9.9MW WILDEBEESKUIL 1 SOLAR PV PLANT, 132KV POWER LINE AND ASSOCIATED INFRASTRUCTURE , NEAR LEEUDORINGSTAD IN THE NORTH WEST PROVINCE

SOCIO-ECONOMIC BASIC ASSESSMENT

APRIL 2021

URBAN-ECON
Development Economists

Celebrate Development Diversity

P.O. Box 13554, HATFIELD 0028
Tel: (012) 342-8686
Fax: (012) 342 8688
E-mail: pta@urban-econ.com

Celebrate Development Diversity.

Version:

Draft version 3

October 2020

Project leader:

Elena Broughton

Cell: 082 463 2325

Email: elena@urban-econ.com

Report writer:

Tsebo Majoro

Cell: 051 444 6324

Email: tsebo@urban-econ.com

SPECIALISTS DETAILS

Elena Broughton

Cell: 082 463 2325

E-mail: elena@urban-econ.com

Position: Manager/Senior Economist

Qualifications: MSc Technology Management, BSC (Hon) Technology Management, BCom (Hon) Economics

Experience: 11 years

Brief profile: Elena Broughton is a senior professional and the manager of the Innovation & Sustainable Development Unit at Urban-Econ. She has extensive knowledge in various fields of economic development that includes 11 years of experience in undertaking socio-economic impact assessment studies for a variety of private clients spanning the mining, manufacturing, energy, infrastructure, and retail sectors. She also acted as a peer reviewer in a number of socio-economic impact assessment studies and completed a few strategic socio-economic impact assessments. Her involvement in the field allowed her to develop a sound understanding of the South African environmental legislation and developmental policies and equipped her with a widespread knowledge of socio-economic implications and benefits of various new developments.

Tsebo Majoro

Cell: 051 444 6324

E-mail: tsebo@urban-econ.com

Position: Development Economist

Qualifications: B.Com (Hons)

Experience: 2 years

Brief profile: Born and raised in the local area, Tsebo Majoro is a meticulous researcher, coordinator and strategist with an extensive theoretical background in Economic research and development. He possesses the ability to undertake analytical work and projects with minimal supervision. He's able to handle multiple priorities, and constricted deadlines.

Tsebo is part of Urban-Econ's Free State unit, which is responsible for research in a variety of applications including feasibility studies, economic studies, local economic development, market research, socio-demographic profiling, business plan formulation, and strategic property analyses

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS

Abbreviation	Term
BA	Basic Assessment
CAGR	Compounded Average Growth Rate
DEFF	Department of Environment, Forestry and Fisheries
DM	District Municipality
EIA	Environmental Impact Assessment
GDP	Gross Domestic Product
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
LM	Local Municipality
NDP	National Development Plan
NGPF	New Growth Path Framework
NSDP	National Spatial Development Perspective

PV	Photovoltaic
SA	South Africa
SIP	Strategic Integrated Project
UE	Urban-Econ Development Economists

NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) AND ENVIRONMENTAL IMPACT REGULATIONS 2014 (AS AMENDED) REQUIREMENTS FOR SPECIALIST REPORTS (APPENDIX 6)

Section in EIA Regulations 2014 (as amended)		Clause	Section in Report
Appendix 6	(1)	A specialist report prepared in terms of these Regulations must contain —	
	(a)	Details of - (i) the specialist who prepared the report; and	Page ii
		(ii) the expertise of that specialist to compile a specialist report including a curriculum vitae.	Page ii
	(b)	A declaration that the person is independent in a form as may be specified by the competent authority;	Annexure C: Declaration of Specialist
	(c)	An indication of the scope of, and the purpose for which, the report was prepared;	Section 1.2
	(cA)	An indication of the quality and age of base data used for the specialist report;	Section 1.5
	(cB)	A description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 5
	(d)	The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 1.5

	(e)	A description of the methodology adopted in preparing the report or carrying out the specialised process; inclusive of equipment and modelling used;	Section 1.4
	(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 alternative;	Section 5
	(g)	An indication 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;	Section 1.3
	(i)	A description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1.6
	(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 5, 6
	(k)	Any mitigation measures for inclusion in the EMPr;	Section 5
	(l)	Any conditions for inclusion in the environmental authorization;	Annexure B
	(m)	Any monitoring requirements for inclusion in the EMPr or environmental authorization;	N/A
	(n)	A reasoned opinion – (i) as to whether the proposed activity, activities or portions thereof should be authorized;	Section 5
		(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 authorized, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	Section 6

	(o)	A description of any consultation process that was undertaken during the course of preparing the specialist report;	Section 1.5
	(p)	A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Section 1.5
	(q)	Any other information requested by the authority.	N/A
	(2)	Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	Section 2

1 INTRODUCTION

This document is prepared by Urban-Econ Development Economists in request by SiVEST Environmental Division on behalf of Wildebeestkuil PV Generation (Pty) Ltd (hereafter referred to as "Wildebeestkuil PV Generation"), to undertake a Socio-Economic Basic Assessment Study for the construction of the 9.9 megawatt (MW) Wildebeestkuil 1 Solar Photovoltaic (PV) Plant, 132 kilovolt (kV) power line and associated infrastructure, near Leeudoringstad in the North West Province. The socio-economic study is conducted as part of the Basic Assessment (BA) process managed by SiVEST Environmental Division.

1.1 Project History

The original BA process for the proposed Wildebeestkuil PV Generation solar PV plant was initiated in August 2016. All specialist studies were undertaken and subsequently all site sensitivities were identified. The specialist studies and draft basic assessment reports (DBARs) were completed and released for 30-day public review.

The BA was however put out on hold prior to submitting the final basic assessment reports (FBARs) to the Department of Environmental Affairs (DEA). In February 2017, the proposed capacity and layout of the solar PV plant was amended, and a new connection point and associated power line corridors were assessed. However, the project was put on hold prior to submitting the application forms to the DEA or commencing with the legislated public participation process.

In August of 2020, Wildebeestkuil PV Generation proposed an additional 9.9MW solar PV plant on the Wildebeestkuil site (now referred to as the 9.9MW Wildebeestkuil 1 Solar PV Plant & 132kV Power Line and 9.9MW Wildebeestkuil 2 Solar PV Plant & 132kV Power Line) outside of all site sensitivities that were identified in 2016, and as such specialist studies have been commissioned to assess and verify the now two (2) solar PV plants and 132kV power lines under the new Gazetted specialist protocols[1].

1.2 Scope of the Study

The purpose of the socio-economic basic assessment is to determine the potential socio-economic implications of the proposed project activities at the proposed site layout (including the

[1] GOVERNMENT GAZETTE No. 43110, PROCEDURES FOR THE ASSESSMENT AND MINIMUM CRITERIA FOR REPORTING ON IDENTIFIED ENVIRONMENTAL THEMES IN TERMS OF SECTIONS 24(5)(a) AND (h) AND 44 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998, WHEN APPLYING FOR ENVIRONMENTAL AUTHORISATION, 20 MARCH 2020.

In terms of sections 24(5)(a), (h) and 44 of the National Environmental Management Act, 1998, prescribe general requirements for undertaking site sensitivity verification and for protocols for the assessment and minimum report content requirements of environmental impacts for environmental themes for activities requiring environmental authorisation, as contained in the Schedule hereto. When the requirements of a protocol apply, the requirements of Appendix 6 of the Environmental Impact Assessment Regulations, as amended, (EIA Regulations), promulgated under sections 24(5) and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), are replaced by these requirements. Each protocol applies exclusively to the environmental theme identified within its scope. Multiple themes may apply to a single application for environmental authorisation, and assessments for these themes must be undertaken in accordance with the relevant protocol, or where no specific protocol has been prescribed, in accordance with the requirements of the EIA Regulations.

power line corridor route alternatives), and to compare their effects with the "no-go" alternative. The "no-go" alternative assumes that the proposed Wildebeestkuil 1 Solar PV Plant, 132kV Power Line and associated infrastructure are not established at the proposed project site, which means that it represents the *status quo* of the environment, including the socio-economic situation.

The current report is prepared as an input into the basic assessment report that is compiled by SiVEST Environmental Division. The basic assessment report addresses the impacts as set out in the guidelines in terms of the Environmental Impact Assessment Regulations of 2014 (as amended). The purpose of the socio-economic Basic Assessment is as follows:

- Undertake a policy review and assess the alignment of the proposed project with the national, provincial and local socio-economic policies, with a focus on the compatibility of the project with the spatial planning, development objectives and land use management plans of the respective authorities.
- Create a socio-economic profile for the study area using secondary data. The guidelines for Basic Assessment specifically call for information on the level of unemployment and skills available in the local community, as well as the economic profile of the local municipality.
- Identify and analyse the potential socio-economic value of the proposed project and recommend the preferred site alternative considering the socio-economic characteristics of the two proposed locations and their surrounding environments.
- Evaluate the potential positive impacts versus any negative socio-economic effects that may ensue as a result of the change in status quo of the affected and benefiting communities and economies.

1.3 Project Content, Location and Study Area Delineation

Wildebeestkuil PV Generation proposes to construct a 9.9MW Solar Photovoltaic (PV) Plant, 132kV power line and associated infrastructure approximately 4km east of the town of Leeudoringstad in the Maquassi Hills Local Municipality, which falls within the Dr Kenneth Kaunda District Municipality in the North West Province of South Africa (hereafter referred to as the "proposed development").

The proposed development will have total maximum generation capacity of up to approximately 9.9MW and will be referred to as the Wildebeestkuil 1 Solar PV Plant & 132kV Power Line. The overall objective of the proposed developments is to generate electricity (by capturing solar energy) to feed into the national electricity grid and "wheel" the power to customers based on a power purchase agreement. Additionally, an agreement is in place to sell the energy to PowerX, who hold a National Energy Regulator of South Africa (NERSA)-issued electricity trading license which allows them to purchase energy generated from clean and renewable resources and sell it to its customers.

The proposed solar PV plant will be located on the following properties:

- Portion 13 of the Farm Wildebeestkuil No. 59;

- Portion 14 of the Farm Wildebeestkuil No. 59; and
- Remainder of Portion 22 of the Farm Wildebeestkuil No. 59.

The combined extent of the above-mentioned properties is approximately 115.5ha. The proposed solar PV plant and associated infrastructure assessed as part of this BA will however only occupy a portion of this property.

The power line corridor alternatives which were assessed traverse the following properties:

- Portion 13 of the Farm Wildebeestkuil No. 59;
- Portion 14 of the Farm Wildebeestkuil No. 59;
- Remainder of Portion 5 of the Farm Wildebeestkuil No. 59;
- Remainder of Portion 7 of the Farm Leeuwbosch No. 44;
- Remainder of Portion 29 of the Farm Leeuwbosch No. 44;
- Remainder of Portion 22 of the Farm Wildebeestkuil No. 59;
- Portion 35 of the Farm Leeuwbosch No. 44;
- Portion 36 of the Farm Leeuwbosch No. 44;
- Portion 37 of the Farm Leeuwbosch No. 44; and
- Portion 38 of the Farm Leeuwbosch No. 44.

The proposed development is located directly west of the Harvard Substation, where the current supply of electricity for the local areas and businesses is extracted from.

A summary of the key components to be constructed for the proposed development is provided below.

The key components to be constructed include the following:

- Solar PV field (arrays) comprising multiple PV modules
- PV panel mountings. PV panels will be single axis tracking mounting, and the modules will be either crystalline silicon or thin film technology
- Each PV module will be approximately 2.5m long and 1.2m wide and mounted on supporting structures above ground. The final design details will become available during the detailed design phase of the proposed developments, prior to the start of construction
- The foundations will most likely be either concrete or rammed piles. The final foundation design will be determined at the detailed design phase of the proposed development

In addition, related infrastructure required are:

- Underground cabling (≈ 0.8m × 0.6 wide)
- Permanent Guard House (≈876m²)
- Temporary building zone (≈2994m²)
- Switching Substation (≈2000m²)
- Internal gravel roads (≈3.5m width)
- Upgrade to existing roads; and
- Site fencing (≈2.1m high)

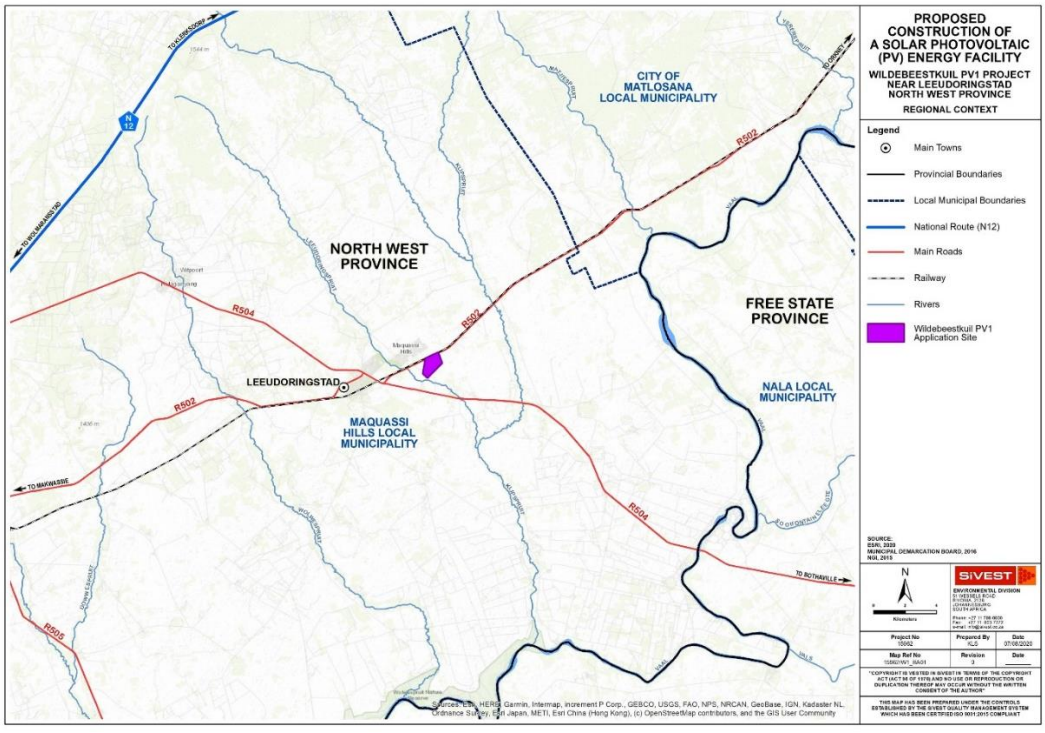
In addition to the above, the electricity generated by the proposed solar PV plant will be fed into the national electricity grid via a 132kV power line, which will connect to the Leeudoringstad Solar

Plant Substation (part of a separate BA process). Three (3) power line corridor route alternatives for the proposed 132kV power line were identified and assessed as part of the current BA process. These alternatives essentially provide for different power line route alignments contained within an assessment corridor (see section 7). The power line corridor route alternatives were informed by the identified environmental sensitive and/or “no-go” areas.

For the purpose of this BA, corridors between approximately 60m and 150m wide were assessed for the proposed power line corridor route alternatives. This is to allow for flexibility to route the power line within the assessed corridor. As such, the selected preferred power line will be routed within the assessed corridor. The final servitude will be routed within the power line corridor, and it expected that the servitude swill not exceed 32m (Map 1-2). The power line corridor route alternatives are detailed in section 7 of this report, while the results of the comparative assessment of alternatives are also provided in this section.

As mentioned, once fully developed, the intention is to generate electricity (by capturing solar energy) to feed into the national electricity grid and “wheel” the power to customers based on a power purchase agreement. Additionally, an agreement is in place to sell the energy to PowerX, who hold a NERSA-issued electricity trading license which allows them to purchase energy generated from clean and renewable resources and sell it to its customers.

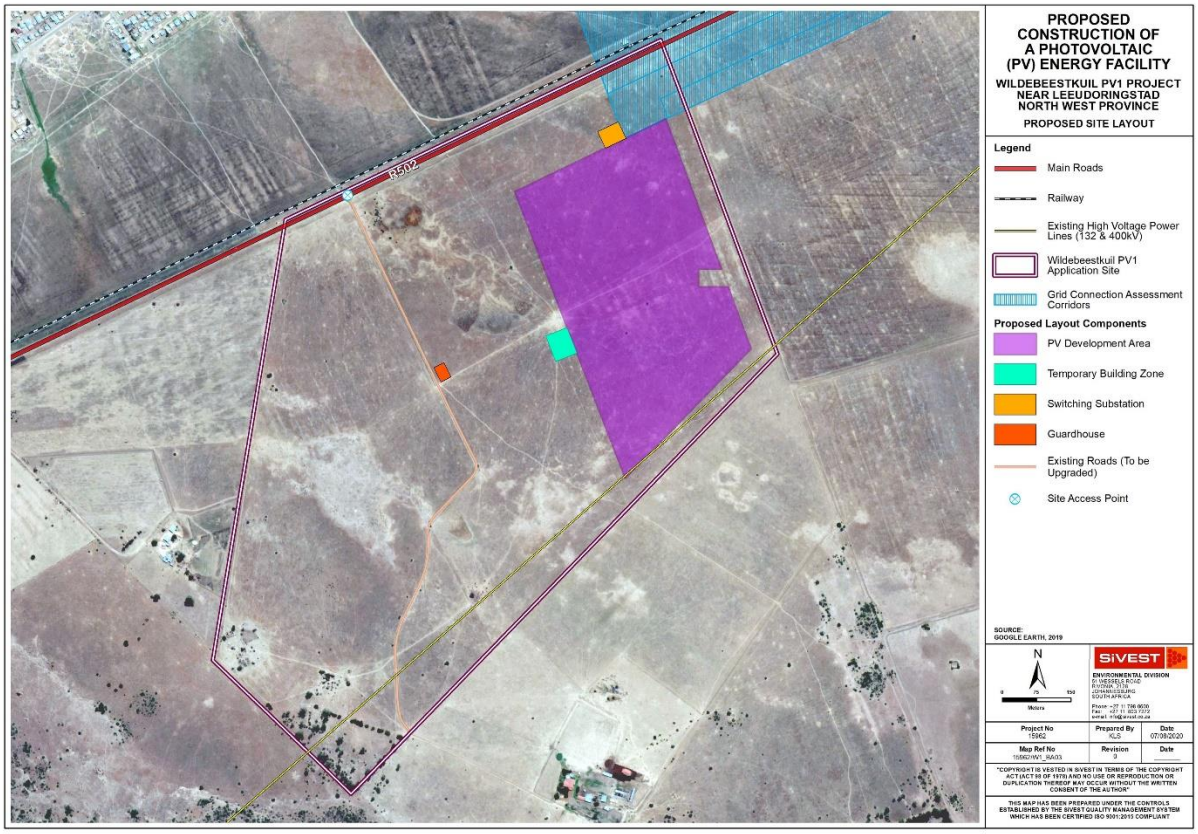
The construction phase will be between 12 and 24 months and the operational lifespan will be approximately 20 years, depending on the length of the power purchase agreement with the relevant off taker.



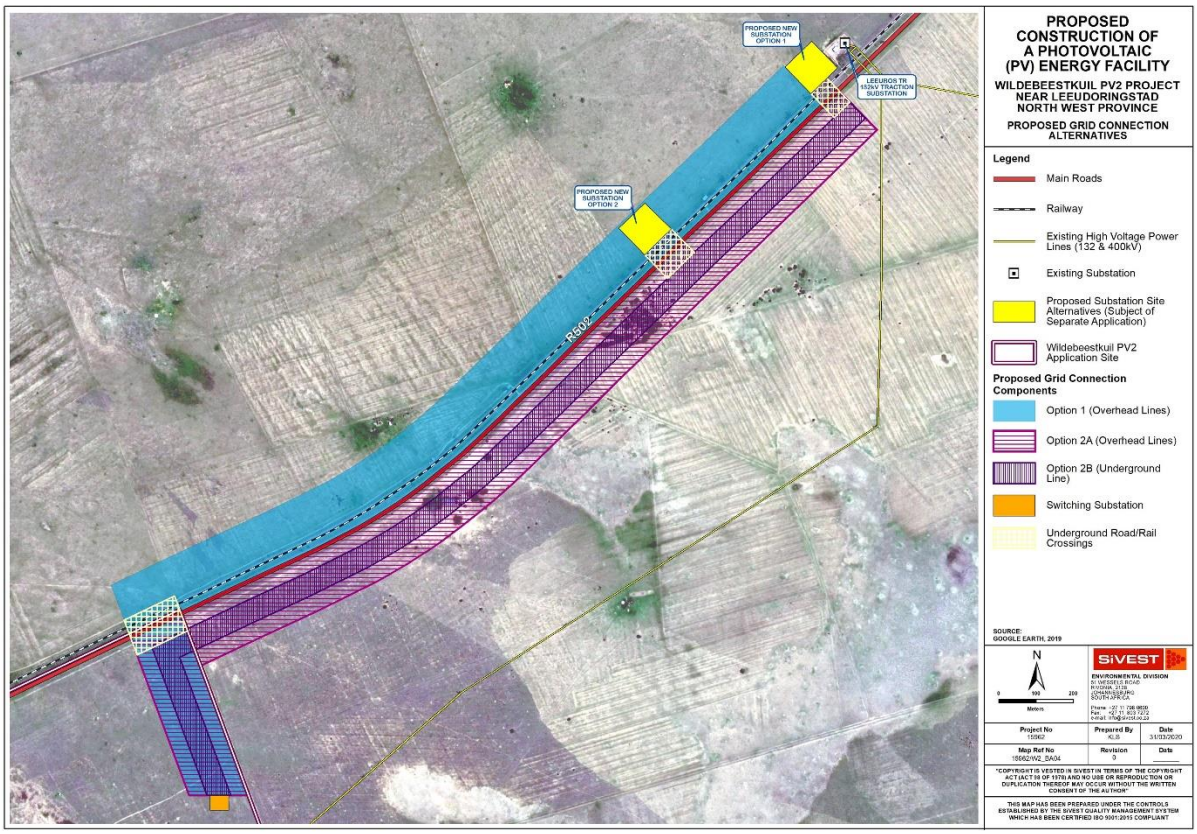
Map 1-1 Regional Contextualization of Wildebeestkuil 1 Solar PV Plant & 132kV Power Line (Source: SiVEST, 2020)

Map 1-2 and Map 1-3 below illustrates the site layout for the proposed Solar PV plant and 132kV power line corridor (including alternatives). An overlay of the site developmental components is illustrated in the map below as it relates to the site-specific environmental sensitivity considerations.

As mentioned, the combined extent of the properties which make up the application site for the solar PV plant is approximately 115.5ha. The proposed solar PV plant and associated infrastructure assessed as part of this BA will however only occupy a portion of this property. A switching substation and a permanent guard house will be located within the Wildebeestkuil property. Three (3)Power Line Corridor Route Alternatives connecting the Wildebeestkuil 1 Solar PV Plant to the Leeudoringstad Solar Plant Substation (part of separate BA process) run either side of the connecting road.



Map 1-2: Wildebeestkuil 1 Solar PV Plant Site Layout (Source: SiVEST, 2020)



Map 1-3: 132kV Power Line Site Layout (Source: SiVEST, 2020)

It should note that no design or layout alternatives for the PV development area, Switching Substation, Guard house and Temporary Building Zone (and all other associated infrastructure) are being considered or assessed as part of the current BA process. Design and layout alternatives were considered and assessed as part of a previous BA process that was never completed, and as such the PV development area, Switching Substation, Guard house and Temporary Building Zone (and all other associated infrastructure) have been placed to avoid site sensitivities identified as part of a previous BA process as well as the current BA process. Specialist studies were originally undertaken in 2016 and all current layouts and/or positions being proposed were selected based on the environmental sensitivities identified as part of these studies in 2016. All specialist studies which were undertaken in 2016 were however updated in 2020 (including ground-truthing, where required) to focus on the impacts of the layout being proposed as part of the current project. The results of the updated specialist assessments have informed the layout being proposed as part of the current BA process. The proposed layout has therefore been informed by the identified environmental sensitive and/or “no-go” areas.

As mentioned above, three (3) power line corridor route alternatives for the proposed 132kV power line were however identified and assessed as part of the current BA process. The power line corridor route alternatives which have been assessed are detailed in section 7 of this report, while the results of the comparative assessment of alternatives are also provided in this section.

1.4 Methodology

The methodology employed in conducting the study comprised of the steps illustrated in Figure 1-1.

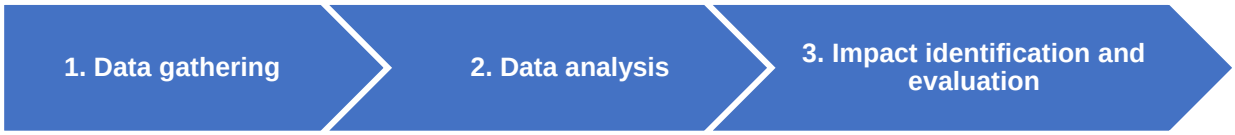


Figure 1-1: Methodology

The following paragraphs briefly describe each step.

Step 1: Data gathering

Impact assessment requires the knowledge of the socio-economic environment that will be affected by the proposed project and envisaged expenditure on the project during both the construction and operational phases. In order to create a comprehensive understanding of the socio-economic environment that might be affected by the proposed development, a socio-economic profile of the study areas as well as the zone of influence was developed.

Step 2: Data Analysis

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

Step 3: Impact Identification and Evaluation

This step includes the description and evaluation of socio-economic impacts that could be expected during the construction and maintenance phases of the proposed solar PV plant, 132kV power line and associated infrastructure. Where applicable, the anticipated impacts will be analysed in the context of each of the possible power line corridor alternatives.

The assessment of impacts is done following the methodology prescribed by the environmental consultant and outlined in Annexure A.

1.5 Data Gathering and Consultation Process

The project made use of both secondary and primary data.

Secondary Data Gathering

Secondary data was sourced from the following databases and documents:

- Stats SA Census, 2011
- Quantec Research Standardised Regional Data, 1995-2018

- Stats SA Labour Force Survey, 2019
- Community Survey, 2016
- Integrated Development Plans (IDP)
    - Dr Kenneth Kaunda District Municipality Integrated Development Plan 2017/18 – 2021/22
    - Maquassi Hills Local Municipality Third Generation Integrated Development Plan 2013-2016 (Amendments based on the 2016 Annual Report)
- Provincial Strategic documents
    - North West Provincial Development Plan 2030

Primary Data Gathering

The main purpose of the primary data collection exercise was to gain insight into the socio-economic characteristics of the zone of influence. Therefore, the primary data gathering exercise focused on engaging with interested and affected parties (I&APs) by means of personal interview, telephone and e-mail. In-person interviews were undertaken during the site visit that took place on 12 September 2016. Telephonic communications and e-mail communications took place during the second half of September 2016.

The following table outlines the parties that were successfully engaged with during the course of the study.

Table 1-1: Information on directly interested and affected parties

I&AP	Reason for contacting	Position	Means and date of data collection (2016)
Wildebeestkuil 59 Portion 13 & 14	Directly affected	Farm owner	Meeting on 12 September 2016
Maquassi Hills Local Municipality	Municipality representative	IDP Manager	Telephone interview on 27 September
Kgakala Township	Local Community Representative	Ward Councillor	Telephone interview on 27 September

1.6 Assumptions, Limitations and Gaps in Knowledge

- Project-related information supplied by the environmental practitioner and the client for the purpose of the analysis is assumed to be reasonably accurate.
- The secondary data sources used to compile the socio-economic baseline (demographics, dynamics of the economy) although not exhaustive, can be viewed as being indicative of broad trends within the study area.
- Possible impacts, as well as stakeholder responses to these impacts, cannot be predicted with complete accuracy, even when circumstances are similar and these predictions are

based on research and years of experience, taking the specific set of circumstance into account.

- Limited timeframes were allocated for the study. However, it is believed that the data gathered from various I&APs is sufficient to confidently predict the potential socio-economic impacts of the proposed project and objectively evaluate their significance. This is assuming that:
    - Questions asked during the interviews were answered accurately and truthfully by respondents and to the best of their abilities and knowledge.
    - That the attitudes of the respondents towards the project will remain reasonably stable over the short- to medium-term.
- The focus on the primary data collection was on those parties that were perceived to be most sensitive to the proposed project. As such, it is believed that the study was able to identify the most significant impacts and assess the most pertinent issues.

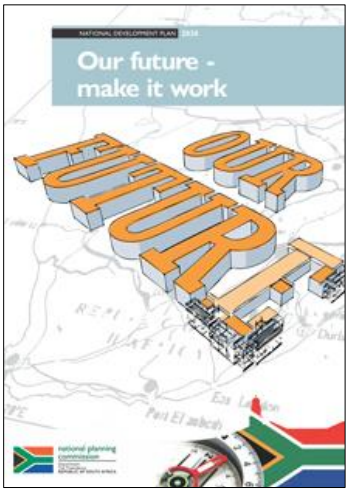
2 POLICY REVIEW

A policy review plays an integral role in the early stages of a project. The review provides a high-level indication of whether a project is aligned with the goals and aspirations of the developmental policy within a country and at a local level. Furthermore, the analysis signposts any red-flags or developmental concerns that could jeopardise the development of the project, and assists in amending it, preventing costly and unnecessary delays.

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

- National (South Africa):
  - Integrated Resource Plan (IRP) for Electricity 2010-2030: Update Report 2019
  - National Development Plan (NDP) 2030 (2011 - 2030)
  - National Spatial Development Framework 2018
  - New Growth Path Framework (NGPF), 2010
  - A Summary of the South African National Infrastructure Plan (Presidential Infrastructure Coordinating Commission report 2012)
  - Industrial Policy Action Plan (IPAP) 2018/2019 – 2020/2021
- Regional:
  - North West Provincial Development Plan (2013)
  - Renewable Energy Strategy for the North West Province 2012
- Local:
  - Dr Kenneth Kaunda District Municipality Integrated Development Plan 2017/18 - 2021/22
  - Maquassi Local Municipality Integrated Development Plan (IDP) 2013-2016 (Amendments based on the 2016 Annual Report)

National Policy Overview

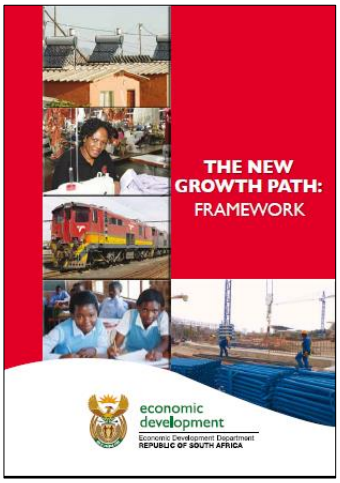


The **National Development Plan, 2011 - 2030** (NDP) aims to address parts of the South African triple development challenges of poverty and inequality by 2030. In order to achieve this, numerous enabling milestones and critical actions have been formulated. One of the critical actions is the formulation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

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

A more efficient and competitive infrastructure is envisaged, particularly infrastructure that facilitates economic activity and is conducive to growth and job creation. The plan identifies key services that need strengthening; namely commercial transport, energy, telecommunications and water, while ensuring their long-term affordability and sustainability. The National Planning Commission argues that South Africa

has missed a generation of capital investment in many infrastructure including electricity. Therefore, one infrastructure investment priority is in the procurement of at least 20000 MW of renewable energy-efficiency (National Planning Commission, 2011). The Solar PV Plant near the town of Leeudoringstad in the North West Province is thus well aligned with the aims of the NDP.



The purpose of the **New Growth Path, 2011 - 2030** is to provide a framework that enables the achievement of the vision of 'jobs and decent work placed at the centre of economic policy'. One of the identified job drivers is in the green economies. The green economy necessitates profound changes in energy infrastructure. The framework states that public investment can create 250 000 jobs annually in energy, transport, water and communications infrastructure and in housing. These jobs are said to be in four activities, the construction of new infrastructure; the operation of new facilities; expanded maintenance; and the manufacture of components for the infrastructure programme. Most of these activities correspond to those in the proposed PV Plant project. The strategy developed to achieve employment creation is essentially in offering comprehensive support for energy efficiency and renewable energy, including appropriate pricing policies, combined with programmes to encourage the local production of inputs, commencing with solar water heaters (Department of Economic Development, 2011).

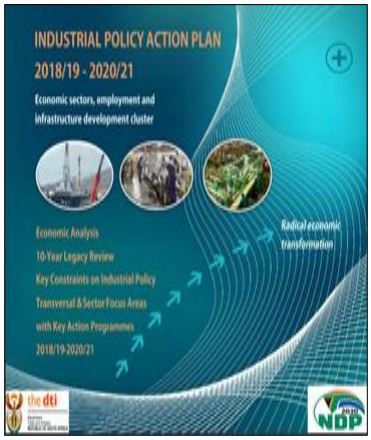
The **National Spatial Development Framework, 2018** (NSDP) is a government document that seeks to make a bold and decisive contribution to bringing about peaceful, prosperous and truly transformed South Africa, as articulated in the Freedom Charter, the Reconstruction and Development Programme (RDP) and the National Development Plan (Department of Planning, 2018). It does so in full recognition of:

- The stranglehold that the unjust national spatial development paradigms, logics and patterns of the past have placed on many attempts at breaking the back of poverty, unemployment and inequality.
- The valuable, and often hard lessons learnt over the last twenty-four years in the pursuit of national reconstruction, inclusive economic growth and spatial transformation.
- The necessity for decisive, collaborative and targeted state action in national space, to drive South Africa towards the shared, inclusive and sustainable future we desire and require.

The **Integrated Resource Plan for Electricity, 2019** notes that the 2008 electricity supply crisis emerged from Eskom's maintenance delay on the generation fleet. The resultant deterioration in performance of the ageing fleet and the exacerbation of the current electricity crisis has had a long-term impact on the effectiveness of the fleet to meet future demand. Solar power was thus, outlined as an alternative and additional source of energy. Furthermore, a solar corridor linking the Northern Cape to the North West is envisaged. The goal is to reduce dependence on coal used in electricity generation to below 50% by 2030 (Energy, 2013). The proposed Wildebeestkuil solar project is therefore well in line with this plan.

The **South African National Infrastructure Plan, 2012** speaks of 'greening the economy'. In terms of electricity generation, transmission and distribution, three Strategic Integrated Projects (SIP) are relevant:

- SIP 4: Unlocking the economic opportunities in the North West Province
- SIP 9: Accelerate the construction of new electricity generation capacity in accordance with the IRP 2010 to meet the needs of the economy
- SIP 10: Expanding the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development (Presidential Infrastructure Coordinating Commission, 2012).

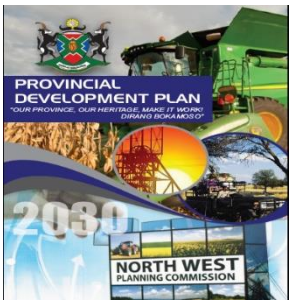


The **Industrial Policy Action Plan, 2018/2019 – 2020/2021** provides an economic analysis of prevailing global and domestic economic conditions relevant to industrial policy; time bound action plans and programmes across a range of sectors and listing the key constraints to an optimal industrial strategy (DTI, 2018).The South African electro-technical sector is largely dependent on imported content. As a result, South Africa needs to increase the design and production capabilities through the following:

- Attract and maintain investments in certain areas of production.
- Localise production of inputs where local capacity and capability exists.
- Focus on potentially highly lucrative export markets across the African continent.

All of these are aimed at addressing historical imbalances. The proposed Wildebeestkuil Solar project is evidently in line with this plan.

Provincial Policy Overview



The detriments of climate change are reflected in the North West Province and it is dominantly the poorer communities who could be exposed if development challenges are not addressed in a manner that ensures environmental sustainability and builds resilience. The Province significantly depends on non-renewable sources and experiences pollution and environmental degradation. The **North West Provincial Development Plan (2013)** further acknowledges that energy provision is a concern in some areas, given that the mining sector consumes a great portion of the available electricity.

Energy is undisputedly considered an economic enabler and due to the critical role it plays in socio-economic development, it forms part of the Sustainable Development Goals (i.e. SDF7). Renewable energy sources have the potential to be implemented in smaller units that can function in a more decentralised way. The objective developed is therefore to produce sufficient energy to support industry at competitive prices ensuring access for poor households, while reducing carbon emissions per unit of power by approximately one-third. Furthermore, the specific targets are to:

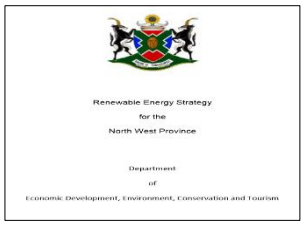
- Increase the population with access to electricity from 84% in 2011 to 95% by 2030, with non-grid options available for the rest
- Increase renewable energy consumption to 37% by 2030
- Ensure that 67% of households have a solar water heater installed

The actions set out to achieve this are:

- Develop energy infrastructure and service provision
- Expand renewable energy with special reference to solar power
- Increase energy efficiency (reduce demand)

Furthermore, the job creation potential of the renewable energy industry is not so much in the operation and maintenance of such facilities but rather in the manufacturing of such technologies. Thus, the goal is to promote renewable energy throughout the province in order to increase demand and resultantly increase jobs in the manufacturing of PV panels (Commission N. W., 2013).

The proposed Wildebeestkuil solar PV and power line project near the town of Leeudoringstad in the North West Province fulfils the operation and maintenance of PV plants aims. Nonetheless, the successful implementation of the project will stir the demand and serve as an indicator of the advantages of solar power. The plan further states that renewable energies, particularly solar and waste/biomass-to-energy initiatives will play an increasingly important role in the following two decades and will contribute a much greater share to the provincial energy consumption (Commission N. W., 2013). The North West Province is the second most receptive province following Northern Cape in terms of radiation, thus the location of the proposed project is appropriate.



Similar to the North West Provincial Development Plan (PDP), the **Renewable Energy Strategy for the North West Province 2012** argues that the generation of clean energy is one of the responses to climate change and it is a way to meet the commitments of the Kyoto Protocol. The Dr Kenneth Kaunda District Municipality is identified as having a high PV prioritisation; therefore, the proposed project is relevant and will assist in this quest. The strategy further concurs with the PDP in that solar technologies hold the greatest potential for the province since there is a favourable solar insulation and suitable area to install solar energy technologies. The Strategy targets 50% of renewable energy consumption (Department of Economic Development, 2012).

Local Policy Overview

The **Dr Kenneth Kaunda District Municipality Integrated Development Plan 2017/18 - 2021/22** identifies the comparative advantage of electricity provision and production that the region has in the provincial context. The 2019/20 IDP amendments ensures municipalities adopt a single, inclusive and strategic plan for the development of the municipality which links, integrates and co-ordinates plans and takes into account proposals for the development of the municipality (Municipality D. K., Dr Kenneth Kaunda District Municipality Intergrated Development Plan 2017/18 - 2021/22, 2017). One of the key strategic goals for the district is to promote physical infrastructure development and services. The proposed solar project can thus accentuate the comparative advantage of the region and is additionally in sync with one of the key strategic goals.

The **Maquassi Hills Local Municipality (LM) Integrated Development Plan, 2013 - 2016** (*latest available IDP*) recognises that the municipality's electricity network has aged. In line with the National Electrification Programme as a key spending programme, a total operational expenditure of R48.4 million was allocated for the provision of electricity services (Maquassi Hills Local Municipality, 2016). A further rationale for alternative sources of electricity is that 3 970 households do not have access to electricity in the Maquassi Hills LM (Quantec, 2020).

The Maquassi Hills LM is the electricity supply authority in the towns and townships of Wolmaransstad, Makwassie, Leeudorinstad, Witpooort, Tswelelang, Kgakala, Lebaleng. Furthermore, the Maquassi Hills LM is a service provider in the areas of Wolmarannstad, Leeudoringstad, Makwassie and the villages of Boskuil and Oeronskraal. The minimum level of level of electricity service connections is 80% (Maquassi Hills Local Municipality, 2016).

There is a total of 2 571 customers that are supplied by the Maquassi Hills LM. The other areas are directly supplied by Eskom. In total, Eskom supplies in excess of 14 000 customers. The major growth in demand for residential supply is in the Eskom supplied areas (Maquassi Hills Local Municipality, 2016). The proposed project is thus, relevant and will contribute to the LM's plan.

3 BASELINE INFORMATION

This chapter examines key socio-economic characteristics of the study area, as per delineation provided. This is essential as it provides both qualitative and quantitative data related to the communities and economies under observation, creating a baseline against which the impacts can be assessed.

3.1 Study Area's Composition and Locational Factors

The proposed 9.9MW Wildebeestkuil 1 Solar PV Plant and 132kV Power Line is planned to be located in the Maquassi Hills LM of the Dr Kenneth Kaunda District Municipality in the North West Province. As mentioned, the proposed solar PV plant will be located on the following properties:

- Portion 13 of the Farm Wildebeestkuil No. 59;
- Portion 14 of the Farm Wildebeestkuil No. 59; and
- Remainder of Portion 22 of the Farm Wildebeestkuil No. 59.

The combined extent of the above-mentioned properties is approximately 115.5ha.

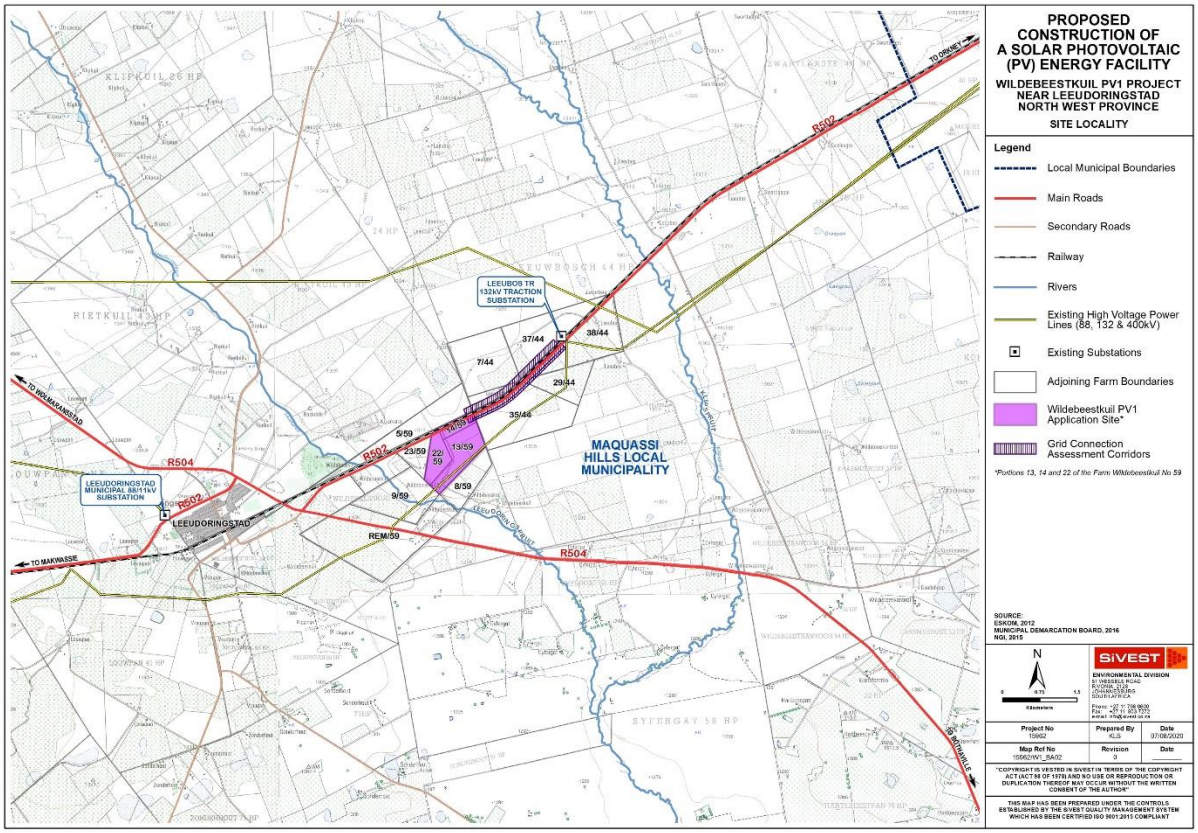
The power line corridor alternatives which were assessed traverse the following properties:

- Portion 13 of the Farm Wildebeestkuil No. 59;
- Portion 14 of the Farm Wildebeestkuil No. 59;
- Remainder of Portion 5 of the Farm Wildebeestkuil No. 59;
- Remainder of Portion 7 of the Farm Leeuwbosch No. 44;
- Remainder of Portion 29 of the Farm Leeuwbosch No. 44;
- Remainder of Portion 22 of the Farm Wildebeestkuil No. 59;
- Portion 35 of the Farm Leeuwbosch No. 44;
- Portion 36 of the Farm Leeuwbosch No. 44;
- Portion 37 of the Farm Leeuwbosch No. 44; and
- Portion 38 of the Farm Leeuwbosch No. 44.

The closest town is Leeudoringstad, which is approximately 4km east from the application site which forms part of the solar PV plant (namely Portion 13, Portion 14 and Remainder of Portion 22 of the Farm Wildebeestkuil No. 59). The closest residential area is a township called Kgakala.

It may be classified as the local community for this project. According to the ward councillor, the main socio-economic issues in Kgakala are unemployment and crime. Furthermore, service delivery is a major municipal limitation. The proposed project is supported by both the local authority and ward councillor.

The project site may be accessed from the R502, parallel to which the Leeubos Railway line is located. The surrounding land uses consist of commercial farming, mining and residential. The closest tourist destination is the Wolwespruit Nature Reserve, 21km south-west from the project area. Lastly the project site is in close proximity to the boundary separating the Free State Province from the North West Province.



Map 3-1 Contextual Representation of Project Area

3.2 Demographic Profile

The population of any geographical area is the basis of the development process, as it affects all areas of human activity. Demography serves as an indicator of trends, which assists in understanding population dynamics. This numerical profile is essential in gaining an accurate perspective of those who are likely to be affected by any prospective development or project.

The population of Maquassi Hills Local Municipality is estimated to be 96 042 in 2020 and constitutes 11.6% of the Dr Kenneth Kaunda District Municipality and only 2.4% of the North West Province's population (Urban-Econ calculations based on Quantec 2020). Evidently, the Maquassi Hills LM, from a provincial and district context, houses a relatively small population. The average growth rate over the past ten years has been 2.3%, which is slightly above the national and provincial growth rates by 1.4% and 1.6%, respectively (Urban-Econ calculations based on Quantec 2020). A recorded 26 941 households resided in the Maquassi Hills LM in 2020 and thus comprise of 2% of all households in the Province. This indicates a significantly small residential footprint from a provincial level. The average household size in the LM is 3.9; whereas the average provincial household size is 3.4 (Quantec, 2020) Thus, the household size in Maquassi LM is higher than that of the province.

Approximately 59 065 residents of the Maquassi LM's population are between the ages of 15 and 64 and therefore comprise of the working age population (Quantec, 2020) This makes up 61.5%

of the LM's population. In terms of gender distribution, there is a 1% difference between males and females with males dominating.

3.3 Economy

The structure of the economy and the composition of its employment provide valuable insight into the dependency of an area on specific sectors and its sensitivity to fluctuations of global and regional markets. Knowledge of the structure and the size of each sector is also important for the economic impact results' interpretation, as it allows the assessment of the extent to which the proposed activity would change the economy, its structure, and trends of specific sectors.

The economy of Maquassi Hills LM was valued at R3 515,9 million in current prices. The tertiary sector accounts for 65% of the LM's Gross Domestic Product (GDP), followed by the primary sector and secondary sector with 21% and 14% contributions, respectively (Quantec, 2020). The general government sector particularly contributes close to a fifth (19.06%) of the local economy's production. The second largest contributing sector is the wholesale and retail trade with a contribution of R549 million in current prices

Based on constant 2005 prices, the Maquassi Hills LM grew at a relatively small rate of 0.51% CAGR over the ten-year period spanning 2010-2020. The growth was driven by the increasing performance of the trade sector at which grew by 7.2% over the same period. Other sectors that contributed to the growth over the same ten-year period included the agriculture sector at 7.1% and the community, social and personal services with 6.6% (Quantec, 2020). However, the growth of the above-mentioned sectors was offset by the decline observed in the other industries, resulting in a notably lower performance of the economy over the years.

3.4 Labour Force and Employment Structure

Employment is the primary means by which working age individuals may earn an income that will enable them to provide for their basic needs and improve their standard of living. As such, employment and unemployment rates are important indicators of socio-economic well-being.

A significant proportion (61.5%) of the population of the Maquassi Hills LM is of working age (Quantec, 2020). However, only close to one-third of this population is employed. The Maquassi Hills LM employment figure represents only 2% of the provincial employment figure due to the fact that it holds only 2.4% of the province's population (Quantec, 2020). Thus, from a local level, the 66.1% unemployment rate is massive; however, from a provincial scale it is relatively minor.

Information suggests that 16 113 people are absorbed in the formal sector and 4 588 work in the informal sector. The formal sector thus, has over three times the number of employees than the informal sector. In the formal sector, semi-skilled workers dominate with 7 235, followed by unskilled workers with 6 268 and lastly, there are 2 610 skilled workers (Stats SA, 2020). The skill levels are, therefore, low in the Local Municipality.

The economic sectors with the highest proportion of employees on the local scale are Agriculture with a quarter of all employed individuals. This is followed by the Community, Social and Personal Services sector with 3 722 employees and the Wholesale and Trade sector with 3 334 employees.

3.5 Income

Income is a commonly used proxy for measuring poverty. A poverty line is a minimum threshold that is required by a household to meet its basic needs. Income analysis is imperative as it serves as an indicator of the standard of living of the population of the study area concerned.

According to the 2011 National Census, the weighted average household income in the Maquassi Hills LM was R4 836 in basic prices. About 2 973 or 14.5% of the LM's households had no regular income in 2011 (Stats SA, 2020). In total 77.2% of LM's households are surviving on an income less than R3 200 per month in current prices (Stats SA, 2020). One fifth (20.6%) of the population are in the middle-income category. In this light, the LM can be considered as dominantly relatively poor. This status can be attributed to the education levels of the LM.

Just over a fifth of the population aged over 20 in the LM have no schooling, 18.5% have acquired a matric qualification, and 4.8% have acquired a higher education qualification. On the provincial level, 11.6% of the population aged over 20 do not have schooling, whilst a quarter have acquired a matric and 7.5% have acquired a higher education qualification (Quantec, 2020). From this, it can be deduced that the education levels are low and less than a quarter of the population over 20 have successfully completed formal schooling.

3.6 Access to Electricity

The introduction of new solar PV and power line developments in the Maquassi Hills LM region will have an impact on the local household's access to electricity, if the municipality purchases electricity directly from the SPV. An analysis of the types of electricity usage in the Maquassi Hills LM will indicate the number of households that may utilise additionally generated electricity.

The household access to electricity can be seen in the table below. An estimated 26 557 households had access to the electricity grid in 2020, while 2 141 households had no access to electricity. In accordance with the North West Provincial Development Plan (2013) target of 95% of households with access to the electricity grid, the Maquassi Hills LM falls short by approximately 2,6%

Table 3-1: Access to Electricity (Source: Quantec (2020)

Access to Electricity	Households (Number)	Proportion %
In-house conventional meter	1 408	4,9%
In-house prepaid meter	24 326	84,7%
Connected to other source which household pays for (e.g. connected to neighbour's line and paying neighbour, paying landlord)	681	2,4%
Connected to other source which household is not paying for (e.g. connected to neighbour's line and not paying neighbour)	141	0,5%

Generator	0	0,0%
Solar home system	0	0,0%
Battery	0	0,0%
Other	32	0,1%
No access to electricity	2 141	7,5%
Total	**28 730**	**100%**

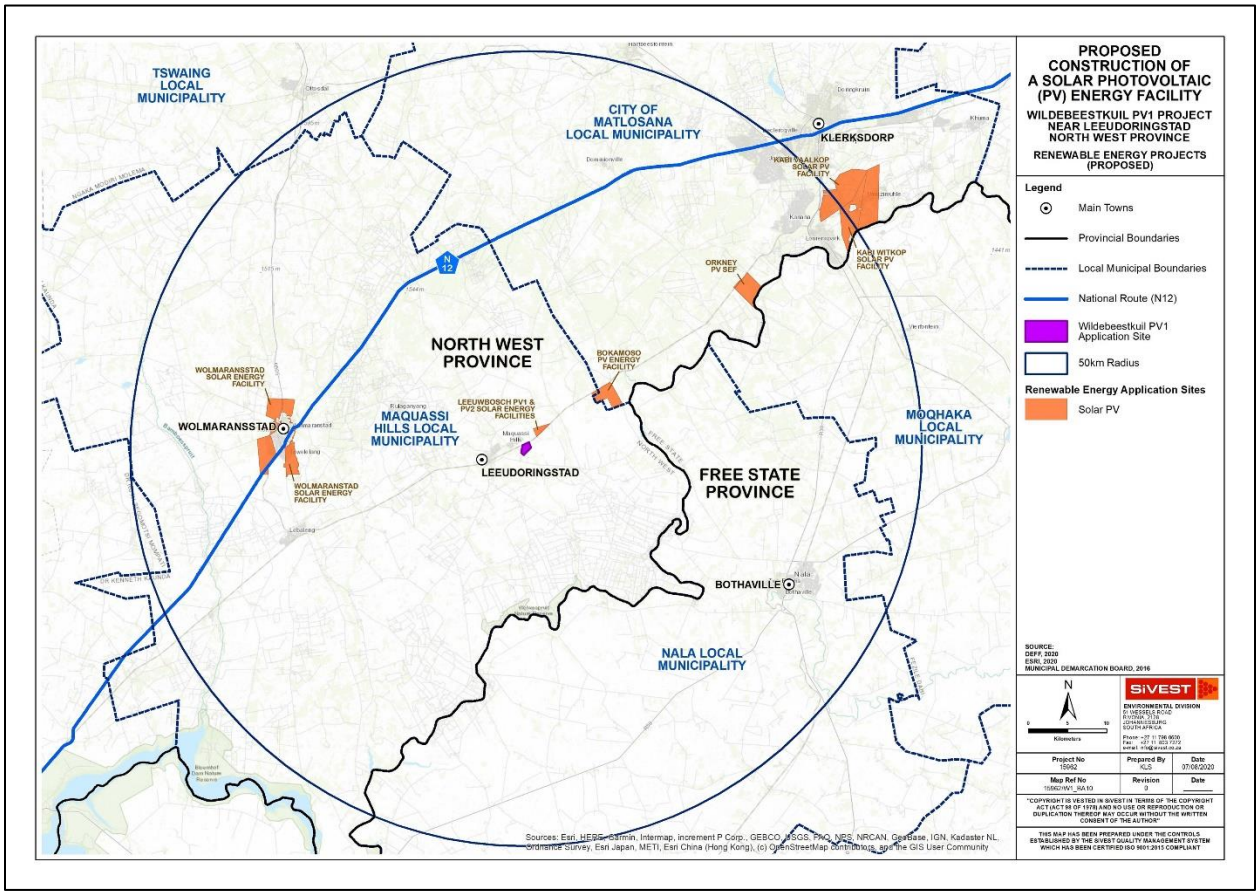
In order to reach the goals of the North West Provincial Development Plan, additional energy generators are required to increase electricity supply, which would therefore improve the affordability in the long run, due to a decrease in rea prices.

3.7 Existing and Planned Developments in the Area

The area has seen a notable interest from developers of various renewable energy projects, which could be associated with the solar energy resource potential found in the region, proximity to the existing substation and its evacuation capacity, as well as other factors. Such developments, whether already approved or only proposed, need to be considered as they have the potential to create numerous cumulative impacts, whether positive or negative, if implemented. Table 3-2 below lists the projects that will need to be considered when examining the cumulative impacts.

Table 3-3-2: Proposed Renewable Energy Projects in the Area

Proposed Development	Reference Number	Current Status of BA / EIA	Proponent	Proposed Capacity	Farm Details
Leeuwbosch 1 Solar PV Plant Project	TBA	BA ongoing	Leeuwbosch PV Generation (Pty) Ltd	9.9MW	Farm Leeuwbosch 44
Leeuwbosch 2 Solar PV Plant Project	TBA	BA ongoing	Leeuwbosch PV Generation (Pty) Ltd	9.9MW	Farm Leeuwbosch 44
Wildebeestkuil 1 Solar PV Plant Project	TBA	BA ongoing	Wildebeestkuil PV Generation (Pty) Ltd	9.9MW	Farm Wildebeestkuil 59
Wildebeestkuil 2 Solar PV Plant Project	TBA	BA ongoing	Wildebeestkuil PV Generation (Pty) Ltd	9.9MW	Farm Wildebeestkuil 59
Bokamoso Solar Energy Facility	14/12/16/3/3/2/559	Project has received environmental authorisation	SunEdison	75MW	A portion of the farm Matjesspruit 145



Map 4-2: Renewable energy projects within 50km of Wilderbeestkuil 1 Solar PV Plant & 132kV Power Line

The proposed project is to be located in an area of very limited activity when it comes to renewable energy projects. However, when evaluating the potential impacts, one renewable energy project has already been approved under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) and refers to the Bokamoso Solar PV project.

Bokamoso is the site for the approved 75MW solar PV plant. It is approximately 10km from the proposed 9.9MW Wildebeestkuil 1 Solar PV Plant site (energyblog, 2016). In addition, another 9.9MW solar PV plant, namely Wildebeestkuil 2 Solar PV Plant (part of separate BA process) will be located on Portion 13, Portion 14 and Remainder of Portion 22 of the Farm Wildebeestkuil No. 59, adjacent to the Wildebeestkuil 1 Solar PV Plant (this project). Two (2) more 9.9MW Solar PV Plants, namely the Leeuwbosch 1 Solar PV Plant and Leeuwbosch 2 Solar PV Plant (part of separate respective BA processes), will also be located on Portion 37 of the Farm Leeuwbosch No. 44, 1km from the project area. The next closest approved renewable energy project is just over 150km from the Wildebeestkuil 1 Solar PV Plant. Thus, the immediate area surrounding the proposed project has very limited renewable energy projects.

Bokamoso, due to its size, is expected to have a much larger impact, both positive and negative, in the area compared to the proposed project. Therefore, when assessing the cumulative effect

of the proposed 9.9MW Wildebeestkuil 1 Solar PV Plant & 132kV Power Line considering other developments in the area, the effects are expected to be of lower significance.

The significance of the cumulative impacts associated with the proposed development have been rated according to SiVEST's Impact Rating Methodology (Annexure A) in Table 5-1 below. The impact assessment has revealed that cumulative impacts are expected to be positive low after the implementation of the recommended mitigation measures.

4 PROFILE OF THE ZONE OF INFLUENCE

The map below demonstrates a 3km radius from the proposed project area. Furthermore, it represents the demarcation of farm portions in the zone of influence. Various activities have been identified within this zone. Most of the land is underutilised, however scattered commercial farming takes place. There are eight (8) built structures identified to be located in the zone of influence, which are mainly farmhouses. In addition, a portion of the Kgakala Township is located within the zone of influence.

In total, 20 farm portions are identified to be located within the zone of influence. In order to collect information on the current land uses and socio-economic profile of each of these farms portions, both visual observation and interviews were employed. The following table summarises the information collected. It is important to note that no concerns were raised during the interviews with the potentially affected parties.

Table 4-1: Affected Farms Information

Farm Portions	Area (Ha)	Impact nature	Land use	Presence of residence
Portion 13 Farm Wildebeestkuil 59	120	9,9MW Solar PV Plant Footprint	Commercial Farming. Livestock Farming.	4 farm structures and residences
Portion 14 of the Farm Wildebeestkuil No. 59;		Potential Power Line Corridor	Commercial Farming. Livestock Farming.	N/A
Remainder of Portion 5 of the Farm Wildebeestkuil No. 59;		Potential Power Line Corridor	Commercial Farming. Livestock Farming.	N/A
Remainder of Portion 7 of the Farm Leeuwbosch No. 44;		Potential Power Line Corridor	Commercial Farming. Livestock Farming.	N/A
Remainder of Portion 29 of the Farm Leeuwbosch No. 44;		Potential Power Line Corridor	Commercial Farming. Livestock Farming.	N/A
Remainder of Portion 22 of the Farm Wildebeestkuil No. 59;		Potential Power Line Corridor	Commercial Farming. Livestock Farming.	N/A

Farm Portions	Area (Ha)	Impact nature	Land use	Presence of residence
Portion 35 of the Farm Leeuwbosch No. 44;		Potential Power Line Corridor	Commercial Farming. Livestock Farming.	N/A
Portion 36 of the Farm Leeuwbosch No. 44;		Potential Power Line Corridor	Commercial Farming. Livestock Farming.	N/A
Portion 37 of the Farm Leeuwbosch No. 44; and		Potential Power Line Corridor	Commercial Farming. Livestock Farming.	N/A
Portion 38 of the Farm Leeuwbosch No. 44.		Potential Power Line Corridor	Commercial Farming. Livestock Farming.	N/A
Farm portions located further away from the project site				
Portion 47 Farm Leeuwbosch 44	642	Visual but further away from site	Commercial Farming	None
Remainder of Portion 5 Farm Leeuwbosch 44	333	Visual but away from site	Commercial Farming	None
Portion 21 Leeuwbosch 44	924	Visual but away from site	Commercial Farming	None
Portion 36 Farm Leeuwbosch 44	200	Visual but away from site	Commercial Farming	None
Remainder of Portion 29 Farm Leeuwbosch 44	618	Visual and opposite site	Commercial Farming	None
Portion 13 Farm Leeuwbosch 44	644	Visual but further away from site	Commercial Farming	None
Portion 14 Farm 59	172	Visual but away from site	Commercial Farming	None
Portion 13 Farm Leeuwbosch 44	219	Visual but further away from site	Commercial Farming	None
Portion 26 Farm Leeuwbosch 44	128	Visual but away from site	Commercial Farming	None
Portion 27 Farm Leeuwbosch 44	128	Visual but further away from site	Commercial Farming	None
Kgakala	200	Visual but away from site	Medium density Residential area	2369 households

Source: Based on interviews, Google Earth map observations and spatial data from Chief Surveyor-General website (csg.dla.gov.za)

5 SOLAR PV PLANT AND 132KV POWER LINE (INCLUDING ASSOCIATED INFRASTRUCTURE) SOCIO-ECONOMIC IMPACT EVALUATION – ALL PHASES

The following sections discuss the socio-economic impacts that the proposed 9.9MW Wildebeestkuil 1 Solar PV Plant & 132kV Power Line is expected to create considering the knowledge of the potentially affected socio-economic environment. The impacts identified were informed by interviews with I&APs, as well as the information available about the project. Project-related information concerning the capital costs and employment were sourced from the client and are assumed to be the most accurate data available at the time of the study. A summary of the findings is seen in the table below and an explanation of the Impact assessment rating methodology can be viewed in Annexure A: Impact assessment rating methodology.

Table 5-1: Impact rating table for Wilderbeestkuil 1 Solar PV Plant & 132kV Power Line (including associated infrastructure) – All phases

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Construction Materials	Availability of sufficient local construction materials of PV Plant	1	3	3	2	1	4	14	-	High	Source unavailable materials from abroad (import)	4	3	1	2	2	4	16	+	Low
Construction Phase																				
Economic Production	Increase in production of the national and local economies due to project capital expenditure.	4	4	1	1	1	2	22	+	Low	• Procure inputs from local and domestic suppliers • Employ local contractors where possible	4	4	1	1	1	2	22	+	Low

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Employment measured in Full-time Equivalent Enrolment (FTE)-person years	The creation of new direct and indirect opportunities related to the construction and operation of the proposed solar PV plant and facilities (including 132kV power line and associated infrastructure)	4	4	1	1	1	1	11	+	Low	• Employ labour-intensive methods • Employ local residents and communities • Sub-contract to local construction companies • Utilise local suppliers	4	4	1	1	1	1	11	+	Low
Operational Phase																				
Economic Production	The solar PV plant and 132kV power line will increase the size of the local utility sector and stimulate economic production through multiplier effects.	2	4	1	1	3	1	11	+	Low	Procure goods and services required for the operation of the plant from the local economy.	2	4	1	1	3	1	11	+	Low

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Employment	Creation of jobs to support operation and maintenance of the plant	2	4	1	1	3	1	11	+	Low	Aim to fill all the positions by labour from the local community	2	4	1	1	3	1	11	+	Low
Municipal Service Delivery	Generated electricity will improve the security of electricity in the local municipality and increase government's revenue and service delivery	2	4	1	1	3	2	22	+	Low	No mitigation measures proposed	2	4	1	1	3	2	22	+	Low
Decommissioning Phase																				
Loss of agricultural production	Land demarcated for the solar PV plant and 132kV power line will be sterilised and all current activities taking place on said	1	4	1	2	3	1	11	-	Low	Rehabilitation of land should take place at the end of the project's life to allow for the land to be used for commercial livestock farming after the project's closure.	1	4	1	2	3	1	11	-	Low

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
	land will be discontinued.																			
Cumulative																				
The proposed project will result in several positive cumulative effects on the socio-economic environment	• Stimulation of the economy and increased production • Creation of employment and business opportunities • Increased household income and standard of living • Adoption of clean, renewable energy and benefits in terms of global warming and climate change.	2	3	1	1	3	2	20	+	Low	• Implement the "locals first" policy Aim to employ the people who have already worked on other similar projects in the area to provide them with an opportunity for long-term employment and to continue developing their skills • Apply labour-intensive construction methods, where feasible • Use local suppliers, where feasible.	2	3	1	1	3	2	20	+	Low

5.1 Stimulation of the Economy during Construction

The establishment of the proposed solar PV and power line project will be associated with numerous capital expenses. Expenses would usually include expenditure on transport and erection of solar PV modules, powerlines, electrical and grid connection, foundation, civil works and construction of supporting structures. If goods and services are procured locally, i.e. within South Africa, it increases the production of the respective industries.

This has a positive impact on the national economy and economies of the municipalities where inputs are procured. The capital investment of R135 million in current prices, is required for the development and construction of the proposed projects. Some of this is expected to be spent in South Africa, which will resultantly stimulate the national economy, although for a temporary period of about six months.

The size of the Maquassi Hills LM's economy was estimated at R 3 515,9 million in current prices and primarily comprises of the agricultural and tertiary services sectors. Considering the small economic base of the municipality, the opportunities for the procurement of goods and services within the local economy will be very limited.

Having said this, it is likely that some of the local businesses will benefit from sub-contracting opportunities, consumer expenditure of the construction crew, and an increase in income of locals who are directly employed in the construction activities, or who benefit from the project through local procurement.

The stimulation of the economy will not be dependent on the layout of the solar PV plant within the application site; thus, there are no fatal flaws associated with the layout being proposed. In addition, the stimulation of the economy will not be dependent on the route of the power line corridor within the study area; thus the power line corridor route alternatives are equally preferred.

Table 5-1: Assessment of economy stimulation per power line corridor route alternative

Proposed PV Site Layout	**Preference**	Concerns / Impact Summary	Fatal Flaws
Wildebeestkuil 1 Solar PV Plant Layout	*No Alternatives*	R135 million CAPEX will lead to an increase in production in the national and local economies.	None Identified
Powerline Options	**Preference**	**Concerns / Impact Summary**	**Fatal Flaws**
Power Line Corridor Alternative Option 1	No Preference	• The above-ground powerline will have a short-term impact on both direct and indirect economic sectors.	None Identified
Power Line Corridor Alternative Option 2A	No Preference	• The above-ground powerline will have a short-term impact on both direct and indirect economic sectors.	None Identified
Power Line Corridor Alternative Option 2B	No Preference	• The underground powerline will have a higher direct short-term impact on in the construction sector	None Identified

5.2 Creation of Employment during Construction

Info Box: Full Time Equivalent (FTE) man-year or FTE jobs

Employment impacts are calculated in terms of the Full Time Equivalent (FTE) employment positions, which is the same as a FTE job or one man-year of work. This does not directly translate into the headcount of people employed or into new job opportunities. Generally, one FTE man-year is equal to one person working for 40 hours per week for about 50 weeks per year; however, it could vary depending on the industry.

A FTE man-year means that if one person worked only 20 hours per week for 50 weeks in a year, its FTE equivalent would be 0.5; if two people worked for 20 hours per week for 50 weeks in a year, the combined work load would be estimated as one FTE man-year or one FTE job. In the short-term, an increase in FTE employment positions could be absorbed by the existing workforce, either by working overtime or if these labour resources are underutilised in the industry.

The construction of the solar PV plant and associated infrastructure will require temporary employment of construction workers, foremen, and engineers on site. For the first two months, about 30 people will be working on site, for the following three months – 60 jobs will be created, and for the last month, an additional 10 jobs will be created.

Thus, the construction phase will span over six months and create between 10 and 60 temporary employment opportunities throughout its duration, which equates to about 20 FTE. About 90% of the jobs will be allocated to unskilled workers and the remaining 10% will be filled by skilled workers. Considering the current skills profile of the local municipality, a good portion of these jobs are likely to be filled by people from the local communities.

This project will thus contribute to improving the employment situation in the local municipality for a temporary period, as semi-skilled individuals make up most of the local municipality. Employment of the individuals, albeit temporary, will increase their household income, improve their standard of living and benefit their families.

In addition to those benefitting from direct employment created at the project, various multiplier effects will assist in temporarily supporting existing jobs in the businesses offering services and goods that will be procured during construction activities. The increased temporary income earned by these businesses will in turn stimulate consumption spending, creating another round of multiplier effect.

Table 5-2: Assessment of Employment for proposed site layout

Proposed PV Site Layout	Preference	Concerns / Impact Summary	Fatal Flaws
Wildebeestkuil 1 Solar PV Plant Layout	*No Alternatives*	Between 10 and 60 temporary jobs will be created during different stages of the construction period, with an equivalent of 20 FTE.	None Identified
Powerline Options	**Preference**	**Concerns / Impact Summary**	**Fatal Flaws**
Power Line Corridor Alternative Option 1	No Preference	• The above-ground powerline will have a short-term impact on both direct and indirect employment.	None Identified

Proposed PV Site Layout	Preference	Concerns / Impact Summary	Fatal Flaws
Power Line Corridor Alternative Option 2A	No Preference	• The above-ground powerline will have a short-term impact on both direct and indirect employment	None Identified
Power Line Corridor Alternative Option 2B	Preference	• The underground powerline will have a higher direct short-term impact on construction sector employment	None Identified

5.3 Loss of Agricultural Production due to Land Sterilisation

As discussed in Chapter 4, the proposed project location and surrounding land is currently used for commercial farming. The current economic activity(ies) and residences on the directly impacted farm, adjacent farms as well as the farms located in immediate proximity from the proposed site are summarised in Table 4-1.

It is estimated that the solar PV plant and facilities footprint will be approximately 22ha. These will be established on land currently used for commercial livestock farming. The area where the solar PV plant and facilities are located will be sterilised, i.e. any activity that is currently taking place on the site that will be affected by the plant's footprint will be stopped.

The agreement between the landowner and the property developer is that livestock farming activities will continue along the periphery of the fenced solar PV plant's footprint. Therefore, loss of agricultural activity and income will not occur.

The nature of the activities taking place on the farms adjacent to the proposed project's site is also not expected to be sensitive to the proposed project's construction or operation; therefore, no negative effects on the commercial activities observed in the surrounding area are expected due to visual or noise effects that may be created by the development of the solar PV plant and power line.

Table 5-3: Assessment of land sterilization per power line corridor route alternative

Proposed PV Site Layout	Preference	Concerns / Impact Summary	Fatal Flaws
Wildebeestkuil 1 Solar PV Plant Layout	*No Alternatives*	22ha of land will be sterilised.	None Identified.
Powerline Options	**Preference**	**Concerns / Impact Summary**	**Fatal Flaws**
Power Line Corridor Alternative Option 1	No Preference	• The above-ground powerline will sterilise approximately 37 ha of land.	None Identified
Power Line Corridor Alternative Option 2A	No Preference	• The above-ground powerline will sterilise approximately 37 ha of land.	None Identified
Power Line Corridor Alternative Option 2B	Preference	• The underground powerline will have no significant impact on agricultural land	None Identified

5.4 Stimulation of the Local Economy during Operations

The operational period of the proposed Solar PV plant and power line is 20 years. Approximately R200 000 will be spent annually during the operations period, of which a significant portion will comprise of salaries and wages of the plant's employees. The operations of the plant will make some contribution towards the growth of the local economy, as it will increase the size of the local electricity sector, as well as stimulate the demand for other sector's services and goods such as water, transportation, and trade.

The proposed powerline alternatives will result in the same level of production output during operations; no differential among layout alternatives can be made, as seen in Table 5-4

Table 5-4 Assessment of economy stimulation for proposed site layout

Proposed PV Site Layout	Preference	Concerns / Impact Summary	Fatal Flaws
Wildebeestkuil 1 Solar PV Plant Layout	*No Alternatives*	Operational Expenditure (OPEX) of R200 000 will stimulate the local economy.	OPEX of R200 000 will stimulate the local economy.
Powerline Options	**Preference**	**Concerns / Impact Summary**	**Fatal Flaws**
Power Line Corridor Alternative Option 1	No Preference	• The above-ground powerline will have no distinguishable economic impact from the proposed PV	None Identified
Power Line Corridor Alternative Option 2A	No Preference	• The above-ground powerline will have no distinguishable economic impact from the proposed PV	None Identified
Power Line Corridor Alternative Option 2B	No Preference	• The underground powerline will have no distinguishable economic impact from the proposed PV	None Identified

5.5 Creation of Employment and Increased Household Income during Operations

The operation of the solar PV plant and associated infrastructure will require functional and maintenance employees. It is envisaged that about six direct jobs will be created during the operations phase, which will occur for a duration of 20 years. Half of these jobs are to be filled by people from the local communities. Employment of the six individuals for the entire operational period will increase their household income, improve their standard of living and benefit their families.

The proposed powerline alternatives will create no additional employment opportunities, regardless of its location on the site; thus, layout alternatives are equally preferred, as seen in Table 5-5.

Table 5-5: Assessment of employment per power line corridor route alternative

Proposed PV Site Layout	Preference	Concerns / Impact Summary	Fatal Flaws
Wildebeestkuil 1 Solar PV Plant Layout	*No Alternatives*	Six (6) sustainable jobs will be created.	None Identified.
Powerline Options	**Preference**	**Concerns / Impact Summary**	**Fatal Flaws**
Power Line Corridor Alternative Option 1	No Preference	• No distinguishable additional employment opportunities	None Identified
Power Line Corridor Alternative Option 2A	No Preference	• No distinguishable additional employment opportunities	None Identified
Power Line Corridor Alternative Option 2B	No Preference	• No distinguishable additional employment opportunities	None Identified

5.6 Improved Municipal Service Delivery

The proposed 9.9MW Solar PV Plant will be connected to the Leeudoringstad Solar Plant Substation via a 132kV power line (part of this project) and generated electricity will be sold nationwide. As stated before, the municipality's electricity network has aged, and a notable electricity supply backlog exists. The proposed project, albeit relatively small, will contribute towards diminishing this backlog; thus, improving the government service delivery, and could potentially also aid in growing the local economy by increasing the overall supply of electricity in the local economy.

Furthermore, due to the taxes and rates that will be paid by the project to the municipality, the revenue of the latter will be increased, thus allowing it to improve the service delivery in other areas.

Table 5-6 Assessment of service delivery improvement for proposed site layout

Proposed PV Site Layout	Preference	Concerns / Impact Summary	Fatal Flaws
Wildebeestkuil 1 Solar PV Plant Layout	*No Alternatives*	An improvement in municipal service delivery will take place.	None Identified.
Powerline Options	**Preference**	**Concerns / Impact Summary**	**Fatal Flaws**
Power Line Corridor Alternative Option 1	No Preference	• The above-ground powerline will assist the transfer of electricity only	None Identified
Power Line Corridor Alternative Option 2A	No Preference	• The above-ground powerline will assist the transfer of electricity only	None Identified
Power Line Corridor Alternative Option 2B	No Preference	• The above-ground powerline will assist the transfer of electricity only	None Identified

5.7 Potential cumulative effects

As stated in section 3.7 of this report, the area has seen a notable interest from developers of various renewable energy projects (Table 3-3-2 and Map 4), which could be associated with the solar energy resource potential found in the region, proximity to the existing substation and its evacuation capacity, as well as other factors. As a result, four (4) additional solar PV projects are planned in the area. These are:

- The 9.9MW Wildebeeskuil 2 Solar PV Plant & 132kV Power Line (part of separate BA process) on the Farm Wildebeeskuil and Leeuwbosch No.44, adjacent to the 9.9MW Wildebeeskuil 1 Solar PV Plant & 132kV Power Line (this project);
- The two (2) 9.9MW Leeuwbosch solar PV plants, namely the Leeuwbosch 1 Solar PV Plant and Leeuwbosch 2 Solar PV Plant (part of separate respective BA processes), on the Farm Leeuwbosch No.44, 1km west from proposed project area, and
- The 75MW Solar PV facility on Farm Matjesspruit, 10km east from the project area.

None of the solar projects have been developed yet, therefore there is a possibility that the construction and operational phases of all five (5) developments, including this proposed development (namely the Wildebeestkuil 1 Solar PV Plant & 132kV Power Line), may coincide. In this case, the socio-economic cumulative effects will be more evident; however, most of these will be created by the larger project planned to be built on Farm Matjesspruit (namely the Bokamoso Solar Energy Facility).

As mentioned in section 3.7 of this report, the significance of the cumulative impacts associated with the proposed development have been rated in Table 5-1. The impact assessment has revealed that cumulative impacts are expected to be positive low after the implementation of the recommended mitigation measures.

6 THE “NO-GO” SCENARIO

No site alternatives for this proposed development are being considered as the placement of solar PV installations and power lines is dependent on several factors, all of which are favourable at the proposed site location. This included land availability and topography, environmental sensitivities, distance to the national grid, solar resource site accessibility and current land use.

The proposed introduction of a solar PV plant and power line on the project site near the town of Leeudoringstad will have several significant impacts, as discussed in the following sections. In the case were the project is delayed or abandoned, it could be expected that the baseline information will remain the same. There will be no economic and employment growth directly attributable to the solar PV plant and power line.

The continued strain placed on the national energy grid will continue to worsen as population growth adds higher demands for energy, therefore the load-shedding strategy utilised by Eskom will continue to hamper businesses production and leave households without energy for heating, cooking and lighting.

7 COMPARATIVE ASSESSMENT OF ALTERNATIVES

7.1 Location alternatives

As mentioned above, no site alternatives for the proposed developments are being considered as the placement of solar PV installations and power lines is dependent on several factors, all of which are favourable at the proposed site location. This included land availability and topography, environmental sensitivities, distance to the national grid, solar resource site accessibility and current land use.

7.2 Technology alternatives

No other activity / technology alternatives are being considered. Renewable energy development in South Africa is highly desirable from a social, environmental and development point of view. Based on the flat terrain, the climatic conditions and current land use being agricultural, it was determined that the proposed site would be best-suited for a solar PV plants and associated power lines, instead of any other type of renewable energy technology. It is generally preferred to install wind energy facilities (WEFs) on elevated ground. In addition, concentrated solar power (CSP) installations are not feasible because they have a high water requirement and the project site is located in a relatively arid area. There is also not enough rainfall in the area to justify a hydro-electric plant. Therefore, the only feasible technology alternative on this site is solar PV with associated power lines, and as such this is the only technology alternative being considered.

7.3 Layout alternatives

As mentioned, no design or layout alternatives for the PV development area, Switching Substation, Guard house and Temporary Building Zone (and all other associated infrastructure) are being considered or assessed as part of the current BA process. Design and layout alternatives were considered and assessed as part of a previous BA process that was never completed, and as such the PV development area, Switching Substation, Guard house and Temporary Building Zone (and all other associated infrastructure) have been placed to avoid site sensitivities identified as part of a previous BA process as well as the current BA process. Specialist studies were originally undertaken in 2016 and the current layout and/or positions being proposed were selected based on the environmental sensitivities identified as part of these studies in 2016. All specialist studies which were undertaken in 2016 were however updated in 2020 (including ground-truthing, where required) to focus on the impacts of the layout being proposed as part of the current project. The results of the updated specialist assessments have informed the layout being proposed as part of the current BA process. The proposed layout has therefore been informed by the identified environmental sensitive and/or “no-go” areas.

Three (3) power line corridor route alternatives for the proposed 132kV power line were however identified and assessed as part of the current BA process. These alternatives essentially provide for different power line route alignments contained within an assessment corridor. The power line

corridor route alternatives were informed by the identified environmental sensitive and/or "no-go" areas. The power line corridor route alternatives work as follows:

- **Power Line Corridor Option 1** - This involves an overhead power line which will run north of the R502, from the switching substation located within the Wildebeestkuil PV1 Solar PV Plant application site to either Option 1 or Option 2 of the Leeudoringstad Solar Plant Substation (part of separate BA process), depending on the alternative chosen as 'preferred' for the Leeudoringstad Solar Plant Substation site[2]. The Leeudoringstad Solar Plant Substation site alternatives are situated approximately 2km to the north-east of the Wildebeestkuil PV1 Solar PV Plant application site, within Portion 37 of the Farm Leeuwbosch No. 44.

- **Power Line Corridor Option 2A** - This involves an overhead power line which will run south of the R502, from the switching substation located within the Wildebeestkuil PV1 Solar PV Plant application site to either Option 1 or Option 2 of the Leeudoringstad Solar Plant Substation (part of separate BA process), depending on the alternative chosen as 'preferred' for the Leeudoringstad Solar Plant Substation site[2]. The Leeudoringstad Solar Plant Substation site alternatives are situated approximately 2km to the north-east of the Wildebeestkuil PV1 Solar PV Plant application site, within Portion 37 of the Farm Leeuwbosch No. 44.

- **Power Line Corridor Option 2B** - This involves an underground power line which will run south of the R502, from the switching substation located within the Wildebeestkuil PV1 Solar PV Plant application site to either Option 1 or Option 2 of the Leeudoringstad Solar Plant Substation (part of separate BA process), depending on the alternative chosen as 'preferred' for the Leeudoringstad Solar Plant Substation site[2]. The Leeudoringstad Solar Plant Substation site alternatives are situated approximately 2km to the north-east of the Wildebeestkuil PV1 Solar PV Plant application site, within Portion 37 of the Farm Leeuwbosch No. 44.

See Map 1-2 for an illustration of the above-mentioned 132kV power line corridor route alternatives. The three (3) power line corridor route alternatives mentioned above were considered during the impact assessment.

[2] 132kV power line corridor route associated with solar PV plant intrinsically linked to Leeudoringstad Solar Plant Substation site (part of separate on-going BA process). Leeudoringstad Solar Plant Substation site chosen as "preferred" by respective specialists as part of that separate BA process therefore informed connection point for power line corridor being proposed as part of this BA application.

Table 7-1: Comparative Assessment of Power Line Corridor Route Alternatives

Key to Table 7-1

PREFERRED	The alternative will result in a low impact / reduce the impact / result in a positive impact
FAVOURABLE	The impact will be relatively insignificant
LEAST PREFERRED	The alternative will result in a high impact / increase the impact
NO PREFERENCE	The alternative will result in equal impacts

Alternative	Preference	Reasons (incl. potential issues)
Power Line Corridor Route Alternative		
Option 1	No Preference	
Option 2A	No Preference	
Option 2B	Preference	The only distinguishing preference is based on the minimal loss of agricultural land

Based on the comparative assessment of alternatives undertaken in the table above, Option 2B is distinguishable from Option 1 and Option 2A only on the grounds of the agricultural land influenced, as such, the Option 2B powerline connecting the proposed PV to the substation is preferred.

8 CONCLUSION

Wildebeeskuil PV Generation (Pty) Ltd proposes the development of a 9.9MW solar PV plant, 132kV power line and associated infrastructure near the town of Leeudoringstad in the Maquassi Hills LM, which forms part of the Dr Kenneth Kaunda District Municipality located in the North West Province. A recognition of the potential of renewable energy projects to stimulate the local economy, create new jobs, and contribute to sustainable development, is evident.

The policy review indicates that from national and local levels, renewable energy projects are key to sustainable development of the national economy. In fact, one renewable project has been approved for the development and will be located 10km from the proposed project site.

The economy and communities of Maquassi Hills need economic injection, particularly considering the decline and stagnation of the economy since 2009, the poor access to basic services, and heavy reliance of the entire economic base of the municipality on the purchasing power of its households. It is clear that the economy of Maquassi Hills needs to be diversified and the installation of the solar PV plant in the area will offer such an opportunity.

Furthermore, this project could inspire and stimulate the development of similar projects in the area, contributing to the growth of the utilities sector as well as stimulating economic development further. The project will also have the potential to improve the standard of living of the local communities and slightly decrease unemployment in the area.

During the site visit and interviews with the potentially affected land owners, directly or indirectly, no concerns were raised with respect to the project. The proposed solar PV plant will sterilise some agricultural land currently used for commercial livestock farming, but it will not impact on the production of the farm; therefore, no negative effects on the current economic activities in the area are envisaged.

Overall, the project will require an investment of about R135 million and create between 10 to 60 temporary jobs during various stages of the construction period. Thirty to 200 people will be working on site at different stages during the construction phase. Many of these jobs will be filled by labourers from the local communities, which will be highly beneficial considering the high unemployment rate observed in the local municipality.

During operations, the project will employ only six people. Although these jobs will increase the overall employment in the municipality they will not make a notable positive effect on the high unemployment rate in the area. The major benefit of the project though will be in the improved electricity security that the municipality will gain as the electricity generated by the plant will be supplied directly to the municipality and then to its customers.

The local government will also experience an increase in its earnings through the collection of taxes and rates from the operating plant, which in turn will be spent on providing services to the residents and business. Furthermore, the project will contribute to the increase in the size of the local utilities industry.

With respect to the site layout of the PV Plant,, there are no alternative site layouts proposed therefore the proposed layout is the preferred layout. All potential impacts considered had no differential results for the layout. No fatal flaws have been identified for the layout across all potential impacts considered. Three (3) alternative powerline layouts are considered, namely Option 1 and Option 2A, which are above-ground powerlines either side of the R502 road, and Option 2B, which is an underground powerline on the southern side of the R502 road. With respect to the alternative powerline site layout, all potential impacts considered had no differential results for the layout, except for the minimal loss of agricultural land of the underground powerline, while no fatal flaws have been identified for the alternative layouts across all potential impacts considered. Option 2B is the preferred site layout.

ANNEXURE A: IMPACT ASSESSMENT RATING METHODOLOGY

ENVIRONMENTAL PARAMETER		
A brief description of the environmental aspect likely to be affected by the proposed activity (e.g. Surface Water).		
ISSUE / IMPACT / ENVIRONMENTAL EFFECT / NATURE		
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity (e.g. oil spill in surface water).		
EXTENT (E)		
This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment of a project in terms of further defining the determined.		
1	Site	The impact will only affect the site
2	Local/district	Will affect the local area or district
3	Province/region	Will affect the entire province or region
4	International and National	Will affect the entire country
PROBABILITY (P)		
This describes the chance of occurrence of an impact		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
REVERSIBILITY (R)		
This describes the degree to which an impact on an environmental parameter can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES (L)		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource.	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.

4	Complete loss of resources	The impact is result in a complete loss of all resources.
DURATION (D)		
This describes the duration of the impacts on the environmental parameter. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase (0 – 1 years), or the impact and its effects will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 50 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered transient (Indefinite).
INTENSITY / MAGNITUDE (I / M)		
Describes the severity of an impact (i.e. whether the impact has the ability to alter the functionality or quality of a system permanently or temporarily).		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/ component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.

4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapse). Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.

SIGNIFICANCE (S)

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. This describes the significance of the impact on the environmental parameter. The calculation of the significance of an impact uses the following formula:

Significance = (Extent + probability + reversibility + irreplaceability + duration) x magnitude/intensity.

The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.

Points	**Impact Significance Rating**	**Description**
5 to 23	Negative Low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
5 to 23	Positive Low impact	The anticipated impact will have minor positive effects.
24 to 42	Negative Medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
24 to 42	Positive Medium impact	The anticipated impact will have moderate positive effects.
43 to 61	Negative High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
43 to 61	Positive High impact	The anticipated impact will have significant positive effects.
62 to 80	Negative Very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
62 to 80	Positive Very high impact	The anticipated impact will have highly significant positive effects.

PROPOSED DEVELOPMENT OF THE 9.9MW WILDEBEESTKUIL 1 SOLAR PHOTOVOLTAIC (PV) PLANT, 132kV POWER LINE AND ASSOCIATED INFRASTRUCTURE NEAR LEEUDORINGSTAD IN THE NORTH WEST PROVINCE, MAQUASSI HILLS LOCAL MUNICIPALITY IN THE DR KENNETH KAUNDA DISTRICT MUNICIPALITY

TERMS OF REFERENCE (ToR) FOR SPECIALIST STUDIES

1 INTRODUCTION

The purpose of the Terms of Reference (ToR) is to provide the specialist team with a consistent approach to the specialist studies that are required as part of the Basic Assessment (BA) process being conducted in respect of the proposed solar photovoltaic (PV) plant and associated power line development. This will enable comparison of environmental impacts, efficient review, and collation of the specialist studies into the BA report, in accordance with the latest requirements of the EIA Regulations, 2014 (as amended).

2 PROCESS

In terms of the Environmental Impact Assessment (EIA) Regulations, which were published on 04 December 2014 and amended on 07 April 2017 [promulgated in Government Gazette 40772 and Government Notice (GN) R326, R327, R325 and R324 on 7 April 2017], various aspects of the proposed development are considered listed activities under GNR 327 and GNR 324 (this project is considered a BA process due to energy capacity thresholds of under 20MW and vegetation clearance thresholds of under 20ha), which may have an impact on the environment and therefore require authorisation from the provincial competent authority, namely the North West Department of Economic Development, Environment, Conservation and Tourism (NW DEDECT), prior to the commencement of such activities.

3 PROJECT DESCRIPTION

3.1 Project history

The original BA process for the proposed Wildebeestkuil PV Generation (Pty) Ltd (hereafter referred to as "Wildebeestkuil PV Generation") solar photovoltaic (PV) plant was initiated in August 2016. All specialist studies were undertaken and subsequently all site sensitivities were identified. The specialist studies and draft basic assessment reports (DBARs) were completed and released for 30-day public review. The BA was however put out on hold prior to submitting the final basic assessment reports (FBARs) to the Department of Environmental Affairs (DEA). In February 2017, the proposed capacity and layout of the solar PV plant was amended, and a new connection point and associated power line corridors were assessed. However, the project was put on hold prior to submitting the application forms to the DEA or commencing with the legislated public participation process. In August of 2020, Wildebeestkuil PV Generation proposed an additional 9.9MW PV plant on the Wildebeestkuil site (now referred to as the Wildebeestkuil 1 Solar PV Plant & 132kV Power Line and Wildebeestkuil 2 Solar PV Plant & 132kV Power Line) outside of all site sensitivities that were identified in 2016, and as such specialist studies have been commissioned to assess and verify the now two (2) solar PV plants and 132kV power lines under the new Gazetted specialist protocols[1].

3.2 Project location

Wildebeestkuil PV Generation is proposing to construct a solar PV plant, 132kV power line and associated infrastructure approximately 4km east of the town of Leeudoringstad in the Maquassi Hills Local Municipality, which falls within the Dr Kenneth Kaunda District Municipality in the North West Province of South Africa (hereafter referred to as the "proposed development") (Department Ref No.: To be Allocated). The proposed development will have a total maximum generation capacity of up to approximately 9.9 megawatt (MW) and will be referred to as the Wildebeestkuil 1 Solar PV Plant and 132kV Power Line. SiVEST Environmental Division (hereafter referred to as "SiVEST") has subsequently been appointed as the independent Environmental Assessment Practitioner (EAP) to undertake the BA process for the proposed construction of the Wildebeestkuil 1 Solar PV Plant, 132kV power line and associated infrastructure. The overall objective of the solar PV plants and power lines is to generate electricity (by capturing solar energy) to feed into the national electricity grid and "wheel" the power to customers based on a power purchase agreement. Additionally, an agreement is in place to sell the energy to PowerX, who hold a National Energy Regulator of South Africa (NERSA)-issued

[1] GOVERNMENT GAZETTE No. 43110, PROCEDURES FOR THE ASSESSMENT AND MINIMUM CRITERIA FOR REPORTING ON IDENTIFIED ENVIRONMENTAL THEMES IN TERMS OF SECTIONS 24(5)(a) AND (h) AND 44 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998, WHEN APPLYING FOR ENVIRONMENTAL AUTHORISATION, 20 MARCH 2020.

In terms of sections 24(5)(a), (h) and 44 of the National Environmental Management Act, 1998, prescribe general requirements for undertaking site sensitivity verification and for protocols for the assessment and minimum report content requirements of environmental impacts for environmental themes for activities requiring environmental authorisation, as contained in the Schedule hereto. When the requirements of a protocol apply, the requirements of Appendix 6 of the Environmental Impact Assessment Regulations, as amended, (EIA Regulations), promulgated under sections 24(5) and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), are replaced by these requirements. Each protocol applies exclusively to the environmental theme identified within its scope. Multiple themes may apply to a single application for environmental authorisation, and assessments for these themes must be undertaken in accordance with the relevant protocol, or where no specific protocol has been prescribed, in accordance with the requirements of the EIA Regulations.

electricity trading license which allows them to purchase energy generated from clean and renewable resources and sell it to its customers.

The proposed solar PV plant will be located on the following properties:

- Portion 13 of the Farm Wildebeestkuil No. 59;
- Portion 14 of the Farm Wildebeestkuil No. 59; and
- Remainder of Portion 22 of the Farm Wildebeestkuil No. 59.

The combined extent of the above-mentioned properties is approximately 115.5 hectares (ha). The proposed solar PV plant and associated infrastructure assessed as part of this BA will however only occupy a portion of the above-mentioned properties.

The power line corridor alternatives associated with each proposed solar PV plant which were assessed as part of the respective BA processes traverse the following properties:

- Portion 13 of the Farm Wildebeestkuil No. 59;
- Portion 14 of the Farm Wildebeestkuil No. 59;
- Remainder of Portion 5 of the Farm Wildebeestkuil No. 59;
- Remainder of Portion 7 of the Farm Leeuwbosch No. 44;
- Remainder of Portion 29 of the Farm Leeuwbosch No. 44;
- Remainder of Portion 22 of the Farm Wildebeestkuil No. 59;
- Portion 35 of the Farm Leeuwbosch No. 44;
- Portion 36 of the Farm Leeuwbosch No. 44;
- Portion 37 of the Farm Leeuwbosch No. 44; and
- Portion 38 of the Farm Leeuwbosch No. 44.

The proposed development is located directly west of the Harvard Substation, where the current supply of electricity for the local areas and businesses is extracted from.

3.3 Solar PV Plant Components

The key components to be constructed are listed below:

- Solar PV field (arrays) comprising multiple PV modules.
- PV panel mountings. PV panels will be single axis tracking mounting, and the modules will be either crystalline silicon or thin film technology.
- Each PV module will be approximately 2.5m long and 1.2m wide and mounted on supporting structures above ground. The final design details will become available during the detailed design phase of the proposed development, prior to the start of construction.
- The foundations will most likely be either concrete or rammed piles. The final foundation design will be determined at the detailed design phase of the proposed development.

In addition, related infrastructure required are:

- Underground cabling (≈0.8m × 0.6 wide)
- Permanent Guard House (≈876m²)
- Temporary building zone (≈2994m²)
- Switching Substation (≈2000m²)

- Internal gravel roads (≈3.5m width)
- Upgrade to existing roads; and
- Site fencing (≈2.1m high)

In addition to the above, the electricity generated by the proposed solar PV plant will be fed into the national electricity grid via a 132kV power line, which will connect to the Leeudoringstad Solar Plant Substation (part of a separate BA process)[2]. The proposed 132kV power line will consist of a series of towers anticipated to be located approximately 200m to 250m apart at this stage. The type of power line towers will be determined during the final design stages of the proposed development, prior to construction commencing. The height will vary based on the terrain, but will ensure minimum overhead line (OHL) line clearances with buildings and surrounding infrastructure. The exact location of the towers will be determined during the final design stages of the proposed development.

For the purpose of this BA, corridors between approximately 60m and 150m wide were assessed for the proposed power line corridor route alternatives (see **Section 4** below). This is to allow for flexibility to route the power lines within the assessed corridors. As such, the selected preferred power lines will be routed within the assessed corridors. The final servitudes will be routed within the power line corridors, and it expected that the servitude swill not exceed 32m.

Once fully developed, the intention is to generate electricity (by capturing solar energy) to feed into the national electricity grid and “wheel” the power to customers based on a power purchase agreement. Additionally, an agreement is in place to sell the energy to PowerX, who hold a NERSA-issued electricity trading license which allows them to purchase energy generated from clean and renewable resources and sell it to its customers.

The construction phase will be between 12 and 24 months and the operational lifespan will be approximately 20 years, depending on the length of the power purchase agreement with the relevant off taker.

4 BA ALTERNATIVES

4.1 Location alternatives

No site alternatives for the proposed developments are being considered as the placement of solar PV installations and power lines is dependent on several factors, all of which are favourable at the proposed site location. This included land availability and topography, environmental sensitivities, distance to the national grid, solar resource site accessibility and current land use.

4.2 Technology alternatives

No other activity / technology alternatives are being considered. Renewable energy development in South Africa is highly desirable from a social, environmental and development point of view. Based on the flat terrain, the climatic conditions and current land use being agricultural, it was determined that the proposed site would be best-suited for a solar PV plant and associated power line, instead of any

[2] Proposed Leeudoringstad Solar Plant Substation part of separate BA process and will be authorised under a separate EA.

other type of renewable energy technology. It is generally preferred to install wind energy facilities (WEFs) on elevated ground. In addition, concentrated solar power (CSP) installations are not feasible because they have a high water requirement and the project site is located in a relatively arid area. There is also not enough rainfall in the area to justify a hydro-electric plant. Therefore, the only feasible technology alternative on this site is solar PV with associated power line, and as such this is the only technology alternative being considered.

4.3 Layout alternatives

No design or layout alternatives for the PV development area, Switching Substation, Guard house and Temporary Building Zone (and all other associated infrastructure) are being considered or assessed as part of the current BA process. Design and layout alternatives were considered and assessed as part of a previous BA process that was never completed, and as such the PV development area, Switching Substation, Guard house and Temporary Building Zone (and all other associated infrastructure) have been placed to avoid site sensitivities identified as part of a previous BA process as well as the current BA process. Specialist studies were originally undertaken in 2016 and all current layouts and/or positions being proposed were selected based on the environmental sensitivities identified as part of these studies in 2016. All specialist studies which were undertaken in 2016 were however updated in 2020 (including ground-truthing, where required) to focus on the impacts of the layout being proposed as part of the current project. The results of the updated specialist assessments have informed the layout being proposed as part of the current BA process. The proposed layout has therefore been informed by the identified environmental sensitive and/or “no-go” areas.

Three (3) power line corridor route alternatives for the proposed 132kV power line were however identified and assessed by the respective specialists as part of the current BA process. These alternatives essentially provide for different power line route alignments contained within an assessment corridor. The power line corridor route alternatives were informed by the identified environmental sensitive and/or “no-go” areas. The various power line corridor alternatives are described in **Section 5.10** below.

4.4 The operational aspects of the activity

No operational alternatives were assessed in the BA, as none are available for solar PV installations and power lines.

4.5 ‘No-go’ alternative

The “no-go” alternative is the option of not fulfilling the proposed project. This alternative would result in no environmental impacts from the proposed project on the site or surrounding local area. It provides the baseline against which other alternatives are compared and will be considered throughout the report. Implementing the “no-go” option would entail no development.

The “no-go” option is a feasible option; however, this would prevent the Wildebeestkuil 1 Solar PV Plant & 132kV Power Line from contributing to the environmental, social and economic benefits associated with the development of the renewables sector.

5 SPECIALIST REPORT REQUIREMENTS

The specialist assessments should include the following sections:

5.1 Project Description

The specialist report must include the project description as provided above.

5.2 Terms of Reference (ToR)

The specialist report must include an explanation of the Terms of Reference (ToR) applicable to the specialist study. In addition, a table must be provided at the beginning of the specialist report listing the requirements for specialist reports in accordance with Appendix 6 of the EIA Regulations, 2014 (as amended) and cross referencing these requirements with the relevant sections in the report. An MS Word version of this table will be provided by SiVEST.

5.3 Legal Requirements and Guidelines

The specialist report must include a thorough overview of all applicable best practice guidelines, relevant legislation and authority requirements.

5.4 Methodology

The report must include a description of the methodology applied in carrying out the specialist assessment.

5.5 Specialist Findings / Identification of Impacts

The report must present the findings of the specialist studies and explain the implications of these findings for the proposed development (e.g. permits, licenses etc.). This section of the report should also identify any sensitive and/or 'no-go' areas on the development site which should be avoided.

The reports should be accompanied with spatial datasets (shapefiles, KML) and accompanying text documents if required.

5.6 Impact Rating Methodology

The impacts of the proposed solar PV plant and 132kV power line (during the Construction, Operation and Decommissioning phases) are to be assessed and rated according to the methodology developed by SiVEST. Specialists will be required to make use of the impact rating matrix provided (in Excel format) for this purpose. Please note that the significance of Cumulative Impacts should also be rated in this section. Both the methodology and the rating matrix will be provided by SiVEST.

Please be advised that this section must include mitigation measures aimed at minimising the impact of the proposed development.

5.7 Input to The Environmental Management Program (EMPr)

The report must include a description of the key monitoring recommendations for each applicable mitigation measure identified for each phase of the proposed development for inclusion in the Environmental Management Program (EMPr) or Environmental Authorisation (EA).

Please make use the Impact Rating Table (in Excel format) provided for each of the phases (i.e. Design, Construction, Operation and Decommissioning).

5.8 Cumulative Impact Assessment

Cumulative impact assessments must be undertaken for the proposed solar PV plant in order to determine the cumulative impact that will materialise should other Renewable Energy Facilities (REFs) and large-scale industrial developments be constructed within 50km of the proposed development.

The cumulative impact assessment must contain the following:

- A cumulative environmental impact statement noting whether the overall impact is acceptable; and
- A review of the specialist reports undertaken for other REFs and an indication of how the recommendations, mitigation measures and conclusion of the studies have been considered.

In order to assist the specialists in this regard, SiVEST will provide the following documentation / data:

- A summary table listing all REFs identified within 50km of the proposed solar PV plant;
- A map showing the location of the identified REFs;
- KML files; and
- Relevant EIA / BA reports that could be obtained.

The list of renewable energy facilities that must be assessed as part of the cumulative impact will be provided.

5.9 “No-Go” Alternative

Consideration must be given to the “no-go” option in the BA process. The “no-go” option assumes that the site remains in its current state, i.e. there is no construction of a Solar PV Plant, 132kV power line and associated infrastructure in the proposed project area and the status quo would proceed.

5.10 Comparative Assessment of Alternatives

As mentioned, layout alternatives, which subsequently informed the area for the potential erection of PV panels for the proposed solar PV plant, were identified and comparatively assessed as part of the BA process undertaken in 2016. Specialist studies were originally undertaken in 2016 and all current layouts and/or positions being proposed were selected based on the environmental sensitivities identified as part of these studies in 2016. All specialist studies which were undertaken in 2016 were however updated in 2020 (including ground-truthing, where required) to focus on the impacts of the layout being proposed as part of the current project. The results of the updated specialist assessments have informed the layout being proposed as part of the current BA process.

As the positions of the proposed PV development area, Switching Substation, Guard house and Temporary Building Zone (as well as all other associated infrastructure) have already been determined taking the identified environmental sensitive and/or "no-go" areas into consideration, the specialist is to update the comparative assessment as per the latest table provided by SiVEST.

Three (3) power line corridor route alternatives for the proposed 132kV power line were however identified and assessed by the respective specialists as part of the current BA process. These alternatives essentially provide for different power line route alignments contained within an assessment corridor. The power line corridor route alternatives were informed by the identified environmental sensitive and/or "no-go" areas. The various power line corridor route alternatives are described below.

1) Power Line Corridor Option 1:

This involves an overhead power line which will run north of the R502, from the switching substation located within the Wildebeestkuil PV1 Solar PV Plant application site to either Option 1 or Option 2 of the Leeudoringstad Solar Plant Substation (part of separate BA process), depending on the alternative chosen as 'preferred' for the Leeudoringstad Solar Plant Substation site[3]. The Leeudoringstad Solar Plant Substation site alternatives are situated approximately 2km to the north-east of the Wildebeestkuil PV1 Solar PV Plant application site, within Portion 37 of the Farm Leeuwbosch No. 44.

2) Power Line Corridor Option 2A:

This involves an overhead power line which will run south of the R502, from the switching substation located within the Wildebeestkuil PV1 Solar PV Plant application site to either Option 1 or Option 2 of the Leeudoringstad Solar Plant Substation (part of separate BA process), depending on the alternative chosen as 'preferred' for the Leeudoringstad Solar Plant Substation site[3]. The Leeudoringstad Solar Plant Substation site alternatives are situated approximately 2km to the north-east of the Wildebeestkuil PV1 Solar PV Plant application site, within Portion 37 of the Farm Leeuwbosch No. 44.

3) Power Line Corridor Option 2B:

This involves an underground power line which will run south of the R502, from the switching substation located within the Wildebeestkuil PV1 Solar PV Plant application site to either Option 1 or Option 2 of the Leeudoringstad Solar Plant Substation (part of separate BA process), depending on the alternative chosen as 'preferred' for the Leeudoringstad Solar Plant Substation site[3]. The Leeudoringstad Solar Plant Substation site alternatives are situated approximately 2km to the north-east of the Wildebeestkuil PV1 Solar PV Plant application site, within Portion 37 of the Farm Leeuwbosch No. 44.

The specialist is therefore also to undertake comparative assessment for the above-mentioned power line corridor alternatives as per the table provided by SiVEST.

Key

PREFERRED	The alternative will result in a low impact / reduce the impact / result in a positive impact

[3] 132kV power line corridor route associated with solar PV plant intrinsically linked to Leeudoringstad Solar Plant Substation site (part of separate on-going BA process). Leeudoringstad Solar Plant Substation site chosen as "preferred" by respective specialists as part of that separate BA process therefore informed connection point for power line corridor being proposed as part of this BA application.

FAVOURABLE	The impact will be relatively insignificant
LEAST PREFERRED	The alternative will result in a high impact / increase the impact
NO PREFERENCE	The alternative will result in equal impacts

Alternative	Preference	Reasons (incl. potential issues)
Power Line Corridor Route Alternative		
Option 1		
Option 2A		
Option 2B		

5.11 Conclusion / Impact Statement

The conclusion section of the specialist reports must include an **Impact Statement**, indicating whether any fatal flaws have been identified and ultimately whether the proposed development can be authorised or not (i.e. whether EA should be granted / issued or not).

5.12 Executive Summary

Specialists must provide an Executive Summary which summarises the findings of their report to allow for easy inclusion in the BA reports.

6 DELIVERABLES

All specialists will need to submit the following deliverables:

- 1 x Draft Specialist Report for inclusion in DBAR no later than 07 September 2020 and updated version based on EAP and applicant review no later than 11 September 2020;
- 1 x Final Specialist Report for inclusion in FBAR (should updates and/or revisions be required);
- A copy of the Specialist Declaration of Interest (DoI) form, containing original signatures. This form will be provided to the specialists. ***Please note that the undertaking / affirmation under oath section of the report must be signed by a Commissioner of Oaths***; and
- All data relating to the studies, such as shape files, photos and maps (see **Section 7** below).

7 GENERAL SUBMISSION REQUIREMENTS

Please ensure that your specialist report includes the following:

- A detailed description of the study's methodology; indication of the locations and descriptions of the development footprint, and all other associated infrastructures that they have assessed and are recommending for authorisations;
- Provide a detailed description of all limitations to the studies. All specialist studies must be conducted in the correct season and providing that as a limitation will not be allowed;

- All specialist studies must be final, and provide detailed / practical mitigation measures for the preferred alternative and recommendations, and must not recommend further studies to be completed post EA;
- Should a specialist recommend specific mitigation measures, these must be clearly indicated;
- Regarding cumulative impacts:
    - Clearly defined cumulative impacts and where possible the size of the identified impact must be quantified and indicated, i.e. hectares of cumulatively transformed land.
    - A detailed process flow to indicate how the specialist's recommendations, mitigation measures and conclusions from the various similar developments in the area were taken into consideration in the assessment of cumulative impacts and when the conclusion and mitigation measures were drafted for this project.
    - Identified cumulative impacts associated with the proposed development must be rated with the significance rating methodology used in the process.
    - The significance rating must also inform the need and desirability of the proposed development.
    - A cumulative impact environmental statement on whether the proposed development must proceed.
- The report must in line with the DEA Screening Tool Specialist Theme Protocols (As gazetted 20 March 2020) if they apply. If they do not, the report must be written in accordance with Appendix 6 of the EIA Regulations, 2014 (as amended);
- A table at the beginning of your report cross referencing how the requirements for specialist according to Appendix 6 of the EIA Regulations, 2014 (as amended) has been adhered to. An MS Word version will be provided;
- A thorough overview of all applicable legislation, policies, guidelines. etc.;
- Identification of sensitive and/or “no-go” areas to be avoided;
- Please note that the Department considers a “no-go” area, as an area where no development of any infrastructure is allowed; therefore, no development of associated infrastructure is allowed in the “no-go” areas;
- Should the specialist definition of “no-go” area differ from the Departments definition; this must be clearly indicated. The specialist must also indicate the “no-go” area's buffer if applicable;
- Recommend mitigation measures in order to minimise the impact of the proposed development;
- Provide implications of specialist findings for the proposed development (e.g. permits, licenses etc.);
- Specify if any further assessment will be required;
- Include an Impact Statement, concluding whether any fatal flaws have been identified and ultimately whether the proposed development can be authorised or not (i.e. whether EA should be granted / issued or not); and
- A copy of the Specialist Declaration of Interest (DoI) form, containing original signatures, must be appended to all Draft and Final Reports. This form will be provided to the specialists. ***Please note that the undertaking / affirmation under oath section of the report must be signed by a Commissioner of Oaths.***

8 DEADLINES AND REPORT SUBMISSION

- Draft Specialist Report for inclusion in DBAR no later than 07 September 2020 and updated version based on EAP and applicant review no later than 11 September 2020.
- Any changes arising based on stakeholder engagement no later than 16 October 2020

9 REPORT / DATA FORMATS

- All specialist reports must be provided in MS Word format;
- Where maps have been inserted into the report, SiVEST will require a separate map set in PDF format for inclusion in our submission;
- Where figures and/or photos have been inserted into the report, SiVEST will require the original graphic in .jpg format for inclusion in our submission; and
- ***Delineated areas of sensitivity must be provided in either ESRI shape file format or Google Earth KML format. Sensitivity classes must be included in the attribute tables with a clear indication of which areas are "No-Go" areas.***

10 SPECIALIST SPECIFIC ISSUES

Terrestrial Ecology

- Describe the terrestrial ecology features of the project area, with focus on features that are potentially impacted by the proposed project. The description should include the major habitat forms within the study site, giving due consideration to terrestrial ecology (flora), terrestrial ecology (fauna) and Species of Special Concern (SSC).
- Consider seasonal changes and long-term trends, such as due to climate change;
- Identify any SSC or protected species on site and clearly map with a high degree of certainty the exact no-go zones with a high level of confidence;
- Map the sensitive ecological features within the proposed project area, showing any 'no-go' areas (i.e. 'very high' sensitivity). Specify set-backs or buffers and provide clear reasons for these recommendations. Also map the extent of disturbance and transformation of the site;
- Identify and assess the potential impacts of the project on the terrestrial environment and provide mitigation measures to include in the environmental management plan; and
- The assessment should be based on existing information, national and provincial databases, SANBI mapping, professional experience and field work conducted.

Soils and Agricultural Potential

- Describe the existing environment in terms of soils, geology, land-use and agricultural potential. Significant soils and agricultural features or disturbances should be identified, as well as sensitive features and receptors within the project area. The description must include surrounding agricultural land uses and activities, to convey the local agricultural context;
- Describe and map soil types (soil forms), soil characteristics (soil depth, soil colour, limiting factors, and clay content of the top and sub soil layers), and degradation and erodibility of soils etc. to the extent necessary to inform this assessment;

- Varying sensitivities of the soils and agricultural potential must be mapped and highlighted;
- The assessment is to be based on existing information, and professional experience and field work conducted by the specialist, as considered necessary and in accordance with relevant legislated requirements;
- Identify and assess the potential impacts of the proposed development on loss of agricultural land, soils and agriculture, including impacts of associated infrastructure, such as the buildings, fencing etc. and provide relevant mitigation measures to include in the environmental management plan;
- Identify any protocols, legal and permit requirements relating to soil and agricultural potential impacts that are relevant to this project and the implications thereof;
- Map sensitivity of the site and clearly show no-go areas i.e. existing irrigated fields/ cultivated lands; and
- The report needs to fulfil the terms of reference for an agricultural study as set out in the National Department of Agriculture's document, Regulations for the evaluation and review of applications pertaining to renewable energy on agricultural land, dated September 2011, with an appropriate level of detail for the agricultural suitability and soil variation on site (which may therefore be less than the standardised level of detail stipulated in the above regulations).

Avifauna (Birds)

- Describe the affected environment from an avifaunal perspective, including consideration of the surrounding habitats and avifaunal features (e.g. Ramsar sites, Critical Bird Areas, wetlands, migration routes, feeding, roosting & nesting areas, etc.);
- Describe and map bird habitats on the site, based on on-site monitoring, desk-top review, collation of available information, studies in the local area and previous experience;
- Map the sensitivity of the site in terms of avifaunal features such as habitat use, roosting, feeding and nesting / breeding; and
- Identify and assess the potential impacts of the proposed development on avifauna. Provide sufficient mitigation measures to include in the environmental management plan.

Geotechnical

- Comprehensive desktop geotechnical report detailing the geological, hydrogeological and geotechnical conditions is required.
- A literature review should be undertaken as part of the desktop investigation in which topographic and geological maps must be reviewed.
- Consideration must be given, but not limited to, the following at desktop level.
    - The influence of topography on site suitability of the PV Plant and 132kV power line.
    - Any envisaged geological and geotechnical influences and the competency of foundations for the construction of the PV plant and 132kV power line.
    - Tectonic influences on overall stability, namely the presence of faulting, lineaments and preferred discontinuity orientations.
- As part of the literature review, any available previous investigations and reports should be reviewed and critical geotechnical conclusions presented in the desktop report.

Heritage

- Describe and map the heritage features of the site and surrounding area. This is to be based on desk-top reviews, fieldwork, available databases, and findings from other heritage studies in the area, where relevant. Include reference to the grade of heritage feature and any heritage status the feature may have been awarded;
- Assess the impacts and provide mitigation measures to include in the environmental management plan;
- Map heritage sensitivity for the site. Clearly show any "no-go" areas in terms of heritage (i.e. "very high" sensitivity) and provide recommended buffers or set-back distances;
- Identify and assess potential impacts from the project on the full scope of heritage features, including archaeology, palaeontology and the cultural-historical landscape, as required by heritage legislation;
- Liaise with the relevant authority in order to obtain a final comment in terms of section 38 pf the National Heritage Resources Act, 1999 (Act No. 25 of 1999), including Regulations issued thereunder, as necessary; and
- Load the relevant documents on the South African Heritage Resources Information System (SAHRIS) to obtain a comment from SAHRA.

Social

- Describe the social assessment context of the Leeudoringstad and Kgakala areas, focusing on aspects that are potentially affected by a substation project, and taking into consideration the current situation as well as the trends, the local planning (IDPs and SDFs), other developments in the area. The study should look more broadly than the individual land parcels on which the proposed project will developed, as most, if not all, of the anticipated social impacts may be experienced in the urban areas nearest to the proposed development;
- Apply a variety of appropriate options for sourcing information, such as review of analogous studies, available databases and social indicators, and use of interviews with key affected parties such as local communities, local landowners & government officials (local and regional) etc.;
- The social study does not lend itself to providing a spatially based sensitivity map. Therefore, instead, the study could provide a simplified schematic mapping of the links between the project actions (i.e. interventions) and the receiving social environment (i.e. the socio-ecological system), which may occur at a local, provincial or national scale, and showing how these links can be optimized to enhance benefits and minimize negative impacts;
- Consider social issues such as potential in-migration of job seekers, opportunities offered by training and skills development, cumulative effects with other projects in the local area implications for local planning and resource use;
- Provide recommendations to enhance the socio-economic benefits of the proposed development and to avoid (or minimise) the potential negative impacts;
- Identify and assess potential social benefits and costs as a result of the proposed development, for all stages of the project, and including the estimated direct employment opportunities; and
- Evaluate the implications of the project on the local socio-economic context.

Surface Water / Aquatic Ecology

- Compile a Surface Water / Aquatic Ecology Compliance Statement according to the protocol for the assessment and reporting of environmental impacts on aquatic biodiversity on a site identified as being of "low sensitivity" for aquatic biodiversity, gazetted on 20 March 2020

(Sections 24(5)(A) and (H) and 44 of NEMA, 1998) (https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_Aquatic_Biodiversity_Assessment.pdf);

- The Surface Water / Aquatic Biodiversity Compliance Statement, must verify:
- That the site is of "low" sensitivity for aquatic biodiversity; and

- Whether or not the proposed development will have an impact on the aquatic features.
- The Surface Water / Aquatic Biodiversity Compliance Statement, must contain, as a minimum, the following information:
  - Contact details and curriculum vitae of the specialist including SACNASP registration number and field of expertise;
  - A signed statement of independence by the specialist;
  - Baseline profile description of biodiversity and ecosystems, including the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;
  - Methodology used to verify the sensitivities of the aquatic biodiversity features on the national web based environmental screening tool;
  - Methodology used to undertake the Initial Site Sensitivity Verification and preparation of the Compliance Statement, including equipment and modelling used, where relevant;
  - Where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr;
  - A description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations; and
  - Any conditions to which the statement is subjected.
- Where the information gathered from the Initial Site Sensitivity Verification differs from that identified as having a "low" aquatic biodiversity sensitivity by the national web based environmental screening tool and it is found to be of a "very high" sensitivity, the following will be required:
  - Describe the aquatic ecology features of the project area, with focus on features that are potentially impacted by the proposed project. The description should include the major habitat forms within the study site, giving due consideration to freshwater ecosystems, drainage lines and wetlands;
  - Consider seasonal changes and long-term trends, such as due to climate change as far as possible;
  - Identify any Species of Special Concern or protected species on site relevant to the aquatic environment;
  - Map the sensitive ecological features within the proposed project area, showing any 'no-go' areas (i.e. 'very high' sensitivity) with a very high confidence and accuracy. Specify set-backs or buffers and provide clear reasons for these recommendations. Also map the extent of disturbance and transformation of the site;
  - Identify and delineate wetlands that may occur on the site, using the relevant and latest protocols established by DWAF;
  - Determine if a Water Use License (WUL) or General Authorisation (GA) is required and if so, determine the requirements thereof by undertaking the appropriate DWS risk assessment.

- Verify the datasets of watercourses against a digital terrain model (or slope / contour data) to ensure that the watercourses are mapped in the correct places based on topography;
- Identify and assess the potential impacts of the project (including all access roads) on the aquatic environment;
- Provide mitigation measures to include in the environmental management plan; and
- The assessment should be based on existing information, national and provincial databases, SANBI mapping, professional experience and field work conducted.

Visual

- Describe the visual character of the local area. Any significant visual features or visual disturbances should be identified and mapped, as well as any sensitive visual receptors within the proposed project area or within viewsheds of the proposed development;
- Visual character and visual absorption capacity should be described;
- Viewsheds for various elements of the proposed development should be calculated, defined and presented, and the varying sensitivities of these viewsheds must be highlighted;
- Mapping of visual sensitivity of the site will require consideration of visual receptors outside the site, and sensitivity to development on the site for potentially affected visual receptors of 'very high' sensitivity;
- Assessment to be based on findings of the site visit, visual modelling, and a photographic survey of the surrounding region from which the landscape and visual baselines can be prepared;
- Identify and assess potential impacts from the project on the receiving environment. All impacts should be considered under varying conditions as appropriate to the study i.e. day, night, clear weather, cloudy weather etc. Provide mitigation measures to include in the EMPr;
- Maps depicting viewsheds / line of sight across the site should be generated and included in the reports. These maps should indicate current viewsheds / visual landscape / obstructions as well as expected visual impacts during the construction, operational and decommissioning phases of the proposed development;
- Provide specific mitigation on light management and
- Provide photomontages from accessible locations.

ANNEXURE C: DECLARATION OF SPECIALIST

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

Basic Assessments (BAs) for the Proposed Development of the 9.9MW Wildebeestkuil 1 and Wildebeestkuil 2 Solar Photovoltaic (PV) Plants, 132kV Power lines and associated infrastructure near Leeudoringstad in the North West Province, Maquassi Hills Local Municipality in the Dr Kenneth Kaunda District Municipality.

Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
2. This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.environment.gov.za/documents/forms.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Private Bag X447
Pretoria
0001

Physical address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Environment House
473 Steve Biko Road
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

1. SPECIALIST INFORMATION

Specialist Company Name:	Urban-Econ Development Economists			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	2	Percentage Procurement recognition	125% procurement
Specialist name:	Tsebo Majoro			
Specialist Qualifications:	BCom Hons Economics, BCom Economics & International Trade			
Professional affiliation/registration:	N/A			
Physical address:	3 John Leisiring Street, Opkoms, Bloemfontein			
Postal address:	3 John Leisiring Street, Opkoms, Bloemfontein			
Postal code:	9301	Cell:	066 206 4060	
Telephone:	051 444 6324	Fax:		
E-mail:	tsebo@urban-econ.com			

2. DECLARATION BY THE SPECIALIST

I, Tsebo Majoro, declare that –

- 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

Urban-Econ Development Economists (Pty) Ltd

Details of Specialist, Declaration and Undertaking Under Oath

Name of Company:

31/03/2021

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, Tsebo Majoro, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Specialist

Urban-Econ Development Economists (Pty) Ltd

Name of Company

31/03/2021

Date

Signature of the Commissioner of Oaths

05/04/21

Date

MINETTE SCHEEPERS
COMMISSIONER OF OATHS
EX OFFICIO - PROFESSIONAL ACCOUNTANT (S.A.)
P.O. BOX 26080
LANGENHOVEN PARK
BLOEMFONTEIN
9330

REFERENCES

Cape, L., & M Mabin, a. C. (2015). Department of Environmental Affairs Strategic Integrated Projects Strategic Environmental Assessments.

Commission, N. P. (n.d.). *National Development Plan 2030, Our Future- Make it Work, Executive Summary Department.* The Presidency Republic of South Africa.

Commission, N. W. (2013). *Provincial Development Plan " Our Province, Our Heritage, Make it Work! Dirang Bokamoso 2030.*

Commission, P. I. (2012). *A summary of the Infrastructure Plan.*

Department of Economic Development. (2010). *New Growth Path: Framework .*

Department of Economic Development. (2011). The New Growth Path: Framework. Pretoria, Gauteng, South Africa.

Department of Economic Development, e. C. (2012). *Renewable Energy Strategy for the North West Province.*

Department of Energy. (2015, November 12). *Home*. Retrieved from Renewable Energy Independent Power Producer Programme: http://www.ipprenewables.co.za/#index.php

Department of Planning, M. a. (2018). *Draft National Spatial Development Framework.*

Department, E. D. (2011). *The New Growth Path Framework.*

dti. (2016). *Industrial Policy Action Plan: Economic Sectors and Employment Cluster 2016/17-2018/19.* dti.

DTI. (2018). *The Industrial Policy Action Plan (IPAP) 2018/2019 – 2020/2020 .*

DTI. (2018). *The Industrial Policy Action Plan (IPAP) 2018/2019 – 2020/2021: Economic sector, employment and infrastructure development cluster.*

Energy, D. o. (2013). *Integrated Resource Plan for Electricity 2010-2030. Update Report 2013.*

energyblog. (2016, September 23). *energyblog*. Retrieved from www.energyblog.co.za: http://energy.org.za/knowledge-tools/map-south-african-generation-projects

Industry, D. o. (n.d.). *2018.*

Maquassi Hills Local Municipality. (2016). *Annual Report Volume 1.*

Municipality, D. K. (2014). *Dr Kenneth Kaunda District Municipality Integrated Development Plan 2013/14.*

Municipality, D. K. (2017). *Dr Kenneth Kaunda District Municipality Intergrated Development Plan 2017/18 - 2021/22.*

Municipality, D. K. (2017). *Dr Kenneth Kaunda District Municiplaity Intergrated Development Plan 2017/18 - 2021/22.*

Municipalty, M. L. (2013). *Reviewed Maquassi Hills Third Generation Integrated Development Plan 2013-2016.* Wolmaransstad.

National Planning Commission. (2011). *National Development Plan 2030.*

Presidency, T. (2006). *National Spatial Development Perspective, Planning Policy Coordination and Advice Services.* Republic of South Africa.

Presidential Infrastructure Coordinating Commission. (2012). A sumamry of the South African national infrastructure plan. *Presidential Infrastructure Coordinating Commission Report*.

Quantec. (2015). Standard Regionalised Data Series.

Quantec. (2020). *Standard Regionalised Data Series*.

Stats SA. (2015). 2001 National Census.

Stats SA. (2020). 2011 National Census.