be visible from one location).
- Sequential visibility (e.g. the effect of seeing two or more wind farms along a single journey, e.g. road or walking trail).
- The visual compatibility of different wind farms in the same vicinity.
- Perceived or actual change in land use across a character type or region.
- Loss of a characteristic element (e.g. viewing type or feature) across a character type caused by developments across that character type.

The guidelines also note that cumulative impacts need to be considered in relation to dynamic as well as static viewpoints. The experience of driving along a tourist road, for example, needs to be considered as a dynamic sequence of views and visual impacts,

not just as the cumulative impact of several developments on one location. The viewer may only see one renewable energy facility and the associated infrastructure at a time, but if each successive stretch of the road is dominated by views of renewable energy facilities, then that can be argued to be a cumulative visual impact (National Wind Farm Development Guidelines, DRAFT - July 2010).

As indicated above, the nearest renewable facility to the site is Mukondeleli WEF (separate application) located 23 km to the east of the Impumelelo WEF site. The cumulative impacts are also likely to be low to Moderate, specifically given the location of the site next to the Impumelelo coal, other mining operations and the Secunda petrochemical facility. In this regard the potential impact of the proposed WEF and associated infrastructure on the areas sense of place is low. None of the affected landowners raised concerns about visual impacts.

Table 4.15: Cumulative impacts on sense of place and the landscape

Nature: Visual impacts associated with the establishment of more than one REF and the potential impact on the area's rural sense of place and character of the landscape.		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local (2)	Local and regional (2)
Duration	Long term (4)	Long term (4)
Magnitude	Low (2)	Low (2)
Reversibility	Reversible with rehabilitation (3)	Reversible with rehabilitation (3)
Probability	Low Probability (2)	Probable (3)
Significance	Low (26)	Moderate (33)
Status (positive/negative)	Negative	Negative
Can impacts be mitigated?	Limited potential	
Mitigation: See below		

Assessment of No-Go option
There is no impact as it maintains the current status quo.

Recommended mitigation measures
The recommendations contained in the VIA should be implemented.

4.7 CUMULATIVE IMPACT ON LOCAL SERVICES AND ACCOMMODATION

The establishment of a number of REFs has the potential to place pressure on local services and accommodation, specifically during the construction phase. The objective will be to source as many low and semi-skilled workers for the construction phase from the DM. This will reduce the pressure on local services and accommodation in the nearby towns, such as. The capacity of accommodate workers will be addressed during the assessment phase.

The potential impact should also be viewed within the context of the potential positive cumulative impacts for the local economy associated with the establishment of the proposed facility and associated renewable energy projects in the GMDM. These

benefits will create opportunities for investment in the DM, including the opportunity to up-grade and expand existing services and the construction of new houses.

Table 4.16: Cumulative impacts on local services

Nature: The establishment of a number of renewable energy facilities and associated projects, such as the proposed WEF in the MM, has the potential to place pressure on local services, specifically medical, education and accommodation.		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local (2)	Local and regional (3)
Duration	Short term (2)	Medium term (3)
Magnitude	Low (2)	Medium (3)
Reversibility	N/A	N/A
Probability	Low Probability (2)	Low Probability (2)
Significance	Low (12)	Low (18)
Status (positive/negative)	Negative	Negative
Can impacts be mitigated?	Yes	
Mitigation: See below		

Assessment of No-Go option
There is no impact as it maintains the current status quo.

Recommended mitigation measures
The proponent should liaise with the DM to address potential impacts on local services.

4.8 CUMULATIVE IMPACT ON LOCAL ECONOMY

In addition to the potential negative impacts, the establishment of renewable energy facilities and associated infrastructure, including the proposed WEF, will also create several socio-economic opportunities for the DM. The positive cumulative opportunities include creation of employment, skills development and training opportunities, and downstream business opportunities.

The potential cumulative benefits for the local and regional economy are associated with both the construction and operational phase of renewable energy projects and associated infrastructure and extend over a period of 20-25 years. However, steps must be taken to maximise employment opportunities for members from the local communities in the area and support skills development and training programmes.

Table 4.17: Cumulative impacts on local economy

Nature: The establishment of a number of renewable energy facilities and associated projects, such as the proposed WEF in the DM, will create employment, skills development and training opportunities, creation of downstream business opportunities.		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local and regional (2)	Local and regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Low (2)	High (4)
Reversibility	N/A	N/A
Probability	Highly Probable (4)	Definite (5)
Significance	Moderate (32)	Moderate (55)
Status (positive/negative)	Positive	Positive
Can impacts be enhanced?	Yes	
Enhancement: See below		

Assessment of No-Go option
There is no impact as it maintains the current status quo.

Recommended mitigation measures
The proponent should liaise with the DM to identify potential opportunities for the local economy and businesses.

4.9 ASSESSMENT OF NO-DEVELOPMENT OPTION

The aim of the project is to produce renewable energy for the mining and industrial sector in the area. This will assist to reduce South Africa's carbon footprint. South Africa relies on coal-powered energy to meet more than 90% of its energy needs. South Africa is therefore one of the highest per capita producers of carbon emissions in the world and Eskom, as an energy utility, has been identified as the world's second largest producer carbon emissions.

The No-Development option would represent a lost opportunity for South Africa to produce renewable energy and reduce its carbon footprint. This would represent a significant negative social cost.

Table 4.18: Assessment of no-development option

Nature: No-development option would result in the lost opportunity for South Africa to improve energy security and reduce carbon emissions via the use of renewable energy and associated benefits in terms of global warming and climate change.		
	Without Mitigation7	**With Enhancement**8
Extent	Local-International (5)	Local-International (5)
Duration	Long term (4)	Long term (4)
Magnitude	Medium (3)	Medium (3)
Reversibility	N/A	N/A
Probability	High Probability (4)	High Probability (4)
Significance	Moderate (48)	Moderate (48)
Status	Negative	Positive
Can impact be mitigated?	Yes	
Enhancement: See below		
Residual impacts: Reduce carbon emissions via the use of renewable energy and associated benefits in terms of global warming and climate change.		

Recommended enhancement measures

The proposed WEF should be developed, and the mitigation and enhancement measures identified in the SIA and other specialist studies should be implemented.

7 Assumes project is not developed
8 Assumes project is developed

SECTION 5: SUMMARY OF KEY FINDINGS

5.1 INTRODUCTION

Section 5 lists the key findings of the SIA. These findings are based on:

- A review of key planning and policy documents pertaining to the area.
- A review of social and economic issues associated with similar developments.
- Site visit and interviews with key stakeholders.
- The experience of the authors with other renewable energy projects.

5.2 SUMMARY OF KEY FINDINGS

The key findings of the study are summarised under the following sections:

- Fit with policy and planning.
- Construction phase impacts.
- Operational phase impacts.
- Cumulative impacts.
- Decommissioning phase impacts.
- No-development option.

5.2.1 Policy and planning issues

The development of and investment in renewable energy is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all refer to and support renewable energy. The development of renewable energy is also supported at a provincial and local level. The development of the proposed WEF is therefore supported by key policy and planning documents.

5.2.2 Construction phase impacts

The key social issues associated with the construction phase include:

Potential positive impacts

- Creation of employment and business opportunities, and the opportunity for skills development and on-site training.

The construction phase will extend over a period of approximately 36 months and create in the region of 250-300 employment opportunities. Members from the local communities in Secunda and the DM would qualify for the majority of low skilled and semi-skilled employment opportunities and a number of skilled opportunities. The Most of these employment opportunities will accrue to Historically Disadvantaged (HD) members from the local community. Given relatively high local unemployment levels and limited job opportunities in the area, this will represent a significant, if localised, social benefit. The total wage bill will be in the region of R 30 million (2022 Rand values). A percentage of the wage bill will be spent in the local economy which will also create opportunities for local businesses in the DM. The capital expenditure associated with the construction phase will be approximately R 2.5 billion (2022 Rand value). This will create opportunities for local companies and the regional and local economy. The local service sector will also benefit from the construction phase. The potential

opportunities would be linked to accommodation, catering, cleaning, transport, and security, etc. associated with the construction workers on the site.

Potential negative impacts
- Impacts associated with the presence of construction workers on local communities.
- Impacts related to the potential influx of jobseekers.
- Increased risks to livestock and farming infrastructure associated with the construction related activities and presence of construction workers on the site.
- Increased risk of grass fires associated with construction related activities.
- Nuisance impacts, such as noise, dust, and safety, associated with construction related activities and vehicles.
- Impact on productive farmland.

