APPENDIX

F-5 SOCIO-ECONOMIC

SOCIAL IMPACT ASSESSMENT

FOR

MUKONDELELI GRID INFRASTRUCTURE

MPUMPALANGA PROVINCE

NOVEMBER 2022

Prepared for

WSP

by

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EXECUTIVE SUMMARY

INTRODUCTION AND LOCATION

The WSP was appointed by ENERTAG South Africa to manage the Basic Assessment (BA) process for the proposed overhead Grid Connection of up to 132kV and associated infrastructure for the 300 MW Mukondeleli Wind Energy Facility (WEF) located approximately 11 km south west of the town of Secunda in the Mpumalanga Province. The energy generated from the WEF facility will used to produce green hydrogen at the proposed Green Hydrogen Electrolyser facility located at Sasol Secunda. The project site is situated within the Govan Mbeki Municipality (GMM), located within the Gert Sibanye District Municipality (GSDM).

Tony Barbour Environmental Consulting was appointed to undertake a specialist Social Impact Assessment (SIA) as part of an BA process. This report contains the findings of the Social Impact Assessment (SIA) Report undertaken as part of the BA process.

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.

The potential social impacts associated with the Battery Energy Storage System (BESS) will be negligible due to the location of the BESS within in an industrial setting adjacent to the Sasol substation. The focus of the SIA is therefore on the overhead transmission line.

FIT WITH POLICY AND PLANNING

The development of renewable energy and the associated energy infrastructure is strongly supported at a national, provincial, and local level. The development of and investment in renewable energy and associated energy distribution infrastructure is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all highlight the importance of energy security and investment in energy infrastructure. The development of the proposed power line 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.

The construction phase for the grid infrastructure will extend over a period of approximately 6-12 months and create in the region of 30short term employment opportunities. Most of the low and semi-skilled employment opportunities are likely to benefit residents from local towns in the area. Most the beneficiaries are likely to be HD members of the community. This would represent a short term positive social benefit in an area with limited employment opportunities. A percentage of the wage bill will be spent in the local economy which will also create opportunities for local businesses in GMM.

The capital expenditure will be ~R65 million (2022 Rand values) and will create opportunities for the local and regional and local economy. The sector of the local economy most likely to benefit from the proposed development is the local service industry. The potential opportunities for the local service sector would be linked to accommodation, catering, cleaning, transport, and security, etc. associated with the construction workers on the site. However, given the relatively small scale of the development and short construction period the benefits will be limited.

Potential negative impacts

- Impacts associated with the presence of construction workers on local communities.
- Noise, dust, and safety impacts of construction related activities and vehicles.
- Risk of veld fires.
- Risks posed to farming activities by construction workers.

The findings of the SIA indicate that the significance of the potential negative impacts is likely to be negligible. With mitigation they are rated as **Low Negative**. The potential negative impacts associated with the proposed construction of the power line 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	Low (Positive)	Moderate (Positive)
Presence of construction workers and potential impacts on family structures and social networks	Low (Negative)	Low (Negative)
Impact of construction activities and vehicles	Low (Negative)	Low (Negative)
Risk of veld fires	Moderate Negative)	Low (Negative)
Safety risk, stock theft and damage to farm infrastructure associated with presence of construction workers	Moderate Negative)	Low (Negative)

OPERATION PHASE

The benefits associated with the Mukondeleli WEF are dependent upon being able to connect to the national grid. The key social issues associated with the operational phase include:

Potential positive impacts
- Provide energy infrastructure to support the use of renewable energy to produce green hydrogen and ammonia.
- Creation of employment, skills development, and procurement opportunities.
- Generate income for landowners.

Potential negative impacts
- The visual impacts and associated impact on sense of place.
- Impact of maintenance activities on farming activities and operations.

The findings of the SIA indicate that the significance of the potential negative impacts is likely be **Low Negative** if the required mitigation measures are implemented. 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
Provide energy infrastructure to support the use of renewable energy to produce green hydrogen and ammonia	Moderate (Negative) [1]	Moderate (Positive) [2]
Creation of employment and business opportunities during maintenance	Low (Positive)	Low (Positive)
Generate income for landowners	Low (Positive)	Moderate (Positive)
Visual impact and impact on sense of place	Moderate (Negative)	Low (Negative)
Safety risk, stock theft and damage to farm infrastructure associated with presence of maintenance workers	Moderate (Negative)	Low (Negative)

CUMULATIVE IMPACT ON SENSE OF PLACE

There are existing transmission lines associated with the Secunda facility and the mines in the area. The potential for cumulative impacts associated with combined visibility (whether two or more power lines will be visible from one location) and sequential visibility (e.g., the effect of seeing two or more power lines along a single journey, e.g., road or walking) does therefore exist. However, the cumulative impact on the areas sense of place is likely to be low. In this regard the areas sense of place

[1] Assumes power line is not developed
[2] Assumes power line is developed

is dominated by the large industrial Secunda facility and associated mining activities. None of the landowners interviewed raised concerns regarding the potential visual impact on the areas sense of place.

NO-DEVELOPMENT OPTION

The No-Development option would represent a lost opportunity for South Africa to produce green hydrogen and ammonia and reduce its carbon footprint. Given South Africa's current energy security challenges and its position as one of the highest per capita producers of carbon emissions in the world, this would represent a negative social cost.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The benefits associated with the proposed Mukondeleli WEF which include the use of renewable energy to produce green hydrogen and ammonia are dependent upon being able to connect the WEF to the Secunda facility via the establishment of grid connection infrastructure.

The findings of the SIA indicate that the significance of the potential negative social impacts for both the construction and operational phase of the proposed 132 kV Mukondeleli overhead power line, substation and associated infrastructure are **Low Negative** with mitigation. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. The establishment of proposed 132 kV Mukondeleli overhead power line and associated infrastructure, including the Battery Energy Storage System (BESS), is therefore supported by the findings of the SIA.

Recommendations

- Based on the findings of the SIA, Alternative 1 is the preferred Option.
- The section of the alignment that is shared by Alternative 1 and 2 should be realigned to the east so that it follows the cadastral boundary with 291/9[3].

[3] ENERTRAG South Africa has met with the affected landowners to address the issues raised. The alignment can be accommodated within the 200m corridor that is being assessed.

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 1.5, Annexure A
(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Section 1.6, Annexure B
(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;	Interviews in 2021 (Annexure A)
(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;	Section 4
(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;	N/A
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1.4,
(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 description of any consultation process that was undertaken during the course of preparing the specialist report	Annexure A, lists key stakeholders interviewed
(p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Annexure A, lists key stakeholders interviewed
(q) 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	Comply with the Assessment Protocols that were published

Regulation GNR 326 of 4 December 2014, as amended 7 April 2017, Appendix 6	Section of Report
specialist report, the requirements as indicated in such notice will apply.	on 20 March 2020, in Government Gazette 43110, GN 320. This specifically includes Part A, which provides the Site Sensitivity Verification Requirements where a Specialist Assessment is required but no Specific Assessment Protocol has been prescribed. As at September 2022, there are no sensitivity layers on the Screening Tool for Socio-economic-features. Part A has therefore not been compiled for this assessment.

ACRONYMS

DEA&DP	Department of Environmental Affairs and Development Planning
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
IDP	Integrated Development Plan
IPP	Independent Power Producer
kV	Kilovolts
KH	Karoo Hoogland
KHM	Karoo Hoogland Municipality
LM	Laingsburg Municipality
LED	Local Economic Development
MW	Megawatt
OHPL	Overhead Powerline
PGWC	Provincial Government Western Cape
PSDF	Provincial Spatial Development Framework
REDZ	Renewable Energy Development Zone
REIPPPP	Renewable Energy Independent Power Producers Procurement Programme
SDF	Spatial Development Framework
SIA	Social Impact Assessment
SWOT	Strengths, Weakness, Opportunities and Threats
WEF	Wind Energy Facility

TABLE OF CONTENTS

SECTION 1: INTRODUCTION

1.1 INTRODUCTION

The WSP was appointed by ENERTAG South Africa to manage the Basic Assessment (BA) process for the proposed overhead Grid Connection of up to 132kKV and associated infrastructure for the 300 MW Mukondeleli Wind Energy Facility (WEF) located approximately 11km south west of the town of Secunda in the Mpumalanga Province. The energy generated from the WEF facility will used to produce green hydrogen at the proposed Green Hydrogen Electrolyser facility located at Sasol Secunda. The project site is situated within the Govan Mbeki Municipality (GMM), located within the Gert Sibanye District Municipality (GSDM) (Figure 1.1).

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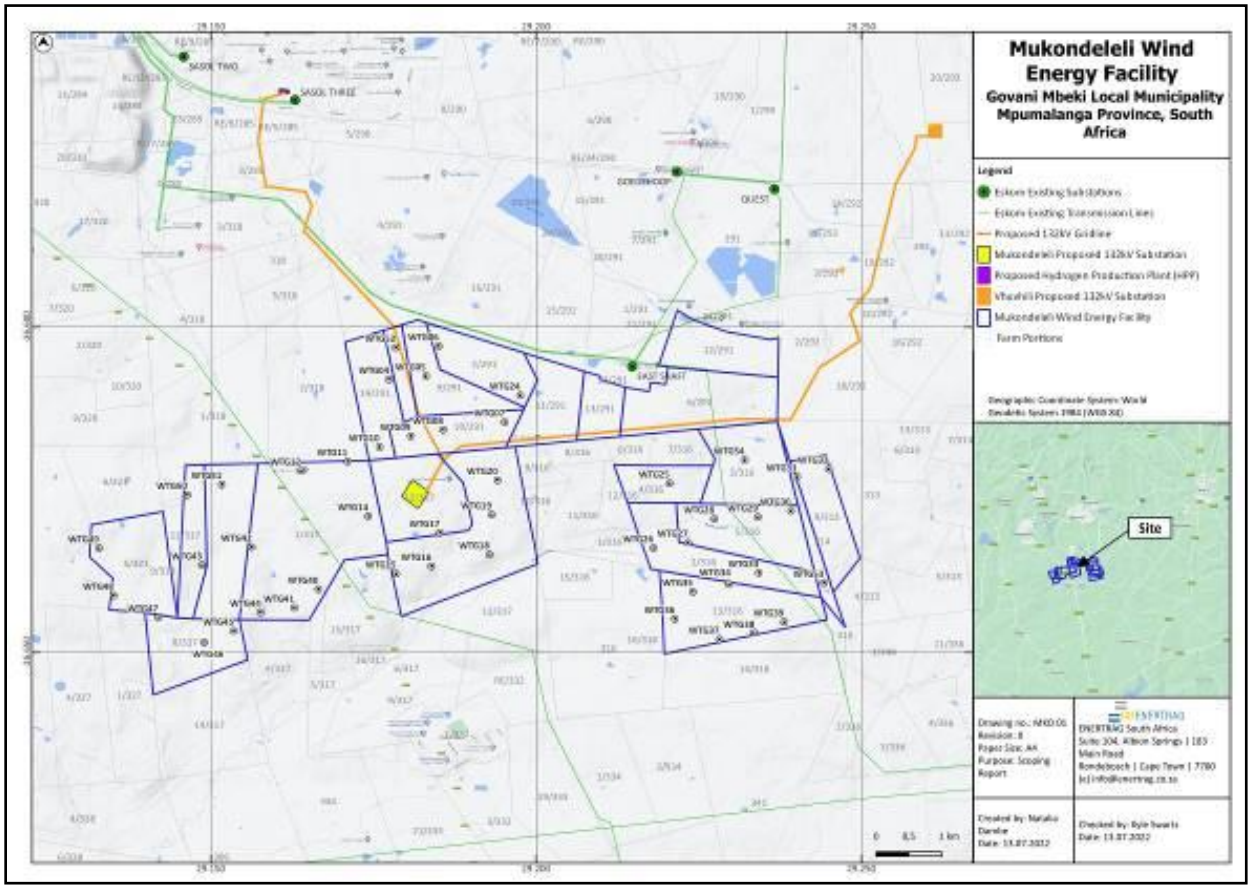


