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BIOTHERM MARALLA WEST WIND FACILITY

SOCIO-ECONOMIC IMPACT ASSESSMENT

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BioTherm Energy (Pty) Ltd

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1 INTRODUCTION

Biotherm Energy (Pty) Ltd (BioTherm) propose to develop a 140 MW renewable energy wind facility within the Western Cape, namely the Maralla West Wind Facility (the proposed project). This project is proposed to be located 35 km southeast of the town of Sutherland within the Karoo Hoogland Local Municipality (**Figure 1**). This project forms part of a larger wind energy complex proposed by Biotherm for the area, namely the Esizayo, Maralla East and Maralla West facilities (140 MW each).

WSP | Parsons Brinckerhoff, Environment and Energy, Africa (WSP | Parsons Brinckerhoff) has been appointed to undertake a Social and Environmental Impact Assessment (SEIA) for the proposed project in order to apply for Environmental Authorisation (EA).

The SEIA is divided into two phases, firstly the Scoping Phase, and secondly and Environmental Impact Assessment (EIA) Phase. This report comprises the Socio-Economic Impact Assessment (SIA) in support of the EIA Phase of the SEIA.

1.1 SCOPE OF WORK

The scope of the SIA was to determine the potential positive and negative impacts of the proposed project, as well as the related infrastructure and alternatives, on the local and regional landscape. Direct, indirect and cumulative impacts of the proposed project in relation to current and proposed activities within the local area have been considered.

1.2 OBJECTIVES OF THE REPORT

The SIA Report has achieved the following objectives:

- à Development of a social profile for the proposed project area through the description of the socio-economic receiving environment that may be affected by the proposed activity;
- à Identification, description and assessment of the potential socio-economic impacts associated with the proposed facility; and
- à Provision of mitigation measures and recommendations to enhance the socio-economic sustainability of all phases of the proposed project

1.3 LEGISLATIVE FRAMEWORK

There is no legal framework in South Africa that governs SIA processes; however, a guideline for SIA is included in the *Western Cape Department of Environmental Affairs and Development Planning Guideline for Involving Social Assessment Specialists in EIA Processes* (Barbour, 2007).

The National Environmental Management Act, as amended (1998) 2014 EIA Regulations provides the general requirements for consultants compiling specialist reports or undertaking specialist processes. In summary, a specialist must:

- à Be independent;
- à Have expertise in conducting the study, including knowledge of NEMA, the EIA Regulations and any relevant guidelines;
- à Perform the work in an objective manner, even if the findings are not favourable to the applicant;

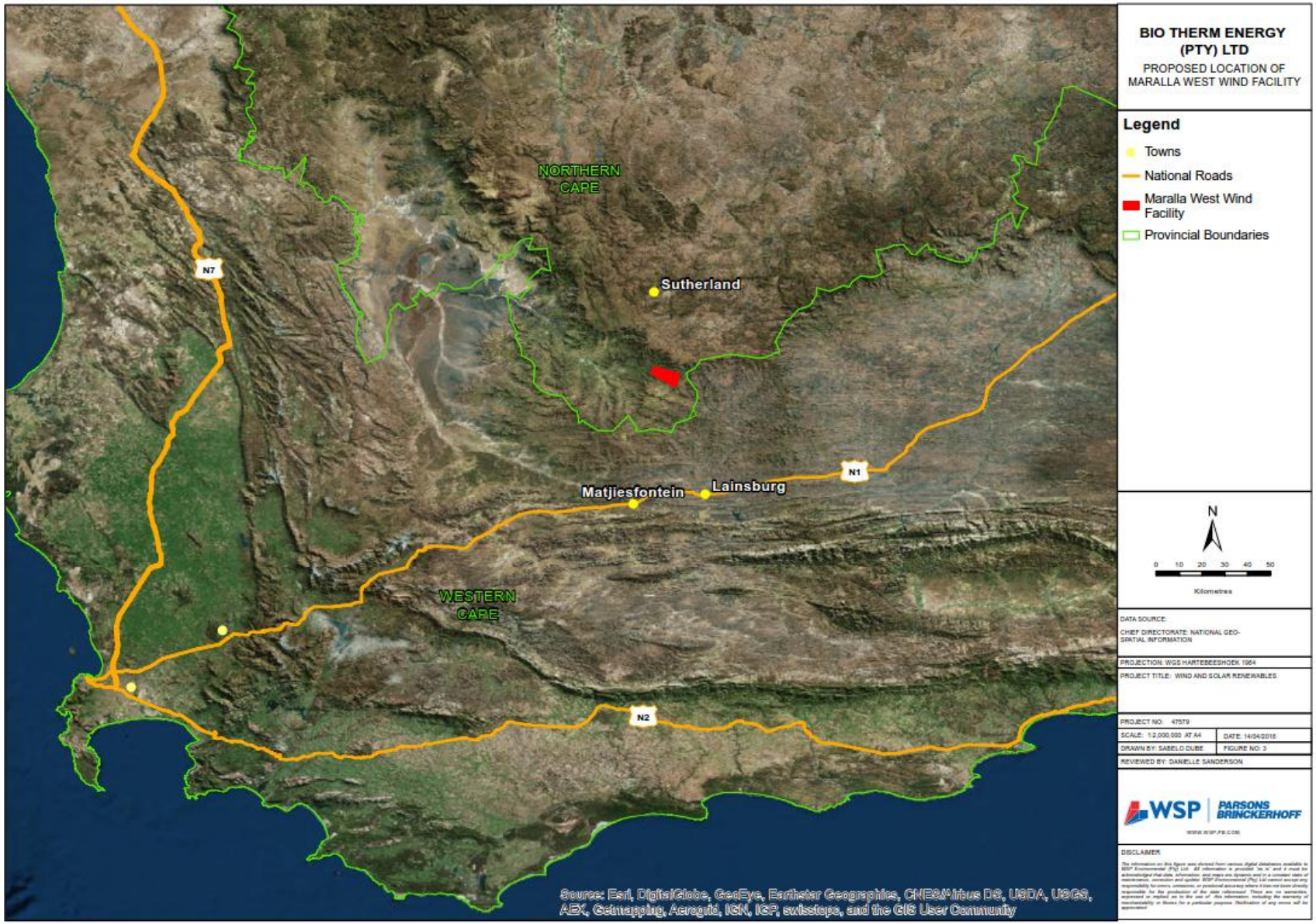

Figure 1 Regional location of proposed project

- Comply with all applicable legislation; and
- Disclose to the applicant and competent authority all material information that may have the potential to influence:
  - Any decision to be taken with respect of the application by the competent authority; or
  - The objectivity of any report, plan or document to be prepared for submission to the competent authority.

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  - The objectivity of any report, plan or document to be prepared for submission to the competent authority.

1.4 STUDY APPROACH AND METHODOLOGY

APPROACH

The approach to the SIA comprised of a combination of desktop and primary data collection, review and assessment. The collection of primary data was to ensure that site-specific issues and potential impacts could be identified and more accurately assessed.

SCOPING PHASE – SCREENING STUDY

The socio-economic screening assessment undertaken during the Scoping Phase sought to obtain insights into the nature of the local social and economic environment, and the potential socio-economic issues that may arise from the proposed project. The following activities were conducted during the Socio-Economic Scoping Study:

- Desktop Review;
- Description of the socio-economic context of the project;
- Identification of potential issues and impacts associated with all components and alternatives associated with the proposed project; and
- Plan of Study for EIA Phase SIA study.

EIA PHASE – SOCIAL IMPACT ASSESSMENT

The Socio-Economic Scoping Report (dated October 2016) provided the terms of reference for the impact assessment phase.

The SIA included the following activities:

- Desktop Review:
  - Review of relevant specialist reports in order to obtain an understanding of the broader impacts associated with the project which may have a bearing on the social landscape; and
  - Review of outcomes of the Scoping Phase stakeholder engagement (including review of meeting minutes, comment and response reports) to obtain insight into the socio-economic issues and concerns raised by stakeholders.
- Primary Data Collection:
  - A Site visit was undertaken between 11 and 13 January 2017 to obtain first-hand information in respect of the site and local area.
  - At the time of the site visit the IDP Manager at Karoo Hoogland Local Municipality was not available to discuss the project. An email was sent to the IDP Manager; however, no response has been obtained.
  - Primary data was collected from the neighbouring Laingsburg Local Municipality during the site visit. It is assumed that the primary data collected from engagement with the Laingsburg Local Municipality is likely to representative of Karoo Hoogland Local Municipality due to their location adjacent to one another, and therefore has been utilised as a secondary resource for this project.
  - Interviews with key representatives of the Laingsburg Local Municipality were held to obtain insights into the anticipated socio-economic impacts associated with the proposed wind projects in the area, namely:
    - Ms Gwynn Harding – Planning and Integrated Development Plan (IDP) Manager; and
    - Mr Tron –Ward Councillor (Ward 2), past Mayor, and local farmer.
  - Other local representatives were interviewed via informal discussions, including:
    - Ms Francis van Wyk – Laingsburg Local Municipality council representative, museum curator and resident; and
    - Ms Madre Walters – Laingsburg Tourism Officer.

    The interviews sought to obtain responses to specific socio-economic questions and to obtain clarity on assumptions made in the Scoping Phase. The representatives interviewed were identified through the EIA process and referrals from local stakeholders. These stakeholder were considered knowledgeable and able to represent the local context objectively, and thus meet the requirements of the SIA study. A record of the interviews is provided in **Appendix A**.
- Impact Assessment and Recommendations:
  - Evaluation of potential impacts (as per impact assessment methodology outlined below) and identification of appropriate mitigation and management measures to enhance positive impacts and reduce negative impacts.

IMPACT ASSESSMENT METHODOLOGY

The EIA uses a methodological framework developed by WSP | Parsons Brinckerhoff to meet the combined requirements of international best practice and NEMA, 2014 EIA Regulations.

As required by the EIA Regulations, the determination and assessment of impacts will be based on the following criteria:

- Nature of the Impact

- Significance of the Impact
- Consequence of the Impact
- Extent of the impact
- Duration of the Impact
- Probability if the impact
- Degree to which the impact:
  - can be reversed;
  - may cause irreplaceable loss of resources; and
  - can be avoided, managed or mitigated.

Following international best practice, additional criteria have been included to determine the significant effects. These include the consideration of the following:

- Magnitude: to what extent environmental resources are going to be affected;
- Sensitivity of the resource or receptor (rated as high, medium and low) by considering the importance of the receiving environment (international, national, regional, district and local), rarity of the receiving environment, benefits or services provided by the environmental resources and perception of the resource or receptor); and
- Severity of the impact, measured by the importance of the consequences of change (high, medium, low, negligible) by considering inter alia magnitude, duration, intensity, likelihood, frequency and reversibility of the change.

It should be noted that the definitions given are for guidance only, and not all the definitions will apply to all of the environmental receptors and resources being assessed. Impact significance was assessed with and without mitigation measures in place.

METHODOLOGY

Impacts are assessed in terms of the following criteria:

- The **nature**, a description of what causes the effect, what will be affected and how it will be affected

NATURE OR TYPE OF IMPACT	DEFINITION
Beneficial / Positive	An impact that is considered to represent an improvement on the baseline or introduces a positive change.
Adverse / Negative	An impact that is considered to represent an adverse change from the baseline, or introduces a new undesirable factor.
Direct	Impacts that arise directly from activities that form an integral part of the Project (e.g. new infrastructure).
Indirect	Impacts that arise indirectly from activities not explicitly forming part of the Project (e.g. noise changes due to changes in road or rail traffic resulting from the operation of Project).
Secondary	Secondary or induced impacts caused by a change in the Project environment (e.g. employment opportunities created by the supply chain requirements).
Cumulative	Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.

- The physical **extent**, wherein it is indicated whether:

SCORE	DESCRIPTION
1	the impact will be limited to the site;
2	the impact will be limited to the local area;
3	the impact will be limited to the region;
4	the impact will be national; or
5	the impact will be international;

- The **duration**, wherein it is indicated whether the lifetime of the impact will be:

SCORE	DESCRIPTION
1	of a very short duration (0 to 1 years)
2	of a short duration (2 to 5 years)
3	medium term (5–15 years)
4	long term (> 15 years)
5	Permanent

- The **magnitude of impact on ecological processes**, quantified on a scale from 0-10, where a score is assigned:

SCORE	DESCRIPTION
0	small and will have no effect on the environment.
2	minor and will not result in an impact on processes.
4	low and will cause a slight impact on processes.
6	moderate and will result in processes continuing but in a modified way.
8	high (processes are altered to the extent that they temporarily cease).
10	very high and results in complete destruction of patterns and permanent cessation of processes.

- The **probability of occurrence**, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale where:

SCORE	DESCRIPTION
1	very improbable (probably will not happen.
2	improbable (some possibility, but low likelihood).
3	probable (distinct possibility).
4	highly probable (most likely).
5	definite (impact will occur regardless of any prevention measures).

- the **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high;
- the **status**, which is described as either positive, negative or neutral;
- the degree to which the impact can be reversed;
- the degree to which the impact may cause irreplaceable loss of resources; and
- the *degree* to which the impact can be mitigated.

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

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

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

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

OVERALL SCORE	SIGNIFICANCE RATING	DESCRIPTION
< 30 points	**Low**	where this impact would not have a direct influence on the decision to develop in the area
31-60 points	**Medium**	where the impact could influence the decision to develop in the area unless it is effectively mitigated
> 60 points	**High**	where the impact must have an influence on the decision process to develop in the area

The impact significance without mitigation measures will be assessed with the design controls in place. Impacts without mitigation measures in place are not representative of the project's actual extent of impact, and are included to facilitate understanding of how and why mitigation measures were identified. The residual impact is what remains following the application of mitigation and management measures, and is thus the final level of impact associated with the development of the Project. Residual impacts also serve as the focus of management and monitoring activities during Project implementation to verify that actual impacts are the same as those predicted in this EIA Report.

DECLARATION OF INDEPENDENCE

Danielle Sanderson (Senior Consultant) is a qualified social scientist with a Masters of Social Science in Environmental Management obtained from the University of KwaZulu-Natal in 2006. She has over 8 years' experience in social assessments. Danielle undertook the socio-economic screening process and reporting.

Hilary Konigkramer (Director) is a qualified social scientist with a Bachelor of Social Science Honours in Environmental Management obtained from the University of Natal in 1998. She has over 15 years' experience as a consulting social and environmental scientist. Hilary provided guidance and review of the screening report and SIA Report (this document).

Curriculum vitae of the above specialists are provided in **Appendix B**.

Both Danielle Sanderson and Hilary Konigkramer, responsible for undertaking the study and contributing to the production of the Draft SIA Report, are independent and do not have vested or financial interests in the proposed Maralla West Wind Facility being approved or not. Declaration of Independence forms are attached in **Appendix C**.

2 DESCRIPTION OF THE PROJECT

The proposed Maralla West Wind Facility site is located approximately 34 km south of the town of Sutherland (**Figure 1**). The site falls within the Northern Cape Province. The facility is proposed to include an up to 250 MW power facility (5646 ha) and a 30 km double circuit 132 kV power line to connect the facility to an external substation (grid connection). This double circuit power line and common substation will be assessed under a separate application.

Access to the proposed project site is from a secondary road (unnamed) 15 km from the R354. The properties on which the proposed Maralla West Wind Facility will be located are provided in **Table** 1.

Table 1 Farms included in the Maralla West Site

FARM NAME & NUMBER	21 DIGIT SG CODE	PROVINCE	FARM SIZE (HA)
Farm Drie Roode Heuvels 180, Remainder	C07200000000018000000	Northern Cape	3 929
Farm Annex Drie Roode Heuvels 181, Remainder	C07200000000018100000	Northern Cape	329
Farm Wolven Hoek 182, Portion 1	C07200000000018200001	Northern Cape	763
Farm Wolven Hoek 182, Portion 2	C07200000000018200002	Northern Cape	625

The Maralla West site forms part of the larger Maralla Wind project, which is proposed to comprise two components – namely Maralla East and Maralla West Wind Facilities – which are adjoining. The total capital expenditure for the construction phase of both facilities is estimated at R 5.75 billion (R 2.875 billion for each component) and operational expenditure is estimated at R 5.25 billion (R 2.625 billion for each component) over the 20-year period. The accommodation for the construction phase labour is unknown at this time, but temporary housing is likely to be on or near the site and permanent housing is likely to be located in local towns, specifically Sutherland (as it is an established centre within the local area).

2.1 WIND ENERGY POWER GENERATION PROCESS

Wind turbines, like windmills, are mounted on a tower to harness wind energy at an increased level above the ground where wind is faster and less turbulent. The kinetic energy of the wind is used to turn the blades of the turbine to generate electricity. Wind turbines are able to operate at varying wind speeds, with the amount of energy the wind transfers to the rotor depending on the density of the air, the rotor area and the wind speed.

The electricity generated by the wind turbines is passed through the step-up transformer and then transmitted via either underground or overhead cables to a central substation, which connects the wind energy facility to a high voltage network. Wind turbines are designed to operate automatically with minimal maintenance for approximately 20-25 years.

Figure 2 illustrates the following main components of a wind turbine:

- The **rotor consists of three** blades that are attached to a hub. The blades collect energy from the wind and converts the wind energy into rotational shaft motion/energy to turn the generator;

- The **nacelle** houses the equipment at the top of the tower as well as a gearbox, a generator that converts the turning motion/mechanical energy of the blades into electricity and coupling and brake;
- The **tower** supports the nacelle and rotor and allows the blades to be distanced safely off the ground so as to reach the stronger winds found at higher elevations;
- **Turbine step-up transformer**, which can be indoor or outdoor depending on the turbine, model whose function, is to increase the voltage capacity of the electricity generated by the turbine to a higher, grid-equivalent.
- **The foundation unit** ensures the stability of the turbine structure.

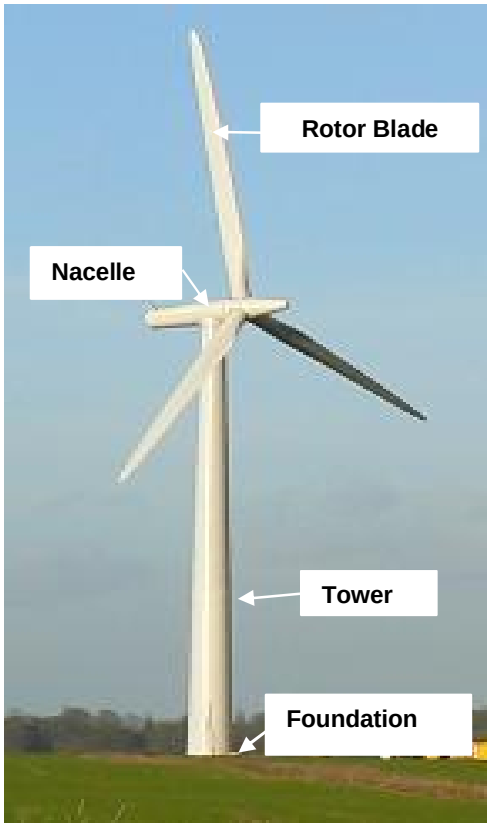


Figure 2 Typical example of wind turbine structure and components

2.2 PROJECT INFRASTRUCTURE

The proposed project is for the construction and operation of an up to 250 MW wind energy facility. A technical summary of the facility and its associated infrastructure is included in **Table 2**.

Table 2 Details of the proposed wind energy facility and associated infrastructure

TECHNICAL DETAILS OF THE PROPOSED FACILITY	
Generation Capacity	Up to 250 MW
Number of turbines	Up to 125
Area of buildable area	Approximately 200 ha

TECHNICAL DETAILS OF THE PROPOSED FACILITY

Area occupied by each turbine	0.5 ha (85m x 60m)
Turbine hub height	Up to 120m
Rotor Diameter	Up to 150m
Turbine Foundation	20m diameter x 3m deep – 500 to 650m^3 concrete. Excavation area approx. 1000 m^2 in sandy soils due to access requirements and safe slope stability requirements.
Electrical turbine transformers	0.5ha (85m x 60m)
Area of preferred Operations and Maintenance building assessment site	Operations and Maintenance buildings will be in proximity of the Substation due requirements for power, water and access.
Footprint of Operations and Maintenance Building(s)	Operations and Maintenance building includes operations, on site spares storage and workshop. Typical areas indicated below: à Operations = 20 x 8 = 160m^2 à Work shop = 12 x 8 = 96m^2 à Stores = 15 x 8 = 120m^2
Area of preferred construction laydown areas	Construction camp typical area 60m x 40m = 2 400m^2 à Laydown or staging area 150m x 75m = 11 250m^2 à Laydown for concrete towers (only if required) = 40 000m^2 "
Cement Batching Plant	Gravel and sand will be stored in separate heaps whilst the cement will be contained in a silo. The actual mixing of the concrete will take place in the concrete truck. The footprint of the plant will be in the order of 0.25ha. The maximum height of the cement silo will be 20m. This will be a temporary structure during construction.
Width of internal roads	Between 4.0m and 6.0m, however this may increase to 8m on bends
Length of internal roads	Approximately 60 km
Type and Height of fencing	Approximately 5m high palisade or mesh fencing where required
Sewage	Septic tanks (with portable toilets during the construction phase)
Footprint of internal onsite substation	150m x 150m
Onsite substation capacity	Up to 132kV
Specifications of onsite switching stations, transformers, invertors, onsite cables etc.	The medium voltage collector system will comprise of cables (1kV up to and including 33kV) that will be run underground, except where a technical assessment suggests that overhead lines are applicable, in the facility connecting the turbines to the onsite substation.
List of additional infrastructure to be built	Access roads and internal roads. Administration, control and warehouse buildings.

2.3 PROPOSED PROJECT DEVELOPMENT ACTIVITIES

DESIGN AND PLANNING PHASE

The main activities during the design and planning phase of the wind energy facility will include the following:

- Undertaking the SEIA and obtaining Environmental Authorisation.
- Prior to the finalisation of the design layout (including the foundations and associated infrastructure) a final site survey and geotechnical survey will be undertaken. The geotechnical survey will identify any topographical constraints that may affect foundation requirement. The final layout will also take into consideration any environmental sensitivities identified during the EIA phase as well as any specific conditions outlined in the Environmental Authorisation (once received).

CONSTRUCTION PHASE

The main activities associated with the construction phase of the wind energy project will include the following:

- **Establishment of an access road to the site** – The site is already easily accessible via the tarred R354 national road; however, the regional gravel road connecting the site to the R354 will need to be upgraded.
- **Establishment of internal roads** – Internal road access will be constructed onsite. These roads will be between 4 and 6 m in width. The length of the internal road network is approximately 60km.
- **Site preparation** – Site preparation includes the clearance of vegetation and any bulk earthworks (including blasting if required) within the footprint of each construction area that may be required in terms of the facility design.
- **Transport of components and equipment to site** – All construction material (i.e. masts, blades and associated infrastructure), machinery and equipment (i.e. graders, excavators, trucks, cement mixers etc.) will be transported to site utilising the national, regional and local road network. Large Components (such as substation transformers and tower sections) may be defined as abnormal loads in terms of the Road Traffic Act (No. 29 of 1989). In such cases a permit may be required for the transportation of these loads on public roads.
- **Establishment of a laydown area on site** – Construction materials, machinery and equipment will be kept at relevant laydown and/or storage areas. A 1.1ha laydown and storage area has been proposed for this project, with an additional 4ha for concrete towers if required. The laydown area will limit potential environmental impacts associated with the construction phase by limiting the extent of the activities to one designated area.
- **Construct foundation** – Concrete foundations will be constructed at each turbine location. Foundation holes will be mechanically excavated to a depth of 3m, depending on the local geology. Concrete will be batched on site. The reinforced concrete foundation will have a footprint of approximately 550m^2.
- **Construction of the turbine** – A large lifting crane will be brought onto site to lift each of the tower parts into place (**Figure 3**).
- **Construct IPP substation and invertors** – Invertors will be installed to facilitate the connection between the wind turbines and the Eskom Grid. The turbines will be connected to the substation via underground or overhead cabling. The substation will be constructed with a maximum footprint of approximately 150m x 150m.
- **Establishment of ancillary infrastructure** – Ancillary infrastructure will include a workshop, storage areas, office and a temporary laydown area for contractor's equipment.

- **Undertake site rehabilitation** – The site will be rehabilitated once the construction phase is complete and all construction equipment and machinery have been removed from site.

Source: BioTherm

Figure 3 Example of turbine construction

OPERATIONAL PHASE

The proposed wind facility is anticipated to have a minimum life of 20 years. The facility will operate 7 days a week. While the project is considered to be self-sufficient, maintenance and monitoring activities will be required. Potable water requirements for permanent staff will be limited and provided by bottled water.

DECOMMISSIONING PHASE

Following the initial 20-year operational period of the wind facility, the continued economic viability will be investigated. In the event that the facility is still deemed viable, the life of the facility will be extended. The facility will only be decommissioned once it is no longer economically viable. In the event that a decision is made to completely decommission the facility all the components will be disassembled, reused and recycled or disposed. The site would be returned to its current use i.e. agriculture (grazing).

2.4 ALTERNATIVES

SITE ALTERNATIVES

The proposed project site has been selected based on several criteria such as terrain, land suitability, site extent, site and surrounding land use, and accessibility of the site. For the purpose of the EIA process, no other site alternative has been considered. The hilly and mountainous terrain and current land use makes the selected site best suited for the proposed project. No site alternatives have therefore been assessed.

TECHNOLOGY ALTERNATIVES

The proposed wind turbine technology will be selected based on the best available technology for the location and power generation requirements. No details of this technology are available at the time of this study. No other renewable energy technologies have been considered for the proposed project due to the hilly and mountainous terrain.

LAYOUT ALTERNATIVES

The layout alternatives that are proposed for the infrastructure associated with the proposed Maralla West Facility include (**Figure 4**):

- Turbines:
  - The initial turbine layout included 125 turbines. On completion of the Scoping phase sensitivity mapping the initial layout was revised to include 70 turbines. However, the layout was revisited again during the EIA phase due to an updated sensitivity map resulting from the detailed biodiversity, avifauna and bat studies. The current layout includes 56 turbines.
- Substations:
  - Internal - Two options for internal (step up) substation were considered during the EIA phase (as indicated in **Figure 4**).

NO-GO ALTERNATIVE

The 'do-nothing' or "no-go" alternative is the option of not implementing the proposed project.

With an increasing demand in energy predicted and growing environmental concerns about fossil fuel based energy systems, the development of large-scale renewable energy supply schemes is strategically important for increasing the diversity of domestic energy supplies and avoiding energy imports in the country.

Without the implementation of this project, the use of renewable options for power supply will be compromised in the future. This has potentially significant negative impacts on environmental and social well-being.

The no-go option is a feasible option; however, this would prevent BioTherm from contributing to the significant environmental, social and economic benefits associated with the development of the renewables sector. Accordingly, the no-go option is not the preferred option.

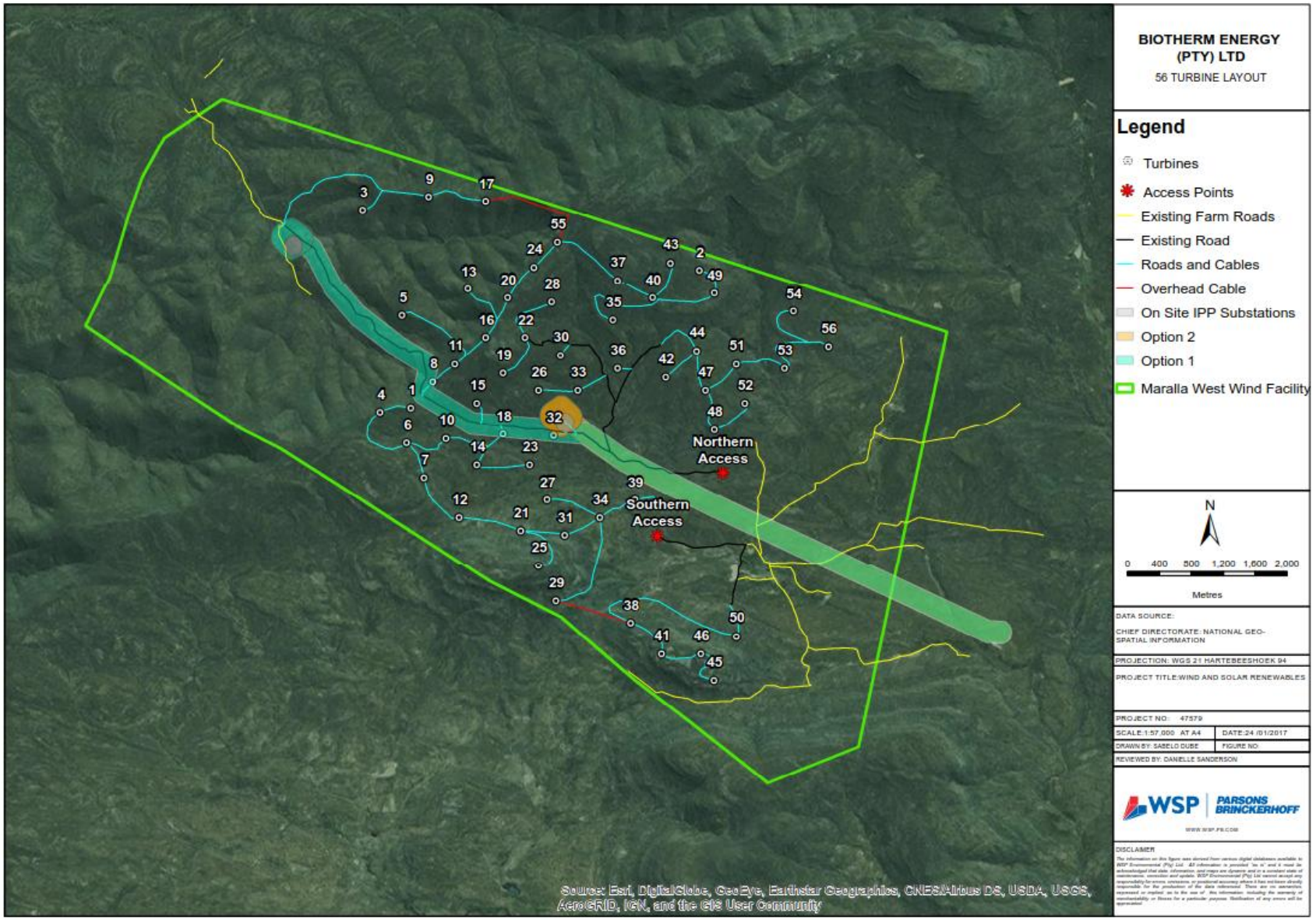


Figure 4 Revised project layout (56 turbines) - Maralla West Facility

3 DESCRIPTION OF THE AFFECTED ENVIRONMENT

The site falls across two provinces, with approximately one third within the Northern Cape and the remaining two thirds of the development site within the Western Cape Province.

3.1 REGIONAL CONTEXT

NORTHERN CAPE PROVINCE

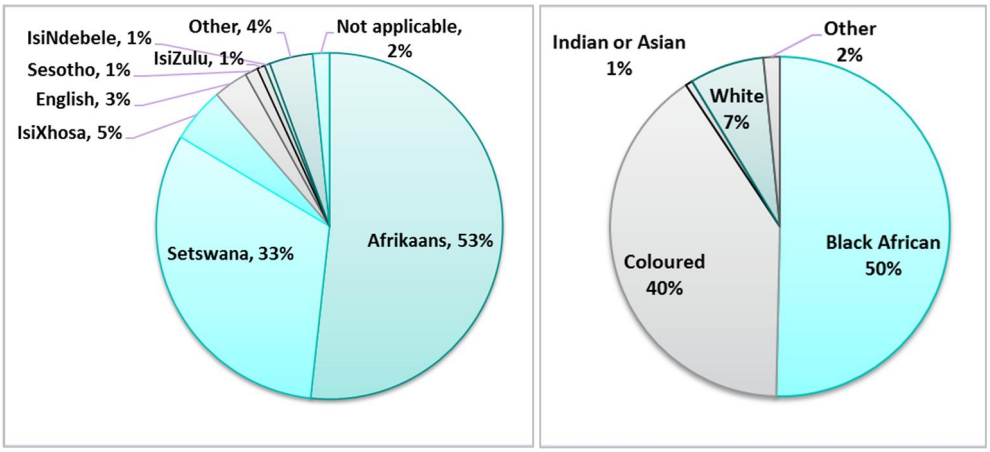
The proposed project is located within Northern Cape Province (**Figure 1**). This is one of the largest provinces within South Africa's, taking up nearly a third of the country's land area (372 889 km²), but has the country's smallest population of approximately 1.1 million people (Statistics South Africa, 2012). The population density of the province is therefore very low (approximately one person per square kilometre) (Statistics South Africa, 2016). The population comprises predominantly Black African (50%) and Coloured (40%) population groups (**Figure 5**). The two main first languages spoken within the province are Afrikaans (53%) and Setswana (33%) (**Figure 5**).

The split between urban and rural populations is 76% and 24% respectively (Statistics South Africa, 2012). This indicates that the majority of the population lives in urban centres, which likely to be a result of sparse natural resources within the province.

Geographically the province shares borders with Namibia in the north and stretches as far as the Atlantic Ocean in the west. The Northern Cape also shares borders with the Western Cape to the south, the Eastern Cape to the southeast, and the Free State and the North West Province to the east. The largest centres in the Northern Cape are Kimberley and Upington.

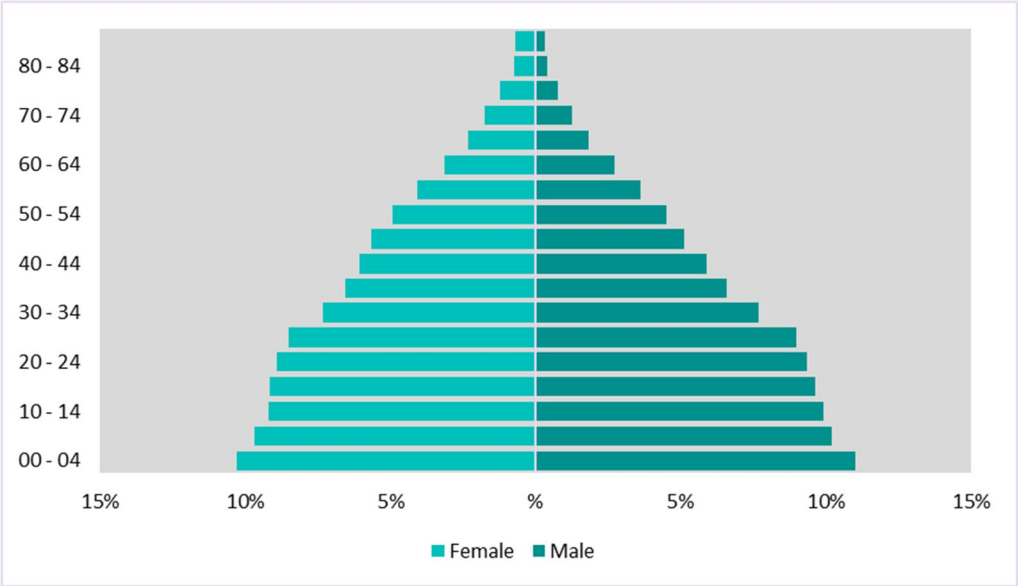
The current unemployment rate, as of the first quarter of 2016, is 27.8% (Statistics South Africa, 2016). The total dependency ratio is 55.7%, which is slightly higher than the national average, which was 52.14% in 2015 (Indexmundi, 2016). **Figure 6** provides a population pyramid for the Northern Cape indicating a high population below the age of 35. The total percentage of people over the age of 20 years of age who do not have schooling is 24%, which is three times the national level of 8% (Statistics South Africa, 2016). The total number of people above the age of 20 that have a matric or higher is 30%, which is lower than the national level of 41% (Statistics South Africa, 2012).

Extensive sheep, goat, and cattle rearing are prominent in the province due to the sparse, arid climate. Farmers in the province contribute to 6.1% to South African agriculture and 6.6% of the province's economy (Statistics South Africa, 2012). Mining (including diamonds, iron, titanium, zinc, lead, and copper) is one of the main economic sectors, generating nearly 7% of South Africa's total mining value and contributes 23.4% to the provinces total economy.



Source: Statistics South Africa (2012)

Figure 5 Population groups and languages spoken – Northern Cape



Source: Statistics South Africa (2012)

Figure 6 Population pyramid – Northern Cape

The Orange River provides a source of fertile land and water within the northern region of the province. The areas immediately adjacent to Orange River are therefore characterised by a concentration of vineyards and other intensive agricultural activities, producing products such as export-quality table grapes, wine, dried and preserved fruit. The Northern Cape is also home to the world's largest telescope, the Square Kilometre Array (SKA). The province has numerous parks and conservation areas. The Kgalagadi Transfrontier Park is Africa's first cross-border game park and one of the largest conservation areas in southern Africa.

CENTRAL KAROO DISTRICT MUNICIPALITY

Central Karoo District Municipality is one of five districts situated in the Western Cape Province and covers a total area of 38 854 km^2 (Central Karoo District Municipality, 2012). The Central Karoo is the largest district in the Western Cape, is predominantly arid and rural in nature, and covers a large, sparsely populated area. The majority (83%) of the population is concentrated in urban areas of the municipality (Statistics South Africa, 2012). The main language spoken within the district

municipality is Afrikaans (Error! Reference source not found.), and of the total population of approximately 71 000, 76% are Coloured (Error! Reference source not found.).

The unemployment rate is high at 30.8% compared to the provincial (22.2%) and national (26.6%) levels (Central Karoo District Municipality, 2012 and Statistics South Africa, 2012). With a moderate to high dependency ratio of 58%, the high unemployment is a significant issue for the local population. This is further hampered by a relatively high percentage of the pollution over 20 not having any schooling (10% compared to the national 8%) and 39% with a matric (compared to 41% nationally).

The key economic sectors within the district are agriculture; community, social and personal services, and wholesale and retail trade (Central Karoo District Municipality, 2012). The arid climate, water scarcity, limited connectivity, and low to moderate infrastructure within the district municipality are economic development constraints for this area.

3.2 LOCAL CONTEXT

KAROO HOOGLAND LOCAL MUNICIPALITY

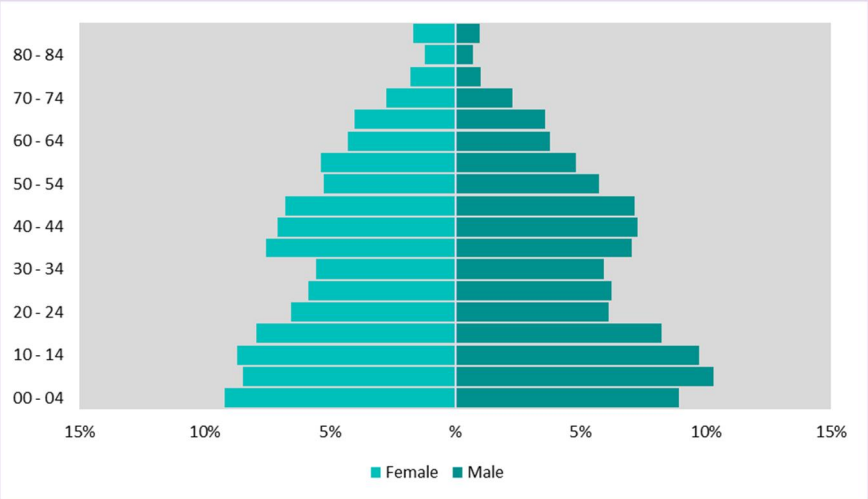
Part of the proposed Maralla West Wind Facility site is located within the Karoo Hoogland Local Municipality, which forms part of the Namaqua District Municipality, in the southernmost area of the Northern Cape. The three main towns in Karoo Hoogland Local Municipality are Williston, Fraserburg and Sutherland (Karoo Hoogland Local Municipality, 2015).

The human settlement within the Karoo Hoogland Local Municipality is concentrated within urban areas, with farming communities and settlements dispersed across the municipality. The population is 12 588, with a population density of 0.4 persons per square kilometre (Statistics South Africa, 2012). The groups representing the highest percentages of the municipality's population are Coloured (79%), followed by White (15%) and Black African (6%) (Statistics South Africa, 2012). The most-spoken first language is Afrikaans (90%), with 1% of the population speaking English and isiXhosa.

The population of the Karoo Hoogland Local Municipality is relatively stable; however, a notable gap occurs between the ages of 15 – 39 (**Figure 7**). This may be indicative of on out-migration of youth in search of education and employment. The dependency ratio is 61%, which is 1.6 dependants for every working age person.

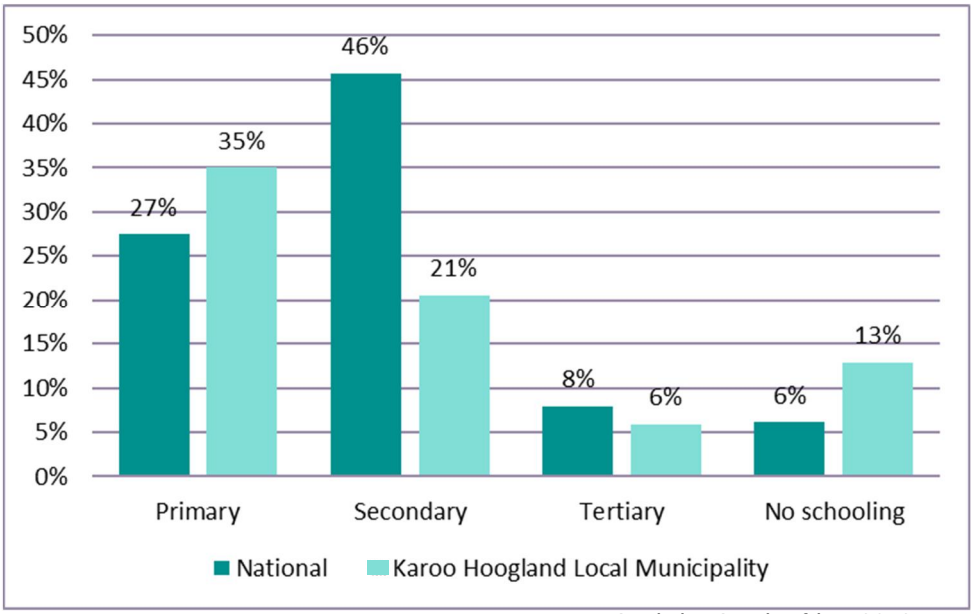
The service levels within the local municipality are moderate with 73.4% of the households having access to electricity for lighting, 58.5% for cooking and 46.4% for heating. This is due to majority (73.3%) of the population residing in urban areas. Sixty-two percent of the municipality's water service is provided by the municipality and other water services, while 33.8% is sourced from boreholes. Refuse removal services level are moderate, as 62.7% of households have their refuse removed by the local authority. Sanitation levels are low with only 39.4% having flush toilets connected to a sewer system. A lack of infrastructure has been identified by the Karoo Hoogland IDP as one of the key a priority development needs (Karoo Hoogland Local Municipality, 2015).

The education levels within the local municipality are low compared to the national average, as indicated in **Figure 8**. Areas with low levels of education and skills generally present a lower level of economic employment than populations with higher education levels, as indirect opportunities through entrepreneurship are also lost. There are therefore likely to be low numbers of skilled individuals available for employment within the Karoo Hoogland Local Municipality.



Data source: Statistics South Africa (2012)

Figure 7 Population pyramid – Karoo Hoogland Local Municipality



Data source: Statistics South Africa, 2012

Figure 8: Education levels – Karoo Hoogland Local Municipality

The income levels of the municipality's population are low with 42.5% earning less than R1600 per month. The unemployment levels are 23.1% higher than national levels, with 33.2% of the potential labour force being unemployed in comparison to the national unemployment levels of 26.7% (as of the first quarter 2016) (Statistics South Africa, 2012 and 2016, Karoo Hoogland IDP, 2015). According to the Karoo Hoogland IDP (2015), more than half (55%) of the population within the municipality is classified as semi-skilled of unskilled

The Karoo Hoogland Local Municipality is characterised by an arid and mountainous environment. The low potential grazing, non-arable land is suited for sheep and game farming, and consequently agriculture and tourism are the main local economic contributors (Karoo Hoogland Local Municipality, 2010).

3.3 LOCAL ECONOMIC ACTIVITIES

AGRICULTURE

KAROO HOOGLAND LOCAL MUNICIPALITY

The Karoo Hoogland Local Municipality has very limited arable land and poor soil conditions, which makes it ideally suited for grazing (Karoo Hoogland Local Municipality, 2010). Sheep farming is therefore the key agricultural and economic driver. Other agricultural activities include ostrich rearing, and limited, intensive crop farming.

TOURISM

KAROO HOOGLAND LOCAL MUNICIPALITY

Tourism plays a secondary, but important, role within the Karoo Hoogland local economy. Sutherland is home to the Southern African Large Telescope (SALT) (14 km from Sutherland), which provides a technology tourism opportunity. In addition, agri-tourism and eco-tourism (including an extinct volcano) attract visitors nationally and internationally.

RENEWABLES

There are a number of proposed renewable energy projects within the Karoo Hoogland Local Municipality (immediately adjacent to the Laingsburg Municipality). The dominant strong winds throughout the province make the region an ideal location for wind farms. There are a number of proposed and existing developments situated within a 100 km radius of the proposed project site (**Table 3** and **Figure 9**). The presence of multiple approved and proposed wind and solar energy farms within the vicinity of the proposed project site creates an opportunity for infrastructure sharing. Currently, however, only three of the proposed surrounding facilities have been awarded preferred bidder status by the Department of Energy.

Table 3: Renewable energy projects in proximity to the Maralla West Wind Facility

WIND FARM (DEVELOPER)	CAPACITY	DISTANCE FROM SITE	STATUS OF DEVELOPMENT
Roggeveld Wind Energy	140 MW	17.5 km	Environmental Authorisation granted (Preferred bidder Renewable Energy Independent Power Producer Procurement (REIPPP) procedure Round 4)
Nxuba (Soerwater) Wind Farm	139.4 MW	25 km	Environmental Authorisation granted (Preferred bidder REIPP Round 4)
Karusa Wind Farm	142 MW	26.6 km	Environmental Authorisation granted (Preferred bidder REIPP Round 4)
Suurplaat Wind Facility	1200 MW	64 km	Environmental Authorisation granted
Komsberg	300 MW	23 km	Environmental Authorisation in progress
Konstabel	50 MW	35 km	Environmental Authorisation granted

Source: Department of Environmental Affairs, 2016

3.4 LOCAL COMMUNITIES

The proposed Maralla West project site lies 35 km south of the town of Sutherland, within an area used predominantly for extensive sheep grazing. There is a number of farming related activities within the proposed Maralla West site and within the surrounding areas, with Sutherland being the closest town to the proposed site (**Figure 10**). A description of these communities is provided in

Table 4. Photographs of the area settlements and views of the area are provided in **Figure 11** to **Figure 14**.

Table 4: Description of local settlements and towns – Maralla West

RELEVANCE TO THE SITE	SETTLEMENT NAME	DISTANCE AND DIRECTION FROM SITE	DESCRIPTION
Within site boundary	Aurora Farm	1 600 m from eastern border	Comprised of several buildings, and planted pastures. This settlement is currently occupied (son of the landowner), but is not within proximity to any of the proposed structures on site.
Adjacent to site boundary	Welgemoed	1.8 km north east	Both farming settlement includes of several buildings and planted pastures.
	Komsberg	1.9 km east	
Within 10 km of site boundary	Surrounding farm settlements	2.9 km northeast 3.7 km southeast 3.9 km southeast 4.7 km south	There are several small settlements along the Komsberg and MeintjiesPlaas River and tributaries surrounding the proposed site. These are predominantly sheep farms, with planted pastures or lucerne[1].
Closet towns	Sutherland	32 km north	Sutherland is historically an agricultural service centre, catering for the surrounding farming community. The town includes tourism activities and is a key technology centre in South Africa, with the South African Astronomical Observatory and the (SALT). The town has a population estimated at 2 836 people and approx. 718 households[2].

[1] Cape Farm Mapper - Crop Census 2013
[2] Statistics South Africa, 2012

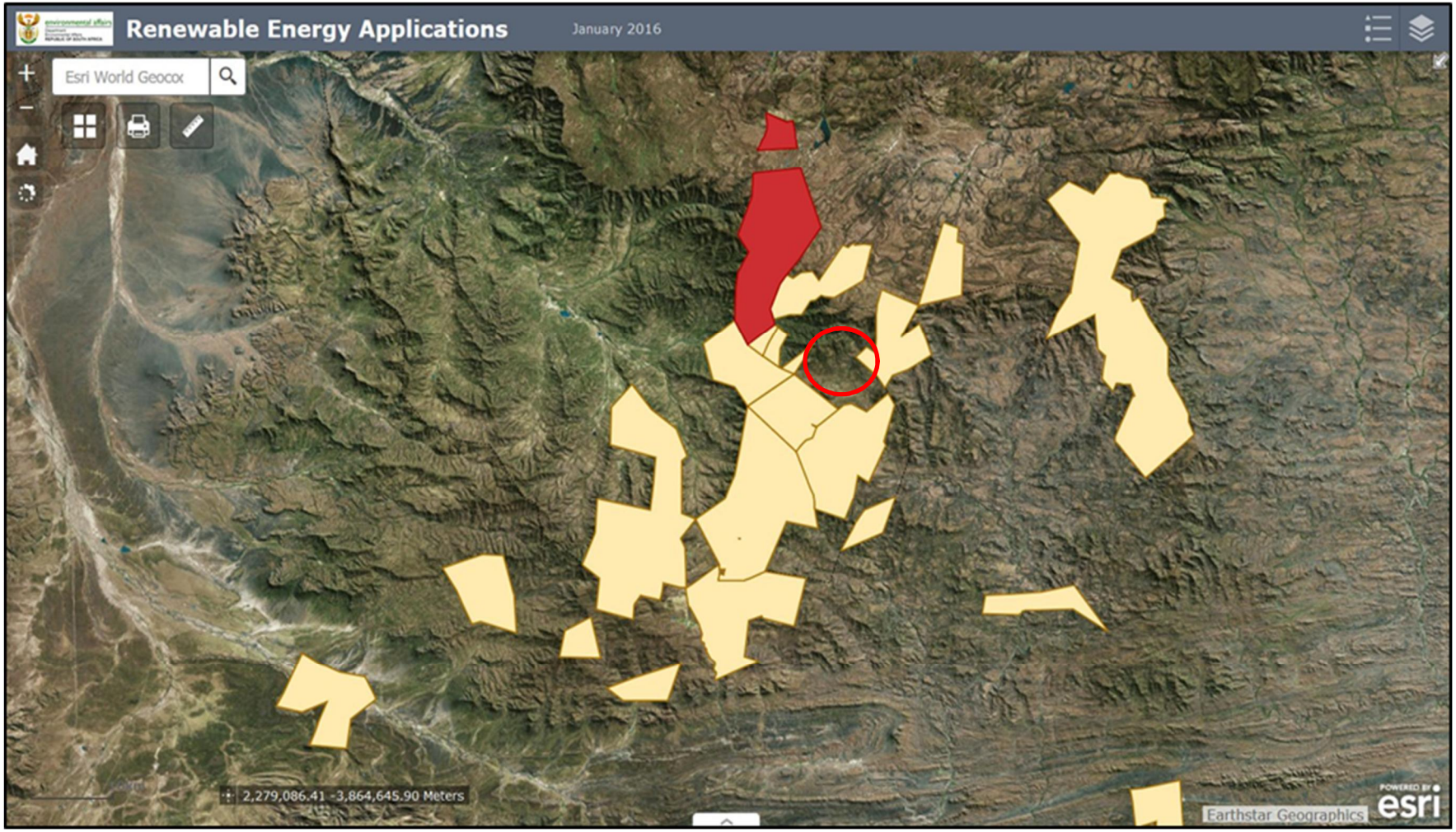


Figure 9 Map of DEA registered renewable energy applications as of April 2016 (Maralla West is indicated by the red circle)

Figure 10 Location of settlements and wind turbines at the Maralla West Wind Facility

Figure 11 Church in Sutherland

Figure 12 The SALT near Sutherland

Figure 13 Windmill pump and sheep near R354

Figure 14 Power pylons near the R354

4 SOCIO-ECONOMIC POLICY AND PLANNING CONTEXT

4.1 NATIONAL POLICIES

There are a number of strategic policies and legislation that have led to the current drive toward advancing the development of renewable energy within South Africa. The broad aim of these frameworks is to promote a diversity in power generation and support with national growth and development, with a positive spin of stimulating local economic development and employment.

An overview of these broader legislation and policies is provided in **Table 5**. Detailed information is provided on renewable energy policies and frameworks below.

Table 5 National legislation and policies framework

TITLE	KEY AIMS/OBJECTIVES
National Energy Act (34 of 2008)	Aims to "ensure that diverse energy resources are available, in sustainable quantities and at affordable prices, to the South African economy in support of economic growth and poverty alleviation…"
New Growth Path Framework (2010)	Proposes strategies "to deepen the domestic and regional market by growing employment, increasing incomes and undertaking other measures to improve equity and income distribution; and to widen the market for South African goods and services through a stronger focus on exports to the region and other rapidly growing economies."
National Infrastructure Plan (2012)	Aims to transform our economic landscape while simultaneously creating significant numbers of new jobs, and to strengthen the delivery of basic services.
Strategic Integrated Projects (SIPs)	The SIPs present five core functions namely to unlock opportunity, transform the economic landscape, create new jobs, strengthen the delivery of basic services, and support the integration of African Economies. SIPs 8 and 9 of the energy SIPs supports the development of the Maralla West Wind Facility which is as follows: à SIP 8: Green energy in support of the South African economy à SIP 9: Electricity generation to support socio-economic development
Integrated Resource Plan 2010-2030	Aimed at providing help and support for the direct expansion of electricity supply including private and own generation and power purchases from regional projects. The overall objectives of the IRP are to evaluate the security of supply, and determine the least-cost supply option through the consideration of various demand side management and supply-side options. In addition, the IRP aims to provide information on the opportunities for investment into new power generating projects.

WHITE PAPER ON THE RENEWABLE ENERGY POLICY OF THE REPUBLIC OF SOUTH AFRICA (2003)

In response to overexploitation of resources and climate change, South African government ratified the United Nations Framework Convention on Climate Change (UNFCC) in August 1997 and acceded to the Kyoto Protocol, the enabling mechanism for the convention, in August 2002. In addition, national response strategies have been developed for both climate change and renewable energy.

The White Paper on Renewable Energy was published in 2003 and supplements the National Energy Policy published in 1998. The White Paper on Renewable Energy sets out the vision, policy principles, strategic goals and objectives of the South African Governments for promoting and implementing renewable energy in South Africa. The paper identifies that the medium and long-term potential of renewable energy is significant and that it is the intention of the government to contribute to the global effort to mitigate greenhouse gas emissions. In addition, it states that there is a need for Government to create an enabling environment through the introduction of fiscal and financial support mechanisms within an appropriate legal and regulatory framework to allow renewable energy technologies to compete with fossil-based technologies.

The objectives of the White Paper are considered in six focal areas:

- Financial instruments;
- Legal instruments,
- Technology development,
- Awareness raising,
- Capacity building and education, and
- Market based instruments and regulatory instruments.

The policy supports the investment in renewable energy facilities as they contribute towards ensuring energy security through the diversification of energy supply, reducing greenhouse gas emissions and the promotion of renewable energy sources.

RENEWABLE ENERGY DEVELOPMENT ZONES

The Department of Environmental Assessment (DEA), in consultation with the Department of Energy (DoE), has been mandated to undertake a Strategic Environmental Assessment (SEA), to identify geographical areas most suitable for the rollout of wind and solar PV energy projects and the supporting electricity grid network (Department of Environmental Affairs (2015). These concentrated development zones are referred to as Renewable Energy Development Zone (REDZs). The outputs of the SEAs directly relate to several government priorities including:

- Contributing to reducing present current energy constraints by facilitating renewable energy development in strategic areas in South Africa;
- Addressing the major objectives of the National Development Plan, namely transitioning to a low carbon economy, developing infrastructure to create jobs and reducing the regulatory burden and the cost of doing business;
- Contributing to achieving the renewable energy target identified in the Integrated Resource Plan and implementation of the REIPPP by the Department of Energy and National Treasury;
- Promoting the green economy and sustainable development; and
- Promoting intergovernmental coordination and integrated authorisations

The outcome of the gazetting process will mean that wind and solar PV activities within the eight Renewable Development Zones and electricity grid expansion within the five Power Corridors will be subjected to a Basic Assessment and not a full EIA process. It is intended that the introduction of the REDZs will lead to:

- A reduction of potential negative environmental impacts or consequences;
- Synchronisation and streamlining of authorisation and approval processes;
- Potentially attractive incentives; and
- Focused expansion of the South African electricity grid.

The DEA has released a map with focus areas best suited for the rollout of wind and solar photovoltaics projects in South Africa. The proposed Maralla West Wind Facility will fall within the Komsberg Wind REDZ, located within the sutherland area of the Northern Cape.

4.2 DISTRICT AND LOCAL MUNICIPALITY POLICIES

The IDP developed by the Karoo Hoogland Local Municipality provides socio-economic context to the proposed project, and highlights the potential social and economic requirements and opportunities within the region.

NORTHERN CAPE

The IDP documents developed by the Namakwa District Municipality and Karoo Hoogland Local Municipality provide socio-economic context to the proposed project, and highlight the potential social and economic requirements and opportunities within the region.

NAMAKWA DISTRICT MUNICIPALITY INTEGRATED DEVELOPMENT PLAN

The Namakwa District Municipality Draft IDP (2015-2016) identifies promoting the improvement of living conditions and economic development of local communities as a key objecting for the municipality (Namakwa District Municipality, 2015). A key focus area within the IDP is the optimal utilisation of natural resources in various sectors and this includes renewable energy (Namakwa District Municipality, 2015).

The key strategic objectives of the Namakwa District Municipality IDP (Namakwa District Municipality, 2015) relevant to this study are as follows:

- Create of job opportunities, as part of the Expanded Public Works Programme; and
- Ensure sustainable economic and social transformation in the district.

The proposed Maralla West Wind Facility has the potential to promote job creation, as well as sustainable economic and social growth through upskilling of local community, diversifying the local economic sector, and potentially uplifting the local communities in the long-term.

KAROO HOOGLAND LOCAL MUNICIPALITY INTEGRATED DEVELOPMENT PLAN (2015-2016)

The Karoo Hoogland Local Municipality views spatial development as crucial in identifying programmes and projects for development of land within the municipality. The IDP identifies spatial development, service delivery and LED as three of the key performance areas that require tangible development within the municipality. The IDP also identifies the need to attract potential investors through incentive programmes.

Renewable energy is a key LED opportunity for the Karoo Hoogland Local Municipality, which will result in spatial development (in an otherwise undeveloped area of the municipality). The proposed Maralla West Wind Facility is therefore aligned with the local municipality's IDP.

5 FINDINGS

The nature of the local and regional landscape in which the Maralla West Wind Facility is located is sparsely populated and arid, with little infrastructure and limited development opportunities. There are a number of small agricultural settlements located within and surrounding the proposed project site, which are unlikely to be directly affected by the proposed project. There are a number of small towns within 100 km radius of the site, which may be affected by the proposed project. As a result, the potential socio-economic impacts of the proposed project have been identified on a local level, with site-specific observations where relevant.

The screening assessment did not identify any fatal flaws in terms of the socio-economic environment for the proposed site or alternatives. A number of socio-economic benefits and opportunities are recognised as being key impacts of the proposed project. The following key potential socio-economic impacts were identified through to the SIA process for assessment:

CONSTRUCTION PHASE	à Increase in employment opportunities à Increased economic development opportunities à Disruption through influx of job seekers à Increase in communicable diseases and reduced public health à Change in sense of place à Nuisance from noise, dust and traffic disturbances à Increase risk to neighbouring land users à Increased risk of veld fires
OPERATIONAL PHASE	à Increased employment and business opportunities à Increased economic development opportunities à Change in sense of place
DECOMMISSIONING PHASE	à Loss of permanent employment à Gain of short term employment à Increase risk to neighbouring land users à Increased risk of veld fires à Nuisance from dust, noise and traffic
CUMULATIVE	à Increased local economic development opportunities à Increased pressure on local service provision à Change in sense of place

It is necessary that the no-go alternative is considered i.e. the implications should the proposed Maralla West Wind Facility not go ahead. The anticipated impacts associated with no-go alternative have been considered. The following impacts have been identified and are discussed in this chapter:

- à Loss of employment and local economic development opportunities; and
- à Maintenance of the existing landscape and sense of place.

5.1 CONSTRUCTION PHASE

INCREASE IN EMPLOYMENT OPPORTUNITIES

It is anticipated that the construction phase for the Maralla West Wind Facility site, which will span a 12 to 18-month period, will generate approximately 27.5[3] new skilled employment opportunities and approximately 36.7[4] new unskilled employment opportunities. This is a total peak number of

[3] *Estimate provided by BioTherm for Maralla East and West is 55.*
[4] *Estimates provided by BioTherm for Maralla East and West is 73.4.*

employment opportunities of 64.2. It is anticipated that 70% (44.9) of these will opportunities accrue to historically disadvantaged individuals.

Due to the specialised nature of some of the construction activities, and the low level of skills available in the local area[5], it is most likely that the skilled labour required during the construction phase will need to be sourced from outside of the Karoo Hoogland Local Municipality. The construction phase, however, will generate a number of unskilled employment opportunities. The majority of the employment opportunities are likely to be associated with contractors appointed to construct the proposed facility and associated infrastructure. As contractors tend to use their own staff, the potential for direct employment opportunities for locals during the construction phase may be limited. Members of the local community are likely to benefit from the low skilled employment opportunities. The high unemployment rate (28.3%) for Karoo Hoogland Local Municipality indicates that the generation of local employment opportunities will have an impact on the local population, and it will be possible to source unskilled labour from the population living within the towns within the Karoo Hoogland Local Municipality.

The potential benefits in terms of short-term employment are therefore likely to be recognised at both a local, regional and national level. The proposed project has the potential to provide a significant number of unskilled employment opportunities within the local municipal area. In line with the REIPPP requirements, the intention is to employ local labour. Provision of employment opportunities to approximately 44.9 historically disadvantaged individuals has the potential to significantly impact numerous households and extended family units in respect of household income, education and other downstream social impacts.

The prioritised employment for historically disadvantaged individuals could contribute to social upliftment and poverty alleviation. Local opportunities will contribute to the development goals of the Karoo Hoogland Local Municipality.

INCREASED ECONOMIC DEVELOPMENT OPPORTUNITIES

The proposed project has the potential to generate positive socio-economic outcomes through the provision of LED opportunities. Local content is a primary focus of the DoE's REIPPP, which emphasises the need to promote job growth, domestic industrialisation, community development, and black economic empowerment.

Construction phase LED opportunities can be identified and implemented on a national, regional and local level as follows:

- Ensuring participation of South African entities in the project.
- Sourcing of materials (steel, aluminium, concrete, etc.).
- Manufacturing of primary components (i.e. blades, masts, other components).
- Utilising local service providers as far as possible (i.e. security, transportation, accommodation, catering, vehicle repairs, etc.).

The total capital expenditure for the construction phase of the Maralla West Wind Facility is estimated at R 2.875 billion[6]. This expenditure will generate business opportunities for the local, regional and national economy. Larger-scale manufacturing and specialised services for the proposed project are likely to be sourced from a regional and national level, however there are likely to be opportunities for local contractors and engineering companies at a local and regional level.

The project offers a business focus within a rural environment that would not ordinarily be realised. The proposed project has the potential to stimulate economic development within the local area if

[5] *pers. comm. Harding, 2017*
[6] *Estimate provided by BioTherm for Maralla East and West is R 5.75 billion.*

local social and economic development opportunities are prioritised. The local service industry is most likely to benefit from the proposed project. The opportunities for the local service sector include accommodation, catering, cleaning, transport, security etc. The nearest towns of Sutherland and Laingsburg could provide services such as accommodation and cleaning services. Other local towns, such as Matjiesfontein and Touws River, may experience positive impacts. The town of Beaufort West could provide services that are more substantial as a regional centre. Fraserburg, while located over 100km from the site, may provide necessary support services at a regional level.

DISRUPTION DUE TO INFLUX OF JOB SEEKERS

The construction phase may lead to the influx of skilled and unskilled employment seekers from outside the immediate area. This could lead to social conflict over the local resources and employment opportunities. This in-migration may have an impact on the Karoo Hoogland Local Municipality and their ability to service additional people within the municipal area.

It has been recognised in other areas where renewable energy projects have been developed that an influx of job-seekers is not easily managed by the municipality or the proponent of the development. This influx can result further pressure on basic and social services, including establishment of informal settlements. These individuals are generally from outside the local municipality and from other provinces, resulting in conflicts in cultural beliefs and resentment of the local community, which further disrupts local social networks and stability.

The Karoo Hoogland Local Municipality currently experiences a number of social issues, including low levels of education and skills development, reliance on social grants, teenage pregnancy, and drug and alcohol abuse (*pers. comm.* Harding, 2017, and Karoo Hoogland Local Municipality, 2015)). The low level of economic and social development is both a partial cause and effect of the existing social issues.

It was noted during the primary data collection that the Laingsburg area has experienced other types of linear or large development in the immediate vicinity of the town, such as roads and telecommunications construction activities (van Wyk, 2017). These have resulted in positive economic impacts, including provision of accommodation and catering services. Based on discussions with local representatives, previous developments did not seem to result in significant negative impacts on the local communities. The use of labour from outside[7] the local area was managed effectively through provision of housing, supply of basic services, and provision of sufficient leave time to return home by the proponent (*pers. comm.* Harding, 2017 and van Wyk, 2017).

INCREASE IN COMMUNICABLE DISEASES AND REDUCED PUBLIC HEALTH

Skilled labour requirements are likely to be sourced from outside the local municipality. This labour force of approximately 64.2 individuals will need to be housed during the construction period. The project proponent has not yet defined housing arrangements. It is likely that skilled labour will be housed in nearby towns or alternatively within the development footprint or neighbouring farm[8].

As the majority of the population within the local municipality live within urban areas, and because the site is located within a rural context some distance from urban centres, it is considered likely that labour will be temporarily housed within close proximity to the development site, within the farm boundary.

[7] *Labour from outside the area was noted to be used as local individuals did not want to undertake the required tasks.*

[8] *Previous construction labour force have been housed on a farm adjacent to Laingsburg, in purpose-built accommodation units. These units were left to the farmer and can be leased.*

Temporary housing of both skilled and unskilled labour could result in a number of short-and long-term localised social issues, such as increased prostitution, and drug and alcohol abuse. The presence of an outside labour force, as well as the influx of job seekers, may negatively affect local public health, due to a higher likelihood of a spread of communicable diseases such as Tuberculosis (TB), as well as HIV/AIDS[9] and other sexually transmitted diseases (STDs). HIV/AIDS is known to be a significant issue within the Northern and Western Cape (Shisana, 2014).

CHANGE IN SENSE OF PLACE

The sense of place is a social construct of individuals and communities and their interaction within the landscape in which they live and work, creating a unique identity for a geographical area.

The proposed Maralla West Wind Facility is located within a remote Karoo landscape, which has a high visual value, but which also has a good visual absorption capacity due to its undulating topography (Gebhardt, 2017). The area is considered remote, with few daily views of the site, but it has been noted that local residents have a "great affinity for the land and landscape" (Gebhardt, 2017).

The change in the nature of the site because of the construction activities of the proposed project, as well as presence of construction staff, is likely to change the local sense of place for the immediate neighbouring homesteads and users of the Klein Roggeveld Road. The overall impact on sense of place, may change temporarily during the construction phase with the increased traffic and people on the site, but is unlikely to change the activities or sense of place significantly during this period.

NUISANCE FROM NOISE, DUST AND TRAFFIC DISTURBANCES

The construction of the proposed project is likely to result in a number of localised disturbances that may indirectly affect local activities, such as farming (on neighbouring sites) and tourism (passing through the area). These may include the generation of dust, noise and traffic associated with the construction of the proposed project and associated infrastructure.

There are farming settlements located on the adjacent property to the proposed project site (approximately 1 km from north of the sit boundary). The construction activities, including increased dust, noise and traffic, may impact on these settlements, as well as on the Roggeveld Road (tourist and commuting route), which lies near the northern boundary of the site.

Appropriate mitigation measures have been identified to manage potential traffic and noise impacts. The Environmental Management Programme (EMPr) will include mitigation measures to reduce dust and noise generation during the construction phase to mitigate the potential nuisance to social receptors adequately.

INCREASED RISK TO NEIGHBOURING LAND USERS

There is the potential for increased risk to neighbouring land users, particularly farmers, as the presence of labour force could result in petty theft of stock and damage to infrastructure. Theft and damage in infrastructure could result in economic losses for neighbouring farmers and land users, and could extend to greater community issues such as mistrust and conflict. This may occur in areas surrounding the proposed project site and areas near to where labour is housed (if different).

The project proponent has not yet defined the type and location of temporary accommodation of labour during the construction phase. It is likely that labour will be accommodated within the broader development or farm footprint thereby potentially affecting surrounding farmers.

[9] *Human immunodeficiency virus infection and acquired immune deficiency syndrome*

INCREASED RISK OF VELD FIRES

Construction phase activities could result in veld fires, which may affect neighbouring farmers and pose a threat to livestock. This is particularly relevant considering the arid climate and the reliance on grazing land in the development area. This risk will increase should labour be temporarily housed within the development footprint. This may affect the livelihoods of neighbouring farmers through the potential loss of grazing, stock and infrastructure.

5.2 OPERATIONAL PHASE

INCREASED EMPLOYMENT OPPORTUNITIES

It is anticipated that the operational phase for the Maralla West Wind Facility will generate a total of 19.5[10] new employment opportunities over a minimum operational period of 20 years. Of this total, 8.7[11] new skilled opportunities and 10.8[12] unskilled opportunities will be generated. The expected current value of the employment opportunities for the Maralla West Wind Facility during the first 10 years is estimated at R 48 million of which 70% is anticipated to accrue to historically disadvantaged individuals.

Professional, technical and management employment is likely to be sourced from outside the Western and Northern Cape provinces, due to the specialised nature of this development. Unskilled employees are likely to be sourced from the local municipality area.

The potential benefits in terms of long-term employment are therefore likely to be recognised at both a local, regional and national level. Whilst the operational employment opportunities are limited to 8.7 skilled and 10.8 unskilled individuals, these opportunities have the potential to uplift a small number of households and family units.

INCREASED ECONOMIC DEVELOPMENT OPPORTUNITIES

The proposed project has the potential to generate positive socio-economic outcomes through the provision of LED opportunities during the operational phase. Local content is a primary focus of the DoE's REIPPP, which emphasises the need to promote job growth, domestic industrialisation, community development, and black economic empowerment.

The total capital expenditure for the operational phase of the Maralla West Wind Facility is estimated at R 2.625 billion.

Operational phase LED opportunities can be identified and implemented on a national, regional and local levels as follows:

- Ensuring participation of South African entities in the project.
- Utilising local service providers as far as possible (i.e. security, transportation, accommodation, catering, fuel provision and vehicle repairs, cleaning, etc.).
- Sourcing of specialised services regionally and nationally as far as possible.
- Investing in social and economic upliftment projects in the local communities surrounding the facility.

As local resources are limited, it is anticipated that the majority of the specialist services are likely to be sourced from regional or national service providers resulting in economic development opportunities in the relevant sectors, including wind turbines and associated infrastructure

[10] *Estimate provided by BioTherm for Maralla East and West is 39.*
[11] *Estimate provided by BioTherm for Maralla East and West is 17.4.*
[12] *Estimate provided by BioTherm for Maralla East and West is 21.6.*

suppliers. The local hospitality industry is likely to benefit from professionals visiting the site during the operational phase.

Local social and economic development opportunities need to be promoted as far as possible. In accordance with the DoE's REIPPP, the proponent is required to assess the needs of the local communities near the proposed facility and ensure that a portion of the revenue generated from the facility is used to contribute to social upliftment in these communities. The proposed project therefore the potential to contribute to social improvement through investment into community upliftment projects. It is important that local community benefits and development targets are defined and aligned to local municipality objectives. This may include aspects such as supporting new local emerging entrepreneurs and youth and business skills development programmes.

CHANGE IN SENSE OF PLACE

The operation of the proposed project is likely to change in the overall nature of the area. A change in the sense of place will primarily result from the visual impact of the proposed infrastructure, namely wind turbines. The turbines will be visible from the nearest sensitive receptors immediately adjacent to the site, namely farm settlement north of the site, as well as the Roggeveld Road. A Visual Impact Assessment has been undertaken in support of the application, which has identified and assessed the anticipated visual impacts of the project and where possible relevant recommendations in respect of mitigation of these impacts have been made (Gebhardt, 2017). The overall visual impact of the proposed project operational phase was assessed as medium (after mitigation) in the Visual Impact assessment (Gebhardt, 2017).

Due to the location of the site in a sparsely populated area, the change in sense of place during the operational phase is likely to be limited to local residents and tourists traveling on the Roggeveld Road network closest to the site. The presence of the turbines mare likely to impact on the skyline and therefore visual sense of place of the area.

5.3 DECOMMISSIONING PHASE

LOSS OF PERMANENT EMPLOYMENT

There is the potential for the loss of the 8.7 skilled and 10.8 unskilled permanent employment positions following the closure and decommissioning of the Maralla West Wind Facility. Due to the low number of permanent employees, the overall impact of the loss of these jobs is not likely to be significant. Skills developed by employed individuals during the operational phase will be transferable to other similar facilities in the area or to other sectors.

GAIN OF SHORT TERM EMPLOYMENT

The decommissioning phase may require a limited number of short-term unskilled or semi-skilled labour to decommission the facility. These employees are likely to be sourced locally for a short-term period. The number of decommissioning employment opportunities and the duration of the decommissioning phase are unknown at this stage. The sourcing of local labour has the potential to provide short-term opportunities for social improvement for those employed individuals.

NUISANCE FROM DUST, NOISE AND TRAFFIC

The decommissioning phase of the proposed project will generate dust nuisance from the demolishing and dismantling of the facility. Noise and traffic impacts are likely to increase with the movement of trucks transporting rubble and infrastructure away from the site. The nearest sensitive receptors are the nearby farm settlement (1 km north of the site), and the Roggerveld Road. The Traffic Impact Assessment and Acoustic Impact Assessment studies have identified and assessed impacts associated with the decommissioning phase of the project and suitable mitigation recommended to reduce impacts as far as possible. Adequate mitigation to reduce dust, traffic and

noise generation during the decommissioning phase must be included in the decommissioning EMPr.

Following the decommissioning and removal of the Maralla West Wind Facility and subsequent rehabilitation of the site, there is likely to be a long term overall positive impact on local aesthetics and the broader landscape.

INCREASED RISK TO NEIGHBOURING LAND USERS

The decommissioning phase could result in an increased risk to neighbouring farmers, due to the presence of a labour force. Issues related to accommodation of labour in this area, such as petty theft and community safety issues, are likely to occur in areas surrounding the proposed project site and areas near to where labour is housed (if different). This could result in direct economic losses for these farmers (loss of stock, and damage to infrastructure), and could extend to greater community issues such as mistrust and conflict.

INCREASED RISK OF VELD FIRES

The decommissioning activities could result in veld fires, which may affect neighbouring land users and farmers. This is particularly relevant considering the arid climate and the reliance on grazing land in the development area. This has the potential to impact on the livelihoods of neighbouring farmers through loss of grazing, stock and infrastructure.

5.4 CUMULATIVE IMPACTS

The presence of a number of renewable power generation projects proposed within a 100 km radius of the proposed site (**Table 3, Figure 9**) was considered at the outset of the SIA. In addition to this, the Department of Environmental Affairs requested that the overall cumulative impacts of projects within the study area be undertaken and each specialist provide a qualitative discussion. The positive social impacts including socio-economic, employment, local and regional economic development and community development are common themes in the majority of the other assessments.

There are a number of Environmental Authorisations for renewable energy projects (either issued or in process) in the area surrounding the Maralla West Wind Facility site. Not all of the proposed project in the area are likely to be developed, as they are all still subject to the REIPPP bidding process.

INCREASED LOCAL ECONOMIC DEVELOPMENT OPPORTUNITIES

Currently most people within the neighbouring Laingsburg area are employed or generate income through agricultural activities, a smaller number through government services, and the hospitality industry (*pers. comm*. Harding 2017). A similar picture is presented in the Karoo Hoogland Local municipality, with over half of the formal employment being in agriculture, followed by households and community services (Karoo Hoogland Local Municipality, 2015).

One PV facility has been constructed 90 km southwest of the site, and a few of the nearby proposed facilities have been awarded preferred bidder status including two BioTherm developments. There are no other significant economic activities within the local area, with agricultural, tourism and social services sectors currently providing the main source of (limited) employment in the local economy.

The construction and operation of a number of renewables projects within the local area will contribute collectively towards a significant increase in local employment and business development opportunities within the local municipality. The proposed development of numerous renewable projects in the municipal area provides the impetus for the development of Small,

Medium, and Micro-Sized Enterprises (SMME), which has the potential to drive economic growth and provide employment.

The provision of services by existing local communities, and the development of new opportunities through the presence of new residents (temporary and permanent) during construction and operational phases could present numerous economic development opportunities through services such as accommodation, transport provision, catering, and cleaning services.

Through the evaluation of specialist studies undertaken in support of application for EA for other renewable energy projects, the positive impacts associated with job creation and economic development are clearly identified.

INCREASED PRESSURE ON LOCAL SERVICE PROVISION

The development of numerous renewable energy projects within the Karoo Hoogland Local Municipality is likely to put significant pressure on the local municipalities and communities.

The most significant challenge that faces the local municipality relates to the accommodation of large numbers of people related to the development of multiple projects. This poses both housing and services related implications for the municipalities. There may be opportunities for these developments to assist the local municipalities by supplying services and infrastructure to local communities in addition to the proposed projects. Currently Karoo Hoogland Local Municipality experiences a considerable challenge in terms of providing bulk basic services (water sanitation, housing), as well as a lack of social services, specifically youth development (*pers. comm*. Harding, 2017). These opportunities should be investigated further, and discussed between the development proponents and the Karoo Hoogland Local Municipality.

CHANGE IN SENSE OF PLACE

The nature of the landscape is anticipated to change significantly as a result of the development of numerous renewable energy projects. The Visual Impact Assessment has considered the cumulative impacts as part of the scope of this study. A change in sense of place can impact on other aspects such as tourism and land values.

Tourism is a contributor to the local economy of the Karoo Hoogland Local Municipality; however, it is unlikely that the development of multiple renewable projects will have negative economic impacts in respect of the tourism sector, as most of the sites are far from tourist routes. The impact would be dependent on how many of the proposed projects are actually constructed and the proximity of turbines to places of interest (e.g. guesthouses, scenic areas) and density of turbines within the developments (resulting in higher visual intrusion).

5.5 NO-GO ALTERNATIVE IMPACTS

LOSS OF EMPLOYMENT AND LOCAL ECONOMIC DEVELOPMENT OPPORTUNITIES

There will be a loss of 64.2 new employment opportunities in the construction phase and 19.5 permanent operational employment opportunities should the proposed Maralla West Wind Facility not be developed. In addition, the opportunities for local, regional and national economic development associated with this proposed project will not be realised.

MAINTENANCE OF THE EXISTING LANDSCAPE AND SENSE OF PLACE

In the event that the proposed Maralla West Wind Facility is not developed, the existing landscape on the site will remain unchanged (farming). As there are a number of renewable energy projects

proposed for the area, some of which are likely to be implemented within the next five to ten years, there is likely to be a change in the sense of place regardless of the implementation of Maralla West Wind Facility.

5.6 SOCIAL SENSITIVITY

AREA OF IMPACT

The Area of Direct Impact (ADI) is defined by the extent of the socio-economic impacts of the proposed project resulting from potential direct and indirect biophysical and other project impacts. For the SIA purposes, the ADI is limited to an area of 50 km of the boundaries of the proposed site. This was determined based on the existing farming settlements and road networks.

The Area of Indirect Impact (AII) is anticipated to extend to 100 km from the boundaries of the proposed site, and beyond. The AII may include the regional impact. The key settlements that are likely to be directly or indirectly impacted as indicated in **Figure 15**.

There are no residents within the proposed site. There is farming infrastructure located within proposed site, but this is redundant (unused) farm infrastructure, and the proposed project will not affect the farming activities. In addition, the farm owner has entered into a lease agreement with BioTherm for the proposed site. **Table 6** provides a summary of key areas and the potential impacts anticipated.

Table 6 Key areas of impact associate with the Maralla West Wind Facility

POTENTIAL IMPACT	AREAS
Closest potentially sensitive receptors (visual, dust, noise and traffic)	à The Komsberg/Welgemoed Farm (assumed to be house and infrastructure) (1 km north of the site) à Roggeveld Road (immediately north of the site)
Directly and indirectly affected (influx of labour, increased employment and LED opportunities)	à Sutherland à Laingsburg
Indirectly affected (employment opportunities, LED opportunities)	à Matjiesfontein à Touws River à Fraserburg (105 km north-east of the site)

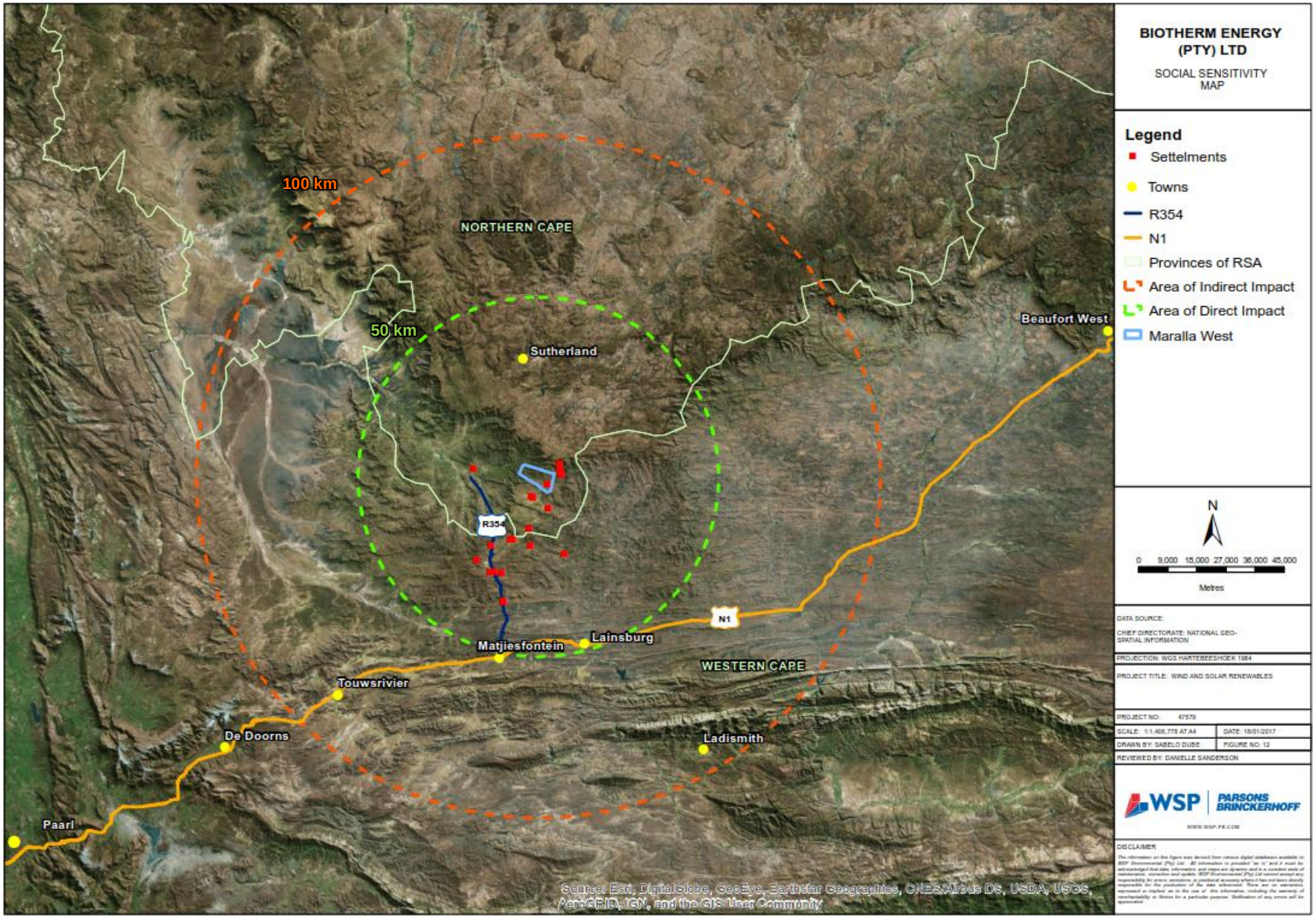


Figure 15 Social Sensitivity Map

6 ASSESSMENT OF IMPACTS

The potential social impacts identified have been assessed using the methodology outlined in **Section 1**. The results of the assessment are presented in **Appendix D**. The assessment has been undertaken with consideration of relevant mitigation, which is outlined in **Section 7**.

6.1 CONSTRUCTION PHASE

The most significant positive impacts associated with the construction phase is the potential for increased employment and economic development opportunities. There are a number of recommendations that can result in an enhancement of these impacts, including appointment of local contractors and use of local labour as far as possible; use of local suppliers and manufacturers; and implementation of skills development programmes.

A number of potential of negative impacts have been identified and were assessed as being of low to medium significance. Mitigation measures have been identified were relevant.

Table 7 provides a summary of significance of potential social impacts associated with the construction phase.

Table 7: Summary of Construction Phase Impacts

POTENTIAL IMPACT	SIGNIFICANCE WITHOUT MITIGATION	SIGNIFICANT WITH MITIGATION
Increase in employment opportunities	**Medium (positive impact)**	**High (positive impact)**
Increased economic development opportunities	**Medium (positive Impact)**	**High (positive impact)**
Disruption due to influx of job seekers	**Medium (negative impact)**	**Medium (negative impact)**
Increase in communicable diseases and reduced public health	**Medium (negative impact)**	**Medium (negative impact)**
Change in sense of place	**Medium (negative impact)**	**Low (negative impact)**
Nuisance from noise, dust and traffic disturbances	**Medium (negative impact)**	**Low (negative impact)**
Increased risk to neighbouring land users	**Low (negative impact)**	**Low (negative impact)**
Increased risk of veld fires	**Medium (negative impact)**	**Low (negative impact)**

6.2 OPERATIONAL PHASE

The operational phase provides permanent employment and local economic development opportunities; both of these positive impacts are considered to be of medium significance. Measures have been identified to enhance these opportunities as far as possible.

The change in sense of place as a result of an altered landscape was identified to be of medium significance. It is unlikely that an altering of the landscape will have impacts on the tourism sector, however the change in the nature of the area will occur and there is action that can be taken to mitigate this impact.

Table 8 provides a summary of significance of potential social impacts associated with the operational phase.

Table 8: Summary of Operational Phase Impacts

POTENTIAL IMPACT	SIGNIFICANCE WITHOUT MITIGATION	SIGNIFICANT WITH MITIGATION
Increased employment opportunities	**Medium (positive impact)**	**Medium (positive impact)**
Increased economic development opportunities	**Low (positive Impact)**	**Medium (positive impact)**
Change in sense of place	**Medium (negative impact)**	**Medium (negative impact)**

6.3 DECOMMISSIONING PHASE

The most significant social impacts associated with the decommissioning phase are associated with loss of permanent jobs and associated income. The decommissioning phase will however create additional, construction type jobs that, with enhancement, can provide local opportunities to contractors and community members. A number of typical construction type impacts, such as nuisance factors (noise, dust and traffic) and risk to neighbouring farmers may occur, however, with adequate mitigation these can be managed appropriately.

Table 9 provides a summary of significance of potential social impacts associated with the decommissioning phase.

Table 9: Summary of Decommissioning Phase Impacts

POTENTIAL IMPACT	SIGNIFICANCE WITHOUT MITIGATION	SIGNIFICANT WITH MITIGATION
Loss of permanent employment	**Medium (positive impact)**	**Low (negative impact)**
Gain of short term employment	**Low (positive impact)**	**Medium (positive impact)**
Nuisance from noise, dust and traffic disturbances	**Low (negative impact)**	**Low (negative impact)**
Increased risk to neighbouring land users	**Low (negative impact)**	**Low (negative impact)**
Increased risk of veld fires	**Medium (negative impact)**	**Low (negative impact)**

6.4 CUMULATIVE IMPACTS

The implementation of numerous renewable energy projects in the local municipal and adjacent areas will result in significant increased employment and local economic development opportunities, which are considered highly significant in the context of high unemployment and the need to generate local economic growth. The projects proposed for the area have the potential to change local employment patterns and provide more versatility in respect of skills and service offerings. A number of negative impacts may occur as a result of the combined implementation of energy projects including increased pressure on local services as a result of the influx of labour and job seekers into the area. The rural character of the landscape will change as a result of the visual impacts associated with collective projects.

The mitigation of cumulative impacts needs to be addressed on a cumulative scale i.e. one project cannot seek to address the cumulative issues associated with a series of projects. The relevant authorities, and particularly Karoo Hoogland Local Municipality, therefore need to be involved in the identification of suitable mitigation measures in respect of renewable energy development at a strategic level in the area. It is recommended that a development forum be made use of to address potential cumulative impacts.

Table 10 provides a summary of significance of potential cumulative social impacts associated with the proposed project.

Table 10: Summary of Cumulative Impacts

POTENTIAL IMPACT	SIGNIFICANT WITHOUT MITIGATION
Increased local economic development opportunities	**High (positive impact)**
Increase pressure on local service provision	**Medium (negative impact)**
Change in sense of place	**Medium (negative impact)**
Change in employment patterns	**Low (positive impact)**

7 MITIGATION AND MANAGEMENT MEASURES

Mitigation and management measures have been identified in order to enhance the potential benefits of the project and to mitigation potential negative impacts to an acceptable level (**Table 11**). It is recommended that these measures be included in the EMPr developed in support of the EA application.

Table 11: Mitigation and Management Measures

ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	MONITORING REQUIREMENTS
Maximise local employment and business opportunities	à Appointment of local contractors and use of local suppliers and manufacturers where possible. à Development of a database of local companies for service provision. à Target 40% of the construction labour and 60% during operation, particularly semi and unskilled opportunities could be sourced locally. à Communication with Karoo Hoogland Local Municipality and community representatives in respect of employment opportunities. à Ongoing engagement with the Karoo Hoogland Local Municipality in respect of anticipated community investment and upliftment projects. à Review of Department of Labour skills audits and undertake relevant skills development programmes targeted at local community members.	Proponent & Contractors	Construction, Operational & Decommissioning		à Local employment and business targets to be formalised in a document before the construction phase commences. à Database of potential local service providers to be developed, before the construction phase commences; à 40% of the construction labour and 60% during could be sourced locally; à Record of engagement with the Karoo Hoogland Local Municipality and community representatives in respect of employment opportunities and community upliftment projects. à A skills and business development programme prior to commencement of construction for the development of a local skills base is recommended.
Minimise disruption caused by influx of job seekers	à Communicate employment opportunities to Karoo Hoogland Local Municipality, and community representatives to manage employment expectations as far as possible and to allow these parties to manage potential issues associated with influx of people. à Engage with, and gain support from, the Karoo Hoogland Local Municipality in respect of	Proponent	Construction		à Engagement with the Karoo Hoogland Local Municipality in respect of accommodation of labour

ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	MONITORING REQUIREMENTS
	accommodation of labour brought into the area by contractors / developers.				
Minimise the increase in communicable diseases and reduced public health	à Preparation and implementation of a labour force Health and Safety Plan. à In consultation with local HIV/AIDS organisations and government structures, all contractors must design and implement a proactive and ongoing HIV/AIDS awareness and prevention campaign. à Provide opportunities for workers to go home over the weekends or regularly. The cost of transporting workers home and back should be the responsibility of the contractor. à All workers are to be transported back to their homes within 2 days of completion of the construction contract at the cost of the contractor.	Proponent & Contractors	Construction		à Health and Safety Plan prepared and implemented during the construction phase. à HIV/AIDS campaign implemented throughout the construction and operational phases. à Evidence of workforce transportation home during and after construction phase. à Trafficking in persons awareness programme;
Minimise nuisance from dust, noise and traffic	à Implement EMPr conditions in respect of mitigating dust, noise and traffic related impacts. à Establish a grievance mechanism to provide a means for affected stakeholders to communicate.	Proponent & Contractors	Construction & Decommissioning		à Compliance with EMPr à Number of complaints raised by stakeholders
Minimise risk to neighbouring land users	à Development of a code of conduct for workers, signed by the contractor, and communicated to work force. à Contractor to be held liable for compensating farmers for any losses / damage that can be linked to workers.	Proponent & Contractors	Construction Decommissioning		à Code of conduct for workers in place, signed, and implemented
Minimise risk of veld fires	à EMPr to include mitigation in respect of activities that may pose a fire risk: - No open fires allowed for cooking / heating; - Activity that pose a fire risk to be properly managed and confined to a designated area; - Adequate fire-fighting equipment to be provided on site, and appropriate training conducted; etc.	Proponent & Contractors	Construction Decommissioning		à Compliance with EMPr

ACTIVITY	MITIGATION AND MANAGEMENT MEASURE	RESPONSIBLE PERSON	APPLICABLE DEVELOPMENT PHASE	INCLUDE AS CONDITION OF AUTHORISATION	MONITORING REQUIREMENTS
Minimise impacts of loss of permanent employment	à Relocation of employees to other renewable energy facilities where possible. à Provision of adequate retrenchment packages, which as a minimum meet relevant South African Labour legislation.	Proponent	Decommissioning		à Retrenchments meet South African Labour legislation

8 STAKEHOLDER CONSULTATION

8.1 STAKEHOLDER CONSULTATION PROCESS

Public participation is a requirement of the Scoping and EIA process; it consists of a series of inclusive and culturally appropriate interactions aimed at providing stakeholders with opportunities to express their views, so that these can be considered and incorporated into the Scoping and EIA decision-making process. Effective public participation requires the prior disclosure of relevant and adequate project information to enable stakeholders to understand the risks, impacts, and opportunities of the proposed project.

A comprehensive stakeholder consultation process was undertaken during the Scoping Phase. Stakeholders were identified through existing databases, site notices, newspaper adverts and meetings. All stakeholders identified to date have been registered on the project database. All concerns, comments, viewpoints and questions (collectively referred to as 'issues') received to date have been documented and responded to in a Comment and Response Report.

There will be ongoing communication between WSP | Parsons Brinckerhoff and stakeholders throughout the EIA process.

8.2 STAKEHOLDER COMMENTS AND RESPONSE

The comments received in respect of the Scoping Phase have been reviewed and a response to the socio-economic related comments are provided in **Table 12**.

Table 12: Responses to Comments

STAKEHOLDER DETAILS	COMMENT	SPECIALIST RESPONSE
Department of Environmental Affairs 24 November 2016	A comprehensive socioeconomic impact assessment with the following terms of reference must be undertaken: - Clearly describe the potential social issues associated with the proposed facility;	In this document - Refer to **Section 5**
	- Assess the socioeconomic profile of the region and the social characteristics of the receiving environment;	In this document - Refer to **Section 3**
	- Comparison of similar large-scale projects and applying the lessons learnt to the proposed project;	Refer to **Section 5.1** – increase in communicable diseases in solar projects and past experience of large-scale projects in Laingsburg.
	- Analyse the potential socioeconomic impacts of the proposed project and provide a description and the significance rating for the construction, operational and decommissioning phases;	In this document - Refer to **Section 6**
	- Meet with relevant stakeholders and document their socioeconomic concerns; and,	Site visit undertaken and evidence provided in this document - Refer to **Section 1.4**

STAKEHOLDER DETAILS	COMMENT	SPECIALIST RESPONSE
	- Provide implementable guidelines for limiting or mitigating negative impacts and optimising benefits of the proposed development.	In this document - Refer to **Section 7**
Warren Petterson 26 September 2016	….Besides the significant visual impact, the destruction of the landscape, noise and the numerous significant environmental impacts of various Fauna and Flora, there is a social impact that seems to be ignored. The above issues along with Increases in numbers of people in the area for construction and maintenance will result in the area becoming a less attractive destination for people who enjoy the pristine environment, attracting less tourists and potentially driving the "weekend "or "leisure" farmer away. Most of the surrounding farms are sheep farms, operating at marginal levels. The attraction to those whose who may be remunerated by means of a turbine on their property is obvious, and to your client a soft target. Increases in a non-agricultural workforce will add to the high rate of stock theft and other issues that the local population are currently faced with. The long-term impact is that these farms will be farmed less, and the impact will spill over to the surrounding / neighbouring farms who have no benefit from the WEF' [Wind Energy Facilities]s. Over 20 years the impact will be significant and create a void in that part of the Karoo from both an agricultural perspective and a leisure farmer perspective. I believe that your choice of area is not suitable and that you should be looking at already disturbed, more intensively used environments instead of destroying one of the most pristine areas in our country. The combined size of these farms is definitely a reason for concern…	The potential impacts on surrounding farmers has been taken into consideration within the SIA study. The following impacts have been assessed in the study: - Disruption due to influx of job seekers - Increase in communicable diseases and reduced public health - Change in sense of place - Nuisance from noise, dust and traffic disturbances - Increased risk to neighbouring land users - Increased risk of veld fires The above impacts have been assessed as low with mitigation for all phases.

9 CONCLUSIONS

The SIA has identified a number of key socio-economic impacts (both positive and negative) associated with the proposed Maralla West Wind Facility. The findings of the study indicate that the development will create employment and business opportunities at a local, regional and national level during the construction and operational phase, and to a lesser extent the decommissioning phase, of the project. The project will result in a change in the rural sense of place and character.

During the construction phase, the influx of job seekers and the increase in communicable disease are likely to pose various challenges for the Karoo Hoogland Local Municipality. These two impacts are considered the most significant negative impacts (both negative, medium significance) on the socio-economic landscape for the operational lifespan (minimum 20 years), which cannot be easily mitigated. A number of negative impacts such as nuisance factors (dust, noise and traffic), and potential risks to neighbouring farmers (including veld fires) were identified to be of low negative significance after the implementation of mitigation and management measures. The potential for cumulative impacts also exist due to the number of other renewable energy projects proposed for within the Karoo Hoogland Local Municipality.

None of the impacts identified are considered fatal flaws that should prevent the project from going ahead. There are significant employment and economic benefits that can be derived from the projects, as such, it is recommended that the Maralla West Wind Facility be authorised. The mitigation and management measures included in **Table 11** are to be included in the EMPr prepared in support of the EA application.

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PERSONAL COMMUNICATIONS

- Harding, G - Laingsburg Local Municipality Planning and Integrated Development Planning Manager, Laingsburg Local Municipality Offices, Laingsburg, 12 January 2017
- Van Wyk, F – Laingsburg Local Municipality council representative, museum curator and resident, Laingsburg Tourism Complex ,12 January 2017
- Walters, M – Laingsburg Tourism Officer, Laingsburg Tourism Complex, 12 January 2017
- Mr Tron, - Laingsburg Local Municipality, Ward councillor (Ward 2), former Mayor and local farmer, 12 January 2017

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  http://www.indexmundi.com/ (Accessed 5 January 2017)

à Statistics South Africa (2012) Superweb
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Appendix A

INTERVIEW QUESTIONS AND RESPONSES

INTERVIEW QUESTIONNAIRES: BIOTHERM SIA – WIND, WESTERN CAPE

INTERVIEW 1: LAINGSBURG LOCAL MUNICIPALITY IDP MANAGER – GWYNN HARDING

Date: 12 January 2016

Time: 10:00 – 11:00

Place: Laingsburg Municipality Offices, Laingsburg

1.	**What is your role at the municipality?**
-	**Planning Manager / IDP Manager**
2.	**Current situation**
2.1	What are the key challenges for the local municipality in respect of local social and economic development requirements?
-	**We've just compelted the PPP for the IDP revision**
-	**Key issues:**
o	**High rates of poverty**
o	**High dependency on grants**
o	**High unemployment rate**
o	**High rate of low-skills levels**
o	**Social ills – including teenage pregnancy, drug abuse, crime**
2.2	What are the key priorities for community development in the local municipality?
-	**The municipality has a small revenue (small, sparsely populated with no major economic centres/activities)**
-	**Mpost people are employed in the agricultural sector**
-	**There are new B&Bs opening, but they don't have many employment opportunities**
-	**The new farmers in the area are not doing intensive farming, or even extensive. Moving towards game farms and guest farms – few employment opportunities.**
-	**Towards the eastern side of the municipality they are still doing a lot of soft/stone fruit farming. Other agriculture is seed farming and sheep.**
2.3	What are some of the municipal infrastructure and/or social services projects being implemented to meet community needs?
-	**Infrastructure – housing, roads, water sewage (bulk services)**
3.	**Biotherm project**
3.1	What benefits do you foresee that this project can bring to the area?

- **It will improve local economy – construction phase**
- **The Social investment initiatives would be good for the area**

3.2 What are some of the challenges or potential negative impacts of the project?

- **No skills in the local area**
- **Brining people in from outside – (may result in) negative social issues**
- **The project needs to be supported by the social responsibility initiatives**
- **We have a young population – many drop out, and are not leaving the area**

Construction phase aspects:

3.3 The project site is located in a sparsely populated area characterised by large tracts of farming area. Have there been issues with past projects in terms of impacts of farmers {*Do think the project poses a risk to these farmers during the construction phase i.e. petty theft, damage in infrastructure, potential fire risk?}*

- **Not really, but could be theft of sheep/produce**
- **Impact on soil (degradation) for those farmers where the project is**

3.4 There are a number of small towns within an 50km radius of the proposed developments site (Matjiesfontein, Laignsburg, Sutherland) – how do you think these local towns could potentially support / service the development? (construction phase only)

-

3.5 The project is anticipated to generate about 250 new job opportunities in the construction phase, 110 skilled and 150 unskilled:

- **There might be business opportunities – but needs an assessment of what opportunities will be available, and this should be provided to the local organisations, so they can ensure they are meeting these needs.**
    - Does the municipality have any records on the availability of skills locally?
    - Has a skills audit been undertaken in the LM area / are you aware of what skills exist within the municipal area which could support this project?

- **The skills levels are very low in the area**
- **There might be a skills audit, but not sure.**
- **The problem is that local youth don't want to take the hard subjects – e.g. maths and science. Opt for math literacy instead.**
- **There needs to be training before construction starts.**
- **There needs to be more business centres – commercial, shopping, etc.,**
    - Unskilled opportunities would be sourced locally – where would these individuals likely to be sourced from?

- **Probably bigger than 40km radius**
- **Laingsburg, Matjiesfontein, Touws River, De Doorns, Ladismith, Beaufort West**

3.6	Have you experienced an impacts form previous project (similar or otherwise) (e.g. increase in communicable diseases) Can you tell me more about this?
-	**We've had other projects in the area – cables/roads**
-	**They do bring in people and money, but not significant.**
3.7	What do you think was the primary cause of this/these issue/s?
-	**n/a**
3.8	What do you think could be done to prevent this from occurring in the future?
-	**n/a**
Operational phase aspects:	
3.9	How do you think the local towns could potentially support / service the development? (operational phase only)
-	**See 3.5**
3.10	How can Biotherm contribute towards the Local Municipality initiatives?
	- The proponent of the project is required to identify community needs and utilise a portion of the revenue from the facility to contribute to social upliftment within these local community areas.
	- What type of projects do you foresee being implemented as part of this initiative?
-	Environmental education centre
-	Air strip upgrade
-	Training/skills development facilities
-	Recreational facilities
-	Early childhood development
-	Youth centre
-	Disability centre
-	Old age centre
-	Upgrading houses, sanitation, solar heaters,
	- It would be preferable for the proponent to work with the LM to support projects already identified by the LM – would you agree?
-	Yes
3.11	To what extent is tourism a significant contributor to the LM? Do you foresee that this project would have a positive or negative impact of tourism?
-	
4.	**Energy projects (cumulative)**
There are a number of renewable projects proposed for this area.	

4.1 What are the potential benefits of a number of renewable projects being implemented in the area?
- Increased possible employment and business development – income through accommodation, etc.
4.2 Do you foresee any challenges or cumulative impacts associated with the implementation of a series of renewable projects in the local area?
- The social issues will probably be made worse.
Community liaison
- How do community convey issues that they experience in the local area? Ward councillor or forums?
- **Ward councillors, municipal structures.** - **(Church is the only other social structure)**
- Key NGO's active in the area
- **No big NGOs in the area – some child welfare and disability**

INTERVIEW QUESTIONNAIRES: BIOTHERM SIA – WIND, WESTERN CAPE

INTERVIEW 3: WARD COUNCILLOR

Date: 12 January 2016

Time: 19:00 – 19:30

Place: Lord Milner hotel, Matjiesfontein

1.	**What is your role at the local area?**
-	**Mr Tron – Ward Councillor (Ward 2). Former Mayor, and local farmer (neighbouring site)**
2.	**Current situation**
2.1	What are the key challenges for the local municipality in respect of local social and economic development requirements?
-	**There is little development in this area.**
-	**The N1 provides opportunities, sheep farming and vegetable (seed) farming also do.**
-	**Wind farms will be the only development in the area – especially during construction**
3.	**Biotherm project**
3.1	What benefits do you foresee that this project can bring to the area?
-	**The main impact will be income generation. Currently the municipality generates 2.5 M/year. These types of project can double this to R5 M/year**
-	**There is also social upliftment, youthupliftment**
-	**Things like transport could be provided locally**
-	**Projects such as sanitation could be provided by the project.**
-	**I don't particularily like the wind farms, but it's not for me it's for future generations – youth and clean energy**
3.2	What are some of the challenges or potential negative impacts of the project?
-	**People coming in to the area**
-	**Jobs aren't long term**
-	**The roads around the sites will be used a lot – this can cause issues for local farmers.**

INTERVIEW QUESTIONNAIRES: BIOTHERM SIA – WIND, WESTERN CAPE

INTERVIEW 2: LAINGSBURG MUSEUM CURATOR AND LAINGSBURG TOURISM OFFICER

Date: 12 January 2016

Time: 11:00 – 12:00

Place: Laingsburg Tourism Complex, Laingsburg

1.	**What is your role at the local area?**
-	**Fancis van Wyk – Museum Curator, and a council representative (current portfolio – Health)**
-	**Madre Walters – Tourism Officer**
2.	**Current situation**
2.1	What are the key challenges for the local municipality in respect of local social and economic development requirements?
-	**Jobs, to be quite honest – jobs is the main thing that is needed in the area. These types of projects are sustainable in the area, as they need specialist skills, which people don't have here**
-	**We are a farming community**
-	**In winter there are no sustainable projects (e.g. road building)**
-	**We have had large project come through the area (like putting in cables and road upgrades)**
-	**Eskom, I think, or one of the contractors built accommodation on a farm just outside of Laingsburg and then left it to the farmer. It is still there – he probably rents it out now. It's on Mr Awyn Nel's Farm**
2.2	What do you stay in Laingsburg?
-	**It is peaceful. It is safe. Things are reasonable (priced).**
-	**Recently we have a bit more theft – but this is from youths without jobs.**
-	**The youth have no work ethic – we had the cable-laying project here. The youth signed up, but when they released to would be digging trenches in the sun all day, they did not go back. The contractor got Rhodesians (Zimbabweans) in. they were happy to do the work. And the contractor made sure they had long weekends to go home to their families.**
2.3	What are the key social issues in this area?
-	**Teenage pregnancy**
-	**Drug abuse**
-	**Low skills/education**

2.4	Are there any social projects in the area? (government/NGOs?)
-	**There are a few small projects – such as the "Kick-about" project but the stuff is usually vandalised until it cannot be used any more. People are not made to be responsible for these projects.**
-	**They should have had a community meeting – get the buy in form the community, and help them understand that they are accountable for the equipment and facilities. Then maybe the youth will keep it in good condition.**
2.5	Is there any traditional leadership or informal community structures?
-	**No traditional structure. There is just the Ward system through the municipality. The people look up to Ward Councillors – they respect them.**
-	**We have regular feedback form the community at the municipality. Most complaints come from the low-income groups about housing, etc.**
2.6	What jobs/income earning options are available in this area?
-	**Farmers – hire daily or seasonal workers**
-	**Tourism – Guest farms and game farms (seasonal hunting farms)**
-	**The area is growing in tourism – mountain biking, off road motor biking, quads – the farms stays are very popular**
-	**"off-the-grid" holidays are becoming popular**
-	**People are looking for a unique, restful experience**
-	**The farms are getting more facilities for day visits – which local churches and families also use for days out.**
-	**Star gazing is becoming very popular**
2.7	What social services are in the town/area?
-	**There is the Laingsburg Thusong Service Centre where the social services include an e-centre (where people can access the internet and print for free), SASSA, EMS, SARS, etc.**
3.	**Biotherm project**
3.1	What benefits do you foresee that this project can bring to the area?
-	**The project will bring workers and families, which will benefit local economy through accommodation, sops, etc.**
-	**They have to do community projects – things like Education centre and tourism centre would be good**
-	**Local employment could be generated from construction work, increased tourism, guided tours of the facilities, elderly care (centre). The latter two would be during off-season (i.e. winter) to supplement income. In-town guesthouses would need to employ more people.**
3.2	What are some of the challenges or potential negative impacts of the project?
-	**We have a lot of social issue (teenage pregnancy, drug abuse, etc.). These could be aggravated. But the economic benefits would be good for the community.**

Appendix B

CURRICULUM VITAE

DANIELLE SANDERSON, M.Soc.Sc.

SENIOR CONSULTANT, ENVIRONMENT & ENERGY

YEARS WITH THE FIRM

7

YEARS TOTAL

9

AREAS OF PRACTICE

Environmental Impact Authorisation Processes

Social Impact Assessments

Waste Management Licensing

Coastal Planning and Permitting

CAREER SUMMARY

Danielle is a senior consultant with 8 years' experience as an environmental and social sciences consultant within a variety of sectors, including renewable energy, infrastructure, mining and industrial. Danielle has managed, and been integrally involved in, numerous environmental management projects, specifically related to environmental impact assessment, social and socio-economic impact assessment, and waste management.

Danielle's environmental management experience includes basic assessment, scoping and environmental impact assessment processes for a variety of industries and sectors, including mining, renewable energy, and infrastructure. Waste management licensing experience includes processes undertaken for paper and pulp sector, as well as various other industrial sectors. Danielle has also managed and undertaken projects related to the integration of sustainable development into local government policies and coastal management initiatives in various provinces around South Africa. Socio-economic consulting experience includes a variety of social impact assessment projects in the mining, renewable energy, and industrial sectors, coordinating and facilitating community participation and stakeholder engagement processes, and coordinating and facilitating socio-economic surveys and field research.

During Danielle's time at WSP she was elected as Sustainability Champion for the Durban office, and represents South Africa on the WSP International Social Sciences Roundtable. Danielle also sits on the national executive committee and the regional branch committee of the South African affiliate of the International Association of Impact Assessors.

EDUCATION

Bachelor of Social Science (Masters), Geography and Environmental Management, University of KwaZulu-Natal, Durban, South Africa	2006
Bachelor of Social Science (Honours), Geography and Environmental Management, University of KwaZulu-Natal, Durban, South Africa	2002

ADDITIONAL TRAINING

Leadership Development Programme and Personal Mastery	2014
Integrating HIV and Gender Related Issues into the EA Process – SAIEA, UNDP and IAIAsa certificated course, International Associated of Impact Assessors South Africa	2013
Sustainable Livelihoods Where Social And Natural Systems Meet – International Associated of Impact Assessors, South Africa	2009

PROFESSIONAL MEMBERSHIPS

International Associated of Impact Assessors, South Africa (IAIAsa) (National Executive Committee member, 2014 – present, and KwaZulu-Natal Branch Committee member)	IAIAsa

DANIELLE SANDERSON, M.Soc.Sc.

PROFESSIONAL EXPERIENCE

EIA Processes

- EIA for the Solis 2 Concentrated Solar Power, Upington, Northern Cape, South Africa (2015): Project Manager and EAP. BrightSource is proposes to develop a 125MW Commercial Concentrated Solar Power (CSP) Client: BrightSource Energy.
- Basic Assessment for Expansion of the Island View Fuel Storage, Durban, KwaZulu-Natal, South Africa (2015). Project Manager and EAP. Client: Engen Petroleum Limited.
- E/F Slab Basic Assessment, Richards Bay, KwaZulu-Natal, South Africa (2015). Project Manager and EAP. Client: Transnet Port Terminals.
- Basic Assessment for the expansion of polyester manufacturing plant, Durban, KwaZulu-Natal, South Africa (2015): Project Manager and EAP. Client: Hosaf (a division of PG Bison (Pty) Ltd).
- Basic Assessment and Water Use and Waste Management Licenses for Jozini Community Healthcare Centre, Jozini, KwaZulu-Natal, South Africa (2013): Project Manager and EAP. Client: Sakisizwe Architects.
- Basic Assessment for Energy Expansion at Tugela Mill, Tugela, KwaZulu-Natal, South Africa (2012). Project Manager and EAP. Client: Sappi Southern Africa Limited.
- Scoping and EIA for the upgrade of Liquid Petroleum Gas (LPG) Storage, Durban, KwaZulu-Natal, South Africa (2012). Project Manager and EAP. Client: Easigas (Pty) Ltd.
- Basic Assessment for Photovoltaic Solar Facility, Durban, KwaZulu-Natal, South Africa (2011). Project Manager and EAP. Client: eThekwini Municipality.
- Basic Assessment for Bulk Water Pipeline, Eshowe, KwaZulu-Natal, South Africa (2011). Project Manager and EAP. Client: Aurecon (Pty) Ltd.

Social Impact Assessments

- SIA for Kraft Paper Mill, Frankfort, Free State, South Africa (2015): Lead Social Consultant. Client: Industrial Development Corporation of SA (Pty) Ltd.
- SIA for Sappi Ngodwana Mill Expansion – Ngodwana Mill, Ngodwana, Mpumalanga, South Africa (2014): Lead Social Consultant. Client: Sappi Southern Africa Limited.
- SIA for Block Z Expansion – Isibonelo Colliery, Isibonelo, Mpumalanga, South Africa (2014): Lead Social Consultant. Client: Anglo American Thermal Coal.
- Solis II Concentrated Solar Power, Upington, Northern Cape, Southern Africa (2014): Lead Social Consultant. Client: BrightSource.
- SIA for Tumela Central Shaft, Thabazimbi, Limpopo, South Africa (2013): Social Consultant. Client: Anglo American Platinum Ltd.
- SIA for Proposed Yzermyn Coal Mine, Mpumalanga, South Africa (2013): Social Consultant. Client: Atha-Africa Ventures (Pty).
- SIA for Green Energy Power Project: Socio-Economic Impact Assessment, Nelspruit, Mpumalanga, South Africa (2012): Social Consultant. Client: Sappi Southern Africa Limited.

- SIA for Sasol New Energy's Holding Concentrated Solar Park, Upington, Eastern Cape, South Africa (2012): Social Consultant. Client: Sasol New Energy Holdings.
- Eerstelingsfontein Coal Mine Social Impact Assessment, Belfast, Mpumalanga, South Africa (2011): Social Consultant. Client: Exxaro Coal Mpumalanga (Pty) Ltd.
- Social assessment of a proposed effluent pipeline diversion, Sasolburg, Free State, South Africa (2010): Social Consultant. Client: Sasol Infrachem.
- Nottingham Road Social Impact Assessment, Nottingham Road, KwaZulu-Natal, South Africa (2008): Social Consultant. Client: Afzelia Environmental Consultants.

Waste Management Licensing

- Waste Management Licenses for Jozini Community Healthcare Centre, Jozini, KwaZulu-Natal, South Africa (2014): Project Manager and EAP. Client: Sakisizwe Architects.
- Integrated Waste Management License – Tugela Mill. Mandeni, KwaZulu-Natal, South Africa (2013): Project Manager and EAP. Client: Sappi Southern Africa Limited
- Waste Management License for the Delkor Waste Water Treatment Plant (WWTP), Richards Bay, KwaZulu-Natal, South Africa (2012): Client: Transnet Port Terminals (TPT).

Coastal Planning and Permitting

- Coastal Setback Lines, Environmental consultant and stakeholder engagement, Western Cape, South Africa (2010): Environmental consultant and stakeholder. Client: Western Cape Department of Environmental Affairs and Development Planning.
- Development of a Shoreline Management Plan, Durban, KwaZulu-Natal, South Africa (2009): Project Assistant. Client: eThekwini Municipality.
- Environmental and Engineering Input for the extension of the Durban Yacht Mole, Durban, KwaZulu-Natal, South Africa (2009): Environmental Consultant. Client: eThekwini Municipality.

AWARDS

Phelamanga Award: Continuing Professional Development – IAIAsa KwaZulu-Natal Branch. 2013

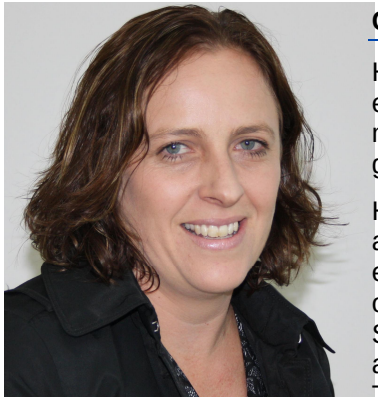
PUBLICATIONS AND PRESENTATIONS

Publications

- Michel, D. P. and Scott, D. (2005). The La Lucia – Umhlanga Ridge as an Emerging 'Edge City'. South African Geographical Journal, vol. 87, no. 2, pp. 104-114.

HILARY KONIGKRAMER, B.SocH., EAP

DIRECTOR (ENVIRONMENTAL SCIENCE), ENVIRONMENT & ENERGY



YEARS WITH THE FIRM

11

YEARS TOTAL

16

PROFESSIONAL QUALIFICATIONS

EAP

AREAS OF PRACTICE

Environmental Impact Assessment Experience

Specialist Environmental Support

Specialist Stakeholder Engagement and Social Impact Assessment Experience

CAREER SUMMARY

Hilary is a Director with 15 years' experience as a consulting social and environmental scientist with extensive experience in integrated environmental management in a variety of sectors including petrochemical, paper and pulp, general industrial, commercial and infrastructure.

Hilary has thorough working knowledge of current environmental laws and policies and a comprehensive understanding of environmental processes. She has experience in undertaking pre-feasibility assessments, legal reviews, and the co-ordination of a wide range of application processes (Basic Assessment and Scoping and EIA processes, Section 24G, and Waste Management License applications). Hilary has been involved in a number of high profile projects for Transnet SOC Ltd; Engen Petroleum Limited, Sappi Southern Africa, and Exxaro Coal Mpumalanga (Pty) Ltd Mpumalanga (Pty) Ltd. She has excellent verbal communication skills in terms of authority consultation, stakeholder engagement and client liaison.

Specialist social science expertise includes conducting Social Impact Assessments (SIA) involving social profiling, social sensitivity mapping, development and implementation of questionnaires, co-ordination of social surveys, stakeholder workshops and focus group sessions. A number of key SIA studies have been undertaken over the past few years for a variety of waste, industrial and mining projects in South Africa, as well as stakeholder engagement for a large residential and tourism development in the Seychelles.

Stakeholder engagement has become a key focus of her capability in recent years. She recognises the value of the development of targeted stakeholder engagement strategies to ensure stakeholder engagement processes are implemented effectively. Recent stakeholder engagement experience includes directing and managing the stakeholder engagement process in the early phases of the proposed Durban Dig-Out Port for Transnet Capital Projects

EDUCATION

BSoc Sci (Hons) Environmental Management, University of Natal, Durban, South African	1998
BSoc Sci Geography, Environmental Management, University of Natal, Durban, South African	1997

ADDITIONAL TRAINING

Sustainability Framework Learning Programme, IFC	2012

PROFESSIONAL MEMBERSHIPS

Member of the International Association for Impact Assessment South Africa	IAIAsa
Certified Environmental Assessment Practitioner (10/2010)	EAP

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HILARY KONIGKRAMER, B.SocH., EAP

PROFESSIONAL EXPERIENCE

Environmental Impact Assessment Experience

- Expansion of polyester manufacturing plant, Durban, KwaZulu-Natal, South Africa (2015): Project Director. Hosaf operates a polyester production facility in Jacobs (South Durban) and proposed to increase polyethylene terephthalate (PET) production at the facility through the expansion of the plant and installation of a second processing facility. The project involved a Basic Assessment process for the amendment of their Atmospheric Emissions License. Client: Hosaf, a division of PG Bison (Pty) Ltd.
- Expansion of the Island View Fuel Storage, Durban, KwaZulu-Natal, South Africa (2014-2015): Project Director. Engen Petroleum Limited proposed the expansion of fuel storage and modification of the Engen Island View D site, located within the Port of Durban. The project entailed a Basic Assessment process, application for Atmospheric Emissions License, and close coordination with consulting and client engineers. Client: Engen Petroleum Limited.
- Decommissioning of the pulp mill and associated structures including tanks at the Sappi Southern Africa Limited: Enstra Mill in Springs, Gauteng, South Africa (2014-2015): Project Director. This project involves the undertaking of a Basic Assessment process in order to gain Environmental Authorisation for the proposed decommissioning of the Pulp Mill and associated structures including tanks. Client: Sappi Southern Africa Limited.
- Green Energy Power Project - Tugela Mill, KwaZulu-Natal, South Africa (2013-2015): Project Director. Environmental Authorisation and Waste Management License procedure associated with the generation of 40WM of electrical power to supply the Tugela Mill and the national grid. Client: Sappi Southern Africa Limited.
- Sappi Ngodwana Expansion Project – Ngodwana Mill, Mpumalanga, South Africa (2013-2014). Project Director. Environmental Authorisation and Waste Management License for the expansion of the existing specialised cellulose production and construction of a sawmill at the Ngodwana Mill. Client: Sappi Southern Africa Limited.
- Green Energy Power Project – Ngodwana Mill, Mpumalanga, South Africa (2012-2013): Project Director. Environmental Authorisation and Waste Management License procedure for the installation of a biomass boiler, condensing turbine and associated biomass handling equipment, collectively termed the green energy power project. Specialist studies included air quality, visual, traffic, noise and socio-economic impact assessments. Client: Sappi Southern Africa Limited.
- Eerstelingsfontein Open Cast Coal Mine, Mpumalanga, South Africa (2010-2013): Project Manager. The project involved facilitating receipt of an Environmental Authorisation for the proposed open cast coal mining activity. The study included an extensive range of specialist inputs, comprehensive authority engagement, stakeholder engagement and project management. Client: Exxaro Coal Mpumalanga (Pty) Ltd Mpumalanga (Pty) Ltd.
- Cato Ridge Regional Landfill Site, KwaZulu Natal, South Africa (2010-2011): Project Director. An EIA process, including a Waste License Application, was undertaken for the development of a regional landfill site to service the west of the eThekwini Municipality. The study included a wide range of specialist

inputs, and extensive stakeholder engagement and project management. Client: eThekweni Cleansing and Solid Waste Department.

- Sanibonani Mixed Development, Himeville, KwaZulu-Natal, South Africa (2005-2011): Project Director. The project commenced with an environmental pre-feasibility assessment in order to clarify the legal requirements and determine opportunities and constraints associated with the proposed mixed housing and commercial development between the towns of Underberg and Himeville. An Environmental Authorisation procedure was undertaken which included significant project management and co-ordination of a large team of specialists. Client: Retsol Holdings (Pty) Ltd.
- Closure and Remediation of the Guernica Chemicals Site in Cato Ridge, KwaZulu-Natal, South Africa (2009-2010): Project Manager. A Basic Assessment process was undertaken for the closure and remediation of the Guernica Chemicals site in Cato Ridge. The focus of this Basic Assessment process is the identification of the best technology to treat and dispose of mercury contaminated material on site, and prepare implementation plans for the rehabilitation of this site. The site has been covered widely in both local and national media for over 15 years. Client: Guernica Chemicals (Pty) Ltd (formally Thor Chemicals).
- Back of Berth Upgrade at the Island View Complex, and a Tank Replacement at the Engen Refinery, KwaZulu-Natal, South Africa (2008-2010): Project Director. The project involved the upgrade of back of berth pipeline infrastructure within the Durban Harbour, as well as a tank replacement at the Engen Refinery. The challenge with the project was addressing impacts associated with two locations within one application, with one of the locations being within the contentious South Durban area. The Environmental Authorisation process involved significant authority and stakeholder engagement. Client: Engen Petroleum Limited.
- Alkylation Unit Upgrade at the Engen Refinery, South Durban, KwaZulu-Natal, South Africa (2006-2009): Project Manager. Environmental Scoping and Environmental Management Plan was undertaken for the proposed upgrade of the Alkylation Unit at the Engen Refinery. This project involved significant public and authority consultation and a detailed technical component. Stakeholder engagement was a significant challenge within the South Durban context, and an innovative approach was require in order to ensure those who were likely to be directly affected by the project were afforded an opportunity to engage in the process. Client: Engen Petroleum Limited.
- Ngwadini Reservoir, KwaZulu-Natal, South Africa (2007-2009): Project Manager. Environmental Scoping and EMP for the proposed off-stream earth embankment dam in the Ngwadini Valley, to ensure a reliable supply of water to the Sappi Saiccor Mill located in Umkomaas, KwaZulu-Natal. The Environmental Authorisation process included extensive stakeholder and authority engagement, and the management of a wide range of specialist. Client: Sappi Saiccor (Pty) Ltd.
- Permit Amendment for the Existing H:H Landfill Site, Newcastle, KwaZulu-Natal, South Africa (2007-2008): Project Manager. A Basic Assessment process was followed for the permit amendment of the existing H:H landfill at the Arcelor Mittal South Africa Ltd Steel Newcastle Plant. This permit amendment allow for certain waste types generated at the Arcelor Mittal South Africa Ltd Vereeniging Plant to be transported and disposed of at the Newcastle Plant. Client: Arcelor Mittal South Africa Ltd.

HILARY KONIGKRAMER, B.SocH., EAP

Specialist Environmental Support

- Environmental support associated with the Richards Bay Oil Spill, KwaZulu-Natal, South Africa (2014-2015): Project Manager. Provision of strategic support in respect of clean-up operations and longer terms monitoring support in respect to the Heavy Fuel Oil spill which occurred in the Port of Richards Bay. Client: Confidential.
- Environmental input into a technical report and Preliminary Economic Assessment for the Enchi Gold Project, Ghana (2015): Project Manager. An environmental screening assessment was undertaken to identify key environmental issues associated with the proposed gold project, and environmental legal review to identify the regulatory requirements and processes applicable to the project.

Specialist Stakeholder Engagement and Social Impact Assessment Experience

- Proposed Durban Dig-Out Port, early planning phase Stakeholder Engagement, Durban, KwaZulu-Natal, South Africa (2012-2013): Stakeholder Engagement Director and Project Manager. The proposed Durban Dig-Out Port is a large infrastructure project of national strategic importance. WSP has been responsible for stakeholder engagement in the early phase (FEL1) of the project planning lifecycle. A Stakeholder Engagement Strategy was developed to ensure the stakeholder engagement process was implemented effectively. Stakeholder identification, mapping and evaluation was undertaken throughout the project. A series of discussion sessions were arranged with key representatives of the various stakeholder groups in order to develop relationships and trust, share information and obtain feedback (key issues) early in the planning process. This early engagement has developed the foundation for future engagement (EIA phase). Client: Transnet Capital Projects.
- Umhlanga Tidal Pool, KwaZulu-Natal, South Africa (2013): Social Impact Assessment (SIA) Project Director. eThekwini proposed to construct a tidal pool at Umhlanga Beach within the northern eThekwini region. The SIA was commissioned due to public request, and involved extensive surveys and interviews. The outcome included the identification of the most socially acceptable site, and recommendations regarding development and management of the tidal pool in the short to long term. Client: eThekwini Municipality.
- Re-Processing of the Waterval Tailings Storage Facility, Rustenburg, North West Province, South Africa (2013): SIA Project Director. An SIA was required in support of the Environmental Authorisation process for the amendment of the Environmental Management Programme. The existing social climate in and around the Rustenburg mining operations was potentially unstable at the time of the study, due to historical and on-going issues between labour and mining companies. The SIA aimed to establish both direct and indirect impacts of the proposed project, and establish the significance of these impacts within the local socio-economic landscape, and included a review of existing information and the collection of primary data through interviews with key local stakeholders. The SIA ultimately determined that there would be no direct significant negative impacts on the local communities, although certain measures would need to be put in place to ensure that any negative impacts would be mitigated during the construction and operational phases. Client: Anglo American Platinum Limited.

HILARY KONIGKRAMER, B.SocH., EAP

- SIA for Proposed Yzermyn Coal Mine, Mpumalanga, South Africa (2013): SIA Project Director. In support of an Environmental Authorisation procedure for the proposed underground coal mine, an SIA was undertaken to assess the socio-economic impacts of the activity. A variety of techniques, including household surveys, stakeholder interviews, and group meetings were used to establish the potential issues, impacts and recommendations. The social impacts of the proposed mine were determined to be of significance to the local population, and firm measures were provided to prevent excessive loss of local sense of place and livelihoods, and ensure economic stability for the local communities. Client: Atha-Africa Ventures (Pty).
- Tumela Central Shaft, Thabazimbi, Limpopo, South Africa (2013): SIA Project Director (2013): In support of the EIA process for the proposed new shaft at the Amandelbult Section, a social screening was undertaken to establish potential socio-economic impacts of the proposed development. The site, being located a number of kilometres away for populated areas, was unlikely to have a significant social impact. To ensure independent assessment, and given the instability of mining communities, and the social screening reviewed existing data, and interviewed a number of key local stakeholders to determine the possible issues, impacts and recommendations. Client: Anglo American Platinum Limited.
- Sasol New Energy Holding Concentrated Solar Park, Upington, Northern Cape, South Africa (2012): SIA Project Director. Sasol New Energys Holding proposed the construction of a solar power generation complex near Upington in the Northern Cape. The SIA was undertaken to determine the socio-economic impact of the proposed project. The objective of the SIA was to identify and assess potential impacts of the proposed SSP on the socio-economic receiving environment. The SIA determined that there were a number of key socio-economic benefits of the proposed project, and provided sound recommendations regarding the development of community trusts, small business opportunities and education programmes, in order to maximise these social benefits. Client: Sasol Energy.
- Social Impact Assessment of the Proposed Green Energy Project at Sappi Ngodwana Mill, Mpumalanga, South Africa (2012): SIA Project Director. Sappi Southern Africa (Pty) Ltd proposes the installation of a biomass boiler to generate electricity, a portion of which will be fed into the national grid. The SIA focuses on the identification and assessment of the direct socio-economic impacts of the proposed project. Client: Sappi Southern Africa (Pty) Ltd.
- Coal Mine Social Impact Assessment, Eeerstelingsfontein, North West Province, South Africa (2011): SIA Project Director. Exxaro proposed to mine an area of agricultural land for the extraction of high-quality coal. The social impact assessment (SIA) team undertook a detailed assessment of the immediate communities, local government and broader social and economic issues through surveys of the local community and farmers, assessment of other specialist studies in terms of the potential social impacts, and the provision of mitigation measures and a social management plan for the construction and operation of the mine. The presence of an established community on the site provided a significant social hurdle; however, the team provided a social management strategy to manage and mitigation potential social impacts on the local communities. Client: Exxaro Coal Mpumalanga (Pty) Ltd.
- Social Impact Assessment of the Town of Nottingham Road – Implications of the Proposed Rawdons and Hillside Developments, KwaZulu-Natal, South

Africa (2008): SIA Project Director. A socio-economic assessment of the proposed Rawdons extension and the Hillside developments was undertaken. Of particular consideration were the cumulative social impacts and the future growth of the town of Nottingham Road. Client: Afzelia Environmental Consultants CC.

- SIA for Proposed Relocation of Denel's Philippi Munitions Facility, Western Cape, South Africa (2007): Social Consultant. A qualitative methodology was employed during the SIA study in order to identify the social issues associated with the relocation of the Philippi munitions facility. The study sought to understand the differing issues and concerns of the stakeholders likely to be affected by the project. The methodology included a social review of the project areas, primary data collection in the form of questionnaires and stakeholder meetings, and the identification and assessment of potential impacts. Client: Denel Munitions (Pty) Ltd.
- Proposed Cato Ridge Regional Landfill Site, KwaZulu-Natal, South Africa (2007): Social Consultant. The eThekwini Municipality propose the development of a large regional general landfill site to meet the future waste management requirements of the municipality. This SIA study involved the identification and assessment of potential social issues associated with the development of the landfill site. The study included a desktop socio-economic review of the area, primary data collection in the form of questionnaires and stakeholder workshops. Client: eThekwini Cleansing and Solid Waste Department.
- Public Impact Assessment for the Proposed Île Aurore Development, Mahé, Seychelles (2007): Social Consultant. A public impact assessment was undertaken as a specialist component of the Scoping study for the development of an exclusive golf course and casino development on the island of Île Aurore, Seychelles. The purpose of the study was to consult with the local community who would be most affected by the development, document the key issues and identify the likely impacts. Client: Pinnacle Point Holdings (Pty) Ltd.
- Social Probe for the Proposed Ngwadini Reservoir, KwaZulu-Natal, South Africa (2006): Social Consultant. Sappi Saiccor proposed the construction of an off-stream storage reservoir, with a design capacity of 10 million cubic meters of water, to supplement water supply to the Saiccor Mill during period of low river flow. The reservoir footprint is 73 hectares, located within a rural context. The social probe provided a description of the social environment surrounding the proposed Ngwadini Reservoir site, thereby identifying possible social issues associated with the proposed project. The report included a description of social impacts, preliminary assessment of impacts and recommendations. Client: Sappi Saiccor (Pty) Ltd.

Appendix C

DECLARATION OF INDEPENDENCE

environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF SPECIALIST AND DECLARATION OF INTEREST

	(For official use only)
File Reference Number:	12/12/20/ or 12/9/11/L
NEAS Reference Number:	DEA/EIA
Date Received:	

Application for integrated environmental authorisation and waste management licence in terms of the-

(1) National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014; and

(2) National Environmental Management Act: Waste Act, 2008 (Act No. 59 of 2008) and Government Notice 921, 2013

PROJECT TITLE

PROPOSED DEVELOPMENT OF THE MARALLA and ESIZAYO RENEWABLE ENERGY PROJECTS, SUTHERLAND, NORTHERN AND WESTERN CAPE PROVINCE

Specialist:	WSP Environmental (Pty) Ltd		
Contact person:	Danielle Sanderson		
Postal address:	1 on Langford, Langford Road, Westville, Durban		
Postal code:	3629	Cell:	072 2598319
Telephone:	(031) 240 8860	Fax:	(031) 240 8861
E-mail:	Danielle.sanderson@wspgroup.co.za		
Professional affiliation(s) (if any)	-		

Project Consultant:	WSP Environmental (Pty) Ltd		
Contact person:	Ashlea Strong / Nigel Seed		
Postal address:	P O Box 98867 Sloane Park		
Postal code:	2152	Cell:	082 786 7819
Telephone:	011 361 1392	Fax:	011 361 1381
E-mail:	Ashlea.Strong@wspgroup.co.za / Nigel.Seed@wspgroup.co.za		

4.2 The specialist appointed in terms of the Regulations_

I, Danielle Sanderson, declare that -- General declaration:

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

D Sanderson

Signature of the specialist:

WSP Environmental (Pty) Ltd

Name of company (if applicable):

2016/08/08

Date:

Appendix D

ASSESSMENT OF IMPACTS

APPENDIX D-1

CONSTRUCTION

Construction Phase									
Maralla West Wind Facility									
Potential Impact		**Extent (E)**	**Duration (D)**	**Magnitude (M)**	**Probability (P)**	**Significance (S=(E+D+M)*P)**		**Status (+ve or -ve)**	**Confidence**
Increase in Employment Opportunities	**Nature of impact:**	Short term employment opportunities to be recognised at a local, regional and national level							
	Without Mitigation	4	2	4	4	**40**	**Medium**	+	
	degree to which impact can be reversed:	None							
	degree of impact on irreplaceable resources:	None							
	Mitigation Measures	Appointment of local contractors; Employment of local labour as far as possible, particularly for semi and unskilled opportunities; Communication with Local Municipality and community representatives in respect of opportunities; skills development programmes for locals							
	With Mitigation	4	2	8	5	**70**	**High**	+	
Increased Economic Development Opportunities	**Nature of impact:**	Generation of construction phase Local Economic Development opportunities (national, regional and local level)							
	Without Mitigation	4	2	2	4	**32**	**Medium**	+	
	degree to which impact can be reversed:	None							

Construction Phase									
Maralla West Wind Facility									
Potential Impact		**Extent (E)**	**Duration (D)**	**Magnitude (M)**	**Probability (P)**	**Significance (S=(E+D+M)*P)**		**Status (+ve or -ve)**	**Confidence**
	degree of impact on irreplaceable resources:	None							
	Mitigation Measures	Use of local suppliers and manufacturers; development of a database of local companies (in local municipal area) for service provision associated with the construction phase; support for entrepreneurs and businesses.							
	With Mitigation	4	2	8	5	**70**	**High**	+	
Disruption due to influx of job seekers	**Nature of impact:**	Influx of job seekers into towns could lead to social conflict of resources and employment opportunities. Challenges for local municipality including establishment of informal settlements and service provision.							
	Without Mitigation	2	2	6	5	**50**	**Medium**	-	
	degree to which impact can be reversed:	Medium - Difficult to manage or control influx of job seekers and the local impacts.							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Manage employment expectations as far as possible, prioritise local employment, engage with local municipality in respect of accommodation of labour/staff brought into the area by contractors/developer							
	With Mitigation	2	2	6	4	**40**	**Medium**	-	

Construction Phase									
Maralla West Wind Facility									
Potential Impact		**Extent (E)**	**Duration (D)**	**Magnitude (M)**	**Probability (P)**	**Significance (S=(E+D+M)*P)**		**Status (+ve or -ve)**	**Confidence**
Increase in communicable diseases and reduced public health	**Nature of impact:**	Presence of an outside labour force, and the influx of job seekers, would potentially affect local public health due to a higher likelihood of a spread of communicable diseases such as TB and HIV/AIDS and other sexually transmitted diseases.							
	Without Mitigation	2	2	8	4	**48**	**Medium**	-	
	degree to which impact can be reversed:	Medium - Difficult to manage or control communicable diseases which could permanently impact local populations							
	degree of impact on irreplaceable resources:	High							
	Mitigation Measures	Development of a labour force Health and Safety Plan, HIV/AIDS awareness, prevention and testing campaign							
	With Mitigation	2	2	6	4	**40**	**Medium**	-	
Change in sense of place	**Nature of impact:**	Change in the local sense of place as a result of construction activities, increased population and economic development in local towns							
	Without Mitigation	2	2	4	4	**32**	**Medium**	-	
	degree to which impact can be reversed:	High - Project could be removed							
	degree of impact on irreplaceable resources:	Low							

Construction Phase									
Maralla West Wind Facility									
Potential Impact		**Extent (E)**	**Duration (D)**	**Magnitude (M)**	**Probability (P)**	**Significance (S=(E+D+M)*P)**		**Status (+ve or -ve)**	**Confidence**
	Mitigation Measures	Air quality, noise and traffic related mitigation measure recommended by relevant specialist and included in the EMPr							
	With Mitigation	2	2	4	3	**24**	**Low**	-	
Nuisance from noise, dust and traffic disturbances	**Nature of impact:**	Localised disturbance as a result of dust, noise and traffic							
	Without Mitigation	2	2	4	4	**32**	**Medium**	-	
	degree to which impact can be reversed:	Medium - Implementation of EMPr measures to reduce noise, dust and traffic related impacts, but unlikely to negate completely							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Air quality, noise and traffic related mitigation measure recommended by relevant specialist and included in the EMPr							
	With Mitigation	2	2	4	3	**24**	**Low**	-	
Increased risk to neighbouring land users	**Nature of impact:**	Potential increased risk to farmers as a result of presence of labour force including petty theft, stock theft, damage to infrastructure							
	Without Mitigation	2	2	6	3	**30**	**Low**	-	
	degree to which impact can be reversed:	High - The provision of compensation to farmers for damage to infrastructure, stock theft, etc.							

Construction Phase									
Maralla West Wind Facility									
Potential Impact		**Extent (E)**	**Duration (D)**	**Magnitude (M)**	**Probability (P)**	**Significance (S=(E+D+M)*P)**		**Status (+ve or -ve)**	**Confidence**
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Development of a code of conduct for construction workers, to be signed by the contractor; Contractor to be held liable for compensating farmers for any losses and/or damage that can be linked to construction workers							
	With Mitigation	2	2	4	3	**24**	**Low**		
Increased risk of veld fires	**Nature of impact:**	Increased risk of veld fires as a result of construction phase activities							
	Without Mitigation	2	2	6	4	**40**	**Medium**	-	
	degree to which impact can be reversed:	High - The provision of compensation to farmers for losses resulting from veld fires							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Implementation of EMPr i.e. mitigation in respect of construction phase activities that may pose a fire risk (i.e. no open fires allowed on site for cooking/heating; activities that pose a fire risk to be properly managed and confined to designated areas; adequate firefighting equipment to be provided; training to be provided)							
	With Mitigation	2	2	4	3	**24**	**Low**	-	
Maralla West **Wind Facility - No Go**									

Construction Phase									
Maralla West Wind Facility									
Potential Impact **Potential Impact**	**Mitigation**	**Extent (E)** **Extent (E)**	**Duration (D)** **Duration (D)**	**Magnitude (M)** **Magnitude (M)**	**Probability (P)** **Probability (P)**	**Significance (S=(E+D+M)*P)** **Significance (S=(E+D+M)*P)**		**Status (+ve or -ve)** **Status (+ve or -ve)**	**Confidence** **Confidence**
Loss of employment and local economic development opportunities	**Nature of impact:**								
	Without Mitigation	4	5	2	5	**55**	**Medium**	-	
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	None.							
	With Mitigation	4	5	2	5	**55**	**Medium**	-	
Maintenance of the existing landscape and sense of place	**Nature of impact:**								
	Without Mitigation	3	5	2	5	**50**	**Medium**	+	
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							

Construction Phase									
Maralla West Wind Facility									
Potential Impact		**Extent (E)**	**Duration (D)**	**Magnitude (M)**	**Probability (P)**	**Significance (S=(E+D+M)*P)**		**Status (+ve or -ve)**	**Confidence**
	Mitigation Measures	None.							
	With Mitigation	4	5	2	5	**55**	**Medium**	+	

APPENDIX D-2

OPERATION

Operational Phase									
Maralla West Wind Facility									
Potential Impact		**Extent (E)**	**Duration (D)**	**Magnitude (M)**	**Probability (P)**	**Significance (S=(E+D+M)*P)**		**Status (+ve or -ve)**	**Confidence**
Increased employment opportunities	**Nature of impact:**	Creation of long term employment opportunities							
	Without Mitigation	4	4	4	3	**36**	**Medium**	+	
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Appointment of local contractors; Employment of local labour as far as possible, particularly for semi and unskilled opportunities; Communication with Local Municipality and community representatives in respect of opportunities; Implementation of a skills development programmes for locals							
	With Mitigation	4	4	8	4	**64**	**High**	+	
Increased economic development opportunities	**Nature of impact:**	Creation of business opportunities and economic development associated with the operational phase							
	Without Mitigation	4	4	4	3	**36**	**Medium**	+	
	degree to which impact can be reversed:	N/A							

Operational Phase									
Maralla West Wind Facility									
Potential Impact		**Extent (E)**	**Duration (D)**	**Magnitude (M)**	**Probability (P)**	**Significance (S=(E+D+M)*P)**		**Status (+ve or -ve)**	**Confidence**
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Use of local suppliers and manufacturers; development of a database of local companies (in local municipal area) for service provision associated with the construction phase; support for entrepreneurs and businesses. Co-ordination with the Local Municipality in respect of community upliftment initiatives and support of community projects to ensure alignment.							
	With Mitigation	4	4	4	4	**48**	**Medium**	+	
Change in sense of place	**Nature of impact:**								
	Without Mitigation	2	4	4	4	**40**	**Medium**	-	
	degree to which impact can be reversed:	High - removal of the proposed development							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Implementation of recommendations contained in Visual Impact Assessment							
	With Mitigation	2	4	4	4	**40**	**Medium**	-	
Maralla West Wind Facility - No Go									
	Mitigation	**Extent**	**Duration**	**Magnitude**	**Probability**	**Significance**		**Status**	**Confidence**

Operational Phase									
Maralla West Wind Facility									
Potential Impact **Potential Impact**		**Extent (E)** **(E)**	**Duration (D)** **(D)**	**Magnitude (M)** **(M)**	**Probability (P)** **(P)**	**Significance (S=(E+D+M)*P)** **(S=(E+D+M)*P)**		**Status (+ve or -ve)** **(+ve or -ve)**	**Confidence**
Lost opportunity for provision of clean, renewable energy and associated employment and economic benefits	**Nature of impact:**								
	Without Mitigation	4	5	6	5	**75**	**High**	-	
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	None.							
	With Mitigation	4	5	6	5	**75**	**High**	-	
Maintenance of the existing landscape and sense of place	**Nature of impact:**								
	Without Mitigation	3	5	2	5	**50**	**Medium**	+	
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							

Operational Phase									
Maralla West Wind Facility									
Potential Impact		**Extent (E)**	**Duration (D)**	**Magnitude (M)**	**Probability (P)**	**Significance (S=(E+D+M)*P)**		**Status (+ve or -ve)**	**Confidence**
	Mitigation Measures	None.							
	With Mitigation	3	5	2	5	**50**	**Medium**	+	

APPENDIX D-3

DECOMMISSIONING

Decommissioning Phase									
Maralla West Wind Facility									
Potential Impact		**Extent (E)**	**Duration (D)**	**Magnitude (M)**	**Probability (P)**	**Significance (S=(E+D+M)*P)**		**Status (+ve or -ve)**	**Confidence**
Loss of permanent employment	**Nature of impact:**	Loss of permanent employment positions							
	Without Mitigation	2	5	4	3	**33**	**Medium**	-	
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Relocation of employees to other renewable energy facilities; provision of retrenchment packages							
	With Mitigation	2	5	2	3	**27**	**Low**	-	
Gain of short term employment	**Nature of impact:**	Limited short term unskilled / semi-skilled opportunities							
	Without Mitigation	2	1	6	3	**27**	**Low**	+	

Decommissioning Phase									
Maralla West Wind Facility									
Potential Impact		**Extent (E)**	**Duration (D)**	**Magnitude (M)**	**Probability (P)**	**Significance (S=(E+D+M)*P)**		**Status (+ve or -ve)**	**Confidence**
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Appointment of local contractors; Employment of local labour as far as possible, particularly for semi and unskilled opportunities; Communication with Local Municipality and community representatives in respect of opportunities; skills development programmes for locals							
	With Mitigation	2	1	6	4	**36**	**Medium**	+	
Nuisance from dust, noise and traffic	**Nature of impact:**	Localised disturbance as a result of dust, noise and traffic							
	Without Mitigation	2	1	4	4	**28**	**Low**	-	
	degree to which impact can be reversed:	High - Implementation of EMPr measures to reduce noise, dust and traffic related impacts							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Air quality, noise and traffic related mitigation measures recommended by relevant specialist and included in the EMPr							
	With Mitigation	2	1	4	3	**21**	**Low**	-	

Decommissioning Phase									
Maralla West Wind Facility									
Potential Impact		**Extent (E)**	**Duration (D)**	**Magnitude (M)**	**Probability (P)**	**Significance (S=(E+D+M)*P)**		**Status (+ve or -ve)**	**Confidence**
Increased risk to neighbouring land users	**Nature of impact:**	Potential increased risk to farmers as a result of presence of labour force including petty theft, stock theft, damage to infrastructure							
	Without Mitigation	2	1	6	3	**27**	**Low**	-	
	degree to which impact can be reversed:	High - The provision of compensation to farmers for damage to infrastructure, theft, etc.							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Development of a code of conduct for decommissioning phase workers, to be signed by the contractor; Contractor to be held liable for compensating farmers for any losses and/or damage that can be linked to decommissioning workers							
	With Mitigation	2	1	4	3	**21**	**Low**	-	
Increased risk of veld fires	**Nature of impact:**	Increased risk of veld fires as a result of construction phase activities							
	Without Mitigation	2	2	6	4	**40**	**Medium**	-	
	degree to which impact can be reversed:	High - The provision of compensation to farmers for losses resulting from veld fires							
	degree of impact on irreplaceable resources:	Low							

Decommissioning Phase									
Maralla West Wind Facility									
Potential Impact		**Extent (E)**	**Duration (D)**	**Magnitude (M)**	**Probability (P)**	**Significance (S=(E+D+M)*P)**		**Status (+ve or -ve)**	**Confidence**
	Mitigation Measures	Implementation of EMPr i.e. mitigation in respect of construction phase activities that may pose a fire risk (i.e. no open fires allowed on site for cooking/heating; activities that pose a fire risk to be properly managed and confined to designated areas; adequate firefighting equipment to be provided; training to be provided)							
	With Mitigation	2	2	4	3	**24**	**Low**	-	

APPENDIX D-4

CUMULATIVE

Cumulative Impacts									
Maralla West Wind Facility									
Potential Impact		**Extent (E)**	**Duration (D)**	**Magnitude (M)**	**Probability (P)**	**Significance (S=(E+D+M)*P)**		**Status (+ve or -ve)**	**Confidence**
Increased local economic development opportunities	**Nature of impact:**	Increase in local employment and business development opportunities							
	Without Mitigation	3	4	8	5	**75**	**High**	+	
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Establish local business forum for renewable energy proponents							
	With Mitigation							+	
Increased pressure on local service provision	**Nature of impact:**	Increased pressure on local municipalities and communities in respect of service provision							
	Without Mitigation	3	4	6	4	**52**	**Medium**	-	
	degree to which impact can be reversed:	Medium - May be mitigated but difficult to reverse once in place							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures								
	With Mitigation								

Cumulative Impacts									
Maralla West Wind Facility									
Potential Impact		**Extent (E)**	**Duration (D)**	**Magnitude (M)**	**Probability (P)**	**Significance (S=(E+D+M)*P)**		**Status (+ve or -ve)**	**Confidence**
Change in sense of place	**Nature of impact:**	Change in the landscape as a result of the development of numerous renewable energy projects							
	Without Mitigation	3	4	4	3	**33**	**Medium**	-	
	degree to which impact can be reversed:	High - Project could be removed							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures								
	With Mitigation								
Change in employment patterns	**Nature of impact:**	Change in the nature of businesses and employment patterns within the local area							
	Without Mitigation	3	4	2	3	**27**	**Low**	+	
	degree to which impact can be reversed:	Medium - May be mitigated but cannot be completely reversed once in place							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures								
	With Mitigation								
	Nature of impact:	Pressure on water resources as a result of numerous renewable energy projects and other development projects in the area.							

Cumulative Impacts									
Maralla West Wind Facility									
Potential Impact		**Extent (E)**	**Duration (D)**	**Magnitude (M)**	**Probability (P)**	**Significance (S=(E+D+M)*P)**		**Status (+ve or -ve)**	**Confidence**
Access to water resources	**Without Mitigation**	3	4	6	4	**52**	**Medium**	-	
	degree to which impact can be reversed:	High - Good water management and equitable provision							
	degree of impact on irreplaceable resources:	Low - Access to water, not water use.							
	Mitigation Measures	DWS to manage water resources equitably to ensure there is sufficient water for all sectors							
	With Mitigation								
Maralla West Wind Facility - No Go									
Potential Impact	**Mitigation**	**Extent (E)**	**Duration (D)**	**Magnitude (M)**	**Probability (P)**	**Significance (S=(E+D+M)*P)**		**Status (+ve or -ve)**	**Confidence**
Lost opportunity for provision of clean, renewable energy and associated employment and economic benefits	**Nature of impact:**								
	Without Mitigation	4	5	0	2	**18**	**Low**	-	
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							

Cumulative Impacts									
Maralla West Wind Facility									
Potential Impact		**Extent (E)**	**Duration (D)**	**Magnitude (M)**	**Probability (P)**	**Significance (S=(E+D+M)*P)**		**Status (+ve or -ve)**	**Confidence**
	Mitigation Measures	None.							
	With Mitigation	4	5	0	2	**18**	**Low**	-	
Maintenance of the existing landscape and sense of place	**Nature of impact:**								
	Without Mitigation	4	5	0	2	**18**	**Low**		
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	None.							
	With Mitigation	4	5	0	2	**18**	**Low**		