The findings of the SIA indicate that the significance of the potential negative impacts with mitigation will be **Low Negative**. The potential negative impacts associated with the proposed construction phase can therefore be effectively mitigated if the recommended mitigation measures are implemented. Table 5.1 summarises the significance of the impacts associated with the construction phase.

Table 5.1: Summary of social impacts during construction phase

Impact	Significance No Mitigation/Enhancement	Significance With Mitigation/Enhancement
Creation of employment and business opportunities	Medium (Positive)	Medium (Positive)
Presence of construction workers and potential impacts on family structures and social networks	Low (Negative)	Low (Negative)
Influx of job seekers	Low (Negative)	Low (Negative)
Safety risk, stock theft and damage to farm infrastructure associated with presence of construction workers	Medium (Negative)	Low (Negative)
Increased risk of grass fires	Medium (Negative)	Low (Negative)
Impact of heavy vehicles and construction activities	Medium (Negative)	Low (Negative)
Loss of farmland	Medium (Negative)	Low (Negative)

5.2.3 Operational phase impacts

The following key social issues are of relevance to the operational phase:

Potential positive impacts
- Generate renewable energy.
- Creation of employment opportunities.
- Benefits associated with establishment of community trust.
- Benefits for local landowners.

The proposed project will supplement South Africa's energy and assist to improve energy security. In addition, it will also reduce the country's reliance on coal as an energy source. This represents a positive social benefit.

Potential negative impacts
- Visual impacts and associated impacts on sense of place.
- Potential impact on property values.
- Potential impact on tourism.

The findings of the SIA indicate that the significance of all the potential negative impacts with mitigation will be **Low Negative**. The potential negative impacts can therefore be effectively mitigated. The significance of the impacts associated with the operational phase are summarised in Table 5.2.

Table 5.2: Summary of social impacts during operational phase

Impact	Significance No Mitigation/Enhancement	Significance With Mitigation/Enhancement
Generate renewable energy	Moderate (Positive)	High (Positive)
Creation of employment and business opportunities	Low (Positive)	Medium (Positive)
Benefit associated with community trust	Moderate (Positive)	High (Positive)
Benefits for landowners	Low (Positive)	Medium (Positive)
Visual impact and impact on sense of place	Low (Negative)	Low (Negative)
Impact on property values	Low (Negative)	Low (Negative)
Impact on tourism	Low (Negative)	Low (Negative)

5.2.4 Assessment of cumulative impacts

Cumulative impact on sense of place
The establishment of the proposed WEF and other renewable energy facilities in the area will create the potential for combined and sequential visibility impacts. However, the impact on the areas sense of place should be viewed within the context of the impact of existing coal mining operations and the Secunda industrial complex on areas sense of place. The areas sense of place has also been impacted by large-sale mining operations. The potential visual impact on the areas sense place is therefore likely to be limited.

Cumulative impact on local services and accommodation
The potential cumulative impact on local services and accommodation will depend on the timing construction phases for the different renewable energy projects in the area. With effective planning the significance of the potential impact was rated as **Low Negative**.

Cumulative impact on local economy
The significance of this impact with enhancement was rated as **Moderate Positive**.

5.2.5 Decommissioning phase

Given the relatively small number of people employed during the operational phase (~ 20), the potential negative social impact on the local economy associated with decommissioning will be limited. In addition, the potential impacts associated with the decommissioning phase can also be effectively managed with the implementation of a retrenchment and downscaling programme. With mitigation, the impacts are assessed to be Low (negative). Decommissioning will also create temporary employment opportunities. The significance was assessed to be Low (positive).

5.2.6 Assessment of no-development option

The No-Development option would represent a lost opportunity for South Africa to generate renewable energy. This would represent a significant negative social cost.

5.3 CONCLUSION

Conclusion

The findings of the SIA study indicate that the proposed Impumelelo WEF project will create a number of social and socio-economic benefits, including creation of employment and business opportunities during both the construction and operational phase. In addition, the WEF will generate renewable energy for use by mines and industrial operations in the area.

The findings of the SIA also indicate that the potential negative impacts associated with both the construction and operational phase are likely to be **Low Negative** with mitigation. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. The Impumelelo WEF and associated infrastructure is therefore supported by the findings of the SIA.