Figure 3.2: Regional location of Mukondeleli WEF site and grid connection (yellow line running in north easterly direction from yellow square)

1.2 TERMS OF REFERENCE AND APPROACH TO STUDY

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

The proposed Mukondeleli WEF (The Project) will have a project area of approximately 3600ha, with an overhead Grid Connection of up to 132kV. The proposed development also comprises a 132 kV overhead power line (either single circuit or double circuit) and a 33/132kV on-site substation to feed the electricity generated by the proposed project into a step-down substation located on the Sasol Secunda Facility which is between 5 and 10 km from the on-site SS. The 132 kV power line and step-down substation at Sasol is subject to a separate Basic Application to be undertaken by the applicant.

The affected farm portion/s are:

- Farm Bosjesspruit No. 291 (Portions 4, 8, 9 and 10).
- Farm Van Tondershoek No. 317 (Portions 2 and 12).

- Twistdraai 285 (Portions 3, 5, and 6).
- Brandspruit 291 (Portions 0 and 3).

The proposed project entails the construction of 1 x up to 132kV transmission line from the Alternative 1 substation (preferred substation) to the private offtake substation. The alignment runs in a north westerly direction from the substation towards Secunda facilities.

The proposed project will comprise the following key components:

- Construction of 1 x up to 132kV transmission line (either single or double circuit) between the Mukondeleli WEF substation (Alternative 1 preferred substation) to the private offtake substation. The length of the alignment is approximately 7.78 km. A 250m assessment corridor will be assessed to allow for micro-siting. The maximum height will be 40m.
- Establishment of the substation at the preferred Mukondeleli substation area.
- The Battery Energy Storage System (BESS) at the Sasol Substation. The BESS and substation will have a combined footprint of up to 4 ha. The BESS storage capacity will be up to 300MW/1 200 megawatt-hour (MWh) with up to four hours of storage.
- Standard substation electrical equipment, i.e., transformers, busbars, office area, operation and control room, workshop, and storage area, feeder bays, transformers, busbars, stringer strain beams, insulators, isolators, conductors, circuit breakers, lightning arrestors, relays, capacitor banks, batteries, wave trappers, switchyard, metering and indication instruments, equipment for carrier current, surge protection and outgoing feeders, as may be needed.
- The control building, telecommunication infrastructure, oil dam(s) etc,
- All the access road infrastructure to and within the substation
- Associated infrastructure including but not limited to lighting, fencing, and buildings required for operation (ablutions, office, workshop and control room, security fencing and gating, parking area and storerooms).
- The up to 132 kV structures will have a concrete foundation and the sizes may vary depending on design type up to 80m^2 (10m by 8m), with depths reaching up to 3.5m typically in a rectangular 'pad' shape. The actual number of structures required will vary according to the final route alignment determined.

Two alternative substation locations have been proposed for the Mukondeleli WEF, namely, Alternative 1 (preferred) and Alternative 2. The footprint of the substations is approximately 10 ha. Electricity generated from the Mukondeleli WEF will be distributed through the IPP substation, via a 132 kV powerline to a substation located at the Secunda facility.

The substation will consist of a high voltage substation yard to allow for multiple up to 132kV feeder bays and transformers, control building telecommunication, and other substation components as required. Supporting infrastructure such as control room, parking, oil spillage containment dam, fence, and other infrastructure will be constructed as part of the Eskom section substation.

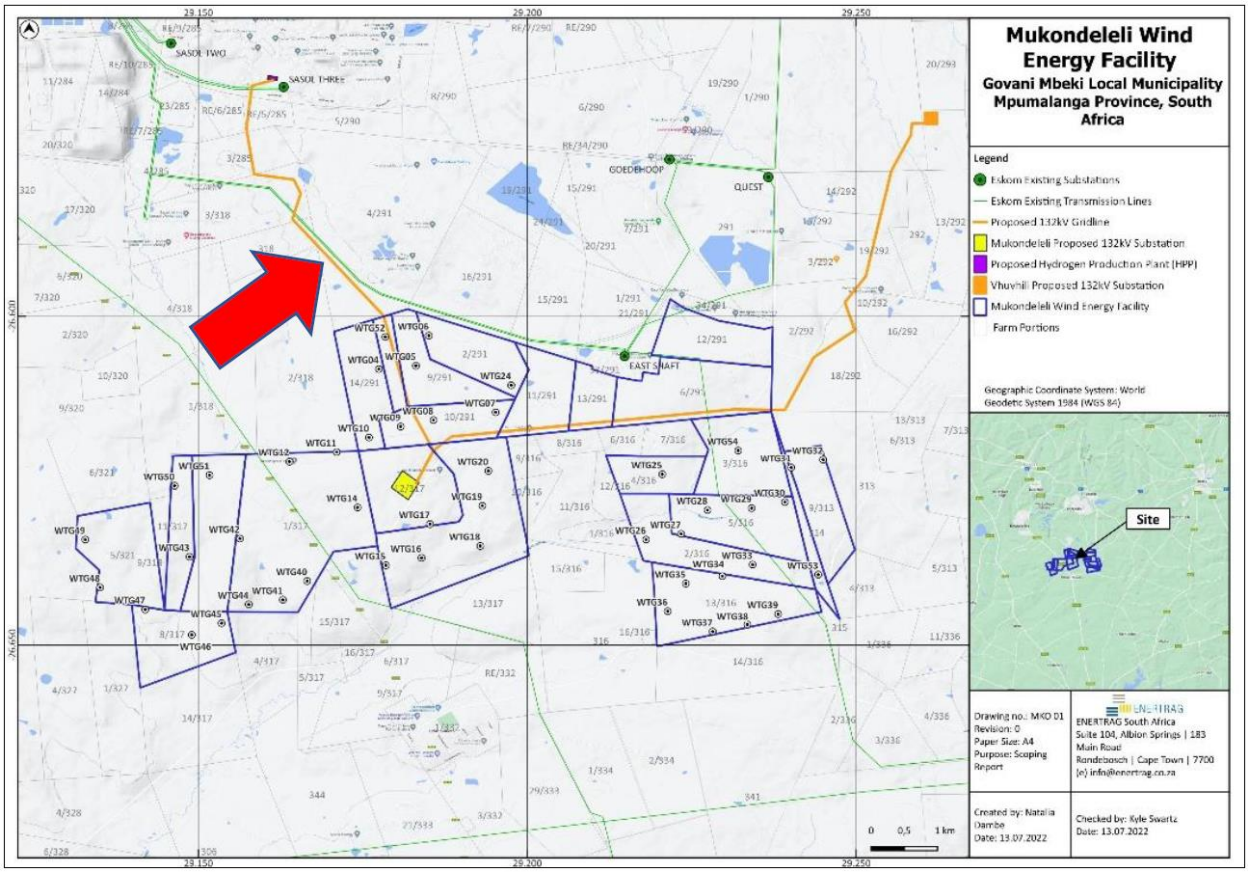


Figure 1.2: Powerline Route (red arrow) and Substation Alternatives for the Mukondeleli overhead power line

1.4 ASSUMPTIONS AND LIMITATIONS

1.4.1 Assumptions

Strategic importance of the project
The strategic importance of promoting renewable energy and associated grid infrastructure 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. However, the study recognises the strategic importance of renewable energy and the technical, spatial and land use constraints required for renewable energy facilities and the associated grid infrastructure.

1.4.2 Limitations

Demographic data
The information contained in some key policy and land use planning documents, such as Integrated Development Plans etc., may not contain data from Community Household Survey if 2016. However, this will not have a material impact on the findings of the study.

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 STRUCTURE

The report is divided into five sections, namely:

- Section 1: Introduction.
- Section 2: Policy and planning context.
- Section 3: Overview of study area.
- Section 4: Identification and assessment of key issues.
- Section 5: Summary of key findings.

SECTION 2: POLICY AND PLANNING CONTEXT

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[4]" 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. Furthermore, it also constitutes a key reporting requirement in terms of the applicable Western Cape Department of Environmental Affairs and Development Planning's *Guidelines for Social Impact Assessment* (2007).

The proposed grid connection infrastructure is linked to the proposed Mukondeleli WEF. The review therefore includes reference to key policy documents that have a bearing on renewable energy. Most of the site is located within the Western Cape Province, with a small portion falling within the Northern Cape. At the local level the focus of the review has been on Local Municipal level policy and planning documents.

- National Growth Path Framework (2010).
- The National Development Plan (2011).
- National Infrastructure Plan (2012).
- Mpumalanga Vision 2030 Strategic Implementation Framework (2013-2030)
- Mpumalanga Economic Growth and Development Path (2011).
- Mpumalanga Spatial Development Framework (2019).
- Govan Mbeki Municipality Integrated Development Plan (2020-2021).

2.2 NATIONAL POLICY ENVIRONMENT

2.2.1 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.

[4] "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 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.

2.2.3 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[5]. 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.

[5] Gazette No. 44951

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
- 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 (and Ermelo).

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

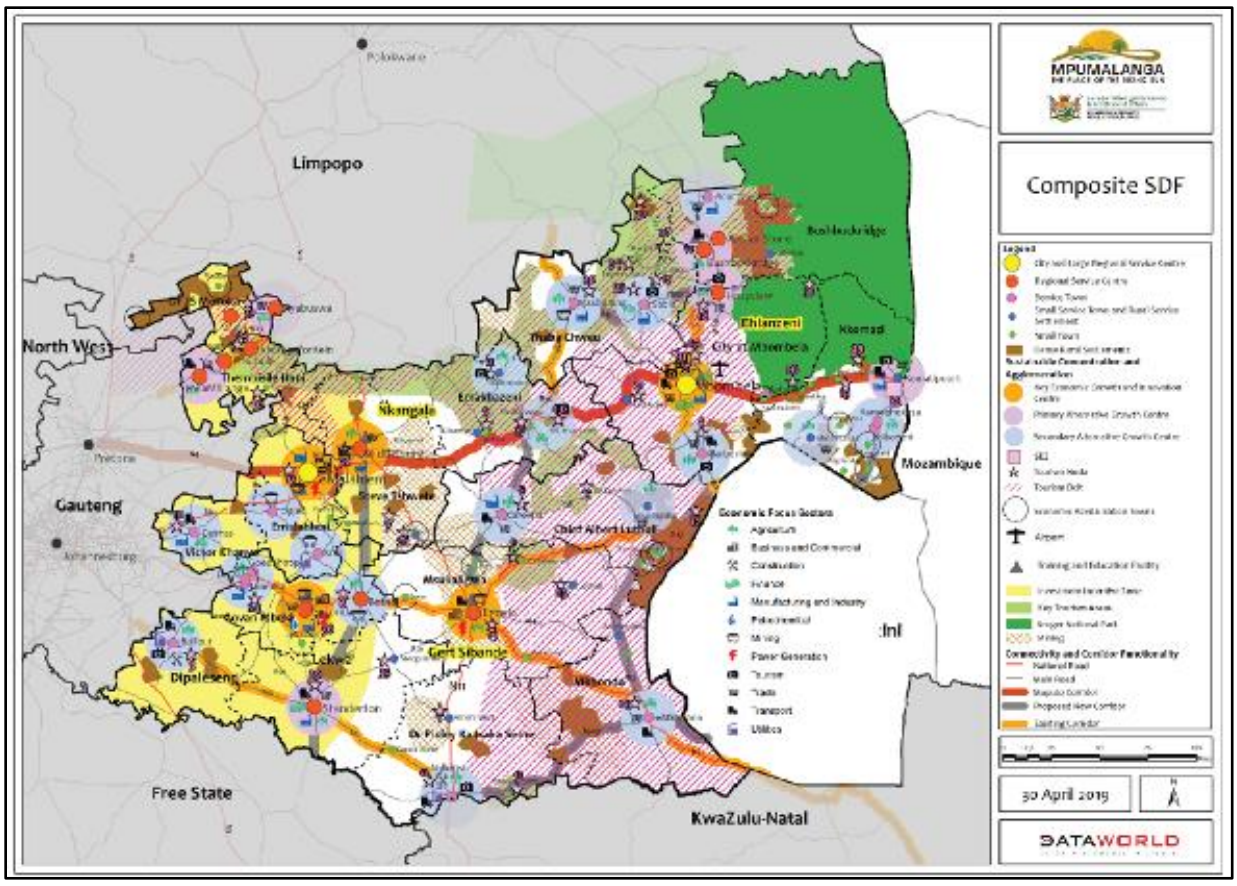
Achieving Strategic Objective 2, Ensure Conservation of all Water Resources and Catchment Areas is closely linked to diversifying the economy. The SDF notes that the provinces water resources are under pressure from high demand activities, including Eskom's power stations, mining, and industrial uses.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

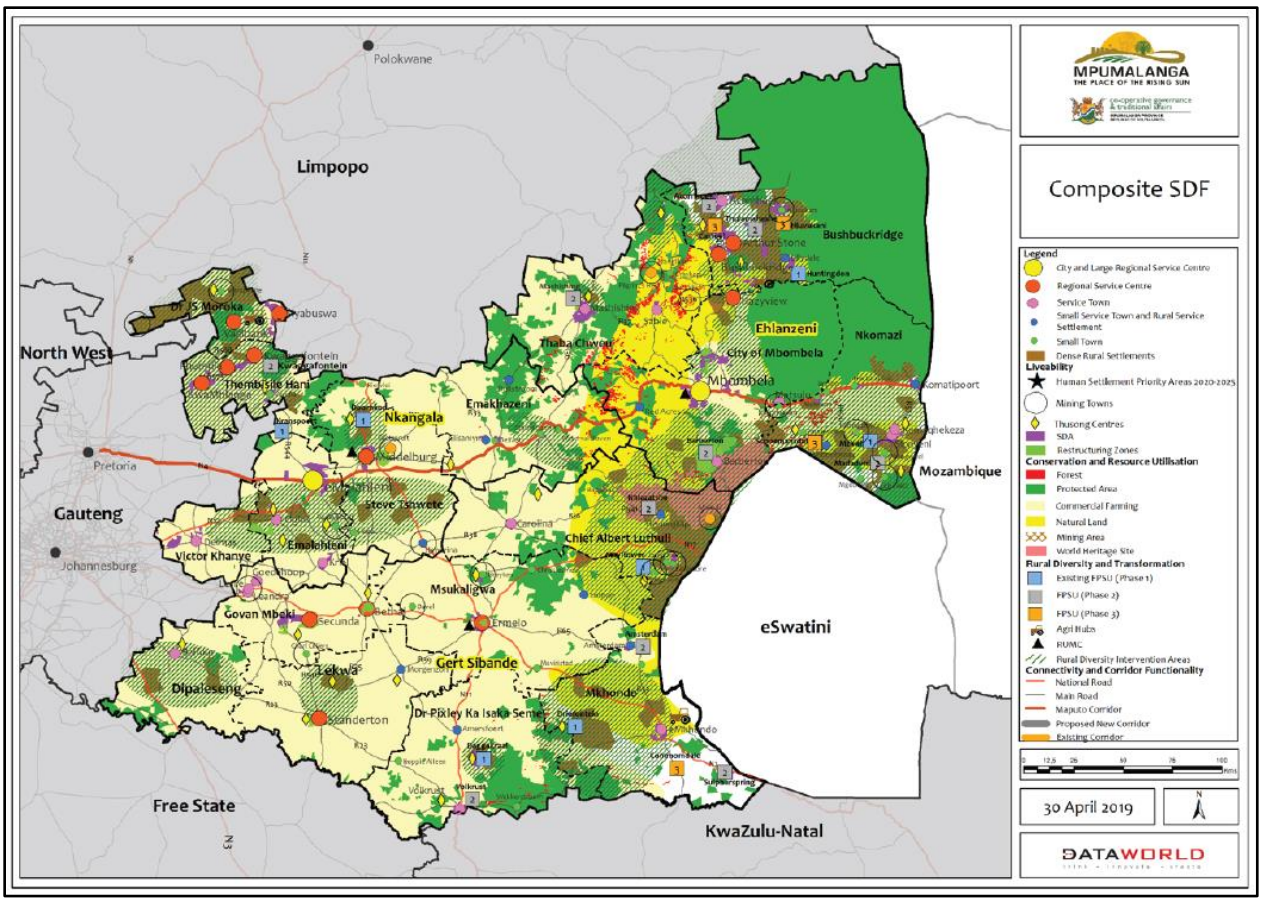
Strategic Objective 6: To optimally utilise the mining potential without compromising the long-term sustainability of the natural environment

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, Ermelo is identified as a Regional Service Centre (red dot) and the development area located to the south east of the town falls within a mining area (brown hatched) (Figure 2.2). The 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 Govan Mbeki Integrated Development Plan

The Govan Mbeki Municipality (GMM) is located in the south-eastern part of Mpumalanga Province and is one of seven local municipalities that make up the Gert Sibande District Municipality (GSDM). The GMM is made up of eight towns and 32 electoral wards. The project site is located within Ward 5 to the east and south east of Secunda. The vision of the Govan Mbeki Municipality (GMM) as set out in the 2020/2021 IDP review is "To be a Model City and Centre of Excellence" The associated Mission Statement is to serve our community by:

- Providing sustainable, quality services.
- Enabling diversified local economic development and job creation.
- Ensuring the financial sustainability of the Municipality.
- Working together with our stakeholders.
- Empowering our workforce.
- Ensuring sound corporate governance.

The Vision, Mission and Values are informed by six (6) Key Strategic objectives of which Strategic Objective 3, To facilitate and create an enabling environment for diversified local economic development, social cohesion, and job creation and Strategic Objective 5, To develop spatially integrated, safe communities and a protected environment, are relevant to the proposed development.

A SWOT analysis undertaken as part of the IDP process identified key strengths, weaknesses, opportunities, and threats. The key findings relevant to the project include:

Strengths
- Petro-Chemical and synthetic fuels plant
- Good tourism potential
- Good infrastructure
- Rail Network
- Mining Area
- University /satellite campus

Opportunities
- Economic development opportunities
- SMME Development
- Industrial Park West of Secunda

Weaknesses
- Ageing electricity infrastructure.
- Pressure on energy sources.

Threats
- Eskom Price increases.
- Unemployment and poverty.
- Climate change.
- Air pollution.
- Water shortages.
- Limited lifespan of mines.
- Increasing population (informal settlements, pressure on housing, unemployment, infrastructure, and municipal services).
- Closure of mining and petrochemical industry.

The IDP provides a summary of the key socio-economic challenges facing the GMM, of which the following are relevant to the project.

- High and rising in unemployment.
- Youth unemployment.
- Creating of local economic development opportunities.
- Closure of mines.
- Increasing dependency rates.
- Low education levels and declining matric pass rate.
- Social development concerns such as clinics, police stations, schools,

The IDP notes that the key economic sectors that contribute to the local economy within in Govan Mbeki community are:

- Trade (including tourism).
- Mining.
- Manufacturing.
- Finance.
- Agriculture.

The IDP lists the Local Economic Development (LED) Strategic Objectives as per the LED Strategy. Of relevance these include:

- Industrialisation of the Govan Mbeki economy using current and future comparative and competitive advantages; and newly targeted industries.
- Diversification of the local economy to reduce overreliance on the two complimentary sectors of coal mining and fuel from coal SASOL production.
- Improvement of living standards of the local citizenry through business and employment opportunities across economic sectors and industries

The LED strategy for the GMM is underpinned by six strategic pillars or programmes, namely:

- **Pillar One:** Govan Mbeki Industrialisation Programme. Of key relevance the programme the programme focuses on manufacturing activities based on sectors and industries with future growth prospects especially agro-processing and ***alternative energy sources***. The aim is to diversify the economy and reduce dependence on the two dominant and complimentary sectors of coal mining and fuel production.
- **Pillar Two:** SMME and Cooperatives Incubation Programme. Agriculture and agro processing have been identified as key sectors and industries that can provide leverage for SMME and cooperatives incubation.
- **Pillar Three:** Tourism Hub Development Programme.
- **Pillar Four:** Warehousing and Logistics Hub Development Programme. –
- **Pillar Five:** Education, Skills and Capacity Development Programme. The programme thrust is to develop and or boost the skills and capacity of small businesses and cooperatives within the GMM.
- **Pillar Six:** Marketing and Investment Promotion Programme.

The IDP also refers to the establishment of a Special Economic Zone (SEZ) in the GMM, including the establishment of an industrial park. The proposed Industrial Park is to be located on an identified portion of land north west of Secunda. The success of the park and other industrial developments in the GMM will be dependent on the provision of reliable energy.

Section 7.1 of the IDP provide an overview of the Spatial Development Framework for the GMM. Six strategic objectives (SOs) are listed namely:

- Strategic Objective 1: Economic development and job creation supporting and guiding development.
- Strategic Objective 2: Promoting education, training, and innovation.
- Strategic Objective 3: Accommodating urbanisation and transforming human settlements.
- Strategic Objective 4: Promote the development of the rural areas within Govan Mbeki that can support sustainable economic, social, and engineering infrastructure.
- Strategic Objective 5: Protect biodiversity, water, and agricultural resources.
- Strategic Objective 6: Infrastructure Investment.

Strategic Objective 1, 5 and 6 are relevant to the proposed development.

Strategic Objective (S0)1: Of specific relevance SO 1 refers to the need to diversify the local mining dependent economy by phasing in renewable energy options, which include concentrated solar power, wind, and natural gas, reducing dependence on coal resources.

Strategic Objective (SO) 5: Of specific relevance SO5 highlights the need to minimise the consumption of scarce environmental resources, particularly water, electricity and land and protect biodiversity, water, and agricultural resources.

Strategic Objective (SO) 6: Of specific relevance SO6 highlights the need to ensure efficient supply of electricity and water install green infrastructure, including renewable energy.

At the local ward level, the needs analysis for Ward 5 indicated that the key challenges and community relevant to the project and that could be supported by SED contributions include repair of street lights, general maintenance of verges, up-grading of taxi rank next to Secunda Mall, cemetery and sports facilities.

SECTION 3: OVERVIEW OF THE STUDY AREA

3.1 INTRODUCTION

Section 3 provides an overview of the:

- The administrative context.
- The demographic context.
- The site and surrounding land uses.

3.2 ADMINISTRATIVE CONTEXT

The study area is located within the Govan Mbeki Municipality (GMM) within the Mpumalanga Province. The MM is one of the seven Local Municipalities that make up the Gert Sibande District Municipality (GSDM)(Figure 3.1). The town of Secunda is the administrative seat of the GMM.

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

3.3 DEMOGRAPHIC OVERVIEW

Population

The population of the GMM in 2016 was 340 091 (Community Household Survey 2016). Of this total, 32.5% were under the age of 18, 63.3% were between 18 and 64, and the remaining 4.2% were 65 and older. The GMM therefore had a high percentage of the population that fall within the economically active group of 18-65. The population of Ward 5 in 2011 was 9 219 (Census 2011). Of this total, 21.5% were under the age of 18, 72.1% were between 18 and 64, and the remaining 6.4% were 65 and older. Ward 5 like the GMM also had a high percentage of the population that fall within the economically active group of 18-65. The figures are higher than the figures for the GSDM and Mpumalanga (57.7% and 56.6% respectively). This is due to the employment opportunities associated with the industrial, mining and manufacturing activities in the MM.

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 GMM, the GSDM and Mpumalanga in 2016 were 58%, 73.5% and 77% respectively. The dependency ratio for Ward 5 in 2011 was 38.6%. The lower dependency ratios in the GMM and Ward 5 reflect the employment and economic opportunities in and around Secunda linked to the towns petrochemical and industrial sector.

In terms of race groups, Black Africans made up 85.8% of the population on the GMM, followed by Whites, 12.1% and Coloureds (1.2%). The figures for Ward 5 in 2011 were Whites (72.6%), Black Africans (22.2%), Indian or Asian (2.7%) and Coloureds (2.3%). The main first language spoken in the GMM was isizulu, 60.5%, followed by Siswati, 7.3% and Afrikaans, 6.2%. In Ward 5 Afrikaans (64.6%) followed by English (11.1%) were the main languages spoken.

Households and house types

The total number of households in the GMM in 2016 was 108 892, which constituted approximately 33% of the total number of households in the GSDM. Of these 63% were formal houses, 20.4% were shacks, and 10.6% 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 GMM 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 Ward 5 82.5% of the dwellings were formal houses. There were no reported shacks.

In terms of ownership, 46% of the dwellings in the GMM were owned and fully paid off, while 10.6% were in the process of being paid off. 17.9% of the dwellings were rented from private individuals. In Ward 5, 15.2% were owned and fully paid off, 34.2% were in the process of being paid off, and 35% were rented.

A relatively large percentage of the properties in the GMM (56.6%) 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 30.8% of the households in the GMM and 39.1% of the households in the GSDM were headed by women. These figures similar to the provincial figure of 39.71%. The figure for Ward 5 in 2011 was substantially lower at 15.5%. The high percentage of households headed by women in the GMM reflects the likelihood that the men have left the area in search of employment opportunities in Gauteng. This is despite the well-developed industrial sector in and around Secunda. Women headed households tend to be more vulnerable.

Household income

Based on the data from the 2011 Census, 16.6% of the population of the GMM had no formal income, 3.6% earned less than R 4 800, 5.5% earned between R 5 000 and R 10 000 per annum, 12.6% between R 10 000 and R 20 000 per annum and 16.4% 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 54.7% of the households in the GMM and 65.2% in the GSDM live close to or below the poverty line. The figure for Ward 5 in 2011 was 16.9%.

The low-income levels in the GMM and GSDM reflect the limited formal employment opportunities outside in 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 GMM. This in turn impacts on the ability of the GMM 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 GMM 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 GMM in 2016 was 17.2%, while 48.5% were employed, and 31% were regarded as not economically active. The figures for Ward 5 in 2011 were 3.6%, 63.6% and 32.4% respectively. However, the COVID-19 pandemic is likely to have resulted in an increase in unemployment rates in both the GMM and Ward 5. 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 GMM and GSDM with no schooling was 6.5% in 2016, compared to 10.8% and 11.3% for the GSDM and Mpumalanga Province respectively. The figure for Ward 5 in 201 was 1.8%. The percentage of the population over the age of 20 with matric in the GMM (2016) and Ward 5 (2011) was 39.4% and 39.2% respectively, compared to 34.3% and 36.1% for the GSDM and Mpumalanga. The education levels in the GMM and Ward 5 are therefore marginally higher than the DM and Provincial figures.

3.4 MUNICIPAL SERVICES

Electricity
Based on 2016 survey, 95.1% of households in the GMM had access to electricity, compared to 90% for the GSDM and 93% for Mpumalanga.

Access to water
Based on the 2016 survey information, 96.9% of households in the GMM were supplied by a service provider. This compares to 86.7% and 80.5% for the GSDM and Mpumalanga respectively. The figure for Ward 5 in 2011 was 91.4%.

Sanitation
94.9% of the households in the GMM had access to flush toilets (2016), while 3.4% relied on pit toilets. This compares to 65.3% and 42.1% for the GSDM and Mpumalanga respectively. The figure for Ward 5 in 2011 was 94.5%. Only 0.5% of the households in the GMM reported that they had no access to formal sanitation, compared to 2.6% and 2.8% for the GSDM and Mpumalanga respectively.

Refuse collection
72.5% of the households in the GMM had access to regular refuse removal service, while for 13.9% the service was provided, but not on a regular basis. This compares to 52.2% for the GSDM (regular) and 5.2% (irregular). 89% of households in Ward 5 had their waste collected on a regular basis by a service provided.

3.5 OVERVIEW OF STUDY AREA

3.5.1 Introduction

The study area is located approximately 8-10 south of the town of Secunda in the GMM (Figure 3.2). The town of Secunda has its origins in the 1973/74 international oil crisis when the then South African Government took the decision to establish a second coal liquefaction plant following the establishment of the first at Sasolburg in the 1950s. After the site for the Sasol complex had been identified, it had to be decided whether or not to combine the existing towns of Evander and Trichardt. The huge burden that extensions of this nature would have had on the financial and administrative resources of the established communities as well as the tempo at which such development should proceed was decisive and resulted in the decision to develop Trichardt and Secunda to be one town, named Secunda. Evander, located ~ 8km to the west of the current day Secunda, remained a separate town. Trichardt borders onto the northern part of Secunda.

The first town area was proclaimed in June 1976[6]. The name Secunda is derived from the from the Latin, secundi meaning second/following, and was given to the town as it was the second extraction refinery producing oil from coal, after Sasolburg, which is located approximately 140km west of Secunda. The town was located adjacent to the large coalfields in the area, including the Evander and Winkelhaak coal mines located to the north west of the town. The Secunda facility consists of Sasol Two (1980) and Sasol Three (1982) is the largest coal liquefaction plant in the world, and produces synthetic fuel, diesel, and related fuels and

[6] https://www.primidi.com/secunda_mpumalanga/early_history

petrochemicals from coal gasification. The Secunda facility is located to the south of the town, approximately 3.5 km from the northern boundary of the Mukondeleli WEF site (Figure 3.1).

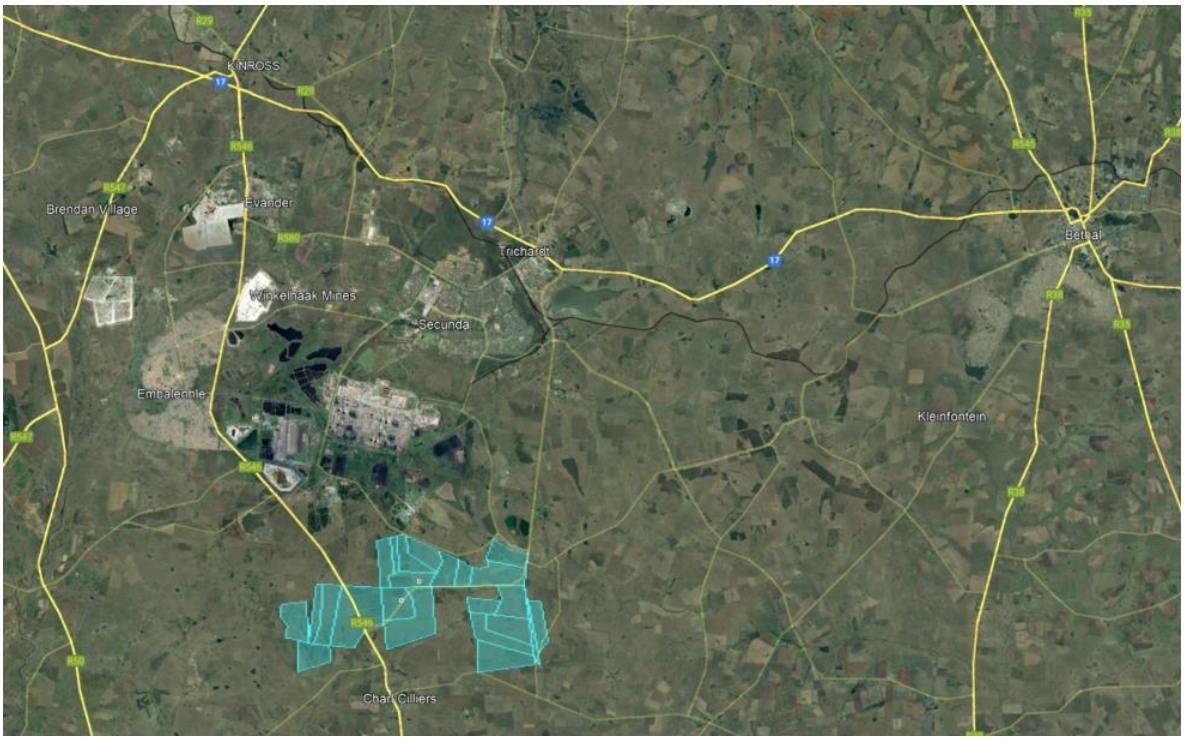


Figure 3.1: Regional location of Mukondeleli WEF (blue area)

The town of Secunda is located approximately 90 km west of Benoni in Guateng, and 23 km west of Bethal. The N17 which runs to the north of the town and the site connects the towns of Benoni and Bethal (Figure 3.2). The small settlement of Charl Cilliers is located ~ 2km to the south of the WEF site. The Brandspruit Mine is located ~ 1.5 km to the north of the northern boundary of the WEF site.

The Mukondeleli WEF grid connection project is located partially within and partially to the south of SASOL's Secunda complex south of the town of Secunda. The small residential settlement of Charl Cilliers is located approximately 1.5 km to the south of the WEF project site (Figure 3.2).

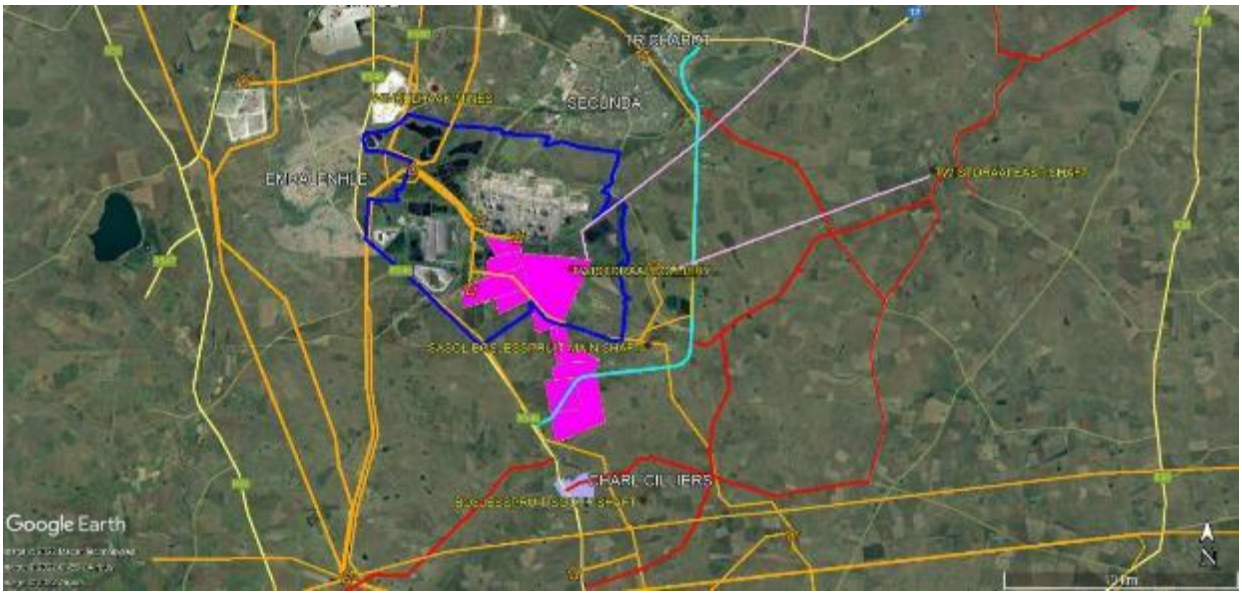
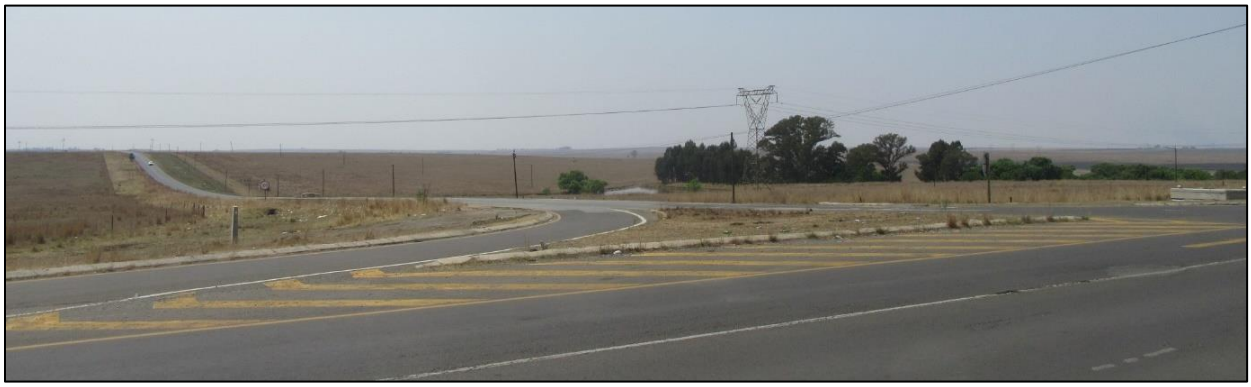


Figure 3.2: Mukondeleli WEF grid connection site properties (pink fill) in relation to Sasol Secunda complex (dark blue outline), existing transmission lines (orange), nearby urban areas (grey), the Trichardt-Charl Cilliers Rd (light blue), other study area roads (red), and coal conveyor belts (light pink)

Access to the study area is directly or indirectly off the R546 (Secunda-Standerton) or the Trichardt-Charl Cilliers Road (a mining road) linking the R546 to the N17 (Standerton-Bethal) (Photograph 3.1). The Trichardt-Charl Cilliers Road carries significant heavy vehicle traffic associated with the movement of coal trucks, and traffic generated by industrial and agro-industrial operations along the road, e.g., Trichardt Crushers, Grootvlei brick factory, the Constantia Fertilizer blending plant. The large Trichardt silo is also located off the road at the south east of the entrance to Trichardt.



Photograph 3.1: Intersection of the R546 (Standerton Rd) and the Trichardt-Charl Cilliers Road.

The SASOL Secunda premises occupies approximately 8 000 ha (Photograph 3.2) and includes petro-chemical-, explosives- and fertilizer production and coal mining. Historic and operational coal mining operations are associated with the farming area to the south and east of the premises. Many properties have been undermined. Closed shafts, rescue boreholes, quarries, and coal conveyor belts are in evidence in the area (Photograph 3.3).

Photograph 3.2: Sasol Complex seen from Bosjesspruit 291/11 to the south

Photograph 3.3: Buried coal conveyor belt on Brandwacht 316/3

The broader study area is criss-crossed by a web of existing transmission lines. This is linked to SASOL Secunda and the collieries and gold mines in the Secunda-Evander area. The area immediately to the south of SASOL Secunda is not currently affected. The site portion of the SASOL premises is affected by 2 x 132 kV lines associated with the Bosjesspruit Main Shaft approximately 4 km east of the project. Four substations are located along or in proximity to the Trichardt-Charl Cilliers Road (Photograph 3.4).

Photograph 3.4: Substation located on Bosjesspruit 291/RE to the west of the Trichardt-Charl Cilliers Road 6 km east of the site

The area immediately to the south of SASOL Secunda is dominated by mixed farming operations. Limited employment opportunities are associated with these operations. Properties are relatively small. Room for expansion of cropped fields is typically hampered by lack of suitable soils. Soy and maize grown under dryland conditions are the key crops. The nearest silo complex is located on the south east of Trichardt (Photograph 3.5). In the broader study area, silos are also located in Delmans and bunkers at Tutuka and Vogelvlei.

Photograph 3.5: Trichardt silos at the southern entrance to Trichardt.

Land unsuitable for cropping is used as rangeland. Beef cattle predominate, but many operations also include sheep (Photograph 3.6). The veld carrying capacity is relatively high, 1 head of cattle to 5 ha (2018), or 2 sheep per hectare.[7] Harvest residue is typically utilized as grazing. Many operations also cultivate pasture crops (e.g., Oulandsgras) for commercial silage and own use. Due to chronic stock theft and predation (jackal), most operations kraal (and count) their stock overnight. Kraals are typically located at the farm yards.

Photograph 3.6: Cattle grazing on Knoppiesfontein 313/9

The study area (main) properties are typically inhabited. Farmsteads are located 2-5 km apart, often in proximity to public or mining roads (Photograph 3.7). Labourers' houses are typically located in proximity (or on) farm yards. The trend is for farmers to transport in workers from nearby urban areas such as Charl Cilliers and Embalenhle on a daily basis. A few labourers continue to live on study area properties (Photograph 3.8).

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

Photograph 3.7: Farmstead and out-buildings on Vantondershoek 317/11

Photograph 3.8: Workers houses on Vantondershoek 317/1.

The sense of place in the study area – and indeed, broader area – is dominated by SASOL Secunda. Infrastructure, smoke and steam emissions and flaring are visible throughout the immediate study area. Odours are perceptible on many study area properties. The area along the SASOL property's eastern and southern periphery is characterized by farming activities mixed with industrial ones, e.g., quarrying, brick making. No significant tourism receptors are located in the study area. This is linked to the disturbed landscape context and the somewhat featureless landscape. Existing tourism in the broader area is associated with essential travel (e.g., work-related), water sports (Trichardsfontein Leisure Resort SE of Trichardt), a few function venues, and a few commercial (paying) hunting operations catering to local biltong hunters.

3.5.2 Affected landowners

The bulk of the proposed alignment (for all alternatives) is located on the SASOL Secunda premises (Table 3.1). No Social impacts are associated with this line portion. The balance of the infrastructure, including the two Mukondeleli WEF substation alternatives and associated line alternatives, is located on properties which belong to Messrs. Izak (son) and Tienie (father) Joubert (Figure 3.3). The Joubert properties form part of the concurrently proposed Mukondeleli WEF. Fourteen turbines are proposed on the site- and site-adjacent Joubert properties.

Table 3.1: Overview of directly affected properties

OWNER	PROPERTY	DWELLINGS	USE
Joubert, Mr Izak	Bosjesspruit 291/8	N.a.	Part of proposed Mukondeleli WEF; Properties farmed as one unit by father (Tienie) and son (Izak); Both owners reside on Vantondershoek (317/12) farm yard; One resident labourer household on 317/12 south of yard; Dryland field cropping and livestock production; Kennels (Sniff Snuff) on 317/12 yard; 4 permanent employees
	Bosjesspruit 291/9	N.a.	
	Bosjesspruit 291/10	N.a.	
Joubert, Mr Tienie	Van Tondershoek 317/2	N.a.	
	Van Tondershoek 317/12	Van Tondershoek[8]	
SASOL complex	Twisdraai 285/3	N.a.	Heavy Industrial uses
	Twisdraai 285/5/RE	N.a.	
	Twisdraai 285/6/RE	N.a.	
	Bosjesspruit 291/4	N.a.	
	Brandspruit 318/RE	N.a.	
	Brandspruit 318/3	N.a.	

Figure 3.3: Overview of non-Sasol owned properties affected by proposed Mukondeleli WEF grid connection: Alternative 1 substation and associated line portion (light green), Alternative 2 substation and associated line portion (light blue) and common (Alternative 1 and 2) line portion (pink). Also indicated are Sasol Secunda (dark blue outline), existing transmission lines (orange), nearby urban areas (grey), and study area roads (red)

No structures are located on the Joubert properties north and west of the Trichardt-Charl Cilliers Road. Messrs Izak and Tienie live on separate dwellings on Vantondershoek 317/12 yard, approximately 150 m east of the road (Photograph 3.9). The yard complex includes

[8] Shading indicates inhabited dwellings on property.

farm out-buildings and a commercial kennel (Sniff Snuff) run by the owners' wives. Kraals are located on the southern periphery of the yard. Only one farm worker is resident on the Joubert properties. The solitary dwelling is located approximately 300 m to the south of the Vantondershoek yard (Photograph 3.10).

Photograph 3.9: Farm yard on Vantondershoek 317/12, seen from the Trichardt-Charl Cilliers Road

Photograph 3.10: Worker's dwelling on Vantondershoek 317/12

The Joubert properties are farmed as one operation. The operation is typical of the study area, consisting of a 50/50 mix of dryland field cropping (soy and maize) and livestock (Photographs 3.11 and 3.12). The operation provides permanent employment to 4 workers, only one of whom tenured on the property.

Photograph 3.11: Ploughed fields on Bosjesspruit 291/10, Sasol complex in the background

Photograph 3.12: Kraal and baled silage on Vantondershoek 317/12

3.5.3 Relationship to receptors

As indicated above, the bulk of the alignment is located on the SASOL Secunda premises. No Social impacts are associated with the SASOL premises. Social impacts are essentially restricted to the Joubert properties. This includes both impacts on land use and proximity to residential receptors. The proposed alignment consists of two alternative line segments associated with the two Mukondeleli WEF substation alternatives (Alternative 1 and 2), and a common alignment that is applicable to both line alternatives. Both substation alternatives are located on rangeland on the Joubert properties (Figure 3.4). Line Alternative 1 is located 800 m north of the Vantondershoek farmstead and traverses the margins of cropped fields up to the point where the common alignment starts. Line Alternative 2 is located 300 m west of the Vantondershoek farmstead, opposite the access to the Vantondershoek yard. The alignment portion north of the Trichardt-Charl Cilliers Road traverses a cropped field on Bosjesspruit 291/10 over a distance of approximately 450 m up to the point where the common alignment starts. The northernmost 750 m of the common alignment on Joubert land traverses a cropping area on Bosjesspruit 291/8.

Figure 3.4: Re-alignment (dark blue) of common line section (pink) proposed by owner. Also indicated are Alternative 1 substation and associated line portion (green), and Alternative 2 substation and associated line portion (light blue)

The landowner indicated that line Alternative 2 is not preferred to the applicable land owner. This is due to substation site Alternative 2 being closely located, within<250 m, from the residential cluster on Van Tondershoek (317/12), and at the entrance to the property. Alternative 2 line would also traverse cropped fields. This is undesirable, as it would restrict ease of tilling and result in (moderate) footprint losses of scarce tillable land. Alternative 1 is regarded as acceptable, as deemed sufficiently distant from residential structures on the Joubert properties, and does not impact on crop land (Joubert, pers. comm).

The owners also indicated that the portion of the common alignment impacts on the cropped area on Bosjesspruit 291/8 and was not preferable. The impact could be mitigated by re-aligning the segment to the east so that it follows the cadastral boundary with 291/9, i.e., just to the easy of the cropping area (Joubert, pers. comm) (See Figure 3.4, dark blue line)[9].

No other residential receptors are located within a 1 km range of proposed infrastructure. As indicated, the general landscape context is disturbed, and dominated by the presence of the SASOL complex and a number of existing power lines.

[9] Enertrag has met with the affected landowners to address the issues raised. The alignment can be accommodated within the 200m corridor that is being assessed.

SECTION 4: ASSESSMENT OF KEY SOCIAL ISSUES

4.1 INTRODUCTION

Section 4 provides an assessment of the key social issues identified during the study. The identification of key issues was based on:

- Review of project related information.
- Review of key policy and planning documents.
- Site visit to the study area and comments submitted by key stakeholders.
- Experience/ familiarity of the authors with the area and local conditions.
- Experience with similar projects.

The assessment section is divided into the following sections:

- Assessment of compatibility with relevant policy and planning context ("planning fit").
- Assessment of social issues associated with the construction phase.
- Assessment of social issues associated with the operation phase.
- Assessment of the "no development" alternative.
- Assessment of cumulative impact on sense of place.

The potential social impacts associated with the Battery Energy Storage System (BESS) will be negligible due to the location of the BESS within in an industrial setting adjacent to the Sasol substation. The focus of the SIA is therefore on the overhead transmission line.

4.2 ASSESSMENT OF POLICY AND PLANNING FIT

The findings of the SIA indicate that investment in renewable energy and the associated energy infrastructure is strongly supported at a national, provincial, and local level. The development of and investment in renewable energy and associated energy distribution infrastructure is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all highlight the importance of energy security and investment in energy infrastructure.

4.3 CONSTRUCTION PHASE SOCIAL IMPACTS

Potential positive impacts

- Creation of employment, skills development, and business opportunities.

Potential negative impacts

- Impacts associated with the presence of construction workers on local communities.
- Impact on local farmers and farming operations.
- Noise, dust and safety impacts of construction related activities and vehicles.
- Increased risk of veld fires.

4.3.1 Creation of local employment, skills development and business opportunities

The construction phase is expected to extend over a period of approximately 6-12 months and create in the region of 30employment opportunities. Approximately 80% of the jobs will be low-skilled, 15% semi-skilled and 5% skilled. Most of the low and semi-skilled employment opportunities would benefit community members from local towns in the area. 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.

The capital expenditure associated with the construction of grid infrastructure will be ~ R 65 million and will create opportunities for local companies and the regional and local economy. Implementing the enhancement measures listed below can enhance these opportunities. The sector of the local economy that is most likely to benefit from the proposed development is the local service industry. The potential opportunities for the local service sector would be linked to accommodation, catering, cleaning, transport, and security, etc. associated with the construction workers on the site. However, given the relatively small scale of the project and short duration of the construction phase these benefits will be limited.

Table 4.1: Impact assessment of employment, skills development, 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 (2)
Duration	Short term (2)	Short term (2)
Magnitude	Low (2)	Medium (4)
Reversibility	N/A	N/A
Probability	Probable (3)	Highly probable (4)
Significance	Low (18)	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 MM 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 MM 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 can pose 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.

Given the relatively small number of construction workers, namely ~ 30-50, the potential impact on the local community is likely to be negligible.

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)	Very Low (1)
Reversibility	With rehabilitation/mitigation (3)	With rehabilitation/mitigation (3)
Probability	Low Probability (2)	Low Probability (2)
Significance	Low (18)	Low (14)
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 mitigation measures
The potential risks associated with construction workers can be mitigated. The detailed mitigation measures should be outlined in the Environmental Management Plan (EMP) for the Construction Phase. Aspects that should be covered include:

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 Risk to safety, livestock, and farm infrastructure

The presence of 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. The presence of construction workers on the site also increases the exposure to local farming operations to the outside world, which, in turn, increases the potential risk of stock theft.

The potential risks (safety, livestock, and farm infrastructure) can be effectively mitigated by careful planning and managing the movement of construction workers on the site during the construction phase. The mitigation measures to address these risks are outlined below.

Table 4.3: 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)	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 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 Plan (EMP) 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.

4.3.4 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. Given the relatively small number of construction workers and the short construction period the traffic related impacts are likely to be limited. The impacts will be largely local and can be effectively mitigated.

Table 4.4: **Assessment of the impacts associated with construction related activities**

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	Low (2)	Low (2)
Reversibility	Reversible (1)	Reversible (1)
Probability	Probable (3)	Low Probability (2)
Significance	Low (21)	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 not responsible for the damage.		

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.

4.3.5 Risk of veld fires

The presence on and movement of construction workers on and off the site and construction related activities such as welding etc., increases the risk of veld fires which pose a risk to livestock, farm infrastructure and crops. The loss of grazing also poses a threat to local livelihoods that are dependent on livestock farming. The risk of veld fires is higher during the dry, windy winter months of May through to November.

Table 4.5: Risk posed by veld fires to livestock, farm infrastructure and grazing

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 mitigation measures include:

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 summer 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 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.

Based on feedback from the affected land owners, Alternative 2 is preferred by the relevant land owner. This is due to substation site Alternative 2 being closely located, within <250 m, from the residential cluster on Van Tondershoek (317/12), and at the entrance to the property. Alternative 2 line would furthermore traverse cropped fields. This is undesirable, as it would restrict ease of tilling and result in (moderate) footprint losses of scarce tillable land. Alternative 1 substation (preferred) is regarded as acceptable, as deemed sufficiently distant from residential structures on the Joubert properties, and does not impact on crop land (Joubert, pers. comm).

The owners also indicated that the portion of the common alignment impacts on the cropped area on Bosjesspruit 291/8 and was not preferable. The impact could be mitigated by re-aligning the segment to the east so that it follows the cadastral boundary with 291/9, i.e., just to the easy of the cropping area (Joubert, pers. comm) (See Figure 3.4, dark blue line)[10].

[10] As indicated above, ENERTRAG South Africa has met with the affected landowners to address the issues raised. The alignment can be accommodated within the 200m corridor that is being assessed.

Table 4.6: 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 transmission line. Based on the comments from the landowners the portion of the common alignment should be relocated to the east so that it follows the cadastral boundary with 291/9[11].
- 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

[11] As indicated above, ENERTRAG South Africa has met with the affected landowners to address the issues raised. The alignment can be accommodated within the 200m corridor that is being assessed.

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
- Provide energy infrastructure to support the use of renewable energy to produce green hydrogen and ammonia.
- Creation of employment, skills development, and procurement opportunities.
- Generate income for landowners.

Potential negative impacts
- The visual impacts and associated impact on sense of place.
- Impact of maintenance activities on farming activities and operations.

4.4.1 Provide energy infrastructure to support the use of renewable energy to produce green hydrogen and ammonia

The proposed power line is essential for the operation of the Mukondeleli WEF. The objective of the WEF is to generate renewable energy to produce commercially usable green hydrogen and ammonia that can be used as a fuel for transport in hydrogen fuel cells and or in different industrial uses. The ammonia will be primarily used for the production of ammonium nitrate (fertiliser) and manufacture of plastics, explosives, textiles, pesticides, and other chemicals. Ammonia can also be used as a stable 'carrier' of hydrogen, allowing hydrogen to be readily stored and transported. 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. The project will also produce green ammonium nitrate for the South African farming and industrial sector and support the transmission of South Africa's fossil fuel-based economy to renewable energy.

Table 4.6: Provide energy infrastructure to support the use of renewable energy to produce green hydrogen and ammonia

Nature: Development of energy infrastructure to support the use of renewable energy to produce green hydrogen and ammonia.		
	Without Mitigation[12]	**With Mitigation[13]**
Extent	Local, Regional and National (4)	Local, Regional and National (4)
Duration	Long term (4)	Long term (4)
Magnitude	Medium (3)	Medium (3)
Reversibility	N/A	N/A
Probability	Highly Probable (4)	Definite (5)
Significance	Moderate (44)	Moderate (55)

[12] Assumes power line is not established
[13] Assumes power line is established

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
Should the proposed grid connection infrastructure be approved the proponent should:

- Maximise the number of employment opportunities for local community members, where feasible.
- Implement training and skills development programs for members from the local community.
- Maximise opportunities for local content and procurement.

4.4.2 Creation of employment, skills development, and business opportunities

The potential employment, skills development and business-related opportunities associated with the power line and substation will be limited and largely confined to periodic maintenance and repairs. The potential socio-economic benefits are therefore likely to be limited. There is limited opportunity to enhance the potential opportunities.

Table 4.7: Impact assessment of employment, skills development, 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 (1)
Duration	Long term (4)	Long term (4)
Magnitude	Low (2)	Low (2)
Reversibility	N/A	N/A
Probability	Highly Probable (4)	Highly Probable (4)
Significance	Low (28)	Low (28)
Status	Positive	Positive
Reversibility	N/A	
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.

4.4.3 Generate income for affected landowners

The proponent will be required to either purchase the land or enter into a lease/servitude agreement with the affected landowners for the use of the land for the establishment of the proposed transmission line and substation. The additional income would assist to reduce the risks to their livelihoods posed by climate change and fluctuating market prices for livestock, crops and farming inputs, such as fuel, feed etc. The additional income would improve economic security of farming operations, which in turn would improve job security of farm workers and benefit the local economy.

Table 4.8: Assessment of benefits associated with income generated for 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
Reversibility	N/A	
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.

4.4.4 Visual impact and impact on sense of place

The proposed transmission line and associated substations has the potential to impact on the areas existing rural sense of place. However, given the location of the site next to the existing, large Secunda petrochemical facility and associated transmission lines and coal mines the potential impact on the areas sense of place is likely to be limited. This was confirmed during the site visit. While none of the affected landowners or adjacent owners interviewed raised significant concerns regarding the potential impact on the areas sense of place, the landowners did indicate that line Alternative 2 is unacceptable. This is due to substation site Alternative 2 being regarded as unacceptable by the owners, as it would be located <250 m from the residential cluster on Van Tondershoek (317/12), and at the entrance to the property (Joubert, pers. comm).

Table 4.9: Visual impact and impact on sense of place

Nature: Visual impact associated with the proposed grid infrastructure and the potential impact on the area's sense of place.		
	Without Mitigation	**With Mitigation[14]**
Extent	Local (2)	Local (2)
Duration	Long term (4)	Long term (4)
Magnitude	Medium (3)	Low (2)
Reversibility	Reversible (1)	Reversible (1)
Probability	Probable (3)	Probable (3)
Significance	Medium (33)	Low (27)
Status	Negative	Negative
Can impact be mitigated?	Yes	
Mitigation: 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
- Alternative 2, which is associated with substation 2 is not regarded as suitable due to the proximity of the substation to the residential cluster on Van Tondershoek (317/12) and at the entrance to the property.
- Recommendations of the VIA should be implemented.

4.4.5 Impact on farming operations during maintenance[15]

The presence on and movement of maintenance workers on and off the site poses a potential risk to farming operations. Farm fence and gates may be damaged and stock losses may also

[14] Alternative 1 is the preferred alternative.
[15] The impacts are similar to the impacts associated with construction phase.

result from gates being left open. The presence of maintenance workers on the site also increases the exposure of their farming operations and livestock to the outside world, which, in turn, increased the potential risk of stock theft and crime.

The key issues raised are linked to the construction phase but are also valid for the maintenance phase. These include:

- Impact of maintenance related activities and movement of maintenance vehicles on the cropped areas and the veld.
- Farm gates left open by maintenance contractors and Eskom employees.
- Damage to farm fences. The damage to farm fences poses the same risks to farming operations as leaving farm gates open.
- Lack of awareness amongst contractors of the impacts that their activities can have on farming operations.

Based on experience with maintenance of the existing Eskom power lines this is an issue that will need to be addressed. The potential risks (safety, livestock, and farm infrastructure) can be effectively mitigated by ensuring the maintenance teams take care to ensure that gates are kept closed and affected property owners are kept informed about timing of maintenance operations. Mitigation measures to address these risks are outlined below.

Table 4.10: Assessment of risk to farming operations and damage to farm infrastructure

Nature: Potential risk to safety to farming operations and livestock associated with the presence of maintenance workers on the site		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Short term (2)	Short term (2)
Magnitude	Medium (3)	Low (2)
Reversibility	Recoverable with compensation paid for stock losses and damage to farm infrastructure etc. (3)	Recoverable with compensation paid for stock losses and damage to farm infrastructure etc. (3)
Probability	Highly Probable (4)	Probable (3)
Significance	Moderate (40)	Low (27)
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
- Affected property owners should be notified in advance of the timing and duration of maintenance activities.

- Maintenance teams must ensure that all farm gates must be closed after passing through.
- Property owners should be compensated for damage to farm property and or loss of livestock or game associated maintenance related activities.
- Movement of traffic and maintenance related activities should be strictly contained within designated areas associated with transmission lines and substations.
- Strict traffic speed limits must be enforced on the farm.
- No maintenance workers should be allowed to stay over-night on the affected properties.

4.5 CUMULATIVE IMPACT ON SENSE OF PLACE

The Scottish Natural Heritage (2005) describes a range of potential cumulative landscape impacts associated with wind farms on landscapes. These issues raised in these guidelines as to what defines a cumulative impact are also regarded as pertinent to transmission lines. The relevant issues identified by Scottish Natural Heritage study include:

- Combined visibility (whether two or more transmission lines) will be visible from one location).
- Sequential visibility (e.g. the effect of seeing two or more two or more transmission lines) along a single journey, e.g. road or walking trail).
- The visual compatibility of different two or more transmission lines 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.

There are existing transmission lines associated with the Secunda facility and the mines in the area. The potential for cumulative impacts associated with combined visibility (whether two or more power lines will be visible from one location) and sequential visibility (e.g., the effect of seeing two or more power lines along a single journey, e.g., road or walking) does therefore exist. However, the cumulative impact on the areas sense of place is likely to be low. In this regard the areas sense of place is dominated by the large industrial Secunda facility and associated mining activities. None of the landowners interviewed raised concerns regarding the potential visual impact on the areas sense of place.

Table 4.13: Cumulative impacts on sense of place and the landscape

Nature: Visual impacts associated with the establishment of associated grid infrastructure 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)	Regional (2)
Duration	Long term (4)	Long term (4)
Magnitude	Low (2)	Low (2)
Reversibility	Reversible (1)	Reversible (1)
Probability	Probable (3)	Highly Probable (4)
Significance	Low (27)	Moderate (40)
Status	Negative	Negative

Can impacts be mitigated?	Limited	
Mitigation: See below		

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

Recommended mitigation measures
- Recommendations of the VIA and SIA should be implemented.

4.6 ASSESSMENT OF NO-DEVELOPMENT OPTION

The proposed power line and substation are essential to enable the proposed Mukondeleli WEF to provide green energy to the Secunda facility to produce green hydrogen and ammonia. This would reduce the carbon footprint of the operations at Secunda, which in turn would also contribute to reducing South Africa's carbon footprint.

The No-Development option would represent a lost opportunity for South Africa to produce green hydrogen and ammonia and reduce its carbon footprint. Given South Africa's current energy security challenges and its position as one of the highest per capita producers of carbon emissions in the world, this would represent a negative social cost.

Table 4.14: Assessment of no-development option

Nature: The no-development option would result in the lost opportunity for South Africa to produce green hydrogen and ammonia and reduce its carbon footprint.		
	Without Mitigation[16]	**With Mitigation[17]**
Extent	Local-National (3)	Local-National (3)
Duration	Long term (4)	Long term (4)
Magnitude	Medium (3)	Medium (3)
Reversibility	Reversible (1)	Reversible (1)
Probability	Highly Probable (4)	Highly Probable (4)
Significance	Moderate (44)	Moderate (44)
Status	Negative	Positive
Can impact be mitigated?	Yes	
Enhancement: See below		
Residual impacts: Improved energy security and benefit for economic development and investment, reduction in CO_2 emission and reduction in water consumption for energy generation.		

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

[16] Assumes power line is not developed
[17] Assumes power line is developed

SECTION 5: KEY FINDINGS AND RECOMMENDATIONS

5.1 INTRODUCTION

Section 5 lists the key findings of the study and recommendations. These findings are based on:

- A review of key planning and policy documents pertaining to the area.
- Site visit and semi-structured interviews with interested and affected parties.
- A review of social and economic issues associated with similar developments.
- A review of relevant literature on social and economic impacts.
- The experience of the authors with other renewable energy projects in South Africa

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.

The potential social impacts associated with the Battery Energy Storage System (BESS) will be negligible due to the location of the BESS within in an industrial setting adjacent to the Sasol substation. The focus of the SIA is therefore on the overhead transmission line.

5.2.1 Policy and planning issues

The development of renewable energy and the associated energy infrastructure is strongly supported at a national, provincial, and local level. The development of and investment in renewable energy and associated energy distribution infrastructure is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all highlight the importance of energy security and investment in energy infrastructure. The development of the proposed power line, substation and associated infrastructure 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.

The construction phase for the grid infrastructure will extend over a period of 6-12 months and create approximately 30-50 employment opportunities. Most of the low and semi-skilled employment opportunities are likely to benefit residents from local towns in the area. Most

the beneficiaries are likely to be Historically Disadvantaged (HD) members of the community. This would represent a short term positive social benefit in an area with limited employment opportunities. A percentage of the wage bill will be spent in the local economy which will also create opportunities for local businesses in GMM.

The capital expenditure associated with the construction of power line will be ~R65 million (2022 Rand values) and will create opportunities for the local and regional and local economy. The sector of the local economy most likely to benefit from the proposed development is the local service industry. The potential opportunities for the local service sector would be linked to accommodation, catering, cleaning, transport, and security, etc. associated with the construction workers on the site. However, given the relatively small scale of the development and short construction period the benefits will be limited.

Potential negative impacts

- Impacts associated with the presence of construction workers on local communities.
- Noise, dust, and safety impacts of construction related activities and vehicles.
- Risk of veld fires.
- Risks posed to farming activities by construction workers.

The findings of the SIA indicate that the significance of the potential negative impacts is likely to be negligible. With mitigation they are rated as **Low Negative**. The potential negative impacts associated with the proposed construction of the power line 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	Low (Positive)	Moderate (Positive)
Presence of construction workers and potential impacts on family structures and social networks	Low (Negative)	Low (Negative)
Impact of construction activities and vehicles	Low (Negative)	Low (Negative)
Risk of veld fires	Moderate Negative)	Low (Negative)
Safety risk, stock theft and damage to farm infrastructure associated with presence of construction workers	Moderate Negative)	Low (Negative)

5.2.3 Operational phase impacts

The benefits associated with the Mukondeleli WEF are dependent upon being able to connect to the national grid. The key social issues associated with the operational phase include:

Potential positive impacts

- Provide energy infrastructure to support the use of renewable energy to produce green hydrogen and ammonia.
- Creation of employment, skills development, and procurement opportunities.

- Generate income for landowners.

Potential negative impacts
- The visual impacts and associated impact on sense of place.
- Impact of maintenance activities on farming activities and operations.

The findings of the SIA indicate that the significance of the potential negative impacts is likely be **Low Negative** if the required mitigation measures are implemented. 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
Provide energy infrastructure to support the use of renewable energy to produce green hydrogen and ammonia	Moderate (Negative) [18]	Moderate (Positive) [19]
Creation of employment and business opportunities during maintenance	Low (Positive)	Low (Positive)
Generate income for landowners	Low (Positive)	Moderate (Positive)
Visual impact and impact on sense of place	Moderate (Negative)	Low (Negative)
Safety risk, stock theft and damage to farm infrastructure associated with presence of maintenance workers	Moderate (Negative)	Low (Negative)

5.2.4 Cumulative impact on sense of place

There are existing transmission lines associated with the Secunda facility and the mines in the area. The potential for cumulative impacts associated with combined visibility (whether two or more power lines will be visible from one location) and sequential visibility (e.g., the effect of seeing two or more power lines along a single journey, e.g., road or walking) does therefore exist. However, the cumulative impact on the areas sense of place is likely to be low. In this regard the areas sense of place is dominated by the large industrial Secunda facility and associated mining activities. None of the landowners interviewed raised concerns regarding the potential visual impact on the areas sense of place.

5.2.5 Assessment of no-development option

The No-Development option would represent a lost opportunity for South Africa to produce green hydrogen and ammonia and reduce its carbon footprint. Given South Africa's current energy security challenges and its position as one of the highest per capita producers of carbon emissions in the world, this would represent a negative social cost.

[18] Assumes power line is not developed
[19] Assumes power line is developed

5.3 CONCLUSIONS AND RECOMMENDATIONS

Conclusion

The benefits associated with the proposed Mukondeleli WEF which include the use of renewable energy to produce green hydrogen and ammonia are dependent upon being able to connect the Mukondeleli WEF to the Secunda facility via the establishment of grid connection infrastructure.

The findings of the SIA indicate that the significance of the potential negative social impacts for both the construction and operational phase of the proposed 132 kV Mukondeleli overhead power line, substation and associated infrastructure are **Low Negative** with mitigation. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. The establishment of proposed 132 kV Mukondeleli overhead power line and associated infrastructure, including the BESS, is therefore supported by the findings of the SIA.

Recommendations

- Based on the findings of the SIA, Alternative 1 is the preferred Option.
- The section of the alignment that is shared by Alternative 1 and 2 should be realigned to the east so that it follows the cadastral boundary with Bosjesspruit 291/9.[20]

[20] As indicated above, ENERTRAG South Africa has met with the affected landowners to address the issues raised. The alignment can be accommodated within the 200m corridor that is being assessed.

ANNEXURE A

INTERVIEWS

- Botha, Ms Melodie (telephonic 2022-10-18). Zorgen Vrij wedding venue.
- Janse van Vuuren, Mr Hannes (telephonic 2022-10-18). Vlakspruit 292/21/RE.
- Joubert, Mr Tienie (2022-10-12). Bosjesspruit 291/2, 291/8, 291/9, 291/10, 291/14; Vantondershoek 317/2, 317/12.
- Kotze, Mr Gert (telephonic 2022-10-18). Vlakspruit 292/14, 292/15.
- Kruger, Mr Tjorrie (2022-10-13). Bosjesspruit 291/6, 291/11, 291/12, 291/13.
- Ludik, Mr Louis (2022-10-13; telephonic 2022-10-18). Vlakspruit 292/22, Poverty Acres 585.
- Serfontein, Mr Alfie (2022-10-11). Tweefontein 321/5.
- Steyn, Mr Jan-Jan (2022-10-13). Vantondershoek 317/1.
- Te Water, Mr Dewald (2022-10-12; telephonic 2022-10-18).). Knoppiesfontein 313/9, Knoppies 314, Brandwacht 316/2, 316/3, 316/4, 316/13, Grootvlei 293/18, 293/20, 293/21, 293/23, Grootvlei 584/RE.
- Van Coller, Mr Herman (telephonic 2022-10-18 and 2020-10-19). Rhino Lodge.
- Van Dyk, Mr Hennie (telephonic 2022-10-18). Vlakspruit 292/13.
- Van Jaarsveld, Mr Jan (2022-10-12). Vantondershoek 317/7, 317/8, 317/11.
- Vermeulen, Mr Andries (2022-10-13). Vlakspruit 292/20/RE.

REFERENCES

- National Growth Path Framework (2010).
- The National Development Plan (2011).
- National Infrastructure Plan (2012).
- Mpumalanga Vision 2030 Strategic Implementation Framework (2013-2030)
- Mpumalanga Economic Growth and Development Path (2011).
- Mpumalanga Spatial Development Framework (2019).
- Govan Mbeki Municipality Integrated Development Plan (2020-2021).

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[21], indirect[22], secondary[23] as well as cumulative[24] 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[25] 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

[21] Impacts that arise directly from activities that form an integral part of the Project.
[22] Impacts that arise indirectly from activities not explicitly forming part of the Project.
[23] Secondary or induced impacts caused by a change in the Project environment.
[24] Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.
[25] 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

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Tony Barbour's has 28 years' experience as an environmental consultant, including 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, Mozambique, Mauritius, Kenya, Ethiopia, Oman, South Sudan, Senegal, Sudan and Armenia.

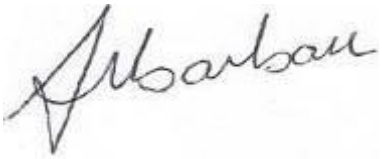
ANNEXURE D

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):

8 November 2022

Date: