

Socio-Economic Impact Assessment Report for the
Prieska Power Reserve Solar PV Plant and Wind
Energy Facility Phase 1, Prieska, Northern Cape

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Photo: View on Prieska town, Northern Cape

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For Greenbox- Consulting on behalf of CENEC

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LIST OF ABBREVIATIONS

Abbreviation	Description
DEA	Department of Environmental Affairs
CBD	Central Business District
DEDAT	Northern Cape's Department of Economic Development and Tourism
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EPC	Employment Procurement and Construction
FPL	Food Poverty Line
GVA	Gross Value Added
kV	Kilovolt
LED	Local Economic Development
LPL	Lower-Bound Poverty Line
MTSF	Medium Term Strategic Framework
MW	Mega Watt
MWh	Mega Watt per hour
REIPPP	Renewable Energy Independent Power Producer Programme
SEIA	Social and Economic Impact Assessment
SLM	Siyathemba Local Municipality
VUT	Vaal University of Technology (Upington Campus)
WWT	Waste Water Treatment
PV	Photovoltaic
PPP	Public Participation Process
SAQA	South African Qualifications Authority
SHEQ	Safety, Health, Environment and Quality
UPL	Upper Poverty Line
WEF	Wind Energy Facility
WSA	Water Service Authority
WSP	Water Services Provider

1. EXECUTIVE SUMMARY

Project background:

Central Energy Corporation (Pty) Ltd (t/a CENEC) plans to develop a 170 MW PV solar plant and the initial 139 MW of wind power (21 wind turbines) and associated infrastructure that form part of Phase 1 of a larger project. The main aim of the proposed solar energy facility is to maximise electricity production for the needs of the proposed ammonia and hydrogen manufacturing industry, which forms part of Phase 3 of the Prieska Power Reserve Project. The 170 MW Prieska Power Reserve Solar PV Plant: Phase 1 is situated 6,5 km south of the Prieska Central Business District (CBD) and south of the N10 on 384 ha of municipal land. The 139 MW wind farm is 12 km south of the Prieska CBD. The total area set aside for all planned turbines is 1008 ha (mainly consisting of private agricultural land).

Project Scope:

The Impact Assessment Report provides a local socio-economic baseline of the project and provides an assessment of potential socio-economic impacts of the project in the local economy of Siyathemba Local Municipality (SLM) and its regions as well as the larger national economy. The report includes a management plan to enhance positive socio-economic impacts and mitigate against negative impacts.

Main Baseline Characteristics of Receiving Environment:

- Although the low population rate growth rate in the local area suggests recent out-migration out of the area, the relative low female percentages and the high percentage of people in the working population in SLM suggests historic high in-migration rates (prior to 2011) and single male migrants having settled in the area possibly working on farms in the local area.
- Since 2016, in-migration into the local area could have resumed due to a number of renewable energy projects implemented in the area and a large-scale mining project in planning. A new residential area consisting of 3,500 residential erven is planned for Prieska town as part of the planning for new mining activities in the area due to the reactivation of Copperton mines;
- Natural areas/grazing land by far dominates land-use in the municipal area while cultivated land (producing oilseed, grains, grapes) is mainly prevalent along the irrigated lands along the banks of the Orange River that runs through the municipal area;
- In general households in this local area fared slightly better than the average national household in terms of basic service delivery with smaller percentages of households living in informal houses/shacks or without basic water and sanitation, waste collection and electricity access;
- Siyathemba LM is considered to have abundant water supply from the Orange River, with the Gariiep and the Vanderkloof Dams on the upstream side of the river;
- The HIV/AIDS prevalence rate in Siyathemba is slightly lower than the national and provincial averages and the municipal area had a higher ratio of primary health care clinics and hospitals than is nationally the case;
- A relatively large percentage of the local labour force is unskilled (73%) while skilled labour is scarcer than in the national economy at large;
- There is a shortage of secondary schools and higher educational institutions in the local area. The DRU-A Professional Further Education and Training College (DRU-A-FET) is the only

tertiary education institution in SLM and presents courses in education, local government and business;

- There is an airfield in Prieska is suitable for the landing and take-off of light aircrafts and an operating rail siding provides rail access to the main Kimberley – De Aar railway line. The majority (63%) of roads in the local area are gravel roads;
- Access to the internet is more limited in SLM than nationally with only 6,1% people having access to the internet in SLM compared to 7,4% nationally;
- The local area is characterised with relatively low crime rates with both violent crime and property crime ratios substantially below the national average;
- Recent community protests in the local area revolved around the perceived lack of local procurement opportunities at the resumption of copper mining activities by the Australian mining company Orion in Copperton, just outside Prieska;
- Core provincial development objectives include support to alternative industries such as tourism, energy-related enterprises and the green economy to diversify the provincial economy. The Siyathemba Local Municipality also place focus on renewable energy as one of the core industries in the municipal area;
- Siyathemba government faces numerous governance challenges including low debt collection rates; low cash flow; lack of maintenance spending; lack of skills to respond to challenges related to new developments. These skills relate to technical capabilities; spatial development planning; roads, works and storm water master planning; water and sanitation planning as well as the planning of electricity and energy infrastructure and distribution;
- The agricultural sector plays a major role in the local economy and made the second highest contribution after the services (government and personal) sector. Most of the region surrounding Prieska and Niekerkshoop are regarded as low potential arable land more suitable for cattle, sheep and goat farming;
- Mining historically played a large role in the local economy due to the copper-zinc mine at Copperton, which had been opened in 1972 but was shut down in 1991 by the Anglovaal Mining due to falling copper prices. In 2020, the Australian junior miner conducted a feasibility study to revive the old Anglovaal copper mine in Copperton and is planning to re-open the mine;
- While the utilities sector (energy and water) still played a minor role in 2017, its role could have increased substantially since then due to several new renewable energy projects (solar and wind) having been allocated through the Renewable Energy Independent Power Producer Programme (REIPPP) including Mulilo Sonnedix solar PV plant (since 2016) (75MW); Copperton wind farm (since 2017) (102 MW) and Garob wind farm (since 2018) (136 MW);
- The tourism sector makes a fairly low contribution to the local economy although there are some tourism attractions in the local area such as Die Bos Nature Reserve; Khoisan Rock Art and other cultural attractions;
- The unemployment and poverty rate in SLM was lower than the national and provincial averages in 2016 and informal activities play a smaller role;
- The economy is fairly diversified between different types of economic activities. With new investments in the mining and renewable energy sectors after 2017, the economic diversity of the local economy is furthermore poised to increase further over the next few years.

Impact Assessment:

The summary table shows that most socio-economic impacts are rated low to medium before mitigation. The project is expected to bring moderate advantages to the local and regional economy during the construction and operational phases due to local employment creation and increase in social spending (including taxes and local economic development funds).

Summary of Socio-Economic Impacts

Socio-economic Impact	Phase	Significance of Impact	
		Pre-mitigation	Post-mitigation
Population change impacts	Construction	Medium-	Low-
Community safety impacts	Construction	Medium-	Low-
Nuisance Factors	Construction	Low-	Insignificant -
Employment creation	Construction	Low +	Medium+
Visual Impact and Sense of Place	Construction	Low-	Low-
Population-change impacts	Operations	Medium -	Low-
Job and income creation	Operations	Low +	Medium +
Community safety impacts	Operations	Low-	Very Low-
Impact on values of adjacent properties	Operations	Low -	Low-
Community Development Funds	Operations	Low+	Medium+
Economic Diversity	Operations	Very Low +	Low+
Local resource use	Operations	Low-	Very Low-
Contribute to stable, renewable electricity supply	Operations	High+	High+
Visual Impact and Sense of place	Operations	Medium -	Medium -
Nuisance Factors	Operations	Low-	Very Low-
Nuisance factors	Closure	Very Low -	Very Low -
Loss of jobs	Closure	Medium-	Low-
Impact on community safety	Closure	Very Low -	Very Low -

Conclusion:

The proposed Project is in line with provincial and local development priorities in support the development of the renewable energy sector in the region. Negative socio-economic impacts related to the project are largely medium/low before mitigation and could be mitigated further to low/very low negative impacts. The visual impact associated with the turbines, however remains medium before and after mitigation.

Positive impacts of the project include local job creation, possible supply links in the local or regional economy that could assist in diversifying the local economy further away from primary industries (agriculture and mining); the potential contribution to community development funds in the local area as well as a positive contribution to a stable (renewable) electricity supply. The project furthermore is expected to unlock further potential and positive spin-offs in follow-up phases that involves the development of green industries in the local area.

Based on the findings of the socio-economic impact assessment for the project it is therefore recommended that the proposed Project be approved.

2. INTRODUCTION AND TERMS OF REFERENCE

2.1 BACKGROUND TO THE PROJECT

The owner of the project is Prieska Power Reserve (Pty) Ltd with a 50% share by Central Energy Corporation (Pty) Ltd (t/a CENEC) and a 50% share of a BEE holding company. The Power Reserve Hub proposal is anticipated to be developed in phases.

The construction of the 170 MW Solar Photovoltaic (PV) plant and the initial 139 MW of wind power (21 wind turbines) planned as part of Phase 1. The other phases will include:

- Phase 2: Further development and construction of a wind generation plant with associated infrastructure; and
- Phase 3: Development and construction of an industrial plant for green hydrogen and ammonia production.

The solar plant: As indicated in Figure 1 below, the Prieska Power Reserve Solar PV Plant: Phase 1 is situated 6,5 km south of the Prieska Central Business District (CBD) and south of the N10 on a portion of the Remaining Extent of Erf 1 of the town of Prieska (RE/1). It is on 384 ha of municipal land, next to the Burchell-Copperton power line. The Solar PV Plant will cover around 180 ha of the total available 384 hectares. Installed hardware will deliver up to 170 MW by PV technology. Single-axis tracking panels will be used. The dominant height of the panels and the fence will be 3,00 metres. The security towers and utility building will reach a height of up to 4,00 metres. A 132 kV transmission line towards the Burchell substation will be constructed adjacent to the existing Burchell-Copperton 132 kV transmission line.



Figure 1: Project Location: Solar Plant

This land for the project was offered by the Siyathemba Local Municipality and its locality and shape was defined in terms of existing leases on the municipal land.

The Wind Energy Facility (WEF): This land area in general is 12 km south of the Prieska CBD as indicated in Figure 2 below. The total area set aside for all planned turbines currently is 1008 ha (mainly consisting of private agricultural land) while the actual footprint of all the 34 turbines will only be 33 ha. In the first phase of the wind turbine project, a total of only 21 turbines will be erected, delivering 139 MW. The second phase will bring the erection of the other thirteen turbines and an additional 86 MW.

Other associated infrastructure of the wind farm includes:

Security fencing around the area

- Various roads, transmission lines, combiner stations, a substation, and waterlines will run over these farm portions to serve the wind and solar fields.
- Parking and stock storing space.
- A 132 KV transmission line will lead from the turbine area to run parallel to the Cuprum-Burchell line A borrow pit providing suitable gravel during construction

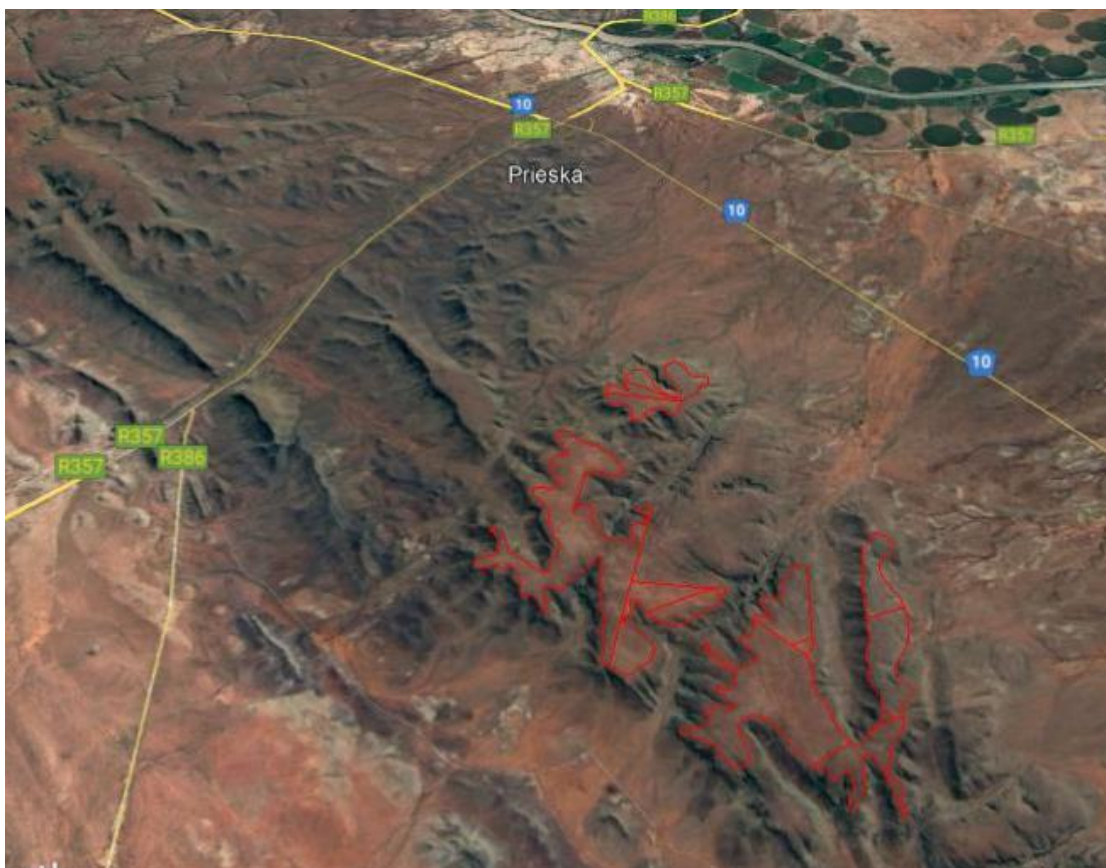


Figure 2: Project Location: Wind Energy Facility

The proposed area for the planned WEF and wind turbines will be situated on the following land portions:

Table 1: Proposed Land for WEF

Farm Name and Portion	Size in hectares	Ownership
Karabee 3/50	289,44 ha	Jan-se-Plaas
Karabee 9/50	36,03 ha	Stoffelshoek
Prieska's Poort(2/51)	19,53 ha	Prieska's Poort
Prieska's Poort (11/51)	347,46 ha	Prieska's Poort
Karabee 4(RE)/50	84,38 ha	Wonderpan
Karabee 8(RE)/50	123,72 ha	Wonderpan
T'Keikans Poort (12(RE)/71)	51,93 ha	Pienaar Boerderye
RE of Erf 1, Prieska (55,20 ha)	55,20 ha	Municipal Land /Townlands
Total Hectares	1007,69 ha	

The main aim of the proposed solar and wind energy facilities is to maximise electricity production for the proposed ammonia and hydrogen manufacturing industry, which forms part of Phase 3 of the Prieska Power Reserve Project.

2.2 TERMS OF REFERENCE

The Socio-Economic Baseline and Socio-Economic Assessment forms part of the larger EIA Process. The terms of reference for the report include the following deliverables:

- A socio-economic baseline description of the local area surrounding the project area
- Identification and assessment of potential impacts anticipated during the construction, operational, decommissioning and post closure phases of the project
- Reporting on the impacts and the quantification of these impacts
- The inclusion of a monitoring plan to enhance the positive impacts and to reduce the negative impacts.

3. DETAILS OF SPECIALISTS

3.1 EXPERTISE OF THE SPECIALISTS

An Kritzinger (*Masters Economics*) is the specialist responsible for the economic baseline description and economic impact assessment of the proposed project.

Ingrid Snyman (*BA Honours degree, Anthropology*) is the specialist responsible for the social baseline description and social impact assessment of the proposed project.

3.2 PAST EXPERIENCE OF THE SPECIALISTS

An Kritzinger has been working as a consultant in the economic development field for the past twenty plus years. She has extensive experience in the economic assessments of projects in various countries in Sub Saharan Africa. Her work has also focussed on applied economic modelling in South Africa, Namibia, Botswana and Mozambique including economic impact analysis, economic cost benefit analysis, social incidence studies and macroeconomic forecast modelling.

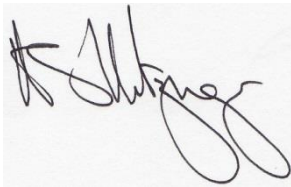
Ingrid Snyman has more than 20 years' experience in the social field. Ingrid has been involved in various Social Impact Assessments during her career as social scientist. These project themes consist of infrastructure development, waste management, road development, water and sanitation programmes, township and other residential type developments. She has also been involved in the design and management of numerous public participation programmes and communication strategies, particularly on complex development projects that require various levels and approaches.

3.3 CV OF THE SPECIALISTS

The detailed Curriculum Vitae (CV) of the specialists is provided in Appendices 1 and 2 below.

4. DECLARATION OF INDEPENDENCE

This report has been prepared as per the requirements of Appendix 6 of Government Notice No. R982 dated 4 December 2014 (Environmental Impact Assessment Regulations) under sections 24(5), 24M and 44 of the National Environmental Management Act, 1998 (Act 107 of 1998). I, Anna Sophia Kritzinger declare that this report has been prepared independently of any influence or prejudice as may be specified by the Department of Environmental Affairs (DEA).



Anna Sophia Kritzinger
Economic Impact Specialist



Ingrid Snyman
Social Impact Specialist

13 September 2022

Date:

5. RELEVANT LEGISLATION AND GUIDELINES

The relevant legislation and guidelines are summarised in Table 2 below.

Table 2: Policy and Legislative Context

Applicable Legislation and Guidelines used to Compile the Report	Reference where Applied during Specialist Study	How does this project Comply with and Respond to the Policy and Legislative Context
<p>Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)</p> <p>Section 24 of the Constitution states that everyone has the right to an environment that is not harmful to their health or well-being; and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that -</p> <ul style="list-style-type: none"> • <i>secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.</i> 	<p>All Application Forms, Documents and Reports (Draft and Final) compiled and submitted in support of the Scoping and Environmental Impact Assessment and Reporting (S&EIR) Process.</p>	<p>A comprehensive SEIA Process will be undertaken to identify the potential socio-economic impacts associated with the project and to prescribe management measures to enhance or mitigate impacts to minimise negative impacts and enhance the project's contribution to socio-economic development.</p>
<p>Mineral and Petroleum Resource Development Act, 2002 (Act No. 28 of 2002)</p> <p>The MPRDA is the central Act governing mining in South Africa and the preamble to the MPRDA affirms the State's obligation to protect the environment for the benefit of present and future generations, to ensure ecologically sustainable development of mineral and petroleum resources and to promote economic and social development.</p> <p>MPRDA REGULATION 50 (c): The regulation sets out the requirement for the assessment and evaluation of the proposed mining operation on the economic conditions of directly affected persons during the construction, operational, decommissioning phases. This includes:</p> <ul style="list-style-type: none"> • <i>the listing of all potential socio-economic impacts</i> • <i>quantification of the loss of value of property or infrastructural assets due to the mining activity</i> • <i>quantification of the net present value of commercial, economic or business activity that will be impacted on as a result of the mining activity</i> • <i>identification of cumulative impacts</i> 	<p>The SEIA will cover the identification of and propose management measures for socio-economic impacts relevant to the project.</p>	<p>A comprehensive SEIA Process will be undertaken to identify the socio-economic baseline of the project area, potential socio-economic impacts (incl. listing of cumulative impacts) associated with the project and to prescribe management measures to enhance or mitigate impacts to minimise negative impacts and enhance the project's contribution to socio-economic development.</p>

Applicable Legislation and Guidelines used to Compile the Report	Reference where Applied during Specialist Study	How does this project Comply with and Respond to the Policy and Legislative Context
<ul style="list-style-type: none"> <i>an impact rating in terms of the listed impacts in terms of its nature, extent, duration, probability and significance.</i> <p>REGULATION 50 (e): This regulation requires the applicant to determine the appropriate mitigation and management measures for each significant impact of the proposed mining operation.</p>		
<p>National Environmental Management Act, 1998 (Act No 107 of 1998) – NEMA and Environmental Impact Assessment Regulations (GN No. R. 982 of 2014) provide a suite of principles and tools to guide South Africa on a path to sustainable development. ‘Environment’ is defined in holistic terms and includes biophysical, social and economic components, as well as the connections within and between these components. While the act does not prescribe a specific methodology in terms of socio-economic impact assessment the following stipulations highlights the necessity to include socio-economic issues in environmental impact assessments.</p> <p>The following general principles apply to all identified impacts:</p> <ul style="list-style-type: none"> <i>Responsibility for the impact should apply throughout its life cycle.</i> <i>The participation of all interested and affected parties in environmental governance must be promoted</i> <i>Decisions must take into account the interests, needs and values of all interested parties</i> <i>The costs of remedying pollution, environmental degradation, consequent adverse health effects and of preventing, controlling or mitigating further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment, i.e. the so-called polluter-pay principle.</i> <p>The regulations also make provision for cumulative effects assessment identifying and evaluating the significance of effects from multiple actions representing potential causes of impacts. The NEMA regulations of 2014 provides for baseline/scoping, impact assessment as well and management reports including the identification of measures to monitor adherence to the ESMP.</p>	<p>The SEIA will cover the identification of and propose management measures for socio-economic impacts relevant to the project.</p>	<p>A comprehensive SEIA Process will be undertaken to identify the socio-economic baseline of the project area, potential socio-economic impacts (incl. listing of cumulative impacts) associated with the project and to prescribe management measures to enhance or mitigate impacts to minimise negative impacts and enhance the project’s contribution to socio-economic development.</p>
<p>The National Water Act No 36 of 1998, draft regulations and 2014 amendments. Section 27 of the Act states that in issuing a water use license the relevant authorities must take all relevant factors into account including:</p>	<p>The SEIA will cover the identification of and propose management measures for socio-</p>	<p>A comprehensive SEIA Process will be undertaken to identify the socio-economic baseline of the project area,</p>

Applicable Legislation and Guidelines used to Compile the Report	Reference where Applied during Specialist Study	How does this project Comply with and Respond to the Policy and Legislative Context
<ul style="list-style-type: none"> • <i>the need to redress the results of past racial and gender discrimination;</i> • <i>efficient and beneficial use of water in the public interest;</i> • <i>the socio-economic impact related to the application</i> 	economic impacts relevant to the project	potential socio-economic impacts (incl. listing of cumulative impacts) associated with the project and to prescribe management measures to enhance or mitigate impacts to minimise negative impacts and enhance the project's contribution to socio-economic development.

6. SCOPE, PURPOSE, APPROACH AND METHODOLOGY

6.1 SCOPE AND PURPOSE OF REPORT

The scope and purpose of the SEIA Report is to provide background of the socio-economic characteristics of the local area relevant to the project, assess possible positive and negative socio-economic impacts that the project could have on the local community and to report on these anticipated impacts. The report further provides a management plan to mitigate negative socio-economic impacts or enhance positive socio-economic impacts.

6.2 APPROACH, METHODOLOGY AND ACTIONS PERFORMED DURING SPECIALIST STUDY

The Report was mainly based on primary as well as secondary resources (see Section 15 for full list of sources) including:

Primary sources include

- Project information supplied by the developer
- Interviews with targeted stakeholders in the local area

Secondary sources include:

- Academic literature review
- Internet searches
- Policy documents relevant to the local and regional area, such as:
 - Integrated development plans, including spatial development frameworks
 - Local economic development plans; and
- Official government data from Stats SA; and
- Public reports from the Municipal Demarcation Board, South African Police Service (SAPS), etc.

For the economic impact of the Project, input-output (I/O) modelling was used to assess the project's potential impact on employment and economic output. The I/O analyses is based on i) direct impacts (income and employment created due to employment by the power plant itself) ii) indirect impacts (backward linkages to local suppliers) and iii) induced impacts due to the overall increase in income levels and increased spending on goods and services which could lead to a further increase in production and employment in the local area.

7. ASSUMPTIONS, UNCERTAINTIES AND KNOWLEDGE GAPS

7.1 ASSUMPTIONS

- Where up to date site specific /ward level socio-economic data is missing, municipal and provincial trends was used as proxy for trends in the local area.
- It is assumed that the local community development priorities are expressed through public processes and public documents such as municipal integrated development plans.
- A SEIA aims to identify possible social and economic impacts that could occur in future. These impacts are based on existing baseline information. There is thus always an uncertainty with regards to the anticipated impact actually occurring as well as the intensity thereof. Impact predictions have been made as accurately as possible based on the information available at the time of the study. Sources consulted are not exhaustive and additional information can still come to the fore to influence the contents, findings, ratings and conclusions made.
- Technical, financial and other information provided by the developer is assumed to be correct.
- Economic multipliers, average salaries and wages and value added as a percentage of total income were based on provincial and national averages.
- The employment impact of the solar plant and wind farm was based on information received from the client.

7.2 UNCERTAINTIES AND LIMITATIONS

- The detailed SEIA Report will include consultations with key stakeholders and potentially affected parties as part of the impact assessment phase. This does not form part of the Public Participation Process (PPP) required for the overall EIA process, except where it was specifically required as such during the consultation session.

7.3 KNOWLEDGE GAPS

Up to date local ward level data (after the 2011 Census) is limited and provincial and municipal trends were used where available to update certain ward level indicators.

8. BASELINE DESCRIPTION

8.1 THE LOCAL AREA

The project is situated in Siyathemba Local Municipality (SLM) which falls under the Pixley Ka Seme District Municipality. The PV Facility is approximately 6km south of Prieska town south of the provincial road the R357 and west of the N10 (the national road to Upington) and the WEF is approximately 12 km to the south of Prieska CBD. The Municipality is located within the central eastern parts of the Northern Cape Province on the banks of the Orange River, and falls within the boundaries of the Pixley Ka Seme District. The nearest business centre is Kimberley, which is about 220km away.

8.2 DEMOGRAPHIC BASELINE

Between 2011 and 2016 the population of SLM grew at an average annual growth rate of 1-1% from 21, 591 to 23,075 people in 2016. The growth rate of the municipal population was below the national population growth of 1.5% per annum during the same period, potentially implying some out-migration from the area during the period. The relative low female percentages and the high percentage of people in the working population in SLM suggests historic high in-migration rates (prior to 2011) The former activities at the copper-zinc mine at Copperton which opened in 1972 and was shut down in 1991 by the Anglovaal Mining Group. At its hey-day the mining town hosted around 3000 workers and their families (SLM, 2019). After 1991, single migrants could have been drawn to the farming areas in the area.

In 2011, the population of Prieska was estimated at approximately 14 000 individuals (Statssa, 2011). Recent estimations indicate a population profile of 16 000 (globalafricannetwork.com). Since 2016, there could have been in-migration into the area due to a number of renewable energy projects implemented in the area and a large-scale mining project in planning phase (see Section 8.5. Economic Profile below). A new residential area consisting of 3,500 residential erven is planned for Prieska town as part of the planning for new mining activities in the area (Orion Minerals, 2020).

SLM consists of 5 wards. The majority of the population stays in and around Prieska town (wards 1,2 and 3):

- Ward 1 covers the northern portions of Prieska town (e'Thembeni and Parts of West-End)
- Ward 2 covers the southern section of Prieska town (Bonteheuwel and Parts of West-End)
- Ward 3 includes the rural areas to the east and north east of Prieska town (including Niekershoop approximately 40km north east of Prieska town)
- Ward 4 to the south of the town includes Copperton some 50km south west from Prieska town and Marydale some 80km north west from Prieska town
- Ward 5 includes the immediate areas surrounding Prieska town including the industrial area to the south of the town (Ext 15, Smarty Town, Krygkor, the Bult and Town areas in Prieska)

Table 3: Population Size and Density, 2016

Area	Population	Population density (persons/km ²)	% Coloured population	% Females	Working population (18-64 years)
Siyathemba Local Municipality	23 075	1,6	74%	48,8%	62%
Ward 1 (Prieska town)	21,7%	2 991,2	-	-	-
Ward 2 (Prieska town)	30,1%	6 695,4	-	-	-
Ward 3 (Niekerkshoop)	14,1%	1,1	-	-	-
Ward 4 (Copperton & Marydale)	15,1%	0,4	-	-	-
Ward 5 (surrounding Prieska town)	19,1%	4,4	-	-	-
Pixley ka Seme	126 333	1,9	63%	50,1%	59%
Northern Cape	1 193 780	3,2	43%	50,0%	58%
South Africa	55 653 654	45,3	9%	51,0%	57%

Source: Based on Stats SA, 2016 (Community Survey) and Stats SA, 2011 (Census)

The number of households in SLM increased from 3 461 in 2011 to 6 616 households in 2016 with an annual growth rate of 2,6%, much higher than the population growth of 1,1% per annum during the same period. This suggests the splitting off of households to form smaller family units. This, in turn, places pressure on local municipalities to provide basic households service in their areas.

Table 4: Households Characteristics, 2016

Area	Number of households	Average household sizes	% Female headed Households
Siyathemba Local Municipality	6 616	3,5	35.6%
Pixley ka Seme	50 732	2,5	36.8%
Northern Cape	353 710	3,4	38.9%
South Africa	16 923 309	3,3	41.3%

Source: Based on Stats SA, 2016 (Community Survey) and Stats SA, 2011 (Census)

8.3 LAND-USE PATTERNS

The land use patterns in the area are indicated in Figure 2 below.

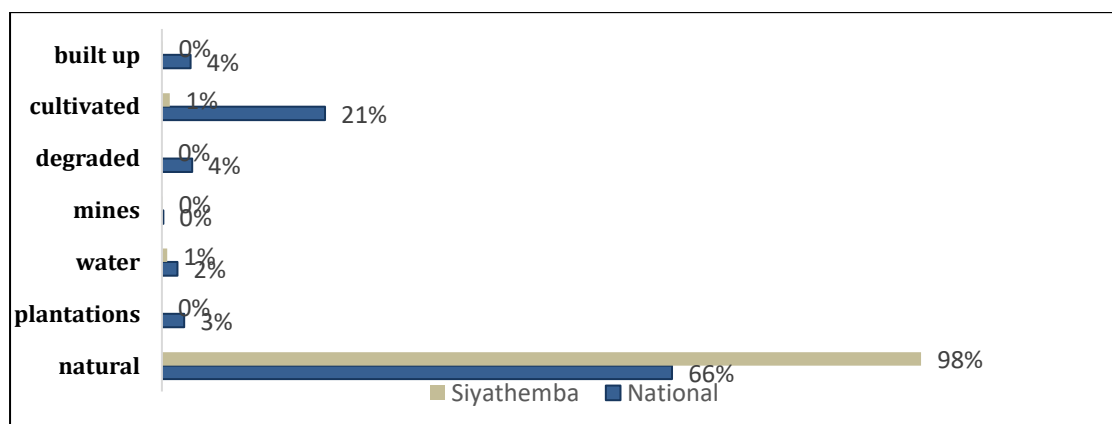


Figure 3: Distribution of Municipal Land

Source: Municipal Demarcation Board, 2018

Figure 3 shows the relative high contribution of natural /grazing areas as percentage of municipal land compared to the national average. Cultivated land (producing oilseed, grains, grapes) is mainly prevalent along the irrigated lands along the banks of the Orange River that runs through the municipal area.

8.4 INSTITUTIONAL PROFILE

8.4.1 Basic Household Services Delivery and Infrastructure

Table 5 below shows that households in the Northern Cape, Pixley ka Seme and SLM fared slightly better than national households in terms of basic service delivery. In SLM, 9% of households live in informal houses or shacks compared to 13% of provincial and national households; 59% did not have access to piped water inside their houses – compared to 70% nationally and 19% of households did not have access to a flush toilet in house compared to 26% nationally. The municipality also fared better than the provincial and national averages in terms of waste collection and access to electricity (Community Survey 2016).

Table 5: Basic Household Services, 2011 (wards) and 2016

Area	% of households				
	living in informal houses/shacks	With no access to piped water in house	Without flush toilet	Without regular refuse removal	Without access to electricity
Siyathemba Local Municipality	8.5%	59%	19%	12%	5%
Pixley ka Seme	9.9%	54%	17%	22%	6%
Northern Cape	12.8%	55%	20%	35%	7%
South Africa	13,0%	70%	26%	43%	7%

Source: Stats_SA, 2016 (Community Survey) and Stats SA, 2011 (Census)

Water supply infrastructure: SLM is considered to have abundant water supply from the Orange River, with the Gariiep and the Vanderkloof Dams on the upstream side of the river. Siyathemba Municipality is the Water Services Authority (WSA) and Water Services Provider (WSP) for Prieska, Niekerkshoop and Marydale. The Municipality is also supplying bulk water to Copperton, but Alkantpan (Armscore) is responsible for the delivery of water, sanitation, and electricity services. No services are currently being rendered on farms. Prieska is abstracting water from the Orange River whilst Marydale and Niekerkshoop are dependent on groundwater (boreholes). Copperton receives its water from the Orange River via Prieska. There are no water treatment works facilities in Marydale and Niekerkshoop. It is envisaged that the bulk water supply to Marydale and Niekerkshoop could become a problem within the next 15 to 18 years. The municipality are furthermore experiencing challenges in terms of maintenance of infrastructure on an ad-hoc basis as well as water quality management (SLM, 2019).

Waste Treatment/Sanitation infrastructure: Services are rendered in Prieska, Niekerkshoop and Marydale. No services are rendered to Copperton, since Alkantpan (Amscor) is responsible for the delivery of water, sanitation, and electricity services. No services are currently being rendered on farms. The Waste Water Treatment (WWT) works in the Niekershoop and Marydale mainly consists of oxidation ponds. WWT in Prieska consists of an internal sanitation system with waterborne sanitation network and onsite sanitation facilities. Furthermore, there are some

septic tanks in areas not serviced with the sewer network. In 2019, the following challenges were highlighted related to wastewater treatment facilities in the area, namely the lack of a wastewater treatment works in Marydale, high service delivery backlogs, collapsing VIP toilets, and lack of maintenance on infrastructure (SLM, 2019). In 2021 the municipality spent some R34m to upgrade WWT works in the municipal area (Magoum, 2021).

Waste management infrastructure: There are currently no formal Municipal driven waste minimisation activities taking place in the Siyathemba Municipality. The landfill site in Prieska is authorised and has enough space for the next 20 years. The Niekerkshoop and Marydale disposal sites are however not authorized. Waste disposal sites are not well managed due to financial, personnel constraints and an ageing vehicle fleet. Wind-blown litter is a serious problem at the site. The Municipality is also experiencing dumping of waste in areas not demarcated for waste disposal (SLM, 2019).

Electricity infrastructure: Two areas in Prieska still need to be upgraded because the electricity network is old and power failures occur. The biggest part of Prieska town, as well as the whole of Marydale and Niekerkshoop, is being supplied by ESKOM directly to customers. The municipality needs to update its Energy Master plan for the Municipality that was last developed during 1998 (SLM, 2019).

8.4.2 Health Status and Facilities

The population with access to medical aid funds are slightly higher in SLM (14%) than nationally (13%) albeit still at a very low level (Municipal Demarcation Board, 2018)

In 2010, the HIV/AIDS prevalence rate of the Siyathemba population was 6.0% compared to the district rate of 6.5%. These rates compared well to the Northern Cape (7.6%) and South African (12.6%) averages in the same year (SLM, 2019). Historically Prieska town is also known for its legal battles of workers who demanded compensation for asbestosis after working in the Koegas mine. Many residents allegedly suffered from asbestosis and other asbestos-related disease through direct exposure through working at the mine or secondarily from asbestos-containing materials in the town (Blignaut et.al, 2009).

There are five public health care facilities in SLM including PHC clinics in Niekerkshoop (one), Prieska (two), Marydale (one) as well as the Bill Prickard district hospital in Prieska. All facilities are serviced with water and sanitation services. The support services to these health facilities such as roads, electricity, water and sanitation are also sufficient. The municipality recorded a ratio of 17 clinics per 100 000 persons in 2016 compared to the national ratio of 12. In the same vein, the ratio of hospitals to population was also much higher in SLM (4) than nationally (Municipal Demarcation Board, 2018).

In terms of health shortages, SLM reported challenges in the areas of ambulances (Niekerkshoop), and Medical Practitioners (SLM, 2019)

8.4.3 Education Status and Facilities

The table below shows that a higher percentage of the labour force were unskilled with no schooling or some schooling (73%) than in the district (70%), province (66%) or nationally

(56%). Only 23% of the SLM labour force were medium skilled (completed matric) compared to 36% nationally and only 4% could be considered highly skilled compared to 8% nationally.

Table 6: Adult (19 years' plus) education levels 2016 (municipal and provincial level)

Area	No schooling	Some schooling but less than matric	Completed Matric	Tertiary
Siyathemba Local Municipality	7,3%	65,9%	23,1%	3,7%
Pixley ka Seme	12,2%	58,2%	25,9%	3,8%
Northern Cape	8,1%	57,4%	29,9%	4,6%
South Africa	7,3%	48,8%	36,3%	7,7%

Source: Stats SA, 2016 (Community Survey) and Stats SA, 2011 (Census)

In 2011, it was indicated that those with no schooling in Prieska town constituted 10%, those with matric was at 21% and individuals with a higher education was at 5% (Statssa, 2011).

SLM had a ratio of 3,9 primary schools per 10 000 of the population compared to 3,8 nationally and only 1,7 secondary schools per 10 000 people compared to 3,9 nationally. On average there were about 565 pupils per educational institution compared to 463 nationally, suggesting some shortage in the number of primary and secondary educational institutions in the area. The number of learners per educator was also slightly higher in SLM at 25,3 compared to the national average of 24,9 learners per educator (Municipal Demarcation Board, 2018). However according to the Integrated Development Plan (IDP), the Municipality does not experience major challenges with regards to the availability of schools. The support services such as roads, electricity, water and sanitation are also sufficient (SLM,2019). Of the 10 schools in the area, 6 are located in Prieska town; two are farm schools, one is located in Marydale and one in Niekershoop.

The DRU-A Professional Further Education and Training College (DRU-A-FET) is the only tertiary education institution in SLM. It is a private institution that was established in 2008 with a main campus in Kimberley and branches in Warrenton and Prieska. The college presents courses in education, local government and business. The only other tertiary education institution in the area was the Vaal University of Technology (VUT) Upington Campus that closed on June 2021. VUT was a sole public provider of higher education within a 400km including Upington and neighbouring towns such as Keimoes, Kakamas, Kenhardt, Olifantshoek, Groblershoop and Prieska, as well as other regions such as Namakwaland, Pixley ka Seme (De Aar-Prieska area), JTG (Kuruman area). The college provided courses in the agricultural field including a National Diploma in Agricultural Management Tourism Management, Internal Auditing, Marketing Management, Retail Business Management, Human Resources Management and Cost & Management Accounting (Vaal University of Technology, 2021).

In 2019 the Siyathemba Municipality have appointed a service provider to pursue and implement its Siyathemba Integrated Education and Skills Development Initiative (SIESDi) (SLM, 2019).

8.4.4 Transport Infrastructure

The 1,7km long airfield in Prieska is suitable for the landing and take-off of light aircrafts. There are 2 runways that are gravelled regularly. This airfield is registered with the Civil Aviation Authority and is inspected by them every year after which a license is issued to the Municipality.

The operating rail siding of Groveput on-route to the town of Prieska, provides rail access to the main Kimberley – De Aar railway line and from there the ports. (SLM, 2019).

SLM have a total road length of 584 km of which 63% are secondary gravel roads (compared to the national average of 17%); 32% is the national tarred road (the N10) and 4% is secondary tarred roads (Municipal Demarcation Board, 2018).

8.4.5 Telecommunications

There are 3 365 landlines per 100 000 people in SLM compared to 3 000 people nationally. Mobile phones are less prevalent with 19 792 mobile phones per 100 000 people compared to 22 518 nationally. Access to the internet is more limited in SLM than nationally with only 6,1% people having access to the internet in SLM compared to 7,4% nationally (Municipal Demarcation Board, 2018).

8.4.6 Community Safety

There is a Police Station in each of the 3 towns (Prieska, Marydale and Niekershoop). There is no fire brigade in the municipal area. The Municipality does not have a Disaster Management Plan but a Community Safety Plan is under development (SLM, 2019).

Table 7 below shows the relatively low per capita crime rate per capita in SLM compared to the provincial and national averages with 34 crimes reported for every 1,000 persons living in the municipality in 2019.

Table 7: Per capita crime rates (cases reported per 1000 persons), 2019

Area	2019
Siyathemba Local Municipality	34
Northern Cape	74
South Africa	36

Source: Crime Stats SA, 2020

The violent crime and property crime ratios for the municipality is both substantially below the national average with 1 231 violent crimes reported per 100 000 people in the municipal area compared to 1 946 nationally and 1 391 property related crimes reported in 2018 compared to 5 326 nationally.

SLM has experienced a number of violent community protest actions that were prevalent across the country for the past two decades. These protests are mainly driven by municipal service delivery issues as well as high levels of local unemployment. Two recent protests that stand out in SLM include:

- In 2016 there was violent community protests when residents marched to the municipal chambers protesting over the newly elected ANC mayor while blocking roads and setting tyres alight (ENCA, 2016).

- In May 2021 there were public protests from community members related to a perceived lack of local procurement opportunities at the resumption of copper mining activities by the Australian mining company Orion in Copperton, just outside Prieska. (Seccombe, 2021)

8.4.7 Local Development Priorities

The national objectives over the medium term according to the 2020-2025 Medium Term Strategic Framework (MTSF) are (DEDAT, 2021)

- Building a capable development state
- Economic transformation and job creation
- Education skills and health
- Reliable and quality basic services
- Spatial integration and human settlements
- Social cohesion and safe communities
- Regional contribution towards better Africa and world

The development vision of the Northern Cape is to create a radically transformed economy in the Northern Cape and its mission to accelerate economic growth and development of the Northern Cape Province through diversification, empowerment, employment, business creation and sustainable development (DEDAT, 2021). To pursue these objectives, the Northern Cape's Department of Economic Development and Tourism (DEDAT) focuses its core activities on small business development; trade and sector development; business support, tourism development and research and innovation.

Core provincial development objectives that were identified for 2020 to 2025 include (DEDAT, 2021):

- Human capital development of youth
- Strengthening international trade
- Support diversification of economies, tourism and the knowledge economy, entertainment industry and energy-related enterprises
- Focus on green economy solutions

The larger development objectives of the Pixley ka seme District IDP include (Pixley ka Seme, 2020):

- Promote growth that is shared within the community
- Enhance integrated development planning in municipal operations
- Sound and financially stable local government that provide essential services, disaster management, health services and spatial development planning

The Siyathemba Local Municipality completed their last Local Economic Development Strategy (LED) in 2012 and have not yet developed an updated strategy. The basic tenets of the 2012 strategy were the provision of access to all basic services and the promotion of the equitable creation and distribution of wealth in the local area. To this end the LED strategy focussed on four anchor projects (SLM, 2012):

- **The Bos Development:** This entails the turn-around and rejuvenation of the "Die Bos" Holiday Resort in Prieska, not only as local, but also as a provincial growth strategy. The focus

of this initiative includes the development of four municipal properties namely [1] Die Bos Holiday Resort situated on the bank of the Orange River, [2] Prieska Golf Course, [3] Die Koppie Nature Garden, and the [4] Municipal Settling Ponds.

- **Solar Energy Project:** SLM signed an MOU with the Department of Energy for a 5 000ha of Commonage Land in Prieska and Marydale to develop a Prieska Solar Park to initially generate 1 GW of Solar Energy into the Eskom Grid with the possible expansion, if the space permits, utilising variety of technologies.
- **Aqua – Commercial Fish Farming Project by the Department of Trade and Industry (DTI):** The DTI and Pixley Ka Seme DM intend to put up Fish Dams for Fish Farming purposes on the Orange River. Aqua Eco have subsequently developed a feasibility study for the DTi on behalf of the Pixley Ka Seme DM and their findings suggest Prieska should be the site for the pilot project. This study included all the municipalities on the banks of the Orange River. The Siyathemba Municipality was identified as ideal for the pilot project provided.
- **Square Kilometre Array (SKA) Strategic position outside the Demarcated Area:** The technology types to be set up by the SKA project is highly sensitive and will not allow any major economic and signal developments within a certain core field hence the opportunity for secondary industries to be develop on the outskirts of their footprint actions, including the peripheral areas of Siyathemba, Emthanjeni and Khara Hais local municipal areas.

In the 2019/20 LED review in the Siyathemba IDP challenges related to the LED strategy includes the lack of an updated strategy since 2012 as well as the lack of an implementation plan for the LED strategy (SLM, 2020).

8.4.8 Local Government Capacity

The high vacancy rates of senior management at SLM as indicated in Table 8 are noticeable. The high municipal personnel per capita ratio couples with high vacancy rates also could suggest some over-staffing in terms of middle management and junior positions.

The financial management of the municipality furthermore experiences challenges as is evident from the qualified audit that the municipality received in the 2018/19 financial year. This audit result indicated that the Auditor-General did not have all of the underlying documentation needed to determine an opinion.

As indicated in the table below, financial challenges that the municipality face that are even more severe than on a national level include the following:

- The low debt collection rates
- The cash flow of the municipality is under pressure, and this is largely due to the low payment culture
- The under-spending of the capital budget suggests under-delivery of basic services.
- Over-spending on the operational budget
- No financial provision is made for the maintenance of municipal assets which, coupled with the current low public investment levels, could have dire implications for municipal service delivery in future.

Other local municipal governance challenges that are highlighted by the municipal IDP (SLM, 2019) include:

- The Municipality does not have an Integrated Human Resource Strategy in place to address all issues with regards to people already on the organogram of the Municipality as well as to retain employees and attract skilled people
- Although the Municipality does have a skills development plan in place, the improvement of skills within the Municipality remains a challenge
- Audit opinions tracked over time indicate that the Municipality is not improving its Audit
- New developments in the municipal area place pressure on the municipality in terms of technical capabilities spatial development planning; roads, works and storm water master planning; water and sanitation planning; the planning of electricity and energy infrastructure and Distribution; the development of technology hub including cyber security planning
- Contract management of IPPs including the lease regulations.

Table 8: Local Government Capacity

Governance issue	Siyathemba Local Municipality	South Africa
Municipal election results (2016):		
African National Congress	60%	60%
Democratic Alliance	31%	26%
Economic Freedom Fighters	3%	9%
Municipal Audit Result (2018/19)	Qualified	Unqualified with findings
Money Generated Locally % of Revenue (2018)	60%	-
Current Debtors Collection Rate (%) (70%-80%) (2018)	0,2%	64%
Fruitless And Wasteful Expenditure (Norm=0) (2018)	63%	13%
Spending Of Capital Budget (% Over Or -Below) (Norm 5% +/-) (2018)	-94%	-29%
Spending Operational Budget (% Over + Or -Below) (Norm 5% +/-) (2018)	+35% (2016)	+9%
Cash Coverage (Months of Operating Expenses that can be covered with cash available) (Ideally 3 Months) (2018)	2,9 months	1.6 months average
Spending on Maintenance and Repairs % of Capital Equipment (2018)	0,0%	0.1% (8% norm)
Municipal Staff per 100 000 population (2018)	745	405
% of vacancies at municipality (2018)	20%	14%
% Senior Management Vacancies	33%	
% Vacancy of Environmental Management Positions	0% (no positions)	
% Vacancy of Technical Positions	10%	
% Vacancy of Finance Manager Positions	4%	

Source: National Treasury, 2021 and Municipalities of South Africa, 2021

8.5 ECONOMIC PROFILE

8.5.1 Economic Activities

The SLM economy provided 5,600 formal job opportunities in 2017 and produced a GVA of R970million (current prices). Table 9 shows the sector distribution of economic activities in SLM compared to the national economy. The economic structure of SLM shows the following characteristics:

- **The agricultural sector** plays a major role in the local economy made the second highest contribution after the services (government and personal) sector. Most of the region surrounding Prieska and Niekerkshoop are regarded as low potential arable land. This indicates that the area is not suitable for the cultivation of crops, but is appropriate for cattle, sheep and goat farming. Game farming also takes place in the area and aids in the development of tourism and hunting activities. The Orange River runs through the

Municipality and provides ideal conditions for irrigation farming in Siyathemba, especially the cultivation of grains and vegetables.

- **Mining** historically played a large role in the local economy due to the copper-zinc mine at Copperton, which had been opened in 1972 but was shut down in 1991 by the Anglovaal Mining due to falling copper prices. In its heyday Copperton housed about 3,000 workers and their families; amenities included a school and recreation facilities, including a golf course. Today, most of the buildings have been demolished and only a few houses are used by Armscor, who operate a weapons' testing centre, Alkantpan Test Range. In 2017, the mining sector played a relatively small role in the local economy and was mainly dominated by mining of various semi-precious stones, such as tiger-eye. In 2020, the Australian junior miner conducted a feasibility study to revive the old Anglovaal copper mine in Copperton. Construction activities and operations are planned for 2021 with an anticipated life of mine of 20 years or more. The revived mine will create 900 additional jobs, potentially increasing the contribution of the local mining employment from 400 jobs in 2017 to 1,300 in the next few years.
- **The manufacturing sector** in SLM is relatively small and confined to agro-processing activities including a cotton mill; a bakery; the production of various meat products: manufacture of furniture, built-in cupboards; cattle fodder pellets; and a tiger's eye processing plant.
- While the **utilities sector (energy and water)** still played a minor role in 2017, its role could have increased substantially since then due to several new renewable energy projects (solar and wind) having been allocated through the Renewable Energy Independent Power Producer Programme (REIPPP) including Mulilo Sonnedix solar PV plant (since 2016) (75MW); Copperton wind farm (since 2017) (102 MW) and Garob wind farm (since 2018) (136 MW).

Table 9: Contribution of different economic sectors to the local economy, 2017/19

Sector	Siyathemba Local Municipality		South Africa	
	% employ	% GVA	% employ	% GVA
Agriculture	22,6%	23,5%	6.4%	2.1%
Mining	6,9%	4,1%	3.4%	8.3%
Manufacturing	2,1%	3,5%	10.9%	13.2%
Utilities	0,4%	2,7%	0.8%	3.8%
Construction	5,7%	4,3%	6.0%	3.8%
Trade	12,6%	12,4%	17.5%	15.1%
Transport	1,3%	10,7%	4.6%	9.8%
Finance	8,9%	14,6%	18.3%	19.7%
Services	39,5%	24,1%	32.0%	24.1%
TOTAL	100%	100%	100%	100%

Source: Based on Northern Cape Provincial Treasury, 2019 and Stats SA, 2019 (a) (Regional GDP)

The local economy grew at an average annual growth rate of 3% between 2007 and 2017 compared to a district growth rate of 1.4% and a national rate of 1,7% for the same period (Northern Cape Provincial Treasury, 2019).

The tourism sector does not play a large role in the local economy and only contributed to 6% of the total 545 344 bed-nights spent in the Pixley ka Seme District in 2017. The bed-nights spent in

the area furthermore declined since 2007. Tourism spending in SLM could have been in the region of 4% of GVA compared to 6% nationally (NC Treasury, 2019). Tourism attractions in the area:

- Die Bos Nature Reserve
- British Fort
- Green Valley Nuts
- The Oranjezicht and the “Keikamspoort Hiking Trails
- Khoisan Rock Art
- Memorial Garden
- Prieska Museum
- Ria Huysamen Aloe Garden
- Schumann Rock Collection
- Wonderdraai Island

8.5.2 Labour Force

As indicated in Table 10 below, the Northern Cape unemployment rate is lower than the national average in 2016, i.e. close to 27,5% of the labour force (excluding discouraged work-seekers) not in employment. The unemployment rate in SLM was lower than the national and provincial averages in 2016. The unemployment rate stayed relatively constant in SLM since 2011 to 2016 at 24% of the labour force.

Table 10: Composition of the labour force (2016)

Labour Force Segment	Siyathemba LM	Northern Cape	South Africa
Formal employment	4 861	238 079	11 491 279
Informal employment	571	43 863	1 640 901
Unemployment (narrow)	1 728	106 723	5 594 055
Total labour force (LF)	7 160	388 665	18 726 235
Unemployment (narrow (%))	24,1%	27,5%	29,9%

Source: Based on Stats SA Census, 2011 and Stats SA Community Survey, 2016

Informal activities play a smaller role in the labour force (7%) of SLM compared to provincially (11%) or nationally (8% of the labour force). Most of the informal activities are in the trade, service and construction sectors (Northern Cape Provincial Treasury, 2019).

8.5.3 Income Levels

As indicated in Table 11 below, there are three official income poverty rates in South Africa namely the food poverty line (FPL) only making provision for basic nutritional needs, the lower-bound poverty line (LPL) also making provision to some extent for other basic needs such as basic clothing, shelter and education. The upper-bound poverty line (UPL) makes full provision for all basic needs including food, clothing, shelter and basic education.

Table 11: National Poverty Lines, South Africa, 2011 and 2017 (nominal terms)

Poverty line	Rand per households per year, 2011	Rand per households per year, 2017
Food poverty line (FPL)	13,220	19,337
Lower-bound poverty line (LPL)	19,771	27,92
Upper-bound poverty line (UPL)	30,742	42,292

Source: Stats SA, 2019 (b) (National Poverty Lines)

Table 12 below shows that the percentage of households that earned below the lower bound poverty line (LBPL) in 2011 (roughly equating R20 000 per year) were slightly lower in SLM than in provincially and nationally - also in line with the unemployment trends discussed above. The larger parts of households in SLM earn less than R75 000 per year while much smaller percentages than nationally earn an income of more than R300 000 per year.

Table 12: Percentage of households per income category, 2011

% of households earning per annum:	Siyathemba LM	Northern Cape	South Africa
less than R20k per year	39,6%	41,6%	44,5%
R20k - R40k	25,9%	21,3%	19,0%
R40k - R75k	16,4%	14,7%	13,0%
R75k - R150k	8,8%	10,2%	9,2%
R150k - R300k	5,6%	7,1%	7,1%
R300k - R600k	2,8%	3,6%	4,6%
R600k - R1.2M	0,5%	1,0%	1,8%
more than R1.2m	0,4%	0,5%	0,8%
Total	100,0%	100,0%	100,0%

Source: Stats SA, 2011

The percentage of households in SLM that fall below the UPL is even much higher, estimated to be close to 60% in 2011 albeit declining to around 45% in 2017 ((Northern Cape Provincial Treasury, 2019).

8.5.4 Economic Diversity

The economic stability of an economy is influenced by the diversity of production activities as well as the diversity of demand for the products produced by these markets.

The table below shows the production diversity of the SLM with the aid of tress indices. A tress index is a single index that provides an indication of the level of concentration of economic activity in particular economic activities. A tress value closer to 100 shows that an economy is concentrated in a few economic sectors while an index closer to 0 shows that the economy is more evenly distributed across a large number of sectors.

The table shows the medium tress index value of the SLM economy compared to the national economy in 2017. This means that economic activities are currently fairly evenly spread among different economic sectors without one sector dominating the rest. With new investments in the mining and renewable energy sectors after 2017, the economic diversity of the local economy is furthermore poised to increase further over the next few years.

Table 13: Diversity Indicators, 2017

Diversity indicators	Siyathemba LM	National
Output (Tress) 2017	43,6	40.8

Source: Northern Cape Provincial Treasury, 2019

8.5.5 Natural Resource Intensity

The table shows the energy and water efficiency of the national economy. It shows that on average the national economy produces R16,517 worth of GVA for every MWh energy used (including petroleum, gas, electricity and coal products). In comparison, the SLM only produces R 13,942 of GVA for every MWh energy used. The GMM economy is therefore less energy efficient than the national economy. The main reason for the lower energy efficiency of the SLM economy is the relatively large contribution of the energy inefficient agriculture sector to the SLM economy.

As indicated in the table below, the SLM is however more water efficient than the national economy despite the relative water inefficiency of the agriculture sector. This is due to the relatively large role played by the more water efficient services and trade sectors.

Table 14: Resource Efficiency of the Siyathemba Local Municipality, 2017/2019

Area	Energy Efficiency	Water efficiency
	GVA (R)/MWh used	GVA (R) /cubic meter water used
Siyathemba Local Municipality	13,942	440
National economy	16,517	207

Source: Department of Energy (2019), Connigarth (2019), Stats SA (2018)

9. IMPACT ASSESSMENT OF PROPOSED ACTIVITIES

9.1 DESCRIPTION OF IMPACTS DURING CONSTRUCTION

9.1.1 Description of the Construction Phase

Solar plant: The start-up phase of the PV facility would typically entail site surveying, which would include a geo-technical survey and environmental assessment of the site. Once the facility has been approved, the construction activities will start with the site preparation which again entails the clearing of vegetation at the footprint of the components for the solar field, levelling of the site, construction and establishment of internal access roads, fencing of the site, and construction of the site entrance. This will be followed by the transportation of components and equipment to the site, establishment of the laydown areas, construction of foundations, supports and platforms, assembly, erection and construction of the solar fields and ancillary infrastructure, as well as the implementations of the connections points by Eskom followed by the commissioning of the facility.

Installed hardware will deliver up to 170 MW AC by PV technology on a 240-hectare footprint. Single-axis tracking panels will be used. The dominant height of the panels will be 3 metres. The following associated infrastructure will be included:

- Solar panels single axis,
- A 132 kV transmission line will lead from the substation for approximately 420 m outside the security fence where it will run northwards and parallel to the existing 132 kV Burchell-Cuprum Eskom line
- Security towers and a utility building which will reach a height of up to 4,00 metres
- Ablution facility
- Internal access roads, and
- Perimeter fence, 3 meters high.

The construction of the solar plant is expected to take between 18 to 24 months. Impacts associated with this phase of the project is thus of a relatively short duration, temporary in nature, but could have long term effects on the surrounding environment.

Wind Energy Facility: Construction activities of the WEF would mainly entail site preparation, access and clearing, road construction, excavations, laying of foundations, cabling, transportation and construction of the wind turbines, followed by commissioning.

The 139 MW plant could host about 21 turbines. For each turbine an area of between 0.4 and 1.2ha can be cleared and numerous laydown and crane staging areas can be established for the duration of the construction phase.

Potable water and sanitation facilities are required on site during the construction phase, which would be obtained from the local municipality or the developer. Sanitary facilities would most likely be in the form of portable latrines.

A (non-residential) construction camp and laydown area of approximately 10 000m² will be required for the duration of the construction process and will likely be temporary in nature.

Associated with this there will be contractor site offices occupying an area of approximately 5000m². This will be rehabilitated after construction.

Overall, the construction process is likely to involve the following activities:

- Establishing site access (pre-construction phase).
- Construction of temporary infrastructure, such as temporary offices, sanitary facilities, etc.
- Site grading.
- Constructing construction lay-down areas and access roads.
- Removing of vegetation from construction and construction lay-down areas (primarily for fire safety).
- Excavation of tower foundations.
- Installing tower foundations.
- Erecting towers.
- Installing nacelles and rotors.
- Installing permanent meteorological towers (if necessary).
- Construction of the central control building and a parts storage area (latter may form part of the control building).
- Construction of the substation with power-conducting cables and signal cables and
- Performing shake-down tests.

The duration of the construction process depends on the site itself and the size of the wind farm. Based on case studies elsewhere it could take 12 to 24 months to construct a wind farm of 139MW.

The following socio-economic impacts have the potential to materialise during the construction phase of the project.

9.1.2 Impacts associated with Population Influx

The controlled population influx refers to the inflow of construction workers during the construction phase. These would include contractors, sub-contractors and those employed by these contractors, whether locals from the area, or an outside workforce. Approximately two hundred and forty (240) individuals would form part of the construction team over the 18-24 month construction period. In addition the wind farm could employ an estimated 300 jobs, representing more than 3% of the current estimated 16,000 inhabitants of Prieska town.

Approximately two hundred and forty (240) individuals would form part of the construction team for the PV Solar Facility over the 18-month construction period, representing 1,5% of the current estimated 16,000 inhabitants of Prieska town. During the estimated 12-18 months construction phase for the WEF, seven hundred and forty-three (743) construction workers could be involved in the process. Of these, five hundred and twenty (520) will fall within the unskilled category. The overall number of workers required constitutes 4.6% of the total population within the town. A rather visible short-term increase in the population profile is thus expected due to construction. This trend will not necessarily continue in the longer term as it is anticipated that outside construction workers will exit the area on completion of the construction phase.

It is anticipated that the construction would be phased and that all workers would not be on site simultaneously, but that they will be divided into teams responsible for different aspects of the construction process. Some local residents could form part of this team, although the number of locals to be employed is unknown at this stage. A key mitigation measure would be to maximise the local labour content, especially the unskilled workers required as part of the WEF and PV Solar Facility.

Considering that the area is largely characterised by low-density, rural, and farming areas, the impact of the inflow of this size of workforce is anticipated to have noteworthy negative impacts on the daily living and movement of the nearby residents, and possibly on the infrastructure and services within the area should this not be catered for by the contractor. The impact can be worsened if the proposed Copperton mine's construction process runs concurrently with the Prieska Power Reserve project's construction period.

The outside workers forming part of the contractor's teams are anticipated to make use of existing accommodation facilities within Prieska. Due to the size of the workforce for both the solar PV facility and the WEF, it is highly likely that some of the contractors would also be accommodated further afield. This inflow will thus result in positive impacts for the local and even regional hospitality and trade sectors.

The inflow of individuals unfamiliar to the resident population is also always perceived to increase the criminal activities in the area. Concerns in this regard relate to the misconduct of workers, promiscuous social activities, trespassing of workers on privately owned farms, the possible increase in crime, littering, increase in traffic, increase in noise, the development of informal vending stations and so forth. Although it is difficult to determine whether these impacts will occur, the sensitivities in this regard should be noted and mitigated by implementing strict guidelines for worker conduct.

The extent of an uncontrolled inflow of people to the area is usually determined by the following factors:

- The proximity of the construction site to existing low-income or informal settlements and the ease of access to the site;
- The unemployment levels of those residents in close proximity to the construction site or in the study area;
- The type of construction activity and the need for unskilled or semi-skilled workers;
- The length of the construction period;
- The scale of the construction activities;
- The existing presence of jobseekers who already came to the area in search of employment at other sources of possible employment;
- Whether recruiting of labourers is taking place at the construction site itself; and
- The confidence of the jobseekers with regards to actually securing employment.

Even though the unemployment levels in SLM was lower than the national and provincial averages in 2016 at 24% of the labour force, a massive influx of jobseekers to the construction site is not foreseen due to the distance of the construction site from the main road (N10), and the R357, as well as from the low-income settlements. The construction of the proposed Copperton

mine should be considered. In the event that the construction periods would take place at the same time, the area could experience an inflow of larger numbers of jobseekers. If recruiting is pro-actively undertaken and managed, it is anticipated that the inflow of jobseekers to the area could be limited without creating socio-economic problems.

Geographic location of impact: On-site, towns near the site, e.g. Prieska, Copperton and Niekerkshoop and other urban areas/towns within the municipal area.

Potential cumulative impacts: Possible overlap with construction periods of the proposed Copperton mining: High

Proposed management measures:

Description:

- Project Proponent and the Employment Procurement and Construction (EPC) contractor should maximise the use of local labour, especially for the semi-skilled to unskilled employment categories as this would limit the negative impacts (e.g. infrastructure requirements) associated with a sudden population increase and to avoid possible conflict arising between locals and the outside workforce
- The local labour procurement strategy as well as proof of residence required should be clearly communicated in the local community and broader regional media well in advance of the construction phase
- Where new job opportunities open up employment of locals (within unskilled and semi-skilled positions) already residing in municipality must receive priority as this would limit the negative impacts (e.g. infrastructure requirements) associated with a sudden population increase and to avoid possible conflict arising between locals and the outside workforce
- Contractors to ensure that workers outside the local area reside in suitable facilities and not establish informal houses. Due to the size of the construction workforce for the PV Solar Facility and the WEF, a contractors accommodation facility can be considered.
- In the event that a contractors accommodation facility will be constructed, the contractors must ensure that all relevant environmental management protocols are adhered to.
- No uncontrolled and unmanaged informal vending stations should be allowed close to site
- Worker conduct to be implemented for on-site construction workers

Legal Requirements/ Compliance with Standards: None

Timeframe for Implementation: Prior to and during the construction period

Standard to be achieved: Zero incidents reported from the community and/or the Community Stakeholder Forum.

Proposed socio-economic monitoring plan:

Locality: On-site management and Head office

Procedure: Establish Community or Stakeholder Forum representing local farming and other representatives in the area, that meet with the project proponent on a quarterly basis. Establish a Complaints Register on-site and respond to these complaints timeously

Relevant standards: Zero complaints from the community and/or the Community Stakeholder Forum

Frequency: Quarterly feedback to Community Stakeholder Forum

Data capture protocols: Contractor and head office to keep complaints register and minutes from Community Stakeholder Forum meetings

Reporting: Through quarterly meeting with stakeholders

Standard operating procedures for non-compliance: Action plan to improve on results and monitor for next quarter

9.1.3 Impacts on Community Safety

The area is a typical rural, sparsely populated community and the affected communities are largely unaccustomed to projects of this nature. As such, risks to community safety and health will be experienced during the construction phase due to the presence of a relatively large workforce in this context.

The main concerns with regards to community safety relate to the inflow of large numbers of workers to the area as it is commonly perceived that this could negatively impact on the local crime levels in the area. The local criminal sector could also view the presence of these workers as a new offset point for their stolen goods and even stolen animals.

Further safety concerns during the construction phase relate to the actual safety of construction workers, unauthorised individuals and even children accessing the construction site, the increased risk of fires emanating from the construction site, as well as the risk associated with the movement of heavy vehicles or machinery on local roads (especially those abnormal size vehicles that transport the turbines and nacelles) or in residential areas. The site is located outside of the town of Prieska and it is unlikely that the construction vehicles would have to travel through the town and residential section. Residents and pedestrian would thus not be at risk.

Fire risks always remain a concern during construction process. This will be applicable to the project due to the large workforce associated with the construction of the PV solar facility and the WEF.

Should locals be employed it could minimise the perceived and actual risk in this regard and would then thus serve as key mitigation measure in this regard. Fencing of the property, lighting, cameras, and 24-hour guarding will improve security at and around the site and can limit any possible negative impacts on the adjacent landowners. A Health and Safety plan according to SHE best practices will be mandatory.

Geographic location of impact: Construction workers, local community and farming communities close to the construction sites.

Potential cumulative impacts: None

Proposed management measures:

Description:

- The construction area should be fenced or access to the area should be controlled to avoid unauthorised entry
- Employ permanent security personnel for the duration of the construction period.

- Adhere to the Occupational Health and Safety Act (Act 85 of 1993) through the development of an Occupational Health and Safety Plan.
- Develop and Implement an Occupational Health and Safety, Community Security and Emergency Preparedness and Response Plan
- In order to protect employees during the construction of the project, only qualified personnel undertaking tasks relevant to their duties must be allowed
- Personal Protection Equipment (PPE) must be provided to all construction workers and contractors
- Adhere to the National Veld and Forest Fire Act (Act 101 of 1998)
- A Fire/Emergency Response and Management Plan should be developed and implemented.
- Contractors and construction workers must be trained with regards to the implementation of the Fire/Emergency Response and Management Plan
- Regularly review the functionality and efficiency of these plans in conjunction with the local emergency teams, management, community representatives and neighbouring landowners
- Appropriate fire-fighting equipment should be on site and construction workers should be appropriately trained for fire fighting
- All construction vehicles should be in a good condition and adhere to the road worthy standards
- Implement regular safety briefings, road signage as well as speed control measures
- Speeding of construction vehicles must be strictly monitored
- Sufficient warning signs should be erected at the turn-off from the N10
- Consider public transport of workers to and from the site on a daily basis
- Restrict the activities and movement of construction workers and vehicles to the immediate construction sites and existing access roads.
- Ensure that all temporary employees, sub-contractors and contractors understand, are aware of the requirements and adhere to the EMPr
- Transgressions to be dealt with through verbal instructions, then written communication and contract notices (in the case of serious transgressions).

Legal Requirements/ Compliance with Standards: EMPr

Timeframe for Implementation: During the construction period

Standard to be achieved: Zero accidents or safety incidents during construction; EMPr compliance

Proposed socio-economic monitoring plan:

Locality: On site management

Procedure: Construction safety record keeping and Complaints Register to be managed through the Contractor Management Plan

Relevant standards: Occupational Health and Safety Act (Act 85 of 1993).

Frequency: Monthly update of construction safety records

Data capture protocols: On site management to keep safety records as required by relevant legislation. On site management to safekeep records of Complaints Register

Reporting:

- Monthly reporting by contractor to project managers/proponent
- Feedback to community through Community Stakeholder Forum on a quarterly basis

Standard operating procedures for non-compliance: Action plan for corrective action, including a review function to continuously assess, and to improve on results and monitor for next quarter.

9.1.4 Nuisance Factors

The construction process could potentially result in intrusion impacts on the neighbouring property owners through the increase in people movement, vehicle movement (especially those abnormal size vehicles that transport the turbines and nacelles), possible lighting at night and increased noise levels.

Workers, whether local labourers or outside contractors, for both the PV facility and WEF would have to be transported to and from site on a daily basis resulting in some intrusion impacts (e.g. an increase in local traffic). Heavy vehicle movement of approximately ten vehicles per day are expected for the construction of the PV Facility. This will have more of an intermittent impact on the traffic patterns along the section of the N10 between the site and Prieska. The transportation of the turbines and nacelles via abnormal size vehicles will have a cumulative negative impact on the roads surrounding the site for a short duration of time.

Noise related impacts created during the construction phase of the project are highly probable. These are anticipated to emanate from heavy vehicles travelling to and from the site, the noise created by the “reverse indication” of the trucks, and the noise generated by the general construction activities. The simultaneous use of construction equipment for the PV facility and WEF will affect the area surrounding the construction sites for a short periods of time in all directions. In terms of vehicle movement, the use of construction vehicles will add to the existing ambient levels and will most likely cause a disturbing noise along the local roads used and at the construction sites, albeit for a short period of time.

Given the general low ambient noise levels in the area, this noise could be particularly intrusive on site. However, due to the distance of existing dwellings to the construction sites for the PV facility and the WEF, a possible, but negligent impact is expected on the surrounding property owners’ quality of life. The nearest dwellings to the WEF that were identified were approximately 2.7 km to the northeast of C05 and 2 km to the south of F02.

It is anticipated that the power line and access roads would be constructed prior to or during the same period as the construction of the PV facility and WEF. These construction activities would also lead to intrusions in the form of noise, movement of heavy vehicles and machinery and intrusion of construction workers onto the properties affected by the servitude and road alignment. Construction work will be contained within the servitude and along the road alignment. The negative impacts will be temporary without any widespread additional impacts.

Geographic location of impact: Areas along the access roads (N10) and on sections of the local roads (possibly in the town of Prieska) that would be used for movement of construction vehicles. Internal local roads used to access to turbine construction sites. Settlements close to the construction sites.

Potential cumulative impacts: None

Proposed management measures:

Description:

- The mitigation measures of the Noise and Air Quality Impact Assessments are relevant
- All construction vehicles should be in a good condition and adhere to the road worthy standards
- Implement regular safety briefings, road signage as well as speed control measures
- Speeding of construction vehicles must be strictly monitored
- Sufficient warning signs should be erected at the turn-off from the N10
- Dust suppression measures should be applied if and when necessary. The frequency of these should be determined by the state of the roads, the prevailing weather and vehicle volume on site at the time
- A Complaints Register must be available at the security office
- Install low-impact lighting on the exterior of the site where night-time lighting is essential
- Consider public transport of workers to and from the site on a daily basis
- The stakeholders (through a forum) should be kept informed of the construction schedules and activities.

Legal Requirements/ Compliance with Standards: Air quality standards, EMPr

Timeframe for Implementation: During construction

Standard to be achieved: No community complaints received; EMPr compliance

Proposed socio-economic monitoring plan:

Locality: On-site management

Procedure: Establish Community or Stakeholder Forum representing local farming and other representatives in the area, that meet with the project proponent on a quarterly basis. Establish a Complaints Register on-site and respond to these complaints timeously

Relevant standards: Zero complaints from the community and/or the Community Stakeholder Forum

Frequency: Quarterly feedback to Community Stakeholder Forum

Data capture protocols: Contractor and head office to keep complaints register and minutes from Community Stakeholder Forum meetings

Reporting: Through quarterly meeting with stakeholders

Standard operating procedures for non-compliance: Action plan for corrective action, including a review function to continuously assess, and to improve on results and monitor for next quarter

9.1.5 Potential Local Employment and Income Opportunities

The construction period for the solar facility is expected to last for 18 -24 months and will create 240 job opportunities (Greenbox Consulting, 2022).

On average between 0,1 and 0,2 indirect (supply-related) jobs are created for every direct job during the construction of solar farms, implying that an additional 24 to 50 supply-related/ indirect jobs could be created over the 2 year construction period (SED, 2018). With close to 80% of inputs in the Northern Cape in general imported from other provinces or the rest of the world, the majority of the indirect jobs would be created outside the local area and the province (Conningarth Economists, 2018).

On average the construction sector nationally employs around 17% skilled workers (post matric); 46% medium skilled (artisan) workers and close to 37% unskilled workers. The construction of a solar plant could be slightly more skills intensive with 24% skilled workers, 47% medium skilled and only 29% unskilled workers (Bhorat and Rooney, 2017).

Based on industry averages the WEF could create close to 743 direct construction jobs over an average construction period of 2 years¹. On average close to 1 indirect (supply-related) job is created for every direct job during the construction of wind farm, implying that an additional 300 supply-related/ indirect jobs could be created over the two years construction period (SED, 2018). With close to 80% of inputs in the Northern Cape in general imported from other provinces or the rest of the world, the majority of the indirect jobs would be created outside the local area and the province, most of them probably in Cape Town (Conningarth Economists, 2018).

Based on experience elsewhere, the construction of the WEF would require 39% unskilled workers; 20% semi-skilled and 41% skilled labour.

It is the stated intent of the project proponent to use local labour as far as possible, although the main contractors will be sourced from outside the study area and even the province. If the low levelled skill work can be sourced from locals it would have a positive impact on the localised unemployed without any form of income and those dependent on grants or others as main income source. Even if these opportunities would only be limited and temporary, it can provide relief to the poorer households for some time.

In 2011 it was indicated that only 21% of locals within the town of Prieska obtained a matric certificate (Statssa, 2011). It is anticipated that the situation would not have changed significantly since then. Due to the average low level of skills found amongst the local population in the study area, as well as the main employment sector being the agricultural sector, it is unlikely that all the semi-skilled and skilled positions could be filled by locals. As stated above, the specialists would also probably be sourced from all over South Africa and in certain cases, even abroad.

The construction of the power line would create approximately thirty (30) (figure based on previous similar projects) construction-related employment opportunities. It is planned that the line will be constructed by private contractors as part of the Prieska Power Project. Contractors involved in this process are usually highly skilled and there is a very limited possibility that locals could be employed for a very short duration.

Localised procurement opportunities during the construction phase are deemed low. Specialised material and structures for the solar energy facility will be obtained, manufactured and assembled elsewhere before being transported to the site. As there is a shortage of credible localized suppliers of the materials and equipment required for the solar facility, local procurement during the construction phase would only be focused on general goods, materials and services. General building supplies, equipment rental and security services could be procured from Prieska, as the business component in this regard is relatively well developed.

¹ Note that wind energy facilities of similar size on average create between closer to 300-400 jobs (SED, 2018). The information above was supplied by the developer.

For the construction of the power line, the project proponent and contractor would make use of experienced local suppliers for civil construction of the power line and the electrical hardware would probably be procured from Gauteng.

Employment creation and the limited procurement opportunities, even only temporary, should thus be seen as a positive impact with some trickle-down positive impacts on the households benefiting from the increased income, and the benefits to the local economy as a result of increased expenditure.

Should the majority of contract workers be sourced from outside the local area, a range of local impacts differing in nature and intensity, are anticipated. It is thus important to consider that jobs are a scarce commodity in the local area, with most opportunities being work within the agricultural sector. Introducing various new types of construction related job opportunities into this environment by itself is likely to create competition among the local jobless. Furthermore, introducing a large sector of outsiders, especially with regards to difference in age, race, ethnical composition and local culture, is therefore expected to aggravate possible discontentment with regards to the project and possibly social conflict between the groupings. As the area has seen violent protests due to previous perceived lack of local procurement opportunities, it is highly likely that conflict can again flare up if similar perceptions with regards to the proposed project exist.

Skills development and on-site training would be imperative to enhance capacity building and the possibility of workers being employed on similar construction related projects in future.

Geographic location of impact: Municipal and Regional (SLM and rest of Northern Cape Province)

Cumulative Impact Description: None

Proposed management measures:

Description:

- Project Proponent and the Employment Procurement and Construction (EPC) contractor should maximise the use of local labour.
- Provide up-skilling opportunities for unskilled and semi-skilled local workers to lessen any possible skills disparity between the local skills available and the requirements of the project (if construction timeframe allows).
- The skill requirements should be communicated to the local community leaders and community based organisations such as the Community Stakeholder Forum.

Legal Requirements/ Compliance with Standards: No legal standard

Timeframe for Implementation: As part of Employment Procurement and Construction (EPC) Contractor Management Plan for the duration of the construction period.

Standard to be achieved: Recruit 100% of unskilled labour from the local areas and secondly in the larger municipal area before recruiting elsewhere.

Proposed socio-economic monitoring plan:

Locality: Head office

Procedure: Part of Employment Procurement and Construction (EPC) Contractor Management Plan, quarterly reporting

Relevant standards: 100% unskilled labour from municipal area

Frequency: Quarterly reporting

Data capture protocols: None specified

Reporting: Part of Employment Procurement and Construction (EPC) Contractor Management Plan

Standard operating procedures for non-compliance: Develop action plan for improvement on results and monitor for next quarter

9.1.6 Visual Impact and Sense of Place

Disturbance of the visual environment during the construction phase (e.g. site clearance, storage of equipment, lighting at night and so forth) would lead to temporary negative visual impacts, although it is expected to diminish once the construction phase has been completed.

The proposed sites for the PV facility and WEF is located outside of the Prieska urban edge. Due to the location of dwellings to the PV facility construction site, the koppies to the west of the site and the proximity of the site to the N10, it is highly unlikely that the temporary visual impacts would result in negative impacts on the quality of life of residents within the area.

The landscape is distinguished for its relative overall flat relief, limited different types and heights of vegetation and some elevated areas or koppies. The turbines of the WEF, however, will be constructed on the higher elevated areas or koppies within the study area. Construction of the turbines will thus probably be visible, but of a short duration with the actual visual impact occurring during the operational phase of the WEF.

Geographic location of impact: Areas surrounding the PV facility and turbine construction sites. Settlements close to the construction sites.

Potential cumulative impacts: None

Proposed management measures:

Description:

- The mitigation measures of Visual Impact Assessment must be implemented.
- Install low-impact lighting on the exterior of the PV site where night-time lighting is essential.
- Ensure the correct specifications and placement of lighting for the WEF (e.g. aircraft warning lights for the WEF turbines to be placed on the perimeters, but in accordance with the relevant regulations.
- Retain natural vegetation adjacent to the development footprints.
- Make use of existing access roads where possible.
- Limit the construction of roads and plan location of additional roads required in such a way that clearing of vegetation is minimised and that limited cut and fill requirements would be necessary.
- Limit erosion risks as erosion scarring can create areas of strong contrast which can be visible from far distances.

- Restrict the activities and movement of construction workers and vehicles to the immediate construction sites and existing access roads.

Legal Requirements/ Compliance with Standards: EMPr, Civil Aviation Regulations

Timeframe for Implementation: During construction

Standard to be achieved: No community complaints received; EMPr compliance; Civil Aviation Regulations compliance.

Proposed socio-economic monitoring plan:

Locality: On site management

Procedure: Establish Community or Stakeholder Forum representing local farming and other representatives in the area, that meet with the project proponent on a quarterly basis. Establish a Complaints Register on-site and respond to these complaints timeously

Relevant standards: Civil Aviation Regulations; EMPr; Zero complaints from the community and/or the Community Stakeholder Forum

Frequency: Quarterly feedback to Community Stakeholder Forum

Data capture protocols: Contractor and head office to keep complaints register and minutes from Community Stakeholder Forum meetings

Reporting: Through quarterly meeting with stakeholders

Standard operating procedures for non-compliance: Action plan for corrective action, including a review function to continuously assess, and to improve on results and monitor for next quarter

9.1.7 Possible attitude formation against the project

Possible attitude formation against the project can occur due to limited number of locals to be employed for higher skilled jobs as a result of the discrepancy between skills locally available and the skills required for specialised work.

Although attitude formation is not an impact per se, it serves an important indication of community sentiments toward the project. Attitude formation will therefore not be rated, but should be noted as part of the SEIA.

Attitudes can be defined as lasting, general evaluations of people. Attitudes can be formed through the individual's own experience and/or reports in the media. It could provide important information regarding the feelings and potential actions of Interested and Affected Parties (I&APs) that could become evident during the appeal period of the Environmental Impact Assessment process, and/or during the construction and operational phases of the proposed project.

The project proponent will use local labour as far as possible, although the main contractors will be sourced from outside the study area and even the province. A key mitigation measure, however, as proposed in previous sections of the report is to provide up-skilling opportunities for unskilled and semi-skilled local workers to lessen any possible skills disparity between the local skills available and the requirements of the project.

9.2 DESCRIPTION OF IMPACTS DURING OPERATIONS

9.2.1 Description of the Operational Phase

Solar plant: The solar energy facility is expected to have a lifespan of thirty (30) years or more. Once operational, the site will include the following infrastructure:

- Solar panels;
- An onsite substation to step up the power;
- A 132 kV transmission line;
- Access road;
- Service road;
- Security towers and a utility building, with ablutions; and
- Perimeter fencing and internal security.

The service road will be shared with Eskom, as the plan is to use the existing Eskom service road alongside the servitude. A new service road will only be constructed where the line diverts from the Burchell-Cuprum line, where it will swerve north to again run parallel and northwest with the Eskom line feeding into the eastern substation of town Prieska.

Ongoing maintenance of the facility will be required, and the infrastructure would probably only be decommissioned once it has reached the end of its economic life. Maintenance activities will include module (panel) cleaning, checking module connection integrity, servicing of the inverter, inspecting the mechanical integrity of the mounting structures, vegetation control (e.g. cutting of grass); plant servicing, verification of the state of the fence around the plant and so forth.

Full-time security, maintenance and control-room staff will be required at the site.

WEF: Although a wind farm can be controlled and monitored from an off-site location, larger sites might be attended by a small maintenance crew during normal business hours. Routine maintenance takes place on all major components of the wind turbine at certain intervals during its operational lifetime. Most turbines are constructed in a modular fashion, which means that overhauls or repairs would involve removing the component from site to a designated off-site repair facility. The lifespan of the average turbine is 20 to 25 years.

9.2.2 Impacts Associated with Population Influx

The proposed PV facility will result in 54 job opportunities during the operational phase, and the WEF in approximately 25 direct work opportunities. The skilled job opportunities would probably be outsourced due to the lack of availability of localised specialised skills. In the case of the WEF, it will still provide 65 unskilled opportunities and for the PV facility approximately 38 (70%) lower skilled opportunities which can be filled by locals from the region.

The inflow of a “new” workforce to the area would result in a change in the social composition in the local area surrounding the site. The extent of the impact would depend on the number of locals that would be permanently employed. If all of the permanent jobs are to be filled by outsiders it would result in less than 1% of the overall population profile of the town of Prieska. Their presence would have some negative intrusion impacts on the social environment, although of a relative moderate magnitude before mitigation and lowered intensity after mitigation.

Negative impacts on the provision of services and infrastructure are foreseen, such as the provision of suitable housing for these individuals. The cumulative impact of the population change in the event that the proposed Copperton mining project would be implemented, as well as Phases 2 and 3 of the proposed project, should also be noted. More pressure on the infrastructure and services delivery in the towns of Prieska and Copperton and even Niekerkshoop can then occur.

The positive impact associated with an increase in the population size relate to the increase in the local buying power and increased tax base of the municipality.

Geographic location of impact: Towns near the site such as Prieska, Niekerkshoop and Copperton, as well as wider municipal area.

Potential cumulative impacts: Possible overlap with development of the proposed Copperton mining: High

Proposed management measures:

Description:

- Project Proponent and the Employment Procurement and Construction (EPC) contractor should maximise the use of local labour
- Where new job opportunities open up, employment of locals (within semi-skilled positions) already residing in municipality must receive priority as this would limit the negative impacts (e.g. infrastructure requirements) associated with a population increase and to avoid possible conflict arising between locals and the outside workforce
- Training and capacity building programmes should be implemented to lessen any possible skills disparity between the local skills available and the requirements of the project
- Focus procurement on businesses in the Prieska area that could supply non-core goods and services (e.g. security, catering and cleaning)
- Assist permanent employees to secure housing and/or to achieve home ownership

Legal Requirements/ Compliance with Standards: None

Timeframe for Implementation: Throughout operations

Standard to be achieved: Zero incidents reported through the community of stakeholder forum; No social conflict; Access to adequate housing for all employees.

Proposed socio-economic monitoring plan:

Locality: Head office

Procedure: Establish Community or Stakeholder Forum representing local farming and other representatives in the area, that meet with the project proponent on a quarterly basis. Establish a Complaints Register on-site and respond to these complaints timeously

Relevant standards: Zero complaints from the community and/or the Community Stakeholder Forum

Frequency: Quarterly feedback to Community Stakeholder Forum

Data capture protocols: Site manager and head office to keep complaints register and minutes from Community Stakeholder Forum meetings

Reporting: Through quarterly meeting with stakeholders

Standard operating procedures for non-compliance: Action plan to improve on results and monitor for next quarter

9.2.3 Potential Local Employment and Income Opportunities

Solar facility: The proposed solar facility would, once operational, employ approximately fifty-four (54) individuals during the operational life of about 21 years itself. Close to 70% of the jobs on-site could be unskilled (land maintenance, safety, module cleaning) while 30% could be medium and high skilled (SED, 2018).

In addition to the 54 jobs at the plant, another 25 jobs could be created in the local economy due to the solar farm's spending on local suppliers., mainly created outside the local area.

Management and maintenance personnel would make up the majority of the staff component as ongoing management and regular maintenance of the facility would be required e.g. the cleaning of the panels, general maintenance of the site, possible replacement of panels and/or other mechanical and infrastructural repairs. Administrative positions can be filled by local labour, but more specialised technical skilled positions in the field of renewable energy would probably be filled by outsiders and even foreigners. Additional indirect employment opportunities could be created by the provision of ancillary services on-site such as the security personnel required and/or general maintenance and catering services. These services can be provided by local individuals and/or businesses.

WEF: Based on industry averages a 139MW sized wind plant could create around 25 direct jobs (full-time) at the plant itself. Close to 75% of the jobs on-site could be unskilled (land maintenance, safety) while 15% could be medium skilled (SED, 2018).

In addition to the 25 jobs at the plant, another 50 jobs could be created due to the wind farm's spending on suppliers. With close to 80% of inputs in the Northern Cape in general imported from other provinces or the rest of the world, the majority of indirect jobs would be created outside the local area and the province (Conningarth Economists, 2018).

Maintenance of the power line would be undertaken by Eskom in-house employees and it is thus highly unlikely that any long-term opportunities will become available for locals.

The long-term aim of the project through the implementation of Phases 1 to 3 would be to utilise renewable energy sources in the region of Prieska to facilitate a green hydrogen (ammonia) industry. This will enhance the cumulative job opportunities in the event that these phases of the proposed project are implemented.

Overall, employment creation is rated as positive as the relative limited long-term benefits to the local communities can be enhanced through ongoing and focused training initiatives. The presence of the solar and wind energy facility and associated skills development and training during its operation could even have further wide range positive impacts should the envisaged Phase 2 and 3 be developed in future. This would also fit in with the government's 'green economy' growth path initiatives.

Geographic location of impact: Municipal and Regional (SLM and rest of Northern Cape Province)

Cumulative Impact Description: None

Proposed management measures:

Description:

- Project Proponent and the Employment Procurement and Construction (EPC) contractor should maximise the use of local labour.
- Provide up-skilling opportunities for unskilled and semi-skilled local workers to lessen any possible skills disparity between the local skills available and the requirements of the project (if construction timeframe allows).
- Training and capacity building programmes must aim to lessen any possible skills disparity between the local skills available and the requirements of the project. This cross training and skills development can focus on technical maintenance and administration.
- Project proponent should create conditions that are conducive for the involvement of entrepreneurs, small businesses, and SMME's during the operational phase for rendering ancillary services to the proposed facility

Legal Requirements/ Compliance with Standards: No legal standard

Timeframe for Implementation: Operational period, life of facility.

Standard to be achieved: Recruit as many as possible permanent employees from the larger municipal area before recruiting elsewhere. 100% of unskilled workers must be sourced locally

Proposed socio-economic monitoring plan:

Locality: Head office

Procedure: Part of Employee Management Plan, quarterly reporting

Relevant standards: 100% unskilled labour from municipal area

Frequency: Quarterly reporting

Data capture protocols: None specified

Reporting: Part of Management Plan

Standard operating procedures for non-compliance: Develop action plan for improvement on results and monitor for next quarter

9.2.4 Impacts on Community Safety

During operations the impact on community safety will be significantly reduced since there is a smaller pool of permanent employees associated with the PV facility and WEF compared to the construction phase. There would also be some occasional vehicle movements, largely on main roads and access roads within the infrastructure footprint. Traffic accident risks and fire risks will be low, but possible.

The presence of the anticipated permanent employees during the operational phase and the movement to and from the site could be noticed by the property owners. However, their presence

on site is not expected to have negative impacts on the social environment and on the community safety in the long term.

Geographic location of impact: On-site and communities close to the site.

Potential cumulative impacts: None

Proposed management measures:

Description:

- The facility should be fenced or access to the area should be controlled to avoid unauthorised entry
- Ensure that sufficient safety and security measures are in place
- Employ permanent security personnel.
- Adhere to the Occupational Health and Safety Act (Act 85 of 1993) through the development of an Occupational Health and Safety Plan.
- Develop and Implement an Occupational Health and Safety, Community Security and Emergency Preparedness and Response Plan
- Adhere to the National Veld and Forest Fire Act (Act 101 of 1998)
- A Fire/Emergency Response and Management Plan should be developed and implemented.
- Contractors and construction workers must be trained with regards to the implementation of the Fire/Emergency Response and Management Plan
- Regularly review the functionality and efficiency of these plans in conjunction with the local emergency teams, management, community representatives and neighbouring landowners
- Appropriate fire-fighting equipment should be on site and employees should be appropriately trained for fire fighting
- All vehicles should be in a good condition and adhere to the road worthy standards
- Implement regular site safety briefings
- Entrance to the site from the N10 must be clearly indicated and local access road must be maintained.
- Consider public transport of workers to and from the site on a daily basis
- Ensure that all employees, sub-contractors and contractors understand, are aware of the requirements and adhere to the EMPr
- Transgressions to be dealt with through verbal instructions, then written communication and contract notices (in the case of serious transgressions).
- A Complaints Register must be available at the security office

Legal Requirements/ Compliance with Standards: EMPr

Timeframe for Implementation: Operations; Life of Facility

Standard to be achieved: Zero accidents or safety incidents; EMPr compliance

Proposed socio-economic monitoring plan:

Locality: On site management

Procedure: Operational safety record keeping and Complaints Register to be managed through the Site Management Plan

Relevant standards: Occupational Health and Safety Act (Act 85 of 1993).

Frequency: Monthly update of safety records

Data capture protocols: On site management to keep safety records as required by relevant legislation. On site management to safekeep records of Complaints Register

Reporting:

- Monthly in-house reporting by project managers/proponent
- Feedback to community through Community Stakeholder Forum on a quarterly basis

Standard operating procedures for non-compliance: Action plan for corrective action, including a review function to continuously assess, and to improve on results and monitor for next quarter.

9.2.5 Impact on Property Values of Landowners and Sense of Place

Solar plant: This impact investigates the social impact associated with the change in property prices as a result of the proposed solar facility.

The exact impact on the different properties, however, could only be undertaken as part of a detailed property evaluation and/or economic study. From a social perspective it is however fair to state that the actual impact would also be determined by social aspects such as:

- the location of the property in relation to the proposed facility (distance, in the view shed or outside the view shed);
- the activities undertaken on adjacent properties and the location of dwellings and other infrastructure;
- the perception of specific property owners with regards to the impact of the facility on the social and bio-physical environment;
- the role which the facility would play with regards to the advancement of the local economy;
- the perception of property owners and the larger community with regards to the operation of the facility and maintenance of the equipment;
- the possible impact of the facility on surrounding land-uses; and
- the local economic climate and need for properties in the area.

The panels would have a height of 3m. The proposed solar facility will affect the landscape character permanently through the installation of these infrastructure components. The facility could negatively impact on the property values in the surrounding area during the short term, as the facility could be seen as an intrusion on the existing environment and land use, thereby influencing the sense of place. The uncertainty associated with the development of such a facility due to it being an “unfamiliar” development could furthermore influence the property prices in the area.

After the construction phase and commissioning of the facility, in the event that the solar facility proves to have no or little impact on the surrounding landowners and the activities undertaken on their properties, as well as on the water quality and quantity, the impact on the property prices could return to normal.

From a social perspective, a limited long-term impact on the property values is thus foreseen mainly due to the overall positive association made with regards to these types of facilities in general as cleaner and greener resources with its limited negative impact on the bio-physical environment.

Wind farm: Visual studies indicate to the following visual impacts of wind turbines:

- 0-5km short distance and very high visibility (Figure 4 below).

- 5-10km medium distance view but still high visibility.
- 10-20km medium to longer distance view where the facility will still be visible and recognisable but will become part of the visual environment (Figure 5 below).

Studies suggest that there is a possibility that property values could decline once a wind turbine is built within a 1-kilometre radius around the property due to potential noise pollution and the turbines' aesthetic impact. Most studies suggests that the effect disappears at a distance of 8 to 9 kilometres (Wehrman, 2019).

Property values in the region of Prieska varies between R1,700 per hectare (dryland livestock) io R4,000 per hectare for mixed game/hunting farms with irrigation possibilities. Given the large size of the farms and the dominant use for dry-land extensive agricultural (livestock) farming, the impact on the property prices of adjacent farms should be limited.



Figure 4: Example of a wind farm at a distance of approximately 3 to 5 kilometres



Figure 5: Example of a wind farm at a distance of approximately 16 kilometres

Geographic location of impact: Farms adjacent the site.

Potential cumulative impacts: None

Proposed management measures:

Description:

- Ensure that sufficient safety and security measures are in place at the site
- Employ permanent security personnel.
- Install low-impact lighting on the exterior of the site where night-time lighting is essential
- Consider public transport of workers to and from the site on a daily basis
- The Visual Impact Assessment's recommendations should be implemented to limit any potential negative impacts on the sense of place.
- Equipment should be maintained and serviced on a regular basis.
- Develop and Implement an Occupational Health and Safety, Community Security and Emergency Preparedness and Response Plan
- A Fire/Emergency Management Plan should be developed and implemented.
- Adhere to the Occupational Health and Safety Act (Act 85 of 1993) through the development of an Occupational Health and Safety Plan.
- Regularly review the functionality and efficiency of these plans in conjunction with the local emergency teams, management, community representatives and neighbouring landowners
- The facility should be managed according to international best practice
- Establish communications with adjacent landowners to register and resolve issues related to the operations of the wind farm
- Landowners affected by the project must be appropriately compensated for sterilisation of their land. The process should include identifying and negotiating with the multiple landowners across the project site to acquire the sections of land enabling the optimal site design and layout. It must also be considered that the farmers will be able to continue their farming activities on the land in between the wind turbines.

Legal Requirements/ Compliance with Standards: None

Timeframe for Implementation: Operational period; Life of Facility

Standard to be achieved: Manage site according to international best practice; Adhere to EMPr

Proposed socio-economic monitoring plan:

Locality: On-site management

Procedure:

Relevant standards: Occupational Health and Safety Act (Act 85 of 1993); EMPr; Visual Impact Assessment recommendations

Frequency: Monthly update of safety and security records

Data capture protocols:

Reporting:

- Monthly reporting on adherence to international best practice and EMPr

Standard operating procedures for non-compliance: Action plan to improve on results and monitor for next quarter

9.2.6 Community Development Funds

The project proponent could, by being present in the area, and by their financial support and social responsibility assist the Siyathemba Local Municipality to build capacity among local businesses and SMME's, as well as assist with the development of infrastructure facilities in the area. As these issues were noted as key intervention areas required to stimulate the local economy, the proponent should also ensure that their interventions are based on the key priority areas already determined by the Integrated Development Plan of the Siyathemba Local Municipality.

Geographic location of impact: Municipal area.

Potential cumulative impacts: None

Proposed management measures:

Description:

- The negotiation of a community funding mechanism is recommended to ensure commitment to social responsibility by the project proponent. This should benefit those living in the immediate vicinity of the project.
- A community trust can be initiated from where funding can be applied through priority IDP projects

Legal Requirements/ Compliance with Standards: None

Timeframe for Implementation: Operational period; Life of Facility

Standard to be achieved: Percentage of profits to go to social responsibility programmes

Proposed socio-economic monitoring plan:

Locality: On-site management

Procedure: Part of social responsibility programmes

Relevant standards: None

Frequency: Annual review

Data capture protocols: Social Responsibility reporting

Reporting:

- Annual in-house reporting and review; review input as part of 5-year IDP reviews

Standard operating procedures for non-compliance: Action plan to improve on performance areas

9.2.7 Impact on Local Economic Diversity

Mining ceased at Copperton in 1991. The agricultural sector plays a major role in the local economy with irrigation farming and agricultural activities (grains and vegetables) along the Orange River. Some game farming with associated tourism activities also takes place in the larger area.

The limited number of permanent local employment opportunities indicates that no visible economic spin-offs for the local economy would result during the operational phase of the solar energy facility and WEF. A relatively small wage bill and limited flow of revenue within the surrounding communities are anticipated. Although very limited, the local procurement of goods and services could result in some secondary economic spin-offs.

Even though the project will create a limited number of employment opportunities it can assist to diversify the local economy, especially if the follow-on phases of the proposed project will be implemented.

The municipality will further benefit through the additional property tax revenue (general property taxation) which could place themselves in a position to promote the land use management in the area as one with a 'green agenda'.

The power generated by the facility would not be fed into the national electricity grid and will thus not enable the strengthening of the system. No positive impacts and spin-offs in this regard will materialise since the Eskom-grid is currently unable to handle electricity inputs from this locality.

Geographic location of impact: Municipal area.

Potential cumulative impacts: None

Proposed management measures:

Description:

- Project proponent should create conditions that are conducive for the involvement of entrepreneurs, small businesses, and SMME's during the operational phase for rendering ancillary services to the proposed facility
- Implementation of Phases 2 and 3 to follow

Legal Requirements/ Compliance with Standards: None

Timeframe for Implementation: Operational period; Life of Facility

Standard to be achieved: Procurement of local business and SMME's

Proposed socio-economic monitoring plan:

Locality: On-site management

Procedure: Part of social responsibility programmes

Relevant standards: None

Frequency: Review as contracts expire

Data capture protocols: Social Responsibility reporting

Reporting:

- Annual in-house reporting and review; review input as contracts expire

Standard operating procedures for non-compliance: Action plan to improve on performance areas

9.2.8 Impact on Local Resource Use

The sites for the PV facility and WEF are currently zoned as agricultural, but has not been used for any intensive agricultural purposes due to the low to medium agricultural potential of the area. Livestock grazing of informal subsistence farmers/land users was taking place on site and within the area.

The farm for the PV facility is 384 ha, and the proposed PV facility infrastructure will utilise less than 250 ha. The final layout of the PV facility will still be decided but will aim to avoid sensitive environmental sections at the footprint area. The total area set aside for all planned turbines of the WEF currently is 1008 ha (mainly consisting of private agricultural land) while the actual footprint of all the 34 turbines will only be 33 ha. Habitat loss at the PV facility will be minimal, and the remaining area outside of the PV facility can still be used for agricultural purposes such as livestock grazing outside the fenced area. Indigenous vegetation growth between the panel arrays will further be allowed, but the vegetation will be maintained to meet the required safety requirements and limit any fire risks. In the case of the WEF, the disturbances would relate to the turbine footprint area and access roads. Agricultural activities can continue within the areas surrounding the turbines. The existing land-uses will therefore remain across the majority of the site project area, together with the existing resource use.

A 132 kV power line will be constructed from the substation to the Eskom line feeding into the eastern substation of the town of Prieska. Sections of this line will be parallel to an existing Eskom servitude and will only add 21 m to the width of the existing servitude, thereby sterilising as little land as possible. Grazing will be able to continue underneath the line. The existing Eskom service road will be used for a large section of the length of the line, and only a short distance of a new service road will be required.

Concerns of the surrounding property owners' could relate to the use of water and the possible impact on their farming practices. Although water is a scarce resource and operations at the facility could put additional pressure on the water service delivery sector, it must be noted that on average there will only be two workers on site. This can increase to ten workers at four one-week events per year. Cleaning of the panels with water will be restricted. At this stage, it is planned that water required during the operational life of the facility will be sourced from the Siyathemba Municipality and will be carted to the proposed site via water tankers and JoJo tanks. A sufficient water supply must be established with the municipality. Continuous bulk water supply and the maintenance of ageing infrastructure can that can result in future water supply problems to the site, must be considered.

The farmers to the north of the N10 are furthermore dependent on the water from the Orange River for their irrigation practices and thus their income. It is also unlikely that maintenance

activities and water run-off at the facility would have any impacts on their water quality and/or quantity.

Geographic location of impact: Municipal area.

Potential cumulative impacts: None

Proposed management measures:

Description:

- A Fire/Emergency Response and Management Plan should be developed and implemented.
- Regularly review the functionality and efficiency of these plans in conjunction with the local emergency teams, management, community representatives and neighbouring landowners
- Transportation should be provided to permanent employees.
- Proper servitude maintenance must be undertaken.
- If subtraction of borehole water occurs, the water source's quantity should not be negatively affected by the volume of water used.
- The water volumes required from municipal sources, should be discussed, negotiated and finalised with the Siyathemba Local Municipality in advance to ensure proper planning in this regard

Legal Requirements/ Compliance with Standards: None

Timeframe for Implementation: Operational period; Life of Facility

Standard to be achieved: Water Quality Standards; EMPr

Proposed socio-economic monitoring plan:

Locality: On-site management

Procedure: Develop a water resource management and monitoring plan

Relevant standards: Water management as per the EMPr and specialist reports

Frequency: Annual reporting

Data capture protocols: As part of water resource management plan

Reporting: Report on annual water use

Standard operating procedures for non-compliance: Action plan to improve on performance areas.

9.2.9 Contribution to stable clean energy

The project is being developed with a maximum possible installed capacity of 170 MW DC which produces 170 MW AC of electricity, and the initial 139 MW of wind power (21 wind turbines) planned as part of Phase 1. The second phase will bring the erection of the other thirteen turbines and an additional 86 MW.

The solar plant and WEF are anticipated to provide green energy to the planned Phase 3 development associated with the larger project namely the development and construction of an industrial park for green hydrogen and ammonia production. It is also expected to provide excess energy to the national grid which will contribute to a more stable electricity supply nationally.

Geographic location of impact: Municipal area and national economy.

Potential cumulative impacts: Other renewable energy projects that are already in the local area

Proposed management measures:

Description: None apart from project implementation

Proposed socio-economic monitoring plan:

None

9.2.10 Visual and Sense of Place

The proposed sites for the PV facility and WEF are currently utilised for livestock farming. The soil supports the growth of grass, bushes and trees of less than 5 m in height. In such an environment, the visual exposure of wind turbines are usually rated as considerable due to the size of the infrastructure and the impact on observers from roads, homesteads, and built-up areas. Due to the construction of the WEF and PV facility, landscape changes with subsequent visual impacts in the immediate environment will occur.

The intensity of the visual impacts of PV facility and wind turbines will depend on a number of aspects, such as the size, colour and shape of the panels and turbines, the observation distance, the landscape diversity, time of day of observance, and number of observers.

From a socio-economic perspective, however, the overall impacts are likely, but are not considered to be significant due to the low population density, the location of homesteads to the facilities thereby limiting the number of permanent observers, and the number of road users (e.g. R386 and N1)), as well as the distance of provincial and national roads to the turbine locations. The impact of 'shadow flicker' is thus also considered to be of a low intensity.

Geographic location of impact: Areas surrounding the PV facility and turbine footprints.

Potential cumulative impacts: None

Proposed management measures:

Description:

- The mitigation measures of Visual Impact Assessment must be implemented.
- Install low-impact lighting on the exterior of the PV site where night-time lighting is essential.
- Ensure the correct specifications and placement of lighting for the WEF (e.g. aircraft warning lights for the WEF turbines to be placed on the perimeters, but in accordance with the relevant regulations.
- Wind turbines to be painted with a non-reflective paint which will prevent blade glint.
- Maintain the general appearance of the PV facility and the turbines.
- Maintain roads and prevent erosion.
- Consideration must be given to the appropriate colour and finishes of the turbines in order to minimise visual effects
- The layout of the turbines and access roads must avoid sensitive landscape features

- Landowners affected by the project must be appropriately compensated for sterilisation of their land. The process should include identifying and negotiating with the multiple landowners across the project site to acquire the sections of land enabling the optimal site design and layout. It must also be considered that the farmers will be able to continue their farming activities on the land in between the wind turbines.
- Ideally it must be ensured that there are no wind turbines closer than 500 m to a residence or historically valuable farm building to avoid the impacts of shadow flickering.
- Maintain the turbines in good working order to ensure operation under the right conditions.
- Signs near wind turbines should be avoided unless they serve to inform the public about wind turbines and their function. Advertising billboards should be avoided.
- Lighting should be designed to minimise light pollution without compromising safety. Investigate using motion sensitive lights for security lighting.
- An information centre in Prieska town can enhance the project by educating the public about the need and benefits of wind power. Engaging school groups can also assist the wind farm proponent, as energy education is paramount in developing good public relations over the long term.
- The above can assist in instilling the concept of sustainability, and creating awareness of the need for WEFs, is an important process that can engage the entire community.

Legal Requirements/ Compliance with Standards: EMPr, Civil Aviation Regulations

Timeframe for Implementation: Operational life

Standard to be achieved: No community complaints received; EMPr compliance; Civil Aviation Regulations compliance.

Proposed socio-economic monitoring plan:

Locality: On site management

Procedure: Establish Community or Stakeholder Forum representing local farming and other representatives in the area, that meet with the project proponent on a quarterly basis. Establish a Complaints Register on-site and respond to these complaints timeously

Relevant standards: Civil Aviation Regulations; EMPr; Zero complaints from the community and/or the Community Stakeholder Forum

Frequency: Quarterly feedback to Community Stakeholder Forum

Data capture protocols: Contractor and head office to keep complaints register and minutes from Community Stakeholder Forum meetings

Reporting: Through quarterly meeting with stakeholders

Standard operating procedures for non-compliance: Action plan for corrective action, including a review function to continuously assess, and to improve on results and monitor for next quarter

9.2.11 Nuisance Factors

An increase in noise levels is a concern associated with wind facilities which mainly manifests during the operational phases of the development due to the movement of the blades. Neighbouring landowners may thus be subject to increased noise impacts. Noise sensitive areas would include homesteads, farmhouses and settlements.

The closest dwellings and thus sensitive receptors that were identified were approximately 2.7 km to the northeast of C05 and 2 km to the south of F02 of the WEF. Due to the distance of these

to the turbines, it is anticipated that the predicted noise levels will not exceed the standard values and that the potential noise would be within acceptable limits.

Geographic location of impact: Homesteads in close proximity to the wind turbine footprints.

Potential cumulative impacts: None

Proposed management measures:

Description:

- The mitigation measures of the Noise Impact Assessment are relevant
- The WEF layout and designs must minimise noise impacts.
- Noise monitoring must be undertaken in order to ensure that levels remain within predicted limits.

Legal Requirements/ Compliance with Standards: Noise standards, EMPr

Timeframe for Implementation: Operational life

Standard to be achieved: No community complaints received; EMPr compliance; No exceedances of noise standards

Proposed socio-economic monitoring plan:

Locality: On-site management; noise monitoring

Procedure: Establish Community or Stakeholder Forum representing local farming and other representatives in the area, that meet with the project proponent on a quarterly basis. Establish a Complaints Register on-site and respond to these complaints timeously

Relevant standards: Zero complaints from the community and/or the Community Stakeholder Forum

Frequency: Quarterly feedback to Community Stakeholder Forum

Data capture protocols: Contractor and head office to keep complaints register and minutes from Community Stakeholder Forum meetings

Reporting: Through quarterly meeting with stakeholders

Standard operating procedures for non-compliance: Action plan for corrective action, including a review function to continuously assess, and to improve on results and monitor for next quarter

9.2.12 Possible attitude formation against the project

As indicated in Section 9.1.7, possible attitude formation against the project can occur due to the limited number of locals to be permanently employed for higher skilled jobs as a result of the discrepancy between skills locally available and the skills required for specialised work. This aspect would thus apply to the operational phase as well.

The project proponent must continue to maximise local employment throughout the operational life of the facility. Up-skilling opportunities for unskilled and semi-skilled local workers and capacity building must continuously be undertaken to lessen any possible skills disparity between the local skills available and the requirements of the project.

9.3 DESCRIPTION OF IMPACTS DURING DECOMMISSIONING AND CLOSURE

9.3.1 Description of the Decommissioning and Closure Phase

Decommissioning would be considered after 30 or more years. If economically feasible, the decommissioning activities would comprise the disassembly and replacement of the individual components with more appropriate technology available at that time. However, if not deemed feasible, the facility would be completely decommissioned and the components would be disassembled, removed and recycled (where possible) or disposed of in accordance with regulatory requirements. Disturbed soil will be restored and re-vegetation of the site to its pre-construction condition would be undertaken. Roads will be rehabilitated.

9.3.2 Nuisance Factors

Decommissioning will result in similar impacts as the construction phase in terms of dust and noise pollution, as well as the movement of heavy vehicles and workers. These intrusions will be intermittent and of a short duration and can be mitigated.

Geographic location of impact:

- Areas along the access roads (N10) and on sections of the local roads (possibly in the town of Prieska) that would be used for movement of vehicles.
- Settlements close to the site.

Potential cumulative impacts: None

Proposed management measures:

Description:

- The mitigation measures of the Noise and Air Quality Impact Assessments are relevant
- All vehicles should be in a good condition and adhere to the road worthy standards
- Implement regular safety briefings, road signage as well as speed control measures
- Speeding of vehicles must be strictly monitored
- Sufficient warning signs should be erected at the turn-off from the N10
- Dust suppression measures should be applied if and when necessary. The frequency of these should be determined by the state of the roads, the prevailing weather and vehicle volume on site at the time
- A Complaints Register must be available at the security office
- Consider public transport of workers to and from the site on a daily basis
- The stakeholders (through a forum) should be kept informed of the schedules and activities.

Legal Requirements/ Compliance with Standards: Air quality standards, EMPr

Timeframe for Implementation: During decommissioning

Standard to be achieved: No community complaints received; EMPr compliance

Proposed socio-economic monitoring plan:

Locality: On-site management

Procedure: Establish Community or Stakeholder Forum representing local farming and other representatives in the area, that meet with the project proponent on a quarterly basis. Establish a Complaints Register on-site and respond to these complaints timeously

Relevant standards: Zero complaints from the community and/or the Community Stakeholder Forum

Frequency: Quarterly feedback to Community Stakeholder Forum

Data capture protocols: Contractor and head office to keep complaints register and minutes from Community Stakeholder Forum meetings

Reporting: Through quarterly meeting with stakeholders

Standard operating procedures for non-compliance: Action plan for corrective action, including a review function to continuously assess, and to improve on results and monitor for next quarter

9.3.3 Loss of Jobs and Income

The permanent job opportunities created during the operational phase will be lost once the facilities are decommissioned. Such job losses can result in reduced economic activity in the local economy and loss of household income. This can impact on approximately 75 households that will have to find alternative sources of employment and income. These families would possibly have to relocate if other similar facilities and sectors in the area cannot offer nearby employment.

Decommissioning and its associated closure programmes must ensure that employees are not left stranded without alternative forms of livelihoods, with subsequent degradation of the communities' socio-economic quality of life.

Should the facility be replaced with newer technology, it can continue in creating long-term job opportunities, and some short-term construction related work. This would have a positive impact on the continued local economic growth patterns.

Geographic location of impact: Municipal and Regional (SLM and rest of Northern Cape Province)

Cumulative Impact Description: None

Proposed management measures:

Description:

- Project proponent (operator) to assist employees, prior to the decommissioning in the and after closure of the facility to be marketable for other positions. This would include undergoing a portable skilled development programme in advance of the proposed retrenchment dates.
- Retrenchments to be phased over a period of time as the facility prepares for decommissioning
- Provide assistance to employees to source jobs in similar sectors within the municipal area and beyond

Legal Requirements/ Compliance with Standards: No legal standard

Timeframe for Implementation: Operational Phase: life of facility

Standard to be achieved: Career path development and skills training and advancement as part of Human Resource Development Plan.

Proposed socio-economic monitoring plan:

Locality: On-site management and head office

Procedure: Capacity building and skills training over the operational period of the facility; portable skills development

Relevant standards: South African Qualifications Authority (SAQA)

Frequency: Quarterly to yearly reporting on progression of employee career advancement programmes and capacity building

Data capture protocols: As part of Human Resource Development Plan

Reporting: Part of Human Resource Development Plan

Standard operating procedures for non-compliance: Develop action plan for improvement on results and monitor for next quarter

9.3.4 Community Safety

As discussed as part of the construction phase of the proposed project, decommissioning would result in similar community safety aspects which include the inflow of workers, traffic accident risks, unauthorised entry onto the site and possible construction related accidents.

The two facilities can contain hazardous materials. Under normal operating conditions these panels are sealed. Care should thus be taken during the decommissioning that the infrastructure is properly disposed of to avoid any possible contamination resulting in community health risks.

Geographic location of impact: Employees, workers involved in decommissioning, local community and farming communities close to the site.

Potential cumulative impacts: None

Proposed management measures:

Description:

- The sites should be fenced or access to the area should be controlled to avoid unauthorised entry
- Employ permanent security personnel for the duration of the decommissioning period.
- Adhere to the Occupational Health and Safety Act (Act 85 of 1993) through the development of an Occupational Health and Safety Plan.
- Develop and Implement an Occupational Health and Safety, Community Security and Emergency Preparedness and Response Plan
- A Fire/Emergency Management Plan should be developed and implemented.
- Regularly review the functionality and efficiency of these plans in conjunction with the local emergency teams, management, community representatives and neighbouring landowners
- Appropriate fire-fighting equipment should be on site and workers should be appropriately trained for fire fighting
- All vehicles used during decommissioning should be in a good condition and adhere to the road worthy standards
- Implement regular safety briefings, road signage as well as speed control measures
- Speeding of vehicles must be strictly monitored
- Sufficient warning signs should be erected at the turn-off from the N10
- Consider public transport of workers to and from the site on a daily basis

- Ensure that all temporary employees, sub-contractors and contractors understand, are aware of the requirements and adhere to the EMPr
- Panels to be dismantled off-site and to be disposed of in compliance with international best practice
- Transgressions to be dealt with through verbal instructions, then written communication and contract notices (in the case of serious transgressions).

Legal Requirements/ Compliance with Standards: EMPr

Timeframe for Implementation: During the decommissioning period

Standard to be achieved: Zero accidents or safety incidents during decommissioning; EMPr compliance

Proposed socio-economic monitoring plan:

Locality: On site management

Procedure: Decommissioning safety record keeping and Complaints Register to be managed through the Contractor Management Plan

Relevant standards: Occupational Health and Safety Act (Act 85 of 1993).

Frequency: Monthly update of safety records

Data capture protocols: On site management to keep safety records as required by relevant legislation. On site management to safekeep records of Complaints Register

Reporting:

- Monthly reporting by contractor to project managers/proponent
- Feedback to community through Community Stakeholder Forum on a quarterly basis

Standard operating procedures for non-compliance: Action plan for corrective action, including a review function to continuously assess, and to improve on results and monitor for next quarter.

9.3.5 End land-use

The larger part of the more than 1,400 hectares could relatively easily be restored to its former land-use. Usually only the foundations of the wind towers would remain. Access tracks and access roads may be retained, subject to landowner requests.

As all infrastructure can be removed no visual impact will remain.

No monitoring or mitigation is proposed once rehabilitation has been completed.

9.3.6 Loss of infrastructure and electricity supply

The project plans to deliver more than 300 MW of electricity. If decommissioning occurs, it will result in a significant loss in electricity supply based on the current strategic energy development plans. The number of megawatts loss can even be more if expansions took place during the life of the facility. This will have negative economic implications and decrease the quality of life of the surrounding communities if alternative sources of power do not replace this supply.

No management and monitoring measures are recommended.

9.4 IMPACT ASSESSMENT METHODOLOGY

The assessment of impacts was based on specialist's expertise, Green-Box professional judgement, field observations and desk-top analysis. The significance of potential impacts that may result from the proposed project was determined in order to assist decision-makers, specifically the competent authority and other relevant authorities, but to some extent also the proponent.

The **significance** of an impact is defined as a combination of the **consequence** of the impact occurring and the **probability** that the impact will occur. The criteria used to determine the consequence of the impacts assessed for the proposed project are listed in the table below, along with the ratings and rating definitions applicable to each consequence criterion.

Table 15: Impact Assessment Criteria

Criteria	Definition	Points
A. Extent/ Spatial Scale	How far does the impact extend?	
	Local (project area or part thereof)	1
	Regional (region or District)	2
	(Inter) national (nationally and or beyond)	3
B. Intensity/Magnitude	Magnitude of impact	
	Low (negligible impact)	1
	Medium (processes moderately impacted)	2
	High (severe impact on local environment)	3
C. Duration	How long will the impact last?	
	Up to two years and reversible	1
	2 -15 years and reversible	2
	More than 15 years and reversible	3

The combined score of these three criteria corresponds to a *consequence rating*, as set out in Table 15.

Table 16: Method used to determine the consequence rating

Combined Score (A+B+C)	3-4	5	6	7	8-9
Consequence rating	Very low	Low	Medium	High	Very High

Once the consequence is derived, the probability of the impact occurring is considered, using the probability classifications presented in Table 16 below.

Table 17: Probability classification

Probability – the likelihood of the impact occurring	
Improbable	< 40% chance of occurring
Possible	40% - 70% chance of occurring
Probable	>70% - 90% chance of occurring
Definite	>90% chance of occurring

The overall **significance** of an impact is determined by considering the consequence rating and the probability classification using the rating system prescribed in the table 17 below.

Table 18: Impact significance rating

		Improbable	Possible	Probable	Definite
Consequence	Very Low	INSIGNIFICANT	INSIGNIFICANT	VERY LOW	VERY LOW
	Low	VERY LOW	VERY LOW	LOW	LOW
	Medium	LOW	LOW	MEDIUM	MEDIUM
	High	MEDIUM	MEDIUM	HIGH	HIGH
	Very High	HIGH	HIGH	VERY HIGH	VERY HIGH

Finally, the impact is also considered in terms of its status (positive or negative) and the confidence in the ascribed impact significance rating.

The prescribed system for considering impact status and confidence (in the assessment) is laid out in Table 18 below.

Table 19: Impact status and confidence classification

Status of Impact

Indication whether the impact is adverse (negative) or beneficial (positive).

+ ve (positive – a ‘benefit’)
- ve (negative – a ‘cost’)

Confidence in the assessment

The degree of confidence in predictions based on available information, Terra Works judgment and/or specialist knowledge.

Low
Medium
High

The impact significance rating should be considered by authorities in their decision-making process based on the implications of ratings ascribed below:

- **INSIGNIFICANT:** the potential impact is negligible and will not have an influence on the decision regarding the proposed activity/development.
- **VERY LOW:** the potential impact is very small and should not have any meaningful influence on the decision regarding the proposed activity/development.
- **LOW:** the potential impact may not have any meaningful influence on the decision regarding the proposed activity/development.
- **MEDIUM:** the potential impact should influence the decision regarding the proposed activity/development.
- **HIGH:** the potential impact will affect the decision regarding the proposed activity/development.
- **VERY HIGH:** The proposed activity should only be approved under special circumstances.

Practicable mitigation and optimization measures are recommended, and impacts are rated in the prescribed way both without and with the assumed effective implementation of the recommended mitigation (and/or optimization) measures. Mitigation and optimization measures are either:

- **Essential:** measures that must be implemented and are non-negotiable; or

- **Best Practice:** recommended to comply with best practice, with adoption dependent on the proponent's risk profile and commitment to adhere to best practice, and which must be shown to have been considered and sound reasons provided by the proponent if not implemented.

Impacts will then be collated into the EMPr and these will include the following:

- Quantifiable standards for measuring and monitoring mitigatory measures and enhancements will be set. This will include a programme for monitoring and reviewing the recommendations to ensure their ongoing effectiveness.
- Identifying negative impacts and prescribing mitigation measures to avoid or reduce negative impacts. Where no mitigatory measures are possible this will be stated.
- Positive impacts will be identified and augmentation measures will be identified to potentially enhance positive impacts where possible.
- Other aspects to be taken into consideration in the assessment of impact significance are:
- Impacts will be evaluated for the construction and operation phases of the development. The assessment of impacts for the decommissioning phase will be brief, as there is limited understanding at this stage of what this might entail. The relevant rehabilitation guidelines and legal requirements applicable at the time will need to be applied;
- Impacts will be evaluated with and without mitigation in order to determine the effectiveness of mitigation measures on reducing the significance of a particular impact;
- The impact evaluation will, where possible, take into consideration the cumulative effects associated with this and other facilities/projects which are either developed or in the process of being developed in the local area; and
- The impact assessment will attempt to quantify the magnitude of potential impacts (direct and cumulative effects) and outline the rationale used. Where appropriate, national standards are to be used as a measure of the level of impact.

Cumulative Effects

It is important to assess the natural environment using a systems approach that will consider the cumulative impact of various actions. Cumulative impact refers to the impact on the environment, which results from the incremental impact of the actions when added to other past, present, and reasonably foreseeable future actions regardless of what agencies or persons undertake such actions. Cumulative impacts can result from individually minor but collectively significant actions or activities taking place over a period of time. Cumulative effects can take place so frequently in time that the effects cannot be assimilated by the environment.

10. EVALUATION OF IMPACTS

10.1 CONSTRUCTION PHASE

Potential Impact	Impact Assessment BEFORE Management		Significance before mitigation	Mitigation Type (Management Objective/ Outcome)	Impact Assessment AFTER Management		Significance after mitigation
Population change impacts	Impact status	Negative	MEDIUM -	Minimise negative impacts related to population influx	Impact status	Negative	LOW -
	Extent	2			Extent	2	
	Magnitude/Intensity	3			Magnitude/Intensity	2	
	Duration	1			Duration	1	
	Consequence	6 (medium)			Consequence	5 (low)	
	Probability	Probable			Probability	Possible	
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	yes			Cumulative impacts	yes	
Community safety impacts	Impact status	Negative	MEDIUM -	Minimise negative impacts on community safety	Impact status	Negative	LOW -
	Extent	2			Extent	2	
	Magnitude/Intensity	3			Magnitude/Intensity	2	
	Duration	1			Duration	1	
	Consequence	6 (medium)			Consequence	5 (low)	
	Probability	Possible			Probability	Possible	
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	yes			Cumulative impacts	yes	
Nuisance factors	Impact status	Negative	LOW -	Minimise negative impacts related to population influx Minimise negative impacts related to nuisance factors	Impact status	Negative	INSIGNIFICANT -
	Extent	2			Extent	2	
	Magnitude/Intensity	2			Magnitude/Intensity	1	
	Duration	1			Duration	1	
	Consequence	5 (low)			Consequence	4 (very low)	
	Probability	Possible			Probability	Possible	
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	no			Cumulative impacts	no	
Job opportunities	Impact status	Positive	LOW+	Minimise negative impacts related to population influx	Impact status	Positive	MEDIUM +
	Extent	2			Extent	2	
	Magnitude/Intensity	2			Magnitude/Intensity	3	
	Duration	1			Duration	1	
	Consequence	5 (low)			Consequence	6 (medium0)	
	Probability	Probable			Probability	Probable	
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	yes			Cumulative impacts	yes	

Potential Impact	Impact Assessment BEFORE Management		Significance before mitigation	Mitigation Type (Management Objective/ Outcome)	Impact Assessment AFTER Management		Significance after mitigation
Visual and Impact on Sense of Place	Impact status	Negative	MEDIUM -	Management measures of Visual Impact Assessment must be implemented, limit road construction and vegetation clearance. Attend to lighting	Impact status	Negative	LOW -
	Extent	2			Extent	1	
	Magnitude/Intensity	3			Magnitude/Intensity	2	
	Duration	1			Duration	1	
	Consequence	6 (medium)			Consequence	4 (low)	
	Probability	Probable			Probability	Possible	
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	no			Cumulative impacts	no	
	Cumulative impacts	Negative			Cumulative impacts	Negative	

10.2 OPERATIONAL PHASE

Potential Impact	Impact Assessment BEFORE Management		Significance before mitigation	Mitigation Type (Management Objective/ Outcome)	Impact Assessment AFTER Management		Significance after mitigation
Population change impacts	Impact status	Negative	MEDIUM -	Minimise negative impacts related to population influx	Impact status	Negative	LOW -
	Extent	2			Extent	2	
	Magnitude/Intensity	3			Magnitude/Intensity	2	
	Duration	2			Duration	2	
	Consequence	7 (high)			Consequence	6 (medium)	
	Probability	Possible			Probability	Possible	
	Confidence level	Low			Confidence level	Low	
	Cumulative impacts	yes			Cumulative impacts	yes	
Job and income creation	Impact status	Positive	LOW+-	Maximise local job opportunities	Impact status	Positive	MEDIUM +
	Extent	2			Extent	2	
	Magnitude/Intensity	1			Magnitude	2	
	Duration	3			Duration	3	
	Consequence	6 (medium)			Consequence	7 (high)	
	Probability	Possible			Probability	Possible	
	Confidence level	Low			Confidence level	Low	
	Cumulative impacts	yes			Cumulative impacts	yes	
Community safety impacts	Impact status	Negative	LOW -	Minimise negative impacts on community safety	Impact status	Negative	VERY LOW -
	Extent	2			Extent	2	
	Magnitude/Intensity	1			Magnitude/Intensity	1	
	Duration	2			Duration	2	
	Consequence	5 (low)			Consequence	5 (low)	
	Probability	Possible			Probability	Improbable	
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	no			Cumulative impacts	no	
Impact on values of adjacent properties	Impact status	Negative	LOW -	Limit impacts on property value through proper site management and adherence to EMPr	Impact status	Negative	LOW -
	Extent	1			Extent	1	
	Magnitude/Intensity	3			Magnitude/Intensity	2	
	Duration	2			Duration	2	
	Consequence	6 (medium)			Consequence	5 (low)	
	Probability	Probable			Probability	Possible	
	Confidence level	Low			Confidence level	Low	
	Cumulative impacts	no			Cumulative impacts	no	
Community Development Funds	Impact status	Positive	LOW +	Enhance the positive impact of community development funds	Impact status	Positive	MEDIUM +
	Extent	2			Extent	2	
	Magnitude/Intensity	2			Magnitude/Intensity	3	

Potential Impact	Impact Assessment BEFORE Management		Significance before mitigation	Mitigation Type (Management Objective/ Outcome)	Impact Assessment AFTER Management		Significance after mitigation
	Duration	2			Duration	2	
	Consequence	6 (medium)			Consequence	7 (high)	
	Probability	Possible			Probability	Possible	
	Confidence level	Low			Confidence level	Medium	
	Cumulative impacts	no			Cumulative impacts	no	
Economic Diversity	Impact status	Positive	VERY LOW+-	Create conditions that are conducive to involvement of local entrepreneurs, SMME's and businesses	Impact status	Positive	LOW +
	Extent	2			Extent	2	
	Magnitude/Intensity	1			Magnitude/Intensity	2	
	Duration	2			Duration	2	
	Consequence	5 (low)			Consequence	6 (medium)	
	Probability	Possible			Probability	Possible	
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	yes			Cumulative impacts	yes	
Local resource use	Impact status	Negative	LOW -	Mitigate against water quality and quantity impacts Limit possible impacts on through proper site management and adherence to EMPr	Impact status	Negative	VERY LOW -
	Extent	1			Extent	1	
	Magnitude/Intensity	2			Magnitude/Intensity	1	
	Duration	2			Duration	2	
	Consequence	5 (low)			Consequence	4 (very low)	
	Probability	Probable			Probability	Probable	
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	no			Cumulative impacts	no	
Contribute to stable, renewable electricity supply	Impact status	Positive	HIGH +	None	Impact status	Positive	HIGH +
	Extent	3			Extent	3	
	Magnitude/Intensity	2			Magnitude/Intensity	2	
	Duration	2			Duration	2	
	Consequence	7 (high)			Consequence	7 (high)	
	Probability	Definite			Probability	Definite	
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	yes			Cumulative impacts	yes	
Visual and Impact on Sense of Place	Impact status	Negative	MEDIUM-	Management measures of Visual Impact Assessment must be implemented, location of wind turbines, maintain facilities and turbines, attend to lighting	Impact status	Negative	MEDIUM-
	Extent	1			Extent	1	
	Magnitude/Intensity	3			Magnitude/Intensity	3	
	Duration	2			Duration	2	
	Consequence	6 (medium)			Consequence	6 (medium)	
	Probability	Probable			Probability	Possible	
	Confidence level	Negative			Confidence level	Medium	
	Cumulative impacts	1			Cumulative impacts	no	

Potential Impact	Impact Assessment BEFORE Management		Significance before mitigation	Mitigation Type (Management Objective/ Outcome)	Impact Assessment AFTER Management		Significance after mitigation
Nuisance Factors	Impact status	Negative	LOW -	Mitigation measures of noise impact assessment to be implemented	Impact status	Negative	VERY LOW -
	Extent	1			Extent	1	
	Magnitude/Intensity	2			Magnitude/Intensity	1	
	Duration	3			Duration	3	
	Consequence	6 (medium)			Consequence	5 (low)	
	Probability	Possible			Probability	Possible	
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	no			Cumulative impacts	no	

10.3 DECOMMISSIONING PHASE

Potential Impact	Impact Assessment BEFORE Management		Significance before mitigation	Mitigation Type (Management Objective/ Outcome)	Impact Assessment AFTER Management		Significance after mitigation
Nuisance factors	Impact status	Negative	VERY LOW -	Mitigate the potential negative contribution of the project towards nuisance factors:	Impact status	Negative	VERY LOW -
	Extent	1			Extent	1	
	Magnitude/Intensity	2			Magnitude/Intensity	1	
	Duration	1			Duration	1	
	Consequence	4 (very low)			Consequence	3 (very low)	
	Probability	Probable			Probability	Probable	
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	no			Cumulative impacts	no	
Job and income losses	Impact status	Negative	MEDIUM-	Mitigate against job losses during closure	Impact status	Negative	LOW -
	Extent	2			Extent	2	
	Magnitude/Intensity	2			Magnitude/Intensity	1	
	Duration	3			Duration	3	
	Consequence	7 (high)			Consequence	6 (medium)	
	Probability	Possible			Probability	Possible	
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	no			Cumulative impacts	no	
Community safety impacts	Impact status	Negative	VERY LOW -	Minimise negative impacts on community safety	Impact status	Negative	VERY LOW -
	Extent	1			Extent	1	
	Magnitude/Intensity	2			Magnitude/Intensity	2	
	Duration	1			Duration	1	
	Consequence	4 (very low)			Consequence	4 (very low)	
	Probability	Probable			Probability	Possible	
	Confidence level	Medium			Confidence level	Medium	
	Cumulative impacts	no			Cumulative impacts	no	

11. MITIGATION AND ENHANCEMENT MEASURES FOR INCLUSION IN EMPR

Mitigation and Management Measure Tables were compiled for each of the life cycle phases, associated with the proposed project. These measures are also described in more detail in Sections 9.3 to 9.5 above.

Table 20: Summary of Management Measures

Phase	Management Measures	Legal Requirements/ Compliance with Standards	Implementation Timeframe	Standard to be achieved
Construction	<p>Mitigate the potential negative contribution of the project towards local population change:</p> <ul style="list-style-type: none"> • <i>Project Proponent and the Employment Procurement and Construction (EPC) contractor should maximise the use of local labour, especially for the semi-skilled to unskilled employment categories as this would limit the negative impacts (e.g. infrastructure requirements) associated with a sudden population increase and to avoid possible conflict arising between locals and the outside workforce</i> • <i>The local labour procurement strategy as well as proof of residence required should be clearly communicated in the local community and broader regional media well in advance of the construction phase</i> • <i>Where new job opportunities open up employment of locals (within unskilled and semi-skilled positions) already residing in municipality must receive priority as this would limit the negative impacts (e.g. infrastructure requirements) associated with a sudden population increase and to avoid possible conflict arising between locals and the outside workforce</i> • <i>Contractors to ensure that workers outside the local area reside in suitable facilities and not establish informal houses. Due to the size of the construction workforce for the PV Solar Facility and the WEF, a contractors accommodation facility can be considered.</i> • <i>In the event that a contractors accommodation facility will be constructed, the contractors must ensure that all relevant environmental management protocols are adhered to</i> • <i>No uncontrolled and unmanaged informal vending stations should be allowed close to site</i> • <i>Worker conduct to be implemented for on-site construction workers</i> 	None	Throughout construction	Zero valid incidents reported through the community or stakeholder forum.
Construction	<p>Mitigate the potential negative contribution of the project towards community safety:</p> <ul style="list-style-type: none"> • <i>The facility should be fenced or access to the area should be controlled to avoid unauthorised entry</i> • <i>Ensure that sufficient safety and security measures are in place</i> • <i>Employ permanent security personnel.</i> • <i>Adhere to the Occupational Health and Safety Act (Act 85 of 1993) through the development of an Occupational Health and Safety Plan.</i> • <i>In order to protect employees during the construction of the project, only qualified personnel undertaking tasks relevant to their duties must be allowed</i> 	Occupational Health and Safety Act (Act 85 of 1993).	Throughout construction	Zero valid incidents reported through the community of stakeholder forum.

Phase	Management Measures	Legal Requirements/ Compliance with Standards	Implementation Timeframe	Standard to be achieved
	<ul style="list-style-type: none"> • <i>Personal Protection Equipment (PPE) must be provided to all construction workers and contractors</i> • <i>Adhere to the National Veld and Forest Fire Act (Act 101 of 1998)</i> • <i>A Fire/Emergency Response and Management Plan should be developed and implemented.</i> • <i>Contractors and construction workers must be trained with regards to the implementation of the Fire/Emergency Response and Management Plan</i> • <i>Regularly review the functionality and efficiency of these plans in conjunction with the local emergency teams, management, community representatives and neighbouring landowners</i> • <i>Appropriate fire-fighting equipment should be on site and employees should be appropriately trained for fire fighting</i> • <i>All vehicles should be in a good condition and adhere to the road worthy standards</i> • <i>Implement regular site safety briefings</i> • <i>Entrance to the site from the N10 must be clearly indicated and local access road must be maintained.</i> • <i>Consider public transport of workers to and from the site on a daily basis</i> • <i>Ensure that all employees, sub-contractors and contractors understand, are aware of the requirements and adhere to the EMPr</i> • <i>Transgressions to be dealt with through verbal instructions, then written communication and contract notices (in the case of serious transgressions).</i> • <i>A Complaints Register must be available at the security office</i> • 			
Construction	<p>Mitigate the potential negative contribution of the project towards nuisance factors:</p> <ul style="list-style-type: none"> • <i>The mitigation measures of the Noise and Air Quality Impact Assessments are relevant</i> • <i>All construction vehicles should be in a good condition and adhere to the road worthy standards</i> • <i>Implement regular safety briefings, road signage as well as speed control measures</i> • <i>Speeding of construction vehicles must be strictly monitored</i> • <i>Sufficient warning signs should be erected at the turn-off from the N10</i> • <i>Dust suppression measures should be applied if and when necessary. The frequency of these should be determined by the state of the roads, the prevailing weather and vehicle volume on site at the time</i> 	Air quality standards Noise standards	Throughout construction	Zero valid incidents reported through the community or stakeholder forum.

Phase	Management Measures	Legal Requirements/ Compliance with Standards	Implementation Timeframe	Standard to be achieved
	<ul style="list-style-type: none"> • <i>A Complaints Register must be available at the security office</i> • <i>Install low-impact lighting on the exterior of the site where night-time lighting is essential</i> • <i>Consider public transport of workers to and from the site on a daily basis</i> • <i>The stakeholders (through a forum) should be kept informed of the construction schedules and activities</i> 			
Construction	<p>Enhance the positive employment and income of the project:</p> <ul style="list-style-type: none"> • <i>Project Proponent and the Employment Procurement and Construction (EPC) contractor should maximise the use of local labour.</i> • <i>Provide up-skilling opportunities for unskilled and semi-skilled local workers to lessen any possible skills disparity between the local skills available and the requirements of the project (if construction timeframe allows).</i> • <i>The skill requirements should be communicated to the local community leaders and community based organisations such as the Community Stakeholder Forum</i> 	No legal standard	As part of contractor management plan for the duration of the construction period.	100% unskilled labour from municipal area
Construction	<p>Mitigate the visual impact assessment and impact on the sense of place:</p> <ul style="list-style-type: none"> • <i>The mitigation measures of Visual Impact Assessment must be implemented.</i> • <i>Install low-impact lighting on the exterior of the PV site where night-time lighting is essential.</i> • <i>Ensure the correct specifications and placement of lighting for the WEF (e.g. aircraft warning lights for the WEF turbines to be placed on the perimeters, but in accordance with the relevant regulations.</i> • <i>Retain natural vegetation adjacent to the development footprints.</i> • <i>Make use of existing access roads where possible.</i> • <i>Limit the construction of roads and plan location of additional roads required in such a way that clearing of vegetation is minimised and that limited cut and fill requirements would be necessary.</i> • <i>Limit erosion risks as erosion scarring can create areas of strong contrast which can be visible from far distances.</i> • <i>Restrict the activities and movement of construction workers and vehicles to the immediate construction sites and existing access roads</i> 	No legal standard	During planning and design phase, as well as during the construction period.	No community complaints received; EMPPr compliance; Civil Aviation Regulations compliance.
Operations	<p>Mitigate the potential negative contribution of the project towards local population influx:</p> <ul style="list-style-type: none"> • <i>Project Proponent and the Employment Procurement and Construction (EPC) contractor should maximise the use of local labour</i> • <i>Where new job opportunities open up employment of locals (within semi-skilled positions) already residing in municipality must receive priority as this would limit</i> 	None	Throughout operations	Zero complaints from the community and/or the Community Stakeholder Forum

Phase	Management Measures	Legal Requirements/ Compliance with Standards	Implementation Timeframe	Standard to be achieved
	<p><i>the negative impacts (e.g. infrastructure requirements) associated with a population increase and to avoid possible conflict arising between locals and the outside workforce</i></p> <ul style="list-style-type: none"> • <i>Training and capacity building programmes should be implemented to lessen any possible skills disparity between the local skills available and the requirements of the project</i> • <i>Focus procurement on businesses in the Prieska area that could supply non-core goods and services (e.g. security, catering and cleaning)</i> • <i>Assist permanent employees to secure housing and/or to achieve home ownership</i> 			
Operations	<p>Enhance the positive employment and income of the project:</p> <ul style="list-style-type: none"> • <i>Project Proponent and the Employment Procurement and Construction (EPC) contractor should maximise the use of local labour.</i> • <i>Provide up-skilling opportunities for unskilled and semi-skilled local workers to lessen any possible skills disparity between the local skills available and the requirements of the project (if construction timeframe allows).</i> • <i>Training and capacity building programmes must aim to lessen any possible skills disparity between the local skills available and the requirements of the project. This cross training and skills development can focus on technical maintenance and administration.</i> • <i>Project proponent should create conditions that are conducive for the involvement of entrepreneurs, small businesses, and SMME's during the operational phase for rendering ancillary services to the proposed facility</i> 	None	Throughout operations	Recruit as many as possible permanent employees from the larger municipal area before recruiting elsewhere. 100% of unskilled workers must be sourced locally
Operations	<p>Mitigate against the potential negative impacts of community safety:</p> <ul style="list-style-type: none"> • <i>The facility should be fenced or access to the area should be controlled to avoid unauthorised entry</i> • <i>Ensure that sufficient safety and security measures are in place</i> • <i>Employ permanent security personnel.</i> • <i>Adhere to the Occupational Health and Safety Act (Act 85 of 1993) through the development of an Occupational Health and Safety Plan.</i> • <i>Develop and Implement an Occupational Health and Safety, Community Security and Emergency Preparedness and Response Plan</i> • <i>Adhere to the National Veld and Forest Fire Act (Act 101 of 1998)</i> • <i>A Fire/Emergency Response and Management Plan should be developed and implemented.</i> • <i>Contractors and construction workers must be trained with regards to the implementation of the Fire/Emergency Response and Management Plan</i> 	None	Throughout operations	<p>Zero accidents or safety incidents; EMPr compliance</p> <p>All relevant cases resolved</p>

Phase	Management Measures	Legal Requirements/ Compliance with Standards	Implementation Timeframe	Standard to be achieved
	<ul style="list-style-type: none"> • Regularly review the functionality and efficiency of these plans in conjunction with the local emergency teams, management, community representatives and neighbouring landowners • Appropriate fire-fighting equipment should be on site and employees should be appropriately trained for fire fighting • All vehicles should be in a good condition and adhere to the road worthy standards • Implement regular site safety briefings • Entrance to the site from the N10 must be clearly indicated and local access road must be maintained. • Consider public transport of workers to and from the site on a daily basis • Ensure that all employees, sub-contractors and contractors understand, are aware of the requirements and adhere to the EMPr • Transgressions to be dealt with through verbal instructions, then written communication and contract notices (in the case of serious transgressions). • A Complaints Register must be available at the security office 			
Operations	<p>Mitigate against the potential impact on property values:</p> <ul style="list-style-type: none"> • Ensure that sufficient safety and security measures are in place at the site • Employ permanent security personnel. • Install low-impact lighting on the exterior of the site where night-time lighting is essential • Consider public transport of workers to and from the site on a daily basis • The Visual Impact Assessment's recommendations should be implemented to limit any potential negative impacts on the sense of place. • Equipment should be maintained and serviced on a regular basis. • Develop and Implement an Occupational Health and Safety, Community Security and Emergency Preparedness and Response Plan • A Fire/Emergency Management Plan should be developed and implemented. • Adhere to the Occupational Health and Safety Act (Act 85 of 1993) through the development of an Occupational Health and Safety Plan. • Regularly review the functionality and efficiency of these plans in conjunction with the local emergency teams, management, community representatives and neighbouring landowners • Landowners affected by the project must be appropriately compensated for sterilisation of their land. The process should include identifying and negotiating with the multiple landowners across the project site to acquire the sections of land enabling the optimal site design and layout. It must also be considered that the 	None	Throughout operations and after decommissioning	Manage site according to international best practice; Adhere to EMPr

Phase	Management Measures	Legal Requirements/ Compliance with Standards	Implementation Timeframe	Standard to be achieved
	<p><i>farmers will be able to continue their farming activities on the land in between the wind turbines.</i></p> <ul style="list-style-type: none"> <i>The facility should be managed according to international best practice</i> 			
Operations	<p>Enhance the positive impact of community development funds:</p> <ul style="list-style-type: none"> <i>The negotiation of a community funding mechanism is recommended to ensure commitment to social responsibility by the project proponent. This should benefit those living in the immediate vicinity of the project.</i> <i>A community trust can be initiated from where funding can be applied through priority IDP projects</i> 	None	Throughout operations	Percentage of profits to go to social responsibility programmes
Operations	<p>Mitigate against the impact on economic diversity:</p> <ul style="list-style-type: none"> <i>Project proponent should create conditions that are conducive for the involvement of entrepreneurs, small businesses, and SMME's during the operational phase for rendering ancillary services to the proposed facility</i> <i>Implementation of Phases 2 and 3 to follow</i> 	None	Throughout operations	Procurement of local business and SMME's
Operations	<p>Mitigate against impact on local resource use:</p> <ul style="list-style-type: none"> <i>A Fire/Emergency Management Plan should be developed and implemented.</i> <i>Regularly review the functionality and efficiency of these plans in conjunction with the local emergency teams, management, community representatives and neighbouring landowners</i> <i>Transportation should be provided to permanent employees.</i> <i>Proper servitude maintenance must be undertaken.</i> <i>If subtraction of borehole water occurs, the water source's quantity should not be negatively affected by the volume of water used.</i> <i>The water volumes required from municipal sources, should be discussed, negotiated and finalised with the Siyathemba Local Municipality in advance to ensure proper planning in this regard</i> 	Water Quality Standards; EMPr	Throughout operations	Water Quality Standards; EMPr
Operations	<p>Mitigate against the visual impact and impact on the sense of place</p> <ul style="list-style-type: none"> <i>The mitigation measures of Visual Impact Assessment must be implemented.</i> <i>Install low-impact lighting on the exterior of the PV site where night-time lighting is essential.</i> <i>Ensure the correct specifications and placement of lighting for the WEF (e.g. aircraft warning lights for the WEF turbines to be placed on the perimeters, but in accordance with the relevant regulations.</i> 	None	Throughout operations	No community complaints received; EMPr compliance; Civil Aviation Regulations compliance.

Phase	Management Measures	Legal Requirements/ Compliance with Standards	Implementation Timeframe	Standard to be achieved
	<ul style="list-style-type: none"> • <i>Wind turbines to be painted with a non-reflective paint which will prevent blade glint.</i> • <i>Maintain the general appearance of the PV facility and the turbines.</i> • <i>Maintain roads and prevent erosion.</i> • <i>Consideration must be given to the appropriate colour and finishes of the turbines in order to minimise visual effects</i> • <i>The layout of the turbines and access roads must avoid sensitive landscape features</i> • <i>Landowners affected by the project must be appropriately compensated for sterilisation of their land. The process should include identifying and negotiating with the multiple landowners across the project site to acquire the sections of land enabling the optimal site design and layout. It must also be considered that the farmers will be able to continue their farming activities on the land in between the wind turbines.</i> • <i>Ideally it must be ensured that there are no wind turbines closer than 500 m to a residence or historically valuable farm building to avoid the impacts of shadow flickering.</i> • <i>Maintain the turbines in good working order to ensure operation under the right conditions.</i> • <i>Signs near wind turbines should be avoided unless they serve to inform the public about wind turbines and their function. Advertising billboards should be avoided.</i> • <i>Lighting should be designed to minimise light pollution without compromising safety. Investigate using motion sensitive lights for security lighting.</i> • <i>An information centre in Prieska town can enhance the project by educating the public about the need and benefits of wind power. Engaging school groups can also assist the wind farm proponent, as energy education is paramount in developing good public relations over the long term.</i> • <i>The above can assist in instilling the concept of sustainability, and creating awareness of the need for WEFs, is an important process that can engage the entire community.</i> 			
Operations	<p>Mitigate against nuisance factors such as noise associated with the WEF:</p> <ul style="list-style-type: none"> • <i>The mitigation measures of the Noise Impact Assessment are relevant</i> • <i>The WEF layout and designs must minimise noise impacts.</i> • <i>Noise monitoring must be undertaken in order to ensure that levels remain within predicted limits</i> 	None	Throughout operations	No community complaints received; EMP compliance; No exceedances of noise standards

Phase	Management Measures	Legal Requirements/ Compliance with Standards	Implementation Timeframe	Standard to be achieved
Decommissioning	<p>Mitigate the potential negative contribution of the project towards nuisance factors:</p> <ul style="list-style-type: none"> <i>The mitigation measures of the Noise and Air Quality Impact Assessments are relevant</i> <i>All vehicles should be in a good condition and adhere to the road worthy standards</i> <i>Implement regular safety briefings, road signage as well as speed control measures</i> <i>Speeding of vehicles must be strictly monitored</i> <i>Sufficient warning signs should be erected at the turn-off from the N10</i> <i>Dust suppression measures should be applied if and when necessary. The frequency of these should be determined by the state of the roads, the prevailing weather and vehicle volume on site at the time</i> <i>A Complaints Register must be available at the security office</i> <i>Consider public transport of workers to and from the site on a daily basis</i> 	Air quality standards Noise reduction requirements	Throughout decommissioning	EMPr compliance
Decommissioning	<p>Mitigate against job losses during closure:</p> <ul style="list-style-type: none"> <i>Project proponent (operator) to assist employees, prior to the decommissioning in the and after closure of the facility to be marketable for other positions. This would include undergoing a portable skilled development programme in advance of the proposed retrenchment dates.</i> <i>Retrenchments to be phased over a period of time as the facility prepares for decommissioning</i> <i>Provide assistance to employees to source jobs in similar sectors within the municipal area and beyond</i> 	None	During operational life and one year prior decommissioning	Career path development and skills training and advancement as part of Human Resource Development Plan
Decommissioning	<p>Mitigate against negative impacts on community safety:</p> <ul style="list-style-type: none"> <i>The site should be fenced or access to the area should be controlled to avoid unauthorised entry</i> <i>Employ permanent security personnel for the duration of the decommissioning period.</i> <i>Adhere to the Occupational Health and Safety Act (Act 85 of 1993) through the development of an Occupational Health and Safety Plan.</i> <i>Develop and Implement an Occupational Health and Safety, Community Security and Emergency Preparedness and Response Plan</i> <i>A Fire/Emergency Management Plan should be developed and implemented.</i> <i>Regularly review the functionality and efficiency of these plans in conjunction with the local emergency teams, management, community representatives and neighbouring landowners</i> <i>Appropriate fire-fighting equipment should be on site and workers should be appropriately trained for fire fighting</i> 	Occupational Health and Safety Act (Act 85 of 1993)	Decommissioning Phase	Zero accidents or safety incidents during decommissioning; EMPr compliance

Phase	Management Measures	Legal Requirements/ Compliance with Standards	Implementation Timeframe	Standard to be achieved
	<ul style="list-style-type: none"> • <i>All vehicles used during decommissioning should be in a good condition and adhere to the road worthy standards</i> • <i>Implement regular safety briefings, road signage as well as speed control measures</i> • <i>Speeding of vehicles must be strictly monitored</i> • <i>Sufficient warning signs should be erected at the turn-off from the N10</i> • <i>Consider public transport of workers to and from the site on a daily basis</i> • <i>Ensure that all temporary employees, sub-contractors and contractors understand, are aware of the requirements and adhere to the EMPr</i> • <i>Panels to be dismantled off-site and to be disposed of in compliance with international best practice</i> • <i>Transgressions to be dealt with through verbal instructions, then written communication and contract notices (in the case of serious transgressions)</i> 			

12. MONITORING PLAN

These monitoring plans associated with each management measure were described in more detail in Sections 9.3 to 9.5 above.

The draft Social Monitoring Plan provides strategies to be used to address the roles and responsibilities of management personnel off and on-site and a framework for socio-economic compliance and monitoring.

12.1 Monitoring Localities

- Head office
- On-site management

12.2 Monitoring Procedures

- Establish Community or Stakeholder Forum representing local farming and other representatives in the area, that meet with the project proponent on a quarterly basis. Establish a Complaints Register on-site and respond to these complaints timeously
- Safety record keeping and complaints register to be managed throughout construction, operation and decommissioning
- Adherence to EMPr

12.3 Relevant Standards for Monitoring

- Occupational Health and Safety Act (Act 85 of 1993)
- Water quality standards as per the Groundwater and Surface Water Specialist reports
- Air Quality Standards
- Noise reduction standards
- Environmental Monitoring Programme

12.4 Monitoring Frequencies

- Monthly update of safety records (construction and decommissioning phases)
- Quarterly meetings with Community Stakeholder Forum
- Continuous up-keep of complaints register

12.5 Data Capture Protocols

- Contractor and head office to keep complaints register and minutes from forum meetings

12.6 Reporting

- Through quarterly meeting with stakeholders
- Annual reporting

12.7 Standard Operating Procedures for Non-Compliance

- Develop and implement Action plan to improve on results and monitor for next quarter
- Action plan for corrective action, including a review function to continuously assess, and to improve on results and monitor for next quarter

13. CONCLUSION

The following key conclusions can be drawn:

The proposed project is expected to result in the following positive impacts:

- Positive impact on job opportunities in the poverty-stricken area, even though the permanent jobs would be limited. It would still generate additional income among some households that previously had to do without these resources. The lack of skills among the resident population, however, is of concern. It is therefore critical that the project proponent focus on sustainable skills training and capacity building programmes among the local communities to ensure that the number of local employees can be maximised.
- Should the proposed project be able to fill the gap with regards to the quantity and quality of labour available and those required for the project it could assist with improving the quality of life of many households.
- The project proponent could, by being present in the area and by their financial support and social responsibility, assist the Siyathemba Local Municipality to build capacity among local businesses and SME's, as well as assist with the development of infrastructure facilities in the area.

Negative impacts to be noted are the following:

- The inflow of construction workers to the area would have impacts on the local social environment of those living in close proximity to the site as the area is currently scarcely populated and characterized as a peaceful rural environment.
- The population change can result in negative social impacts such as conflict between locals and outsiders, as well as placing additional pressure on the delivery of services and infrastructure requirements.
- The negative intrusion impacts during the construction phase on the neighbouring farmers and are expected to be limited due to the distance of the homesteads to the proposed facility. If no trespassing occur, it is anticipated that their daily living and movement activities would be able to continue undisturbed. Once operational, the facility is anticipated to also have a limited impact on the living and movement patterns of surrounding and nearby property owners.
- Other construction related intrusions refer to the movement of heavy vehicles transporting people, goods and materials, especially the turbines and nacelles. Increased risks of accidents, damage to the gravel road surface and speeding on the local roads are of concern. Noise impacts from the construction activities would be intermittent and of a moderate significance.
- The escalation in people movement and presence of workers (and possibly jobseekers) on site could result in increased risks for criminal activities compromising the current safety and security profile of the local communities to some extent.
- Noise impacts and the visual intrusions created by the WEF would be the key concerns from a social perspective.

These impacts will respond to mitigation, although limited mitigation can be achieved to minimise the turbine impacts on the visual environment.

14. REASONED OPINION AND RECOMMENDATIONS

The following recommendations must be considered:

- Skills training and capacity building remains imperative to improve the employability of locals.
- The project proponent, should, through the social responsibility programmes focus on the key intervention areas required to stimulate the local economy, and also ensure that their interventions are based on the key priority areas already determined by the Integrated Development Plan of the Siyathemba Local Municipality.
- To address safety and security concerns and the possible impacts in this regard, it is recommended that no workers be accommodated on site. In addition, security control measures should be strictly implemented, fire prevention measures should be implemented and local labourers should be employed as far as possible.
- The Siyathemba Local Municipality and community representatives, as well as neighbouring property owners should be kept informed of the progress, decisions taken with regards to the development and construction schedules. The establishment of the Community Stakeholder Forum can assist in this regard.
- The mitigation measures noted for the visual impact associated with the wind turbines should be implemented.
- Based on the socio-economic impact assessment for the project the environmental authorisation of the project is recommended.

15. INFORMATION REQUESTED BY THE COMPETENT AUTHORITIES

A Specialist Report Checklist Table has been compiled in accordance with the guideline as set out in the EIA Regulations (GNR 982 of 04 December 2014) as amended; Appendix 6. The chapter which relays the specific information required as per the guideline is given in the second column of the Table. Any other information requested by the Competent Authorities will be included in this chapter.

Table 21: Specialist Report Guideline

Specialist Report Guideline: Appendix 6 GNR 982 EIA Regulations 4 December 2014 as amended	
Details to be Included in the Report	Section in Report
Details of	
Specialist who prepared the report	Section 3.1
Expertise of the specialist	Section 3.1
CV of the specialist	Sections 16 and 17
Declaration that the Specialist is Independent in a form as may be specified by the CA	Section 4
An indication of the Scope of and the Purpose for which the report was prepared	Section 6.1
An indication of the Quality and Age of base data used for the specialist report	Section 6
A Description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change	Section 8

The Duration, Date and Season of the site investigation and the relevance of the season to the outcome of the assessment	Section 9
A Description of the Methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Section 6
Details of an Assessment of the specific identified Sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives	Section 9
An identification of any areas to be avoided including buffers	Not applicable
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 2.1
A Description of any Assumptions made and any Uncertainties or Gaps in Knowledge	Section 7
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 9, 10 and 13
Any Mitigation Measures for inclusion in the EMPr	Sections 11 and 12
Any Conditions for inclusion in the Environmental Authorisation	Not applicable
Any Monitoring Requirements for inclusion in the EMPr or Environmental Authorisation	Section 12
Reasoned Opinion	
As to whether the proposed activity/ activities or portions thereof should be authorised	Section 14
Regarding the acceptability of the proposed activity or activities	Section 14
If the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr and where applicable the closure plan	Section 14
A Description of any Consultation Process that was undertaken during the course of preparing the specialist report	Section 16.2
A Summary and copies of any comments received during any consultation process and where applicable all responses thereto	Part of stakeholder engagement process
Any other Information requested by the CA	Not applicable

16. SOURCES

16.1 LITERATURE

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South African Reserve Bank (2020). Quarterly Bulletin Quarter 1 2020, ASARB, Pretoria

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16.2 INTERVIEWS

Person interviewed	Institution	Interview date
Mrs. Nel	Landowner: Karabee 50 Portion 5	14 February 2022
Ms. Shandy Bridget Ivitta	Councillor for Ward 4	17 February 2022
Mr. Lazarus Mzwandile Zenani	Councillor for Ward 5	18 February 2022
Mr. Herman van Staden	Prieska Poort 51	18 February 2022

17. APPENDIX 1: DETAILED CURRICULUM VITAE OF ECONOMIC SPECIALIST

Profession:	Economic Specialist	Development	Name of firm:	Southern Economic Development
Years of Experience:	20 years			

KEY QUALIFICATIONS

- *Economic impact assessments*
- *Applied economics (macro-economic and social impact analysis; economic cost benefit analysis, economic incidence analysis, scenario planning)*
- *Skills development in development profiling and strategies*
- *Economic databases & economic reviews*
- *Local social and economic development strategies*
- *Industry and market analysis*
- *Analyses of higher education systems in Africa (analyses of demand and supply factors)*

EDUCATION

1985: B.Admin (Hons) (Economics) (University of Pretoria)

1992: M.Admin (Economics) (University of Stellenbosch)

EXPERIENCE RECORD (1998- current): Examples of similar projects

Socio-Economic impact analyses:

- High level economic impact assessment for various projects (including tourism projects) related to the mine closure programme for Sishen Mine, Northern Cape (South Africa (2019)
- High level economic impact assessment including economic cost benefit assessment, direct and flow-on impacts for a number of tourism projects for the national tourism department South Africa (2018)
- Cost effectiveness assessment of a space technology applied for early fire detection in South Africa (BDO-UK, 2018)
- Socio-economic impact assessment of the Animal Health Technology Innovation Programme of the Technical Innovation Agency, South Africa (2017)
- Socio-economic impact assessment for the Cape Health Technology Park (South Africa (2016)
- Socio- economic impact assessment for the closure of Ezulwini gold mine, Gauteng (2016)
- Socio- economic impact assessment for Rustenburg Smelter Ferrochrome Complex, North West (2016)
- Socio- economic impact assessment of the Cape Health Technology Park, Western Cape (2016)
- Socio-economic impact assessment for route selection of power lines in Mpumalanga (2016)
- Study lead for revenue management study, entailing the identification of mitigation strategies related to project –related revenues (employment and public revenues) for a large-scale gas project for Anadarko petroleum in Mozambique (2012-2014)
- Socio-economic impact assessment for Jeanette mine, Free State (2015)
- Economic study for a waste disposal site in Tshwane, Gauteng (2014)
- Economic impact assessment as part of Social Impact Assessment (SIA) of a Glencore/Xtrata chrome mine in Rustenburg, Mpumalanga (2014)

- Economic impact assessment as part of Social Impact Assessment (SIA) for the extension of a mining right application for Boschmanspoort coal mine in Mpumalanga (2014)
- Economic impact assessment as part of Social Impact Assessment (SIA) for a casino/retail project in Delmas, Mpumalanga (2014)
- Economic study for a private regional landfill in the Ga-Rankuwa area of City of Tshwane (2014)
- Economic impact assessment as part of SIA for a CFB coal plant in Delmas area, Mpumalanga, South Africa (2013)
- Economic impact assessment as part of SIA of a coal mine in Chrissiesmeer, Mpumalanga, South Africa (2013)
- Economic impact assessment as part of SIA for an existing vanadium mine in the Brits area (2012)
- Economic impact assessment as part of SIA for selected wind farms and solar plants in the Northern Cape, Sivest (2012)
- Economic impact assessment as part of SIA for a diamond mine in Alexander Bay area, West Coast, South Africa (2012)
- Measured the impact of the global financial crisis on the mining industry of 8 SADC countries including South Africa (SADC countries; 2009)
- Conducted an analysis of the economic contribution of state owned enterprises to the Namibian economy (Namibia; 1999 and 2009)
- Conducted a socio economic impact analysis for the development of an Africa centre and sustainable housing development project in the Western Cape (South Africa; 2007)
- Developed economic criteria for the evaluation of projects for the Strategic Infrastructure Programme (SIP) for the Western Cape Province(2005)
- Conducted the economic evaluation of an infrastructure project in the Mosselbay area (South Africa;2001);
- Economic impact assessment for horse-mackerel industry (Namibia 2003)

18. APPENDIX 2: DETAILED CURRICULUM VITAE OF SOCIAL SPECIALIST

Name: Ingrid Helene Snyman
Profession: Social Development Consultant Name of firm: Batho Earth
Years of Experience: 20 years

KEY QUALIFICATIONS

- *Social Impact Assessment (SIA)*
- *Public Participation programmes*
- *Communication, development of community structures and community facilitation*
- *Community-based training and*
- *Workshop reports*

EDUCATION

1992: B A (Political Science) University of Pretoria

1995: B A (Hons) Anthropology University of Pretoria

1996 - 1997: Train the Trainers Centre for Development Administration - UNISA

EXPERIENCE RECORD

2000 to date Independent Development Consultant: Batho Earth

Mining Industry

- Beeshoek Optimisation Project, near Postmasburg, Northern Cape (ongoing)
- Pilgrim's Rest Underground Mining for TGME, near Pilgrim's Rest, Mpumalanga (ongoing)
- Gloucester development, near Postmasburg, Northern Cape
- Blesboklaagte Colliery Section 102, Mpumalanga
- Kareerand Tailings Storage Facility (TSF) Expansion Project, Near Stilfontein, North West Province
- Khumani Mine, Mokaning Expansion, Kathu, Northern Cape Province (ongoing)
- Theta Hill Gold Mining Project near Pilgrim's Rest, Mpumalanga
- Khulu TSF at Dwarsrivier Mine, near Steelpoort, Limpopo Province (ongoing)
- Social Risk Assessment for Dwarsrivier Chrome Mine, near Steelpoort, Limpopo Province
- Vandyksdrift Central (VDDC) Mining: Infrastructure Development, Mpumalanga
- PPP for the development of various additional listed activities at the Dwarsrivier Chrome Mine, near Steelpoort, Limpopo Province
- Project 10161 and Project 10167 (Gold Mining) by Stonewall (Pty) Ltd., near Sabie and Pilgrims Rest, Mpumalanga
- Manganese Mine North West of Hotazel, Northern Cape (Mukulu Environmental Authorisation Project)
- South32 SA Coal Holdings Middelburg Colliery Environmental Management Plan (EMP) and Water Use Licence (WUL) Application Project (Life of Asset Open Cast Expansion and Dispatch Rider Project), Middelburg, Mpumalanga
- Manganese Mine on the Remaining Extent of the Farm Paling 434, Northern Cape Province: Revision and Amendment of Existing Approved Environmental Management Programme (EMP) For A Mining Right
- Western Bushveld Joint Venture Project (Maseve Platinum Mine), North West Province
- Public Participation for Sable Platinum for the proposed prospecting application on the farm Doornpoort, Pretoria, Gauteng

- Public Participation for the prospecting application on the farms Frischgewaagd and Kleinfontein, Mpumalanga Province for PTM
- Public Participation for the prospecting application on the farm Klipfontein, Gauteng for PTM
- Basic Assessment for the extension of the Komati coal stockyard, Mpumalanga
- Dorstfontein Mine Western Expansion Project, Kriel, Mpumalanga
- Grootboom Platinum Mine, Steelpoort, Limpopo Province
- Dorstfontein Mine Expansion Project, Kriel, Mpumalanga

Mixed Use Land/Housing Developments

- Gauteng Rapid Land Release Programme: Four Sites: Hekpoort / Bryanston / Lenasia / Rietfontein (Ennerdale), Gauteng
- Wildealskloof Mixed Use Development near Bloemfontein, Free State
- Mixed Land Use Township Establishment on the Remainder of Portion 406 of the Farm Pretoria Town and Townlands 351 JR, and investigation with regards to the possible resettlement of households, Salvokop, Tshwane CBD
- Mixed Land Use Development situated on the Remainder of Allandale 10 IR, known as Rabie Ridge Ext 7, Midrand, Gauteng
- Basic Assessment for the proposed development of Project One (1) of the Vosloorus Extension 9 High Density Housing Project, Ekurhuleni Metropolitan Municipality
- Mapochsgronde Residential Development, Roossenekal, Limpop Province
- Cullinan Estate Development, Cullinan, Gauteng
- Vlakfontein Residential Development and investigation with regards to the possible resettlement of individual households, Brakpan, Gauteng
- Township development/eco-estate on the farm Grants Valley, Eastern Cape

Bulk Infrastructure and Supply

- Integrated Public Transport Network for the Mangaung Metropolitan Municipality
- Olifantsfontein Landfill, Gauteng
- K43 Road Construction near Lenasia, Gauteng
- Mangaung Bus Depot for the Integrated Public Transport Network (IPTN) in Bloemfontein, Free State
- Greenwich Landfill Site, Newcastle, KwaZulu Natal
- Mangaung Gariep Water Augmentation Project, Free State
- Tshwane Regional General Waste Disposal Facility (Multisand Landfill), Pretoria, Gauteng Province
- Basic Assessment for the proposed K97 Road northbound of the N4 at Bon Accord and investigation with regards to the possible resettlement of business premises, Pretoria, Gauteng
- Extension of the Wemmershoek Wastewater Treatment Works (WWTW), decommissioning of the Franschoek WWTW and construction of a transfer and outfall sewer between the two works, Franschoek, Western Cape
- Lefaragathle, Mogono, Rasimone, Chaneng outfall sewer and Chaneng sewer treatment plant, Rustenburg (Phokeng), North West Province
- Proposed upgrading of railway stations and railway line for Metrorail in Mamelodi, Gauteng
- ACSA Remote Aprons Project, O.R. Tambo International Airport, Gauteng
- Public Participation and SIA as part of the Environmental Scoping Study for the proposed upgrading of the Waterval Water Care Works

Ecosystem Services Review

- Proposed Ngonye Falls Hydro-Electric Power Plant Project, Western Province, Zambia: Biodiversity Assessment: Stakeholder Engagement Plan and Social Assessment for the Ecosystem Services Review (ESR)

Projects related to electricity generation, transmission and distribution

- Crowthorne-Lulamisa power line, Midrand, Gauteng
- Basic Assessment for the proposed Crowthorne Underground Cable, Gauteng
- Basic Assessment for the proposed Diepsloot East Servitude and substation, Gauteng
- Mitchells Plain-Firgrove-Stikland Transmission Line project and investigation with regards to the possible resettlement of individuals within Mitchells Plain, Western Cape
- 400 kV Transmission Power Line for approximately 10km to the west of the existing Marathon Substation and possible resettlement of homesteads, Nelspruit area, Mpumalanga
- Basic Assessment for the proposed construction of a 400 kV transmission line between the Ferrum substation (Kathu) and the Garona substation (Groblershoop), Northern Cape Province
- Basic Assessment for the proposed construction of the Eskom Rhombus-Lethabong 88kv Powerline and Substation, North West Province
- Aberdeen-Droerivier 400 kV Transmission Power Line, Eastern and Western Cape Province
- Houhoek Substation Upgrade and Bacchus-Palmiet Loop-In and Loop-Out, near Botrivier, Western Cape Province
- Arnot-Gumeni 400 kV Transmission Power Line, Mpumalanga
- Aggeneis-Oranjemond Transmission Line project, Northern Cape Province
- Ariadne-Venus Transmission Line, KwaZulu Natal
- Dominion Reefs Power Line project, North West Province
- Kyalami Strengthening Project, Kyalami, Gauteng
- Apollo Lepini 400 kV Transmission Line Project, Tembisa, Gauteng
- Public Participation for the proposed new Medupi (then referred to as Matimba B) coal-fired power station in the Lephalale area, Limpopo Province
- Public Participation and SIA for the proposed Poseidon-Grassridge No. 3 400 kV Transmission line and the extension of the Grassridge Substation, Eastern Cape Province
- Public Participation and SIA for the proposed construction of power lines between the Grassridge Substation (near Port Elizabeth) and the Coega Industrial Development Zone, Eastern Cape Province
- Public Participation and SIA for the Matimba-Witkop No. 2 400 kV Transmission line in the Limpopo Province

Photovoltaic and Wind Energy Facilities

- Christiana PV facility on the farm Hartebeestpan, North West Province
- Hertzogville PV facility on the farms Albert and Wigt, Free State Province
- Morgenzon PV facility on the farm Morgenzon, Northern Cape Province
- Basic Assessment Process for the Exxaro Photovoltaic Facility, Lephalale, Limpopo Province
- Upington Solar Energy Facility, Northern Cape Province
- Kleinbegin Solar Energy Facility, Northern Cape Province
- Ilanga solar thermal power plant facility on a site near Upington, Northern Cape Province
- Karoo Renewable Energy Facility, Northern Cape
- Wag'nbiokiespan Solar Energy Facility, Northern Cape Province
- Kathu and Sishen Solar Energy Facilities, Northern Cape Province
- Thupela Waterberg Photovoltaic Plant, Limpopo Province
- Kannikwa Vlakte Wind Farm Project, Northern Cape