Recommendations

- Substation Alternative 1 and 2 are both acceptable.
- The developer should liaise with Mr Botha to address the potential impact of certain turbines on professional hunting operations in the area.

ANNEXURE A

INTERVIEWS

- Bierman, Mr Gerhard (telephonic 2022-11-17). Platkop 543/2.
- Botha, Mr Janko (telephonic 2022-12-01). Holgatsfontein 535/6 and 535/15; Platkop 543/10 and 543/11.
- Du Plessis, Mr Kobus (2022-11-23). Hartbeestfontein 522/6.
- Horn, Mr Gideon (telephonic 2022-11-16). Leases Platkop 543/2.
- Kense, Mr Johan (2022-11-24). Hartbeestfontein 522/25.
- Klopper, Mr Lucas (2022-11-23). Platkop 543/4, 543/5, 543/9.
- Van Jaarsveld, Mr Dawie (2022-11-23). Mahemsfontein 544/RE, 544/7, 544/8.

REFERENCES

- National Energy Act (2008).
- White Paper on the Energy Policy of the Republic of South Africa (December 1998).
- White Paper on Renewable Energy (November 2003).
- Integrated Resource Plan (IRP) for South Africa (2019).
- National Infrastructure Plan (NIP) (2012 and 2021).
- National Development Plan (2011).
- Mpumalanga Vision 2030 Strategic Implementation Framework (2013-2030)
- Mpumalanga Economic Growth and Development Path (2011).
- Mpumalanga Spatial Development Framework (2019).
- Dipaleseng Integrated Development Plan (2020-2021).
- Dipaleseng Spatial Development Framework (2020).
- Dipaleseng Local Economic Development Strategy (2011).

ANNEXURE B

METHODOLOGY FOR THE ASSESSMENT OF POTENTIAL IMPACTS

Assessment of Impacts and Mitigation

The assessment of impacts and mitigation evaluates the likely extent and significance of the potential impacts on identified receptors and resources against defined assessment criteria, to develop and describe measures that will be taken to avoid, minimise or compensate for any adverse environmental impacts, to enhance positive impacts, and to report the significance of residual impacts that occur following mitigation.

The key objectives of the risk assessment methodology are to identify any additional potential environmental issues and associated impacts likely to arise from the proposed project, and to propose a significance ranking. Issues / aspects will be reviewed and ranked against a series of significance criteria to identify and record interactions between activities and aspects, and resources and receptors to provide a detailed discussion of impacts. The assessment considers direct[9], indirect[10], secondary[11] as well as cumulative[12] impacts.

A standard risk assessment methodology is used for the ranking of the identified environmental impacts pre-and post-mitigation (i.e. residual impact). The significance of environmental aspects is determined and ranked by considering the criteria[13] presented in **Table 0-1**.

Table 0-1: Impact Assessment Criteria and Scoring System

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Impact Magnitude (M) The degree of alteration of the affected environmental receptor	Very low: No impact on processes	Low: Slight impact on processes	Medium: Processes continue but in a modified way	High: Processes temporarily cease	Very High: Permanent cessation of processes
Impact Extent (E) The geographical extent of the impact on a given environmental receptor	Site: Site only	Local: Inside activity area	Regional: Outside activity area	National: National scope or level	International: Across borders or boundaries
Impact Reversibility (R) The ability of the environmental receptor to rehabilitate or restore after the activity has caused environmental change	Reversible: Recovery without rehabilitation		Recoverable: Recovery with rehabilitation		Irreversible: Not possible despite action
Impact Duration (D) The length of permanence of the impact on the environmental receptor	Immediate: On impact	Short term: 0-5 years	Medium term: 5-15 years	Long term: Project life	Permanent: Indefinite

[9] Impacts that arise directly from activities that form an integral part of the Project.

[10] Impacts that arise indirectly from activities not explicitly forming part of the Project.

[11] Secondary or induced impacts caused by a change in the Project environment.

[12] Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.

[13] The definitions given are for guidance only, and not all the definitions will apply to all the environmental receptors and resources being assessed. Impact significance was assessed with and without mitigation measures in place.

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Probability of Occurrence (P) The likelihood of an impact occurring in the absence of pertinent environmental management measures or mitigation	Improbable	Low Probability	Probable	Highly Probability	Definite
Significance (S) is determined by combining the above criteria in the following formula:	$[S = (E + D + R + M) \times P]$ $Significance = (Extent + Duration + Reversibility + Magnitude) \times Probability$				
IMPACT SIGNIFICANCE RATING					
Total Score	0 – 30	31 to 60	61 – 100		
Environmental Significance Rating (Negative (-))	**Low (-)**	**Moderate (-)**	**High (-)**		
Environmental Significance Rating (Positive (+))	**Low (+)**	**Moderate (+)**	**High (+)**		

ANNEXURE C

Tony Barbour
ENVIRONMENTAL CONSULTING AND RESEARCH

10 Firs Avenue, Claremont, 7708, South Africa
(Cell) 082 600 8266
(E-Mail) tony@tonybarbour.co.za**, tbarbour@telkomsa.net,** www.tonybarbour.co.za

Tony Barbour's has 32 years' experience in the field of environmental consulting and management. His experience includes working for ten years as a consultant in the private sector followed by four years at the University of Cape Town's Environmental Evaluation Unit. He has worked as an independent consultant since 2004, with a key focus on Social Impact Assessment. His other areas of interest include Strategic Environmental Assessment and review work.

EDUCATION

- BSc (Geology and Economics) Rhodes (1984);
- B Economics (Honours) Rhodes (1985);
- MSc (Environmental Science), University of Cape Town (1992)

EMPLOYMENT RECORD

- Independent Consultant: November 2004 – current;
- University of Cape Town: August 1996-October 2004**:** Environmental Evaluation Unit (EEU), University of Cape Town. Senior Environmental Consultant and Researcher;
- Private sector: 1991-August 2000: 1991-1996**:** Ninham Shand Consulting (Now Aurecon, Cape Town). Senior Environmental Scientist; 1996-August 2000: Steffen, Robertson and Kirsten (SRK Consulting) – Associate Director, Manager Environmental Section, SRK Cape Town.

LECTURING

- University of Cape Town: Resource Economics; SEA and EIA (1991-2004);
- University of Cape Town: Social Impact Assessment (2004-current);
- Cape Technikon: Resource Economics and Waste Management (1994-1998);
- Peninsula Technikon: Resource Economics and Waste Management (1996-1998).

RELEVANT EXPERIENCE AND EXPERTISE

Tony Barbour has undertaken in the region of 260 SIA's, including SIA's for infrastructure projects, dams, pipelines, and roads. All of the SIAs include interacting with and liaising with affected communities. In addition, he is the author of the Guidelines for undertaking SIA's as part of the EIA process commissioned by the Western Cape Provincial Environmental Authorities in 2007. These guidelines have been used throughout South Africa.

Tony was also the project manager for a study commissioned in 2005 by the then South African Department of Water Affairs and Forestry for the development of a Social Assessment and Development Framework. The aim of the framework was to enable the Department of Water Affairs and Forestry to identify, assess and manage social impacts associated with large infrastructure projects, such as dams. The study also included the development of guidelines for Social Impact Assessment, Conflict Management, Relocation and Resettlement and Monitoring and Evaluation.

Countries with work experience include South Africa, Namibia, Angola, Botswana, Zambia, Lesotho, Swaziland, Ghana, Senegal, Nigeria, Mozambique, Mauritius, Kenya, Ethiopia, Oman, South Sudan, Sudan and Armenia.

ANNEXURE D

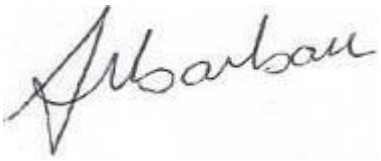
DECLARATION OF INDEPENDENCE

The specialist declaration of independence in terms of the Regulations_

I, ~~Tony Barbour~~ , declare that --

General declaration:

I act as the independent specialist in this application;
I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
I declare that there are no circumstances that may compromise my objectivity in performing such work;
I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
I will comply with the Act, Regulations and all other applicable legislation;
I have no, and will not engage in, conflicting interests in the undertaking of the activity;
I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
all the particulars furnished by me in this form are true and correct;
and
I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



Signature of the specialist:

Tony Barbour Environmental Consulting and Research

Name of company (if applicable):

12 December 2022

Date: