Oya Energy (Pty) Ltd

Proposed 132 kV Oya Power Line near Matjiesfontein, Western and Northern Cape Province

Basic Social Impact Assessment

DEFF Reference: To be allocated
Report Prepared by:

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SOCIAL IMPACT ASSESSORS

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OYA ENERGY (PTY) LTD

Proposed 132 kV Oya Power Line near Matjiesfontein, Western and Northern Cape Province

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EXECUTIVE SUMMARY

INTRODUCTION

Oya Energy (Pty) Ltd is proposing to construct a 132 kV overhead power line and 33/132kV substations near Matjiesfontein in the Western and Northern Cape Provinces. The overall objective of the proposed development is to feed the electricity generated by the proposed Oya Energy Facility as well as potentially the nearby developments into the National Grid. The proposed power line and substations development is located in the Witzenberg and Karoo Hoogland Local Municipalities respectively, which fall within the Cape Winelands and Namakwa District Municipalities. The entire extent of the proposed overhead power line and substation development is located within one of the Strategic Transmission Corridors[1] and within the boundaries of Renewable Energy Development Zone, Komsberg – REDZ 2[2].

PROJECT DESCRIPTION

At this stage, it is anticipated that the proposed development will include a 132 kV power line and 33/132 kV substations to feed electricity generated by the renewable energy facilities owned by the applicant, into the National Grid at the Kappa substation.

The type of power line towers being considered include both lattice and monopole towers, and it is assumed that these towers will be located approximately 200 to 250 meters apart. The towers will be up to 45 meters in height, depending on the terrain, but will ensure minimum overhead line clearances from buildings and surrounding infrastructure.

300-meter-wide power line corridors (i.e. 150 meters on either side) are being assessed to allow flexibility when determining the final route alignment. The proposed power line however only requires a 31-meter-wide servitude, and will would be positioned within the assessed corridor.

[1] Formally gazetted on 16 February 2018 (GN No. 113)

[2] Formally gazetted on 16 February 2018 (GN 114)

The size of the proposed Oya and Kudusberg substation and O&M building sites will be approximately 4 hectares (ha) each.

ALTERNATIVES

It should be noted that only one route is possible for the section of the proposed power line that connects the Kudusberg on-site substation (authorised under 14/12/16/3/3/1/1976/AM1) to the Oya on-site substation (i.e. Kudusberg to Oya). No alternatives can therefore be provided for this section of the power line. The Kudusberg to Oya power line corridor route is approximately 16.6 km in length and runs from the Kudusberg on-site substation along the RE/194, 1/158, RE/159, RE/156, 1/156 and RE/155 properties to the Oya on-site substation.

Five power line corridor route alternatives have however been provided for the section of the proposed overhead power line which connects the Oya on-site substation to the Kappa substation (i.e. Oya to Kappa). The above-mentioned alternatives are described below:

- **Power Line Corridor Alternative 1 (Oya to Kappa):** Approximately 34.14 km in length and runs along the RE/155, RE/152, 2/152, RE/169, RE/243, 241, 240 and RE/244 properties to the Kappa substation.
- **Power Line Corridor Alternative 2 (Oya to Kappa):** Approximately 32.43 km in length and runs along the RE/155, 3/155, RE/152, 2/152, RE/169, 13/168, 5/168, 1/243, RE/243, 241 and 240 properties to the Kappa substation.
- **Power Line Corridor Alternative 3 (Oya to Kappa):** Approximately 30.56 km in length and runs along the RE/155, 4/168, 13/168, 5/168, 1/243, 240 and RE/244 properties to the Kappa substation.
- **Power Line Corridor Alternative 4 (Oya to Kappa):** Approximately 32.94 km in length and runs along the RE/155, 4/168, 13/168, RE/169, RE/243, 241 and 240 properties to the Kappa substation.
- **Power Line Corridor Alternative 5 (Oya to Kappa):** Approximately 32.26 km in length and runs along the RE/155, RE/152, 2/152, RE/169, 5/168, 1/243 and 240 properties to the Kappa substation.

The power line corridor routes mentioned above provide different route alignments contained within an assessment corridor of up to approximately 300 m wide. This is to allow flexibility to route the power line within the authorised corridors.

IMPACTS IDENTIFIED

The potential social impacts associated with the project are as follows:

Construction Phase

- Health and social wellbeing impact:
  - Annoyance, air quality and noise
  - Electromagnetic Fields (EMFs)
  - Increase in crime
  - Increased risk of HIV infections
  - An influx of construction workers
  - Hazard exposure.
- Quality of the living environment:
  - Disruption of daily living patterns
  - Transformation of the sense of place.
- Economy:
  - Job creation and skills development
  - Socio-economic stimulation.

Operational Phase

- Health and wellbeing:
  - Electromagnetic fields.
- Quality of the living environment:
  - Transformation of the sense of place.
- Economic:
  - Socio-economic stimulation.

Cumulative impacts

- Health and social wellbeing:
  - Risk of HIV and AIDS.
- Quality of the living environment:
  - Sense of place
  - Service supplies and infrastructure and.
- Economic:
  - Job creation and skills development
  - Socio-economic stimulation.

A pre- and post-mitigation comparison of the impacts is presented in a tabular format below.

The no go option would mean that the social environment is not affected as the status quo would remain. On a negative front, it would also mean that all the positive aspects

associated with the project would not materialise. Furthermore, the energy facilities in the area would not be able to be connected to the national grid.

COMPARATIVE ASSESSMENT OF LAYOUT ALTERNATIVES

Considered purely on a social basis, no clear route alternatives emerge in respect of any of these routes. Taking into account the results of other specialist studies that may have secondary social consequences, such as the archaeological; heritage; palaeontological and visual studies, no least preferred route emerges. Consequently, no social preference has emerged in respect of these 5 route alternatives as indicated below.

Alternative	Preference	Reasons (incl. potential issues)
POWER LINE CORRIDOR ROUTE ALTERNATIVES		
Power Line Corridor Alternative 1 (Oya to Kappa)	No Preference	Considering both the social and other specialist studies, no clear route alternatives emerge in respect of any of these routes.
Power Line Corridor Alternative 2 (Oya to Kappa)	No Preference	
Power Line Corridor Alternative 3 (Oya to Kappa)	No Preference	
Power Line Corridor Alternative 4 (Oya to Kappa)	No Preference	
Power Line Corridor Alternative 5 (Oya to Kappa)	No Preference	

Construction Phase			
Environmental parameter	**Issues**	**Rating prior to mitigation**	**Rating post-mitigation**
Health & social wellbeing	Air quality	-7	-7
	Noise	-5	-5
	Increase in crime	-18	-18
	Increased risk of HIV infections	-42	-42
	An influx of construction workers	-8	-8
	Hazard exposure.	-18	-18
Quality of the living environment	Disruption of daily living patterns	-8	-8
Economic	Job creation and skills development	+11	+11
	Socio-economic stimulation	+13	+13
Operational Phase			
Health & Wellbeing	Electromagnetic fields	-22	-20
Quality of the living environment	Transformation of the sense of place	-32	-32
	Socio-economic stimulation	+32	+32
Decommissioning Phase			
Considering a time period of 20 years prior to decommissioning and the dynamics of social variables, it would be rather meaningless to attach assessment criteria to decommissioning at this point due to the high level of uncertainty such assessment would be based upon.			
No Project Alternative			
No project		-51	No mitigation measures
Cumulative Impacts			
Health & social wellbeing	Risk of HIV	-57	-54
Quality of the living environment	Sense of place	-54	-54
	Services, supplies & infrastructure	-26	-24
Economic	Economic	+68	+68

SUMMARY AND CONCLUSION

The objective of the proposed development is to feed electricity generated by the proposed Oya Energy Facility into the National Grid and, as such, it is an integral component required to ensure the success of the Oya Energy Facility. An additional advantage of the power line is that it provides a potential opportunity to connect nearby developments to the grid, thus eliminating any need for additional infrastructure in the area. Once commissioned, the power line will be absorbed; operated and maintained by Eskom; thus, resulting in the power line becoming an Eskom asset and eliminating any risk attached to privately owned transmission grid infrastructure. In this regard, Eskom indicates a commitment " …*to developing the electricity supply industry by facilitating the integration of independent power producers (IPPs) into the national grid and buying electricity from IPPs for national distribution*".

The entire extent of the proposed overhead power line and substations is located within the Central Strategic Transmission Corridor[3] while also remaining within the boundaries of Renewable Energy Development Zone, Komsberg – REDZ 2[4].

Regarding the negative impacts associated with the project, it is evident that most apply over the short term and are confined to the construction phase of the project. Of these impacts, all are within acceptable ranges and there are no fatal flaws associated with the construction or operation of the project. Although over the operational phase, the project will be visible and is likely to alter the sense of place of the area, this should be limited to the extent that it is placed within a REDZ and Strategic Transmission Corridor. This should mitigate the impact that the project will have on the sense of place of the area; as these areas have been set aside for such projects to ensure the security of the National Grid.

In accordance with international and governmental requirements, the project will shift the country away from a high reliance on fossil fuels towards a far greener and cleaner energy generation mix. The proposed development also supports the objectives of the RMIPPPP, which serves as an "emergency" power generation programme for accelerated assistance to the national grid amid electricity supply constraints. The DMRE issued an RFP for the emergency procurement of 2000 MW of electricity. Due to the emergency nature of the RMIPPPP, the objective is to procure energy from projects that are near ready and can connect to the grid quickly. The proposed development is deemed to meet these requirements

[3] Formally gazetted on 16 February 2018 (GN 113)

[4] Formally gazetted on 16 February 2018 (GN 114)

and can reduce the risk of load shedding. Grid capacity is also available and no deep grid works are required, which are beneficial for the connection timelines of the RMIPPPP

The Minister of Mineral Resources and Energy also recently welcomed the concurrence by the NERSA to the second Section 34 Ministerial Determination, which enables the Department to undertake procurement of additional electricity capacity in line with the IRP (2019). 6 800 MW of capacity is determined to be generated from renewable energy sources (PV and Wind), 513 MW from storage and 3 000 MW from gas. The proposed development will be able to contribute to this diverse electricity requirement and will thus actively contribute to the commitments made to increase generation capacity and ensure the security of energy supply to society rapidly and significantly.

IMPACT STATEMENT

Considering all social impacts associated with the project, it is evident that the positive elements outweigh the negative and that the project carries with it a significant social benefit. In addition, the project fits with international and governmental policy and legislation. Consequently, the Proposed 132 kV Oya Power Line and Substations development is supported at the social level.

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

Regulation GNR 326 of 4 December 2014, as amended 7 April 2017, Appendix 6	**Section of Report**
1. (1) A specialist report prepared in terms of these Regulations must contain- a) details of- i. the specialist who prepared the report; and ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;	**Section:- 1.3**
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	**Appendix 3**
c) an indication of the scope of, and the purpose for which, the report was prepared;	**Section:- 1**
(cA) an indication of the quality and age of base data used for the specialist report;	**Section:- 2.2**
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	**Sections:- 6 & 7**
d) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;	**N/A**
e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	**Section:- 1.4**
f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	**Sections:- 7 & 9**
g) an identification of any areas to be avoided, including buffers;	**None identified**
h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	**Section:- Figures 1 & 2**
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	**Section:- 2**
j) a description of the findings and potential implications of such findings on the impact of the proposed activity, (including identified alternatives on the environment) or activities;	**Section:- 10**
k) any mitigation measures for inclusion in the EMPr;	**Section:- 8**

l) any conditions for inclusion in the environmental authorisation;	**None**
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	No monitoring requirements included. See Section 8 last paragraph**.**
n) a reasoned opinion- i. (as to) whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	**Section:- 10.1**
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	No feedback has been received from the public participation process
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	**N/A**
q) any other information requested by the competent authority.	**N/A**
2) Where a government notice *gazetted* by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	**N/A**

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Basic Social Impact Assessment

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List of Abbreviations

AIDS	Acquired immunodeficiency syndrome
BA	Basic Assessment
BID	Background Information Document
DBAR	Draft Basic Assessment Report
DBSA	Development Bank of South Africa
DEFF	Department of Environment, Forestry and Fisheries
DEAT	Department of Environmental Affairs and Tourism
DM	District Municipality
DMRE	Department of Mineral Resources and Energy
EMFs	Electromagnetic Fields
FBAR	Final Basic Assessment Report
GPS	Global Positioning System
HIA	Heritage Impact Assessment
HIV	Human Immunodeficiency Virus
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
IPPPP	Independent Power Producers Procurement Programme
IRP	Integrated Resource Plan
IRR	Issues and Response Report
kV	Kilovolt
LM	Local Municipality
MW	Megawatt
NEMA	National Environmental Management Act (No. 107 of 1998)
NERSA	The National Energy Regulator of South Africa
NGO	Non-Governmental Organisation
OHL	Overhead Power Line
OHS	Occupational Health and Safety
O&M	Operation and Maintenance
PA	Per annum (Yearly)
PGDS	Provincial Growth and Development Strategy
PV	Photovoltaic
PPP	Public Participation Process
REIPPPP	Renewable Energy Independent Power Producer Procurement Program
RFP	Request For Proposal

RMIPPPP	Risk Mitigation Independent Power Producer Procurement Programme
SACPVP	South African Council for the Property Valuers Profession
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework
SIA	Social Impact Assessment
SIPs	Strategic Integrated Projects
SMME	Small Medium and Micro Enterprises
Stats SA	Statistics South Africa
STDs	Sexually Transmitted Diseases
ToR	Terms of Reference
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WEF	Wind Energy Facility
WHO	World Health Organisation
WWF	World Wild Fund for Nature

OYA ENERGY (PTY) LTD

1 INTRODUCTION

Dr Neville Bews & Associate was appointed by SiVEST (PTY) Ltd, on behalf of Oya Energy (Pty) Ltd, to assess the proposed 132-kilovolt (kV) overhead power line (OHL) and 33/132kV substations. The OHL is located within one of the Strategic Transmission Corridors as defined and in terms of the procedures laid out in Government Notice (GN) No. 113[5], namely the Central Corridor, near Matjiesfontein in the Western and Northern Cape Provinces of South Africa.

The proposed overhead power line (OHL) and substation project will irrespective of this be subject to a Basic Assessment (BA) process in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA) (as amended) and Appendix 1 of the Environmental Impact Assessment (EIA) Regulations, 2014 promulgated in Government Gazette 40772 and GN R326, R327, R325 and R324 on 7 April 2017. The competent authority for this BA is the national Department of Environment, Forestry and Fisheries (DEFF). The Social Impact Assessment was to assess and verify the OHL and substations under the new Gazetted specialist protocols[6].

1.1 Scope and Objectives

To undertake a basic SIA in respect of the proposed Oya power line and substation development, and on this basis to consider the extent of the proposed project and its likely effect on the social environment within which the project will be located.

1.2 Terms of Reference

General requirements:

- The the report must be written in accordance with Appendix 6 of the EIA Regulations, 2014 (as amended);
- A table at the beginning of the report cross-referencing how the requirements for specialist reports according to Appendix 6 of the EIA Regulations, 2014 (as amended), has been adhered to;

[5] Formally gazetted on 16 February 2018 (GN No. 113)
[6] Formally gazetted on 20 March 2020 (GN No. 320)

- A thorough overview of all applicable legislation, policies, guidelines, etc.;
- Identification of sensitive and/or 'no-go' areas to be avoided;
- Recommend mitigation measures in order to minimise the impact of the proposed development;
- Provide implications of specialist findings for the proposed development (e.g. permits, licenses etc.);
- Specify if any further assessment will be required.

Specific requirements:

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

1.3 Specialist Credentials

Qualifications:

University of South Africa: BA (Honours) – 1984

Henley Management College, United Kingdom: The Henley Post-Graduate Certificate in Management – 1997

Rand Afrikaans University: M.A. (cum laude) – 1999

Rand Afrikaans University: D. Litt. et Phil. – 2000

Projects:

The Social Impact Assessment (SIA) for the Gautrain Rapid Rail Link; The impact assessment for the Australian – South African sports development programme; SIA for Kumba Resources, Sishen South Project; Evaluation of a Centre for Violence Against Women for The United Nations Office on Drugs and Crime; SIAs for the following Exxaro Resources Ltd.'s mines, Leeuwpan Coal Mine Delmas, Glen Douglas Dolomite Mine Henley-on-Klip, Grootegeluk Open Cast Coal Mine Lephalale; SIA for the South African National Road Agency Limited (SANRAL) on Gauteng Freeway Improvement Project; SIA for SANRAL on the N2 Wild Coast Toll Highway; Research into research outputs of the University for the University of Johannesburg; SIA for Waterfall Wedge housing and business development in Midrand Gauteng; SIA for the Environmental Management Plan for Sedibeng District Municipality; Social and Labour Plan for the Belfast Project on behalf of Exxaro Resources Ltd; SIA for the Transnet New Multi-Product Pipeline (Commercial Farmers) on behalf of Golder Associates Africa (Pty) Ltd; SIA for the Proposed Vale Moatize Power Plant Project in Mozambique on behalf of Golder Associates Africa (Pty) Ltd; SIA for Kumba Resources Ltd.'s proposed Dingleton Resettlement Project at Sishen Iron Ore Mine on behalf of Water for Africa (Pty) Ltd; SIA for Gold Fields West Wits Project for EcoPartners; SIA for the Belfast Project for Exxaro Resources Ltd; SIA for Eskom Holdings Ltd.'s Proposed Ubertas 88/11 kV Substation on behalf of KV3 Engineers (Pty) Ltd; SIA for the Mokolo and Crocodile River (West) Water Augmentation Project for the Department of Water and Sanitation on behalf of Nemai Consulting and the Trans Caledonian Water Authority; Assisted Octagon Consulting with the SIA for Eskom's Nuclear 1 Power Plant on behalf of Arcus GIBB Engineering & Science. SIA for the 150 MW Photovoltaic Power Plant and Associated Infrastructure for Italgest Energy (Pty) Ltd, on behalf of Kalahari Survey Solutions cc. SIA for Eskom Holdings Limited, Transmission Division's Neptune-Poseidon 400kV Power Line on behalf of Nemai Consulting. Ncwabeni Off-Channel Storage Dam for the security of water supply in Umzumbe, Mpumalanga. Social Impact Assessment for Eskom Holdings Limited, Transmission Division,

Forskor-Merensky 275kV ±130km Power line and Associated Substation Works in Limpopo Province. Social impact assessment for the proposed infilling of the Model Yacht Pond at Blue Lagoon, Stiebel Place, Durban.ABC Prieska Solar Project; Proposed 75 MWp Photovoltaic Power Plant and its associated infrastructure on a portion of the remaining extent of ERF 1 Prieska, Northern Cape.Sekoko Wayland Iron Ore, Molemole Local Municipalities in Limpopo Province.Langpan Chrome Mine, Thabazimbi, Limpopo; Jozini Nodal Expansion Implementation Project, Mpumalanga, on behalf of Nemai Consulting; SIA for Glen Douglas Dolomite Burning Project, Midvaal Gauteng, on behalf of Afrimat Limited; SIA for Lyttelton Dolomite mine Dolomite Burning Project, Marble Hall Limpopo on behalf of Afrimat Limited; Tubatse Strengthening Phase 1 – Senakangwedi B Integration for Eskom Transmission on behalf of Nsovo Environmental Consulting; Department of Water and Sanitation, South Africa (2014). Environmental Impact Assessment for the Mzimvubu Water Project: Social Impact Assessment DWS Report No: P WMA 12/T30/00/5314/7. Umkhomazi Water Project Phase 1 – Raw Water Component Smithfield Dam - 14/12/16/3/3/3/94; Water Conveyance Infrastructure - 14/12/16/3/3/3/94/1; Balancing Dam - 14/12/16/3/3/3/94/2. Umkhomazi Water Project Phase 1 – Potable Water Component: 14/12/16/3/3/3/95. Expansion of Railway Loops at Arthursview; Paul; Phokeng and Rooiheuwel Sidings in the Bojanala Platinum District Municipality in the North West Province for Transnet Soc Ltd; Basic Social Impact Assessment for the Cato Ridge Crematorium in Kwazulu-Natal Province; SIA for the Kennedy Road Housing Project, Ward 25 situated on 316 Kennedy Road, Clare Hills (Erf 301, Portion 5); Eskom's Mulalo Main Transmission Substation and Power Line Integration Project, Secunda;

Regularly lecture in the Department of Sociology at the University of Johannesburg and collaborated with Prof.Henk Becker of Utrecht University, the Netherlands, in a joint lecture to present the Social Impact Assessment Masters course via video link between the Netherlands and South Africa. Presented papers on Social Impact Assessments at both national and international seminars. Published on both a national and international level.

Affiliation:

Registered on the database for scientific peer review of iSimangaliso GEF project outputs.

1.4 Assessment Method

Data was gathered using the following techniques:

- The project description prepared by Oya Energy (Pty) Ltd.

- Statistics South Africa, Census 2011 and other relevant demographic data generated by Stats SA such as the Quarterly Labour Force Survey and Mid-year Population Estimates.
- Discussions with the project proponents and Environmental Impact Assessment Consultants.
- A site sensitivity verification through the national web-based environmental screening tool; attached as Appendix 2.
- A literature review of various documents such as the relevant Municipal Integrated Development Plans (IDPs) and other specialist reports and documents.
- A broader literature scan.

The assessment technique used to evaluate the social impacts, as provided by SiVEST Environmental Division, is attached as **Appendix 1**.

2 ASSUMPTIONS AND LIMITATIONS

2.1 Assumptions

It is assumed that the technical information provided by the project proponent, Oya Energy (Pty) Ltd and the environmental consultants, SiVEST SA (Pty) Ltd, was credible and accurate at the time of compiling the report. It is also assumed that the data provided by the various specialists as used in this report are credible and accurate.

2.2 Limitations

The demographic data used in this report was sourced from Statistics South Africa and is based on data gathered during Census 2011 and Community Survey, 2016. This data is somewhat outdated but where possible is supplemented with the latest Stats SA's survey data such as the Mid-year population estimates and the Quarterly Labour Force Survey. The limitation of this is that this survey data is restricted to a provincial level and does not extend to a municipal level.

It was also agreed with the project proponent and environmental consultant that contact with landowners would be treated with sensitivity. This, to retain the positive rapport that the project proponent, Oya Energy (Pty) Ltd, had painstakingly established with landowners, and to ensure that the information provided to landowners was of an accurate and consistent nature. No site visit was undertaken as the region was sparsely populated and where necessary

information could be obtained from the environmental consultants. Apart from this, the study was undertaken during Stage 3 of the State of National Disaster declared in South Africa as a result of the COVID-19 pandemic. Accordingly, the need for social distancing and limiting unnecessary interpersonal contact and travel was respected throughout this study.

3 TECHNICAL DESCRIPTION

3.1 Project Location

Oya Energy (Pty) Ltd (hereafter referred to as "Oya Energy") is proposing to construct a 132 kV overhead power line and 33/132kV substations near Matjiesfontein in the Western and Northern Cape Provinces (hereafter referred to as the "proposed development"). The overall objective of the proposed development is to feed the electricity generated by the proposed Oya Energy Facility (part of separate ongoing EIA process with DEFF Ref No.: 14/12/16/3/3/2/2009) as well as potentially the nearby developments into the national grid. The grid connection and substations (this application) require a separate EA, to allow the EA to be handed over to Eskom.

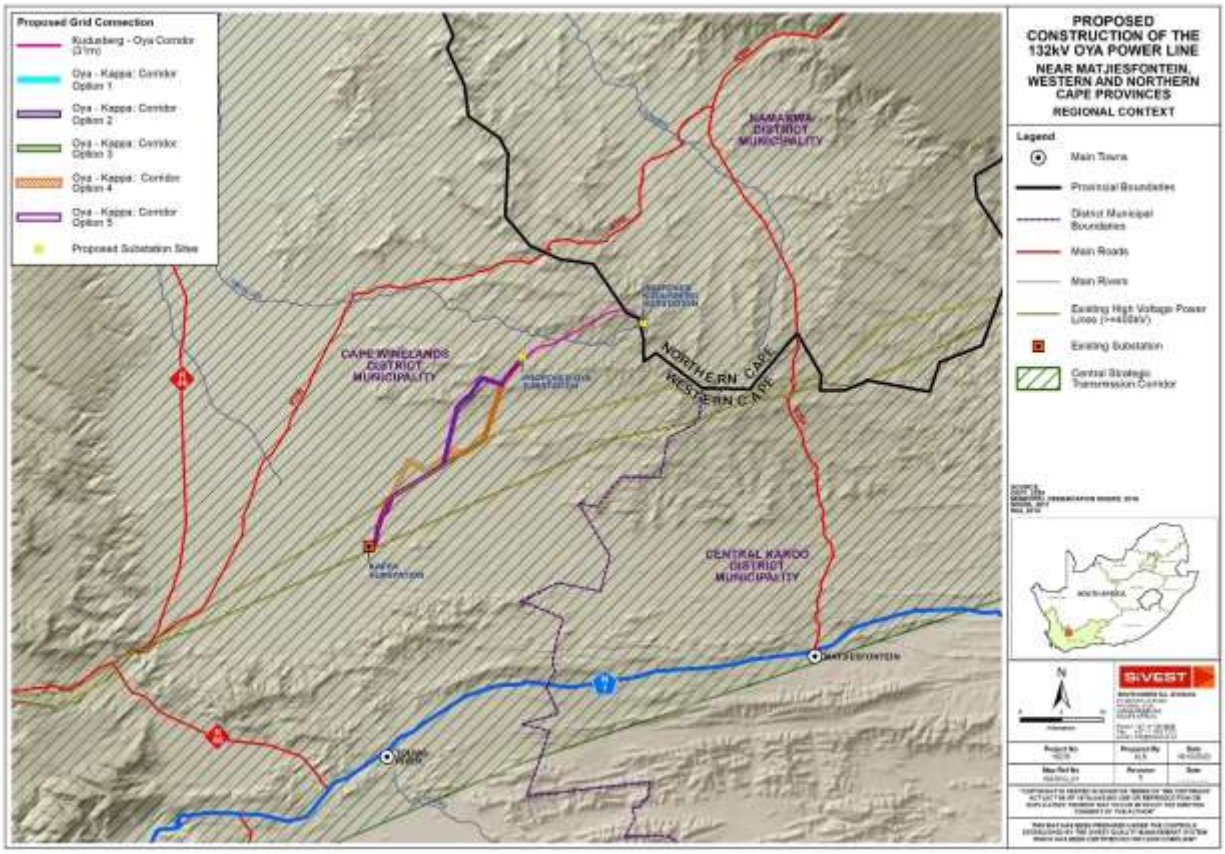


Figure 1: Oya 132kV overhead power line and 33/132kV substations Regional context map

The proposed overhead power line and substations will affect the following properties[7]:

- Portion 2 of the Farm Bakovens Kloof No 152 (2/152): C01900000000015200002
- Remainder of the Farm Bakovens Kloof No 152 (RE/152): C01900000000015200000
- Portion 3 of the Farm Baakens Rivier No 155 (3/155): C01900000000015500003
- Remainder of the Farm Baakens Rivier No 155 (RE/155): C01900000000015500000
- Portion 1 of the Farm Gats Rivier No 156 (1/156): C01900000000015600001
- Remainder of the Farm Gats Rivier No 156 (RE/156): C01900000000015600000
- Portion 1 of the Farm Amandelboom No 158 (1/158): C01900000000015800001
- Remainder of the Farm Oliviers Berg No 159 (RE/159): C01900000000015900000
- Portion 2 of the Farm Bantamsfontein No 168 (2/168): C01900000000016800002
- Portion 4 of the Farm Bantamsfontein No 168 (4/168): C01900000000016800004
- Portion 5 of the Farm Bantamsfontein No 168 (5/168): C01900000000016800005
- Portion 7 of the Farm Bantamsfontein No 168 (7/168): C01900000000016800007
- Portion 13 of the Farm Bantamsfontein No 168 (13/168): C01900000000016800013
- Remainder of the Farm Bantamsfontein No 168 (RE/168): C01900000000016800000
- Remainder of the Farm Lower Roodewal No 169 (RE/169): C01900000000016900000
- Remainder of the Farm Matjes Fontein No 194 (RE/194): C07200000000019400000
- The Farm Platfontein No 240 (240): C01900000000024000000
- The Farm Die Brak No 241 (241): C01900000000024100000
- Portion 1 of the Farm Rietpoort No 243 (1/243): C01900000000024300001
- Remainder of the Farm Rietpoort No 243 (RE/243): C01900000000024300000
- Remainder of the Farm Toover berg No 244 (RE/244): C01900000000024400000

The proposed power line and substations are located in the Witzenberg and Karoo Hoogland Local Municipalities respectively, which fall within the Cape Winelands and Namakwa District Municipalities.

The entire extent of the proposed overhead power line and substations development is located within one of the Strategic Transmission Corridors as defined and in terms of the procedures laid out in GN No. 113, namely the Central Corridor. The proposed overhead power line project irrespective of this would be subject to a BA process in terms of the NEMA (as amended) and Appendix 1 of the EIA Regulations, 2014 promulgated in Government Gazette 40772 and GN R326, R327, R325 and R324 on 7 April 2017. The competent authority for this BA is the DEFF.

[7] 21-digit surveyor general (SG) codes also provided

At this stage, it is anticipated that the proposed development will include a 132 kV power line and a 33/132 kV substations to feed electricity generated by the renewable energy facilities owned by the applicant into the National Grid at the Kappa substation.

The type of power line towers being considered at this stage include both lattice and monopole towers, and it is assumed that these towers will be located approximately 200 m to 250 m apart. The towers will be up to 45 m in height, depending on the terrain, but will ensure minimum overhead line clearances from buildings and surrounding infrastructure.

300 m wide power line corridors (i.e. 150 m on either side) are being assessed to allow flexibility when determining the final route alignment. The proposed power line however only requires a 31 m wide servitude, and as such, this servitude would be positioned within the assessed corridor.

The size of the proposed Oya and Kudusberg substation and O&M building sites will be approximately 4 hectares (ha) each.

3.2 Alternatives

It should be noted that only one (1) route is possible for the section of the proposed power line which connects the Kudusberg on-site substation (authorised under 14/12/16/3/3/1/1976/AM1) to the Oya on-site substation (i.e. Kudusberg to Oya). No alternatives can therefore be provided for this section of the power line. The Kudusberg to Oya power line corridor route is approximately 16.6 km in length and runs from the Kudusberg on-site substation along the RE/194, 1/158, RE/159, RE/156, 1/156 and RE/155 properties to the Oya on-site substation.

Five (5) power line corridor route alternatives have however been provided for the section of the proposed overhead power line which connects the Oya on-site substation to the Kappa substation (i.e. Oya to Kappa). The above-mentioned alternatives are described below:

- **Power Line Corridor Alternative 1 (Oya to Kappa):** Approximately 34.14 km in length and runs along the RE/155, RE/152, 2/152, RE/169, RE/243, 241, 240 and RE/244 properties to the Kappa substation.

- **Power Line Corridor Alternative 2 (Oya to Kappa):** Approximately 32.43 km in length and runs along the RE/155, 3/155, RE/152, 2/152, RE/169, 13/168, 5/168, 1/243, RE/243, 241 and 240 properties to the Kappa substation.
- **Power Line Corridor Alternative 3 (Oya to Kappa):** Approximately 30.56 km in length and runs along the RE/155, 4/168, 13/168, 5/168, 1/243, 240 and RE/244 properties to the Kappa substation.
- **Power Line Corridor Alternative 4 (Oya to Kappa):** Approximately 32.94 km in length and runs along the RE/155, 4/168, 13/168, RE/169, RE/243, 241 and 240 properties to the Kappa substation.
- **Power Line Corridor Alternative 5 (Oya to Kappa):** Approximately 32.26 km in length and runs along the RE/155, RE/152, 2/152, RE/169, 5/168, 1/243 and 240 properties to the Kappa substation.

The power line corridor routes mentioned above provide different route alignments contained within an assessment corridor of up to approximately 300 m wide. This is to allow for flexibility to route the power line within the authorised corridors.

'No-go' alternative

The 'no-go' alternative is the option of not fulfilling the proposed project as well as to prevent the connection of energy development in the area to feed electricity into the national grid. This alternative would result in no environmental impacts from the proposed project on the site or surrounding local area. It provides the baseline against which other alternatives are compared and will be considered throughout the report. Implementing the 'no-go' option would entail no development. The affected properties are currently not used for agricultural activities, although they are suitable for very low-level grazing.

The 'no-go' option is feasible; however, this would prevent the proposed development from contributing to the environmental, social and economic benefits associated with the development of the renewables sector.

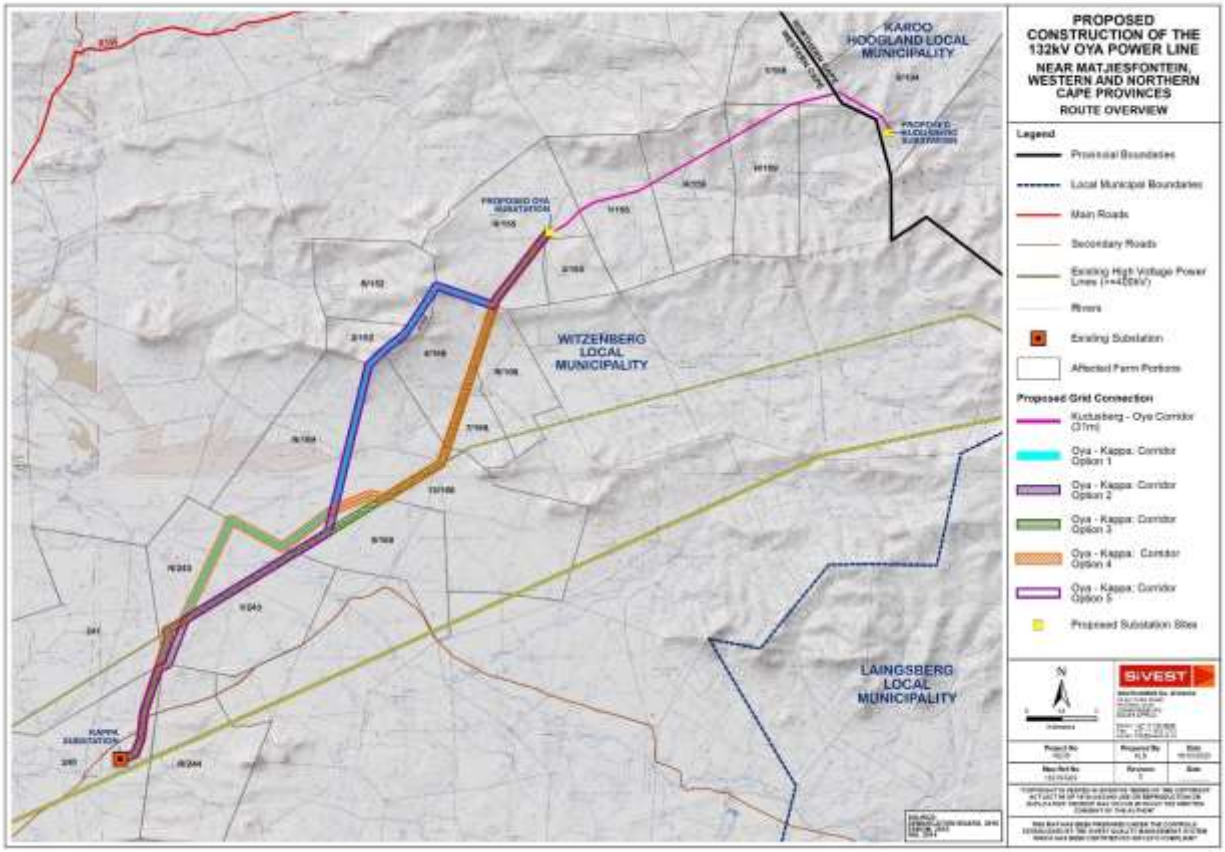


Figure 2: 132 kV Oya Overhead Power Line Alternatives and Substations Sites

4 LEGAL REQUIREMENT AND GUIDELINES

Legislation and policy serve to guide the authorities in undertaking and agreeing on projects that are in the interest of the country as a whole. Consequently, the fit of the project with the relevant national, provincial and municipal legislation and policy is an important consideration. In this respect, the following legislation and policy are applicable to the project.

4.1 International

- Climate Change Action Plan, 2016-2020, World Bank Group (2016)
- Renewable Energy Vision 2030 – South Africa; World Wildlife Fund for Nature-SA (formerly World Wildlife Fund-SA) (2014)
- REthinking Energy 2017: Accelerating the global energy transformation. International Renewable Energy Agency, (2017)
- Renewable Energy Policies in a Time of Transition. International Renewable Energy Agency (2018)

- Global Warming of 1.5 °C. An IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. Summary for Policymakers. Subject to copy-edit: Intergovernmental Panel on Climate Change (2018).

4.2 National

- White Paper on the Energy Policy of the Republic of South Africa (1998)
- White Paper on Renewable Energy (2003)
- The Constitution of South Africa (1996)
- A National Climate Change Response Strategy for South Africa (2004)
- National Energy Act (2008)
- Integrated Resource Plan (IRP) for South Africa (2010-2030)
- The Environmental Impact Assessment and Management Strategy for South Africa (2014)
- Government Gazette Vol. 632; 16 February 2018 No. 41445. Department of Environmental Affairs, No. 114, Page No. 92 (2018)
- Government Gazette No. 43734; 25 September 2020, Notice No. 1015; Determination Under Section 34(1) of the Electricity Regulation Act, 2006 (Act No. 4 of 2006)
- Department of Mineral Resources and Energy's Independent Power Producers Procurement Programme (2020)
- New Growth Path Framework (2010)
- The National Development Plan (2011)
- National Infrastructure Plan (2012).

4.3 Provincial

- Western Cape Green Economy Strategy Framework (2013)
- Western Cape Provincial Strategic Plan (2014 – 2019)
- Western Cape Climate Change Response Strategy (2014)
- Northern Cape Provincial Growth and Development Strategy (2004-2014)
- Northern Cape Province Twenty Year Review (2014)
- Northern Cape Climate Change Response Strategy
- Northern Cape Spatial Development Framework

- Northern Cape Department of Environment & Nature Conservation Annual Report (2016/17)
- Northern Cape Department of Economic Development & Tourism Annual Report (2017)
- Northern Cape State of the Province Address (2018).

4.4 District and Local

- Cape Winelands District Municipality – Regional Socio-Economic Development Strategy (2019)
- Cape Winelands District Municipality – Climate Change Adaption Summary Report (Draft Version) (2017)
- Cape Winelands District Municipality – Integrated Development Plan 2020-2021 (May 2020)
- Cape Winelands District Municipality – Spatial Development Framework: District Management Area (2007)
- Cape Winelands District Municipality – Strategic Environmental Assessment (2006)
- Namakwa District Municipality, Climate Change Vulnerability Assessment and Response Plan (Draft Version 4; 2017)
- Namakwa District Integrated Development Plan (Review 2018/19)
- Witzenberg Local Municipality – Spatial Development Framework Final Report (2020)
- Witzenberg Local Municipality – Towards an LED Strategy for Witzenberg (2005)
- Witzenberg Local Municipality – Amended Integrated Development Plan 2017 – 2022 (2020)
- Karoo Hoogland Municipality Integrated Development Plan (2017 – 2022)
- Karoo Hoogland and Spatial Development Framework (2010).

4.5 Policy and Legislation Fit

Considering the nature and location of the project, there is a clear fit with international, national, provincial and local, at both district and municipal levels, policy and legislation. For instance, the World Wildlife Fund for Nature (WWF)

> " …*calls for a more ambitious plan, suggesting that the IRP* [Integrated Resource Plan for Electricity] *should provide for an 11-19% share of electricity capacity by 2030, depending on the country's growth rate over the next fifteen years*" (Sager, 2014, p. 5).

The issue of climate change is high on the agenda of all levels of government in South Africa, with the Department of Environmental Affairs and Tourism indicating that;

> "*The efforts of all stakeholders will be harnessed to achieve the objectives of the Government's White Paper on Renewable Energy (2003) and the Energy Efficiency Strategy, promoting a sustainable development path through coordinated government policy*" (Department of Environmental Affairs and Tourism, 2004, p. 23).

DEAT goes further in specifically listing renewable energy sources, including wind power, solar power and biomass, as a tool in promoting mitigation against climate change.

In terms of the capacity determinations of the Minister of Energy, in consultation with the National Energy Regulator (NERSA), it has been established that South Africa required;

> *The technological composition of additional new capacity to be added between 2019 and 2030 is as follows:*
> *Wind: 14400 MW (45.7%);*
> ***Solar photovoltaic (PV):** 6000 MW (19.1%);*
> ***Gas and/or diesel:** 3000 MW (9.5%);*
> *Hydroelectricity: 2500 MW (7.9%);*
> ***Energy storage:** 2088 MW (6.6%);*
> ***Coal:** 1 500 MW (4.8%); and*
> ***Range of energy technologies to fill the short-term capacity gap:** 2000 MW (6.4%)"* (Independent Power Producer Office, 2020a, p. 5).
>
> With the Western Cape contributing 5 832 GWh to the National Grid of which 1 189 GWh is through Solar PV (20%) (Independent Power Producers Procurement Office, 2020b, p. 3).

On 16 February 2018, the boundaries of eight Renewable Energy Zones (REZs) that are of strategic importance for large scale wind and solar photovoltaic for the country were gazetted (Government Gazette No. 41445, 2018). In respect of these zones, the project is located partly within the Renewable Energy Development Zone 2, which is located in the Komsberg region and falls across the borders of the Northern and Western Cape Provinces. The project, however, does not fall completely within this zone with a section falling outside the zone.

On 25 September 2020 (Government Notice No. 1015 in Government Gazette No. 43734) the Minister of Mineral Resources and Energy amended the regulations governing the generation

of electricity. This created additional capacity to contribute towards energy security with the requirement that Eskom Holdings SOC Limited purchase additional electricity from independent power producers. Of this 6 800 MW should be sourced from renewable energy sources, both wind and solar; 513 MW from storage and 3 000 MW from gas and diesel. The project fits with this requirement.

In the Western Cape's Provincial Strategic Plan 2014 – 2019 (Western Cape Government, 2014, pp. 49-50) it is indicated that in its response to climate change " …*the province focuses on key areas of potential impact namely renewable energy,*" amongst other areas.

The Northern Cape Department of Economic Development and Tourism identifies six economic development opportunities, one of which is renewable energy, and states that;

> "*During the financial year* [2017/18] *the intension is to focus on additional opportunities such as, Renewable Energy, a focus area of the 9-Point Plan*" (Northern Cape Province. Department of Economic Development & Tourism, 2017, p. 10 & 15).

The importance of renewable energy facilities within the Northern Cape has been recognised in the province's Twenty-Year Review 2014, where it is indicated that;

> "*The New Growth Path that was adopted by national government in 2010 identified the green economy as a new economic sector that will be key to the creation of jobs. The focus of the green economy is on renewable energy and the Northern Cape was identified as the solar hub of the country with a number of solar plants being established across the province*" (Northern Cape Province, 2014, p. 153).

On a municipal level, wide support is also evident across all affected municipalities. In the Namakwa District Municipality Integrated Development Plan Revision 2018/2019 (Namakwa District Municipality, 2018, p. 19) it is stated that;

> "*Renewable energy is recently one of the cornerstones of the economy of the District and there needs to be engagement on National level to ensure that the District benefit from this resource*".

In its Project Priority Matrix,[8] the Karoo Hoogland Local Municipality lists the promotion of renewable energy generation and policy on the development of wind energy facilities as one of its eight priorities. In a similar vein, it is pointed out in the Laingsburg Integrated Development Plan (2017, p. 88) that renewable energy generation in the Greater Karoo region "*...will add value to the GDP within certain economic sectors and, by implication, change the composition and character of the towns.*"

The 2019/2024 Cape Winelands District Spatial Development Framework indicates that;

> "*The provincial energy focus is on lowering carbon emissions and local generation (e.g. renewable and greater use of gas)*" (Cape Winelands District Municipality, 2020, p. 49).

Both the Witzenberg Municipal Spatial Development Framework and Amended Integrated Development Plan 2017 – 2022 indicate that;

> "*The Witzenberg Municipality forms part of the Komsberg REDZ. Any projects or renewable energy developments in the municipal area should preferably be located inside of this boundary*…" (Witzenberg Municipality Local Municipality, 2020b, p. 65; Witzenberg Local Municipality, 2020a, p. 53)

Considering the policy and legislation referred to above, the project largely fits this framework it falls within one of the eight Renewable Energy Zones (REDZs 2 Komsberg) allocated by National Government. Notwithstanding this, however, the provision that the project also conforms to appropriate scale and form, particularly considering the cumulative impacts associated with similar such projects in the area, will need to be considered on a broader basis than can be done as far as this report is concerned. In this regard, attention will need to be given to the cumulative impacts at a later point in this report in as far as they relate to the social environment. In the following section, a description of the affected environment is provided.

5 DESCRIPTION OF THE RECEIVING ENVIRONMENT

The project falls within Witzenberg Non-Urban (NU), Main Place 1650094 (Census, 2011) and Ward 12 of the Witzenberg Local Municipality located within the Cape Winelands District Municipality and the Western Cape Province. A small section of the power line crosses

[8]See the following link: http://www.karoohoogland.gov.za/wp-content/uploads/2015/06/2010-12-03-Karoo-Hoogland-PROJECT-PRIORITISATION.pdf

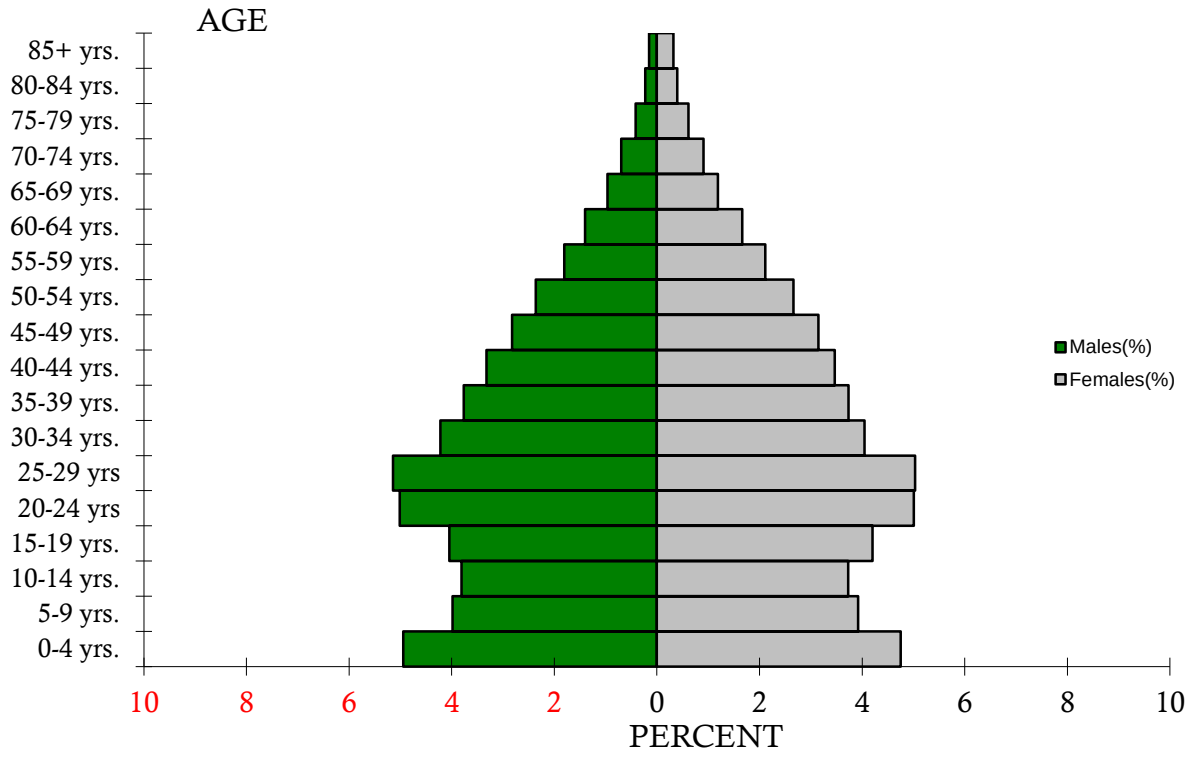
provincial borders and is situated on the Remainder of the Farm Matjes Fontein No 194 (RE/194) located within the Karoo Hoogland NU, Main Place 367002 (Census, 2011) and Ward 3 of the Karoo Hooglands Local Municipality. The Karoo Hoegland is in turn located within the Namakwa District Municipality in the Northern Cape Province.

A screening report for an environmental authorisation as required by the 2014 EIA Regulations (as amended) was undertaken in respect of the proposed development footprint's environmental sensitivity. In this respect, no social sensitive issues were highlighted. This report is attached as **Appendix 2**.

The demographics pertaining to the provincial and municipal areas, as sourced from Statistics South Africa, are described below.

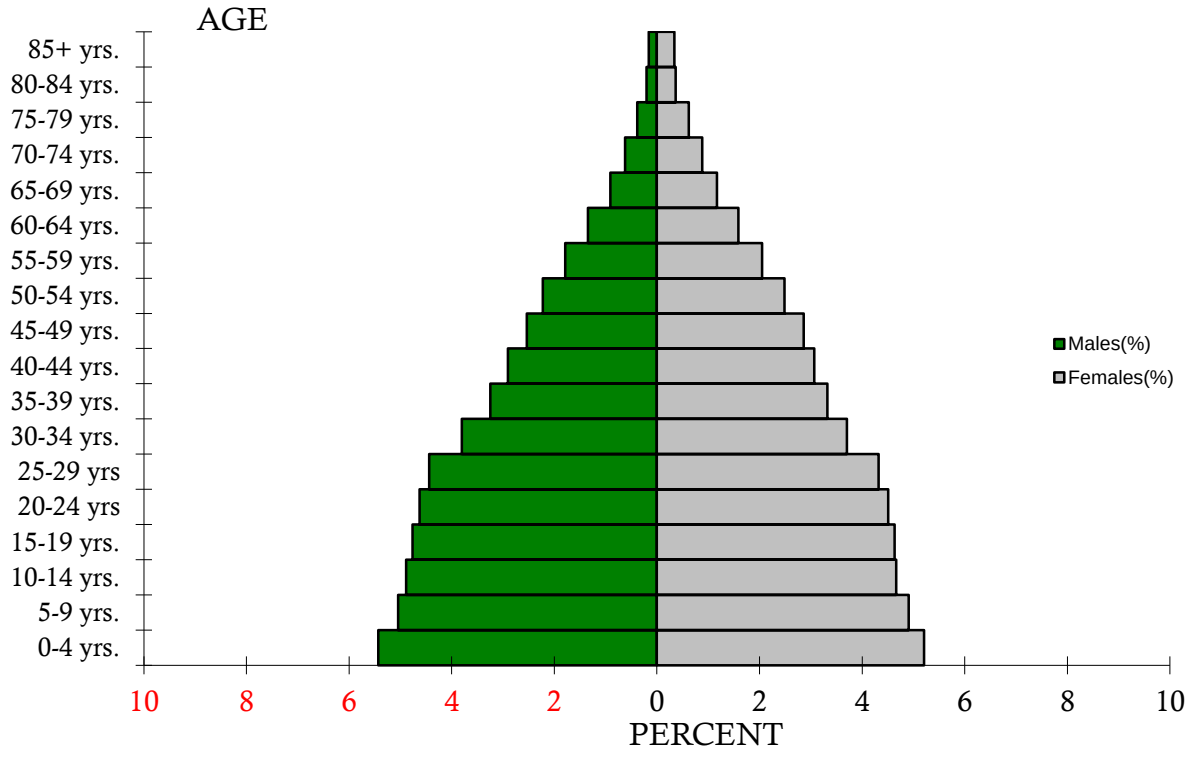
5.1 Provincial

The Western Cape Province covers a geographical area of 129 462.21 km² and, with a population of 5 82 734, according to Census 2011 (Statistics South Africa, 2011), had a population density of 44.98 people per km² in 2011. The Northern Cape Province covers an area of 372 889.36 km² and, over the same period, had a population of 1 145 861 giving it a population density of 3.07 people per km². Regarding age structure, 25.1% of the population of the Western Cape are below 16 years, while 69% are between 15 and 64 years of age and 5.9% are above 64 years. The corresponding figures pertaining to the Northern Cape are as follows; below 16 years = 30.1%, between 15 and 64 years = 64.2% and above 64 years = 5.7%. The population pyramids of the Western and Northern Cape provinces are illustrated in **Figure 3** and **Figure 4**, respectively.



Source: (Statistics South Africa, 2011)

Figure 3: Population pyramid Western Cape Province



Source: (Statistics South Africa, 2011)

Figure 4: Population pyramid Northern Cape Province

According to the 2020 Mid-year population estimates (Statistics South Africa, 2020a), with a population of 7 005 741 in 2020, the Western Cape has the third-highest population across the country; below Gauteng (15 788 137) and KwaZulu-Natal (11 531 628). The Northern Cape Province has the smallest population, with an estimated population of 1 292 786 in 2020. As the Mid-year population estimates remain at a provincial level and are not projected to the district and local municipal levels, for comparative purposes, data gathered during Census 2011 and Community Survey 2016, will be used where appropriate notwithstanding that it is rather outdated.

On this basis and in respect of population grouping at 48.8%, the dominant population group in the Western Cape are coloured people while the dominant population of the Northern Cape, at 50.35%, are black African people. At 49.7% and 53.8%, respectively Afrikaans is the dominant home language spoken across both provinces.

The dependency ratio of the Western Cape, which shows the burden placed on the population of working age, between 15 and 64 years, who support children under 15 years and people over 65 years, is 45.0 while that of the Northern Cape is 55.7. The sex ratio in the Western Cape, which measures the proportion of males to females, is 96.4 showing a higher number of females in the province; while that of the Northern Cape is 97.3 also showing a higher female to male ratio across the province. Between 1996 and 2001 the population growth rate of the Western Cape was 2.68% p.a. while between 2001 and 2011 it was 2.52% p.a. The corresponding data for the Northern Cape was -0.40 between 1996 and 2001 and 1.44 between 2001 and 2011.

In 2011 the official unemployment rate in the Western Cape was 21.6% with the official unemployment rate amongst the youth, aged between 15 and 34 years, being 29%. The corresponding figures for the Northern Cape are 27.4% and 34.5% respectively. In the 2nd Quarter of 2020, the official unemployment rate in the Western Cape was recorded as 16.6% while that in the Northern Cape was 25.1%. These figures must, however, be considered with caution as the official unemployment rate is defined by Stats SA as follows:

"*Unemployed persons are those (aged 15–64 years) who:*

a) Were not employed in the reference week and;

b) Actively looked for work or tried to start a business in the four weeks preceding the survey interview and;

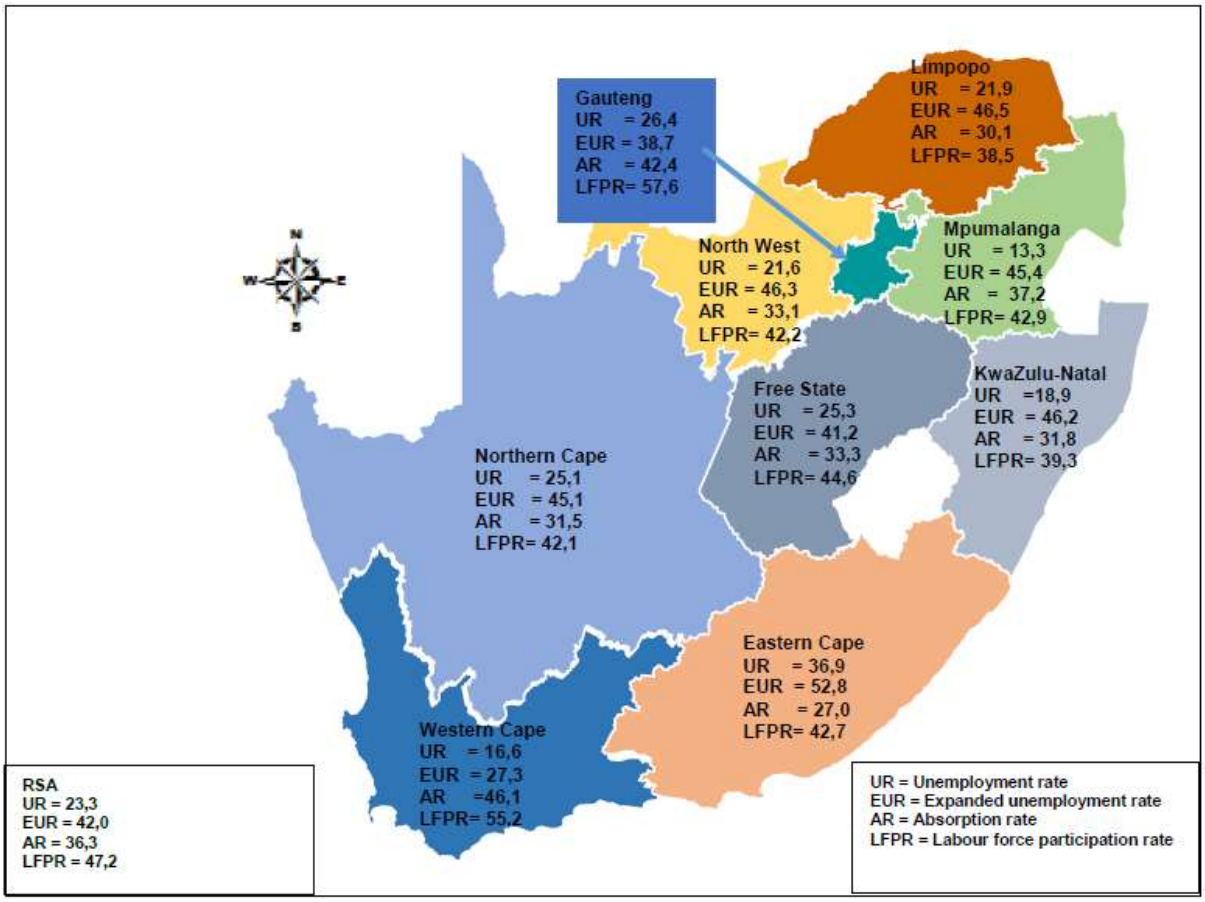
c) Were available for work, i.e. would have been able to start work or a business in the reference week or;

d) Had not actively looked for work in the past four weeks but had a job or business to start at a definite date in the future and where available. (Statistics South Africa, 2020a, p. 24)".

In addition, this data was gathered over the period that the country was under national lockdown because of COVID-19, which distorted the situation even further[9].

Considering this, in the 2nd Quarter of 2020 the expanded rate of unemployment in the Western Cape was 27.3% while that in the Northern Cape stood at 45.1%. During this period the labour absorption rate in the Western Cape was 46.1% while the labour force participation rate was 55.2%. In the Northern Cape, the labour force absorption rate was 31.5% and the labour force participation rate was 42.1%. A summary of the labour market indicators illustrated on a comparative basis across South Africa is provided in **Figure 5**.

[9] In this regard refer to Statistical Release P0211: Quarterly Labour Force Survey, Quarter 2: 2020.



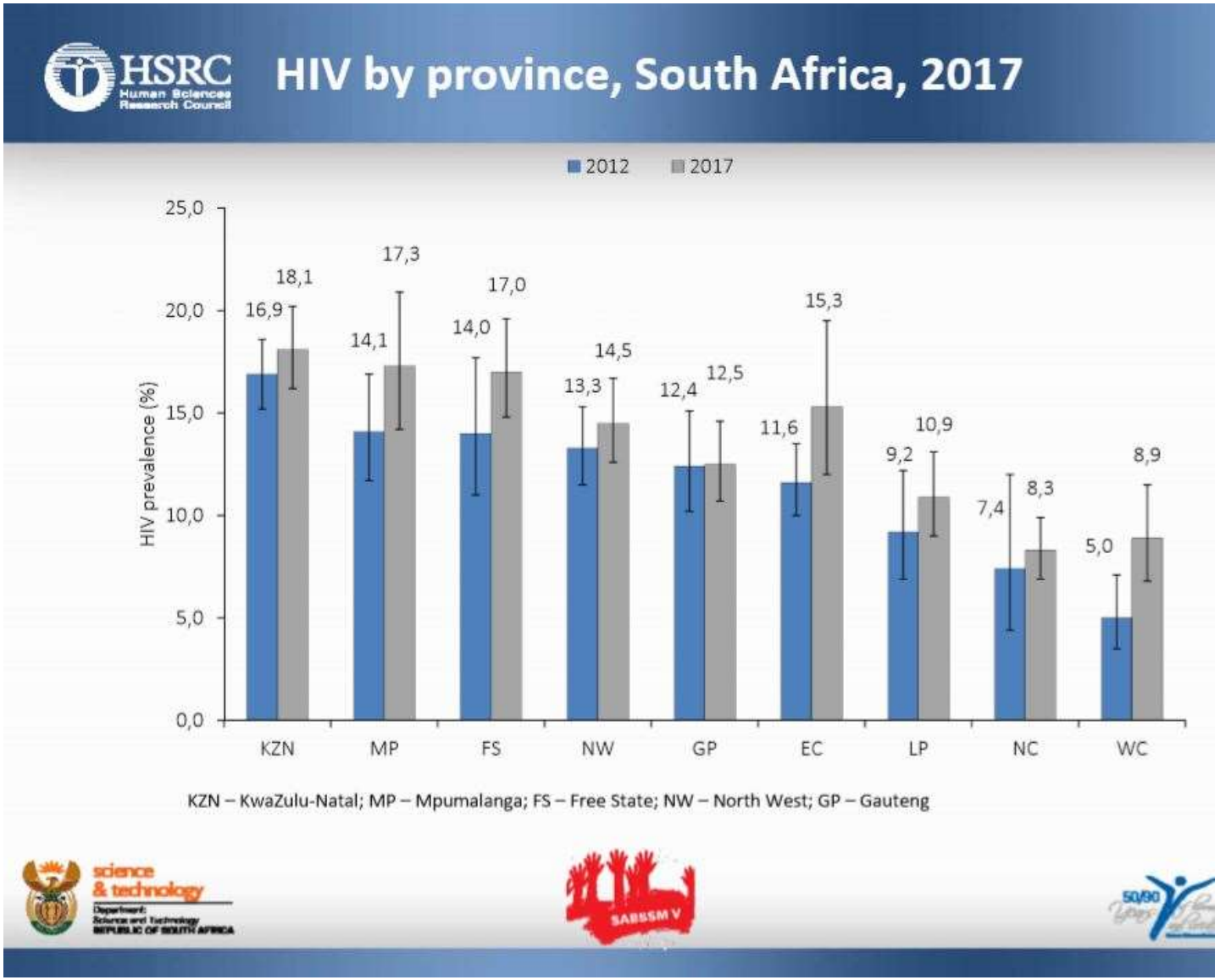
Source: (Statistics South Africa, 2020b, p. 10)

Figure 5: Labour market indicators 2nd Quarter 2020

Regarding households, the 2011 Census indicated that there were 1 634 000 households in the Western Cape with an average household size of 3.6 and 301 405 in the Northern Cape with an average household size of 3.8. Of the households in the Western Cape, 36.6% were female-headed, 80.4% lived in formal dwellings, and 52.4% either owned or were paying off their dwelling. The corresponding figures for the Northern Cape are 38.8% female-headed households with 82.4% living in formal dwellings and 55.1% having either owned or were paying off their dwelling.

Regarding household services in 2011, 85.6% of households in the Western Cape and 60.1% in the Northern Cape had flush toilets connected to the sewerage system. In respect of refuse removal, 89.9% of households in the Western Cape and 64% in the Northern Cape had their refuse removed weekly. Piped water was delivered to 75.1% and 45.8% of households in the Western and Northern Cape respectively, while 93.4% of households in the Western Cape and 85.4% in the Northern Cape used electricity as a means of energy for lighting.

Concerning HIV prevalence, the Northern Cape had the lowest prevalence rate across South Africa at 8.3% in 2017, followed by the Western Cape with a prevalence rate of 8.9%. KwaZulu-Natal, with a prevalence rate of 18.1% had the highest rate with the national HIV prevalence rate at 14.0% in 2017. HIV prevalence rate between 2012 and 2017 as it stood across all South African provinces is illustrated in **Figure 6**.



Source: (Simbayi, et al., 2019)

Figure 6: HIV by province – South Africa 2012 – 2017

The prevalence of HIV as it occurred, between 2012 and 2017, across the Northern and Western Cape provinces are illustrated at the district level in **Table 1.** This shows Overberg having the highest HIV prevalence at 23.9%, with Namakwa presenting with the lowest at 8.5%.

Table 1: HIV prevalence by province and district 2012 – 2017

Western Cape Province										
District	**2012**		**2013**		**2014**		**2015**		**2017**	
	%	**95% CI**	**%**	**95% CI**	**%**	**95% CI**	**%**	**95% CI**	**%**	**95% CI**
Cape Winelands	14.5	99.6 – 21.2	15.0	10.0 – 22.0	14.8	9.9 – 21.6	15.2	11.4 – 19.9	14.2	11.9 – 16.9
Central Karoo	14.9	9.1 – 23.4	6.9	4.4 – 10.6	4.9	1.5 – 14.7	11.8	6.9 – 19.3	8.7	5.6 – 13.3
Eden	14.3	10.3 – 19.5	15.6	10.0 – 23.5	18.2	12.4 – 25.6	15.7	10.8 – 22.4	12.6	9.7 – 16.1
Cape Town Metro	18.6	14.2 – 23.9	21.7	16.6 – 27.7	21.2	16.6 – 26.8	21.6	17.8 – 26.0	20.9	18.5 – 23.5
Overberg	17.8	11.5 – 26.5	13.9	7.4 – 24.6	15.2	8.8 – 25.1	19.8	11.4 – 32.2	23.9	13.2 – 39.4
West Coast	9.5	5.9 – 14.5	9.6	5.0 – 17.3	14	10.6 – 18.2	13.8	10.6 – 17.8	11.1	9.2 – 13.3
Western Cape	**16.9**	**13.8 – 20.5**	**18.7**	**15.1 – 23.0**	**18.7**	**15.7 – 22.3**	**18.9**	**16.4 – 21.7**	**15.9**	**14.2 – 17.8**
Northern Cape Province										
District	**2012**		**2013**		**2014**		**2015**		**2017**	
	%	**95% CI**	**%**	**95% CI**	**%**	**95% CI**	**%**	**95% CI**	**%**	**95% CI**
F. Baard	23.0	18.5 – 28.2	18.2	14.7 – 22.3	19.5	14.5 – 25.6	24.3	20.6 – 28.3	22.3	18.0 – 27.2
J. T. Gaetsewe	14.8	10.4 – 20.5	23.2	17.0 – 30.8	18.5	12.5 – 26.4	21.9	15.1 – 30.7	18.7	15.3 – 22.8
Namakwa	1.5	0.2 – 10.2	2.3	0.5 – 9.1	3.6	1.2 – 10.5	2.9	0.7 – 11.8	8.5	4.2 – 16.5
Pixley ka Seme	18.4	12.7 – 25.9	15.1	9.4 – 23.4	13.6	9.1 – 19.7	15.8	10.0 – 23.9	16.7	12.6 – 21.8
Z. F. Mgcawu	14.3	9.8 – 20.4	20.1	14.3 – 27.5	14.8	9.8 – 21.8	14.5	9.2 – 22.2	16.1	12.1 – 21.1
Northern Cape	**17.8**	**15.3 – 20.7**	**17.5**	**15.0 – 20.4**	**16.1**	**13.5 – 19.2**	**19**	**16.3 – 22.0**	**17.9**	**16.0 – 20.1**

Source: (Woldesenbet, et al., 2019, p. 82 & 91)

Attention is now turned towards the district and local municipalities.

5.2 Municipal

The project affects the two district municipalities of Namakwa in the Northern Cape and the Cape Winelands in the Western Cape Province, as well as their respective local municipalities of the Karoo Hooglands and Witzenberg.

Cape Winelands District Municipality: The district which covers an area of 21 472.67 km^2, incorporates the following local municipalities:

- Breede Valley
- Drakenstein
- Langeberg

- Stellenbosch and
- Witzenberg.

The following towns are also located within the Cape Winelands:

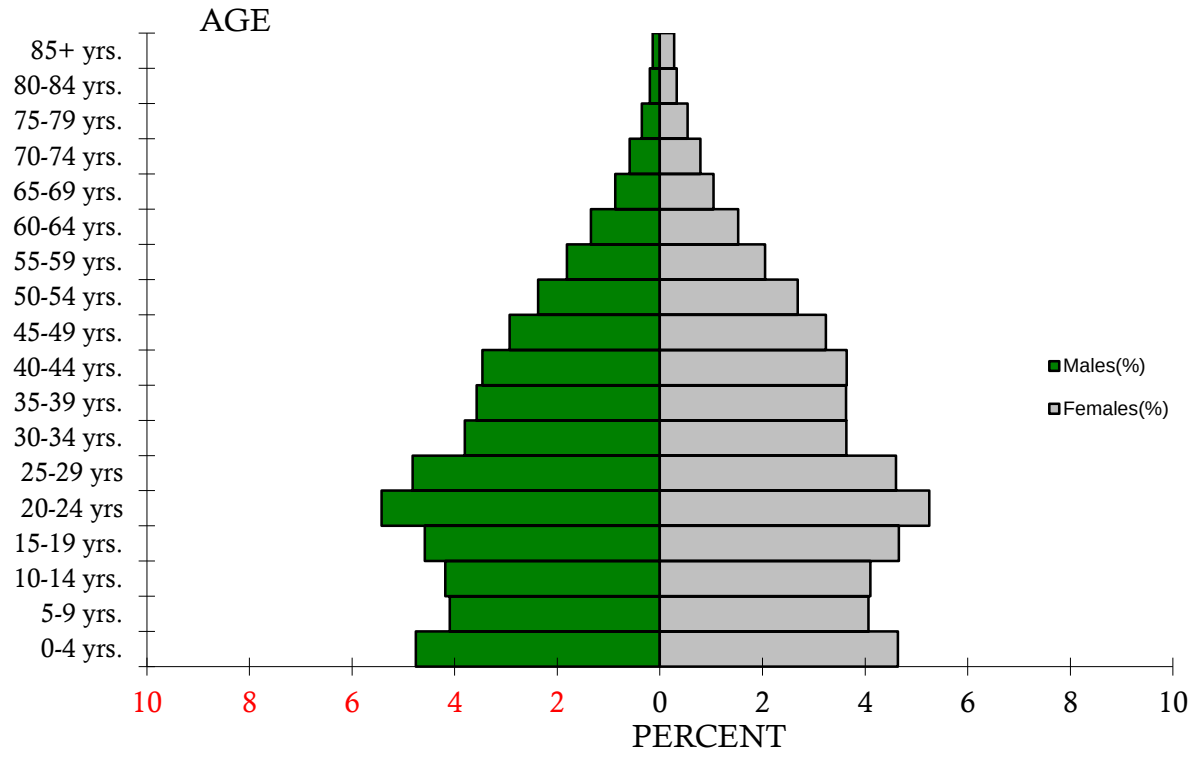
Ashton	Bonnievale	Ceres	De Doorns
Franschhoek	Gouda	Klapmuts	McGregor
Montagu	Op-Die-Berg	Paarl	Pniel
Prince Alfred Hamlet	Rawsonville	Robertson	Saron
Stellenbosch	Stellenbosch Farms	Touws River	Tulbagh
Wellington	Wolseley	Worcester	

The district is regarded as the premier wine growing area with an ideal microclimate created by the mountains surrounding the towns of Stellenbosch and Franschhoek. On an economic basis the following sectors contribute to the economy of the district:

- Finance and business services (23.9%)
- Manufacturing (19.6%)
- Wholesale and retail trade (15.2%)
- Agriculture, forestry and fishing (13.1%)
- Transport and communication (9%)
- Construction (4.5%).

The district also attracts numerous tourists.

With a population of 787 490 people, the Cape Winelands DM has a population density of 36.7/km^2. According to Census, 2011, the district has a sex ratio of 97.2 with 25.8% of the population being under 15 years; 69.0% being between 15 and 65 years and 5.1% being over 65 years of age. The population pyramid of the Cape Winelands is illustrated in **Figure 7**.



Source: (Statistics South Africa, 2011)

Figure 7: Population pyramid Cape Winelands District

The demographic data pertaining to the Cape Winelands District Municipality, based on both Census 2011 and Community Survey 2016 as sourced through Statistics South Africa, is presented below.

Community Survey		**Census**
Population	866 001	787 486
Age Structure		
Population under 15	26.6%	25.8%
Population 15 to 64	68.9%	69.0%
Population over 65	4.4%	5.1%
Dependency Ratio		
Per 100 (15-64)	45.1	44.9
Sex Ratio		
Males per 100 females	98.3	97.2
Population Growth		
Per annum	2.16%	n/a
Labour Market		
Unemployment rate (official)	n/a	n/a
Youth unemployment rate (official) 15-34	n/a	n/a

Community Survey		Census
Education (aged 20 +)		
No schooling	2.5%	4.2%
Matric	30.0%	23.5%
Higher education	9.0%	10.0%
Household Dynamics		
Households	235 906	198 258
Average household size	3.7	3.7
Female-headed households	34.2%	33.2%
Formal dwellings	81.0%	82.3%
Housing owned	48.7%	41.2%
Household Services		
Flush toilet connected to sewerage	93.5%	86.7%
Weekly refuse removal	81.8%	79.9%
Piped water inside the dwelling	77.3%	75.9%
Electricity for lighting	94.1%	92.8%

Namakwa District Municipality: Namakwa covers an area of 126 836 km² incorporating the following local municipalities:

- Hantam Local Municipality
- Kamiesberg Local Municipality
- Karoo Hoogland Local Municipality
- Khai-Ma Local Municipality
- Nama Khoi Local Municipality
- Richtersveld Local Municipality.

The following towns are also located within Namakwa:

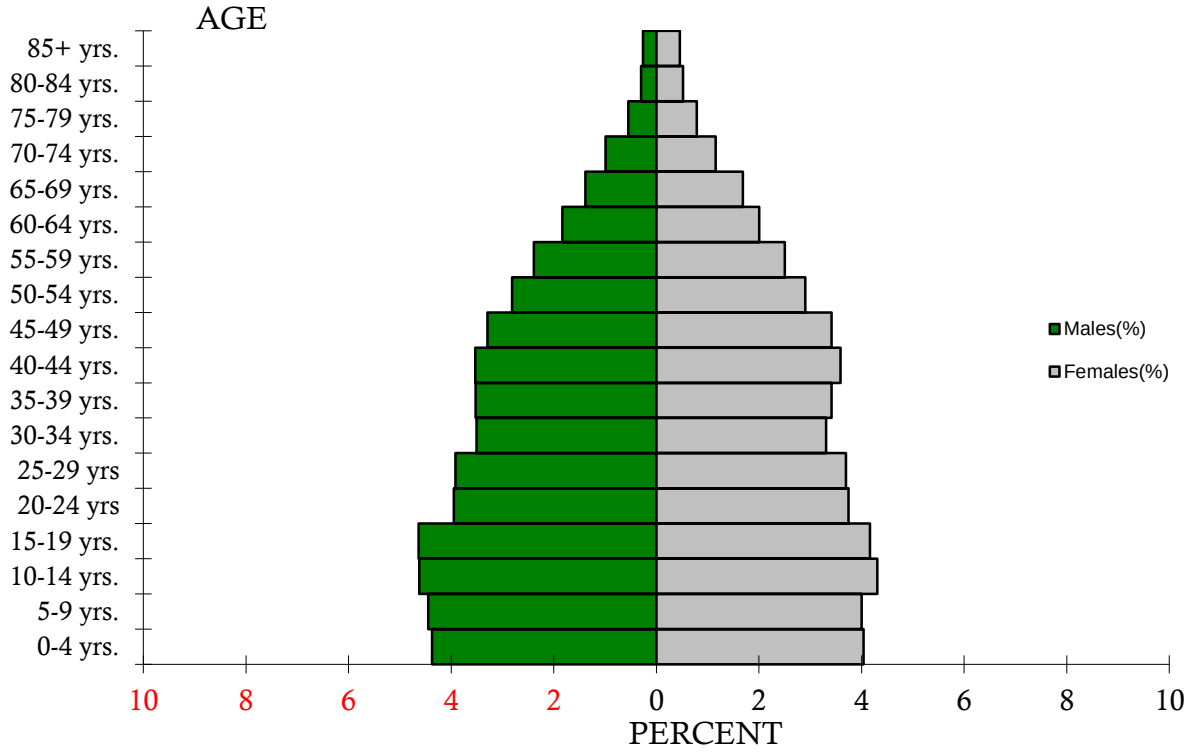
Aggeneys	Alexander Bay	Brandvlei	Bulletrap
Calvinia	Carolusberg	Concordia	Eksteensfontein
Frasersburg	Garies	Hondeklip Bay	Kamieskroon
Kleinzee	Koingnaas	Komaggas	Kuboes
Leliefontein/Kamiesberg	Loeriesfontein	Middelpos	Nababeep
Nieuwoudtville	O'Kiep	Onderste Doorns	Pella
Pofadder	Port Nolloth	Richtersveld	Sanddrift
Springbok	Steinkopf	Sutherland	Williston

The main economic activities of the district include:

- Agriculture; and

- Tourism:

The Namakwa district had a population of 115 842 people in 2011 resulting in a population density of 0.91/km^2 and had a sex ratio of 101.2. Of this population, 25.8% were under 16 years of age; 66.1% were between 15 and 64 years and 8.1% over the age of 64. The population pyramid of Namakwa is represented in **Figure 8**.



Source: (Statistics South Africa, 2011)

Figure 8: Population pyramid Namakwa

The demographic data pertaining to the Namakwa District Municipality, based on both Census 2011 and Community Survey 2016, is presented below.

	Community Survey 2016	**Census 2011**
Population	115 488	115 842
Age Structure		
Population under 15	22.5%	25.8%
Population 15 to 64	68.0%	66.1%
Population over 65	9.5%	8.1%
Dependency Ratio		
Per 100 (15-64)	47.1	51.2
Sex Ratio		

	Community Survey 2016	Census 2011
Males per 100 females	101.5	101.2
Population Growth		
Per annum	-0.07%	n/a
Labour Market		
Unemployment rate (official)	n/a	20.1%
Youth unemployment rate (official) 15-34	n/a	25.4%
Education (aged 20 +)		
No schooling	4.4%	6.6%
Matric	24.2%	18.8%
Higher education	8.0%	7.4%
Household Dynamics		
Households	37 669	33 856
Average household size	3.1	3.2
Female-headed households	37.6%	36.6%
Formal dwellings	95.2%	93.8%
Housing owned	72.6%	60.1%
Household Services		
Flush toilet connected to sewerage	67.9%	57.9%
Weekly refuse removal	81.7%	80.1%
Piped water inside the dwelling	70.5%	63.3%
Electricity for lighting	88.4%	86.5%

Witzenberg Local Municipality: Situated some 150 km north-east of Cape Town and covering a geographical area of 10 753 $km^{2,}$ Witzenberg is the largest of the local municipalities within the Cape Winelands district. The following towns are located within Witzenberg:

- Op-die-Berg
- Prince Alfred Hamlet
- Tulbagh and
- Wolseley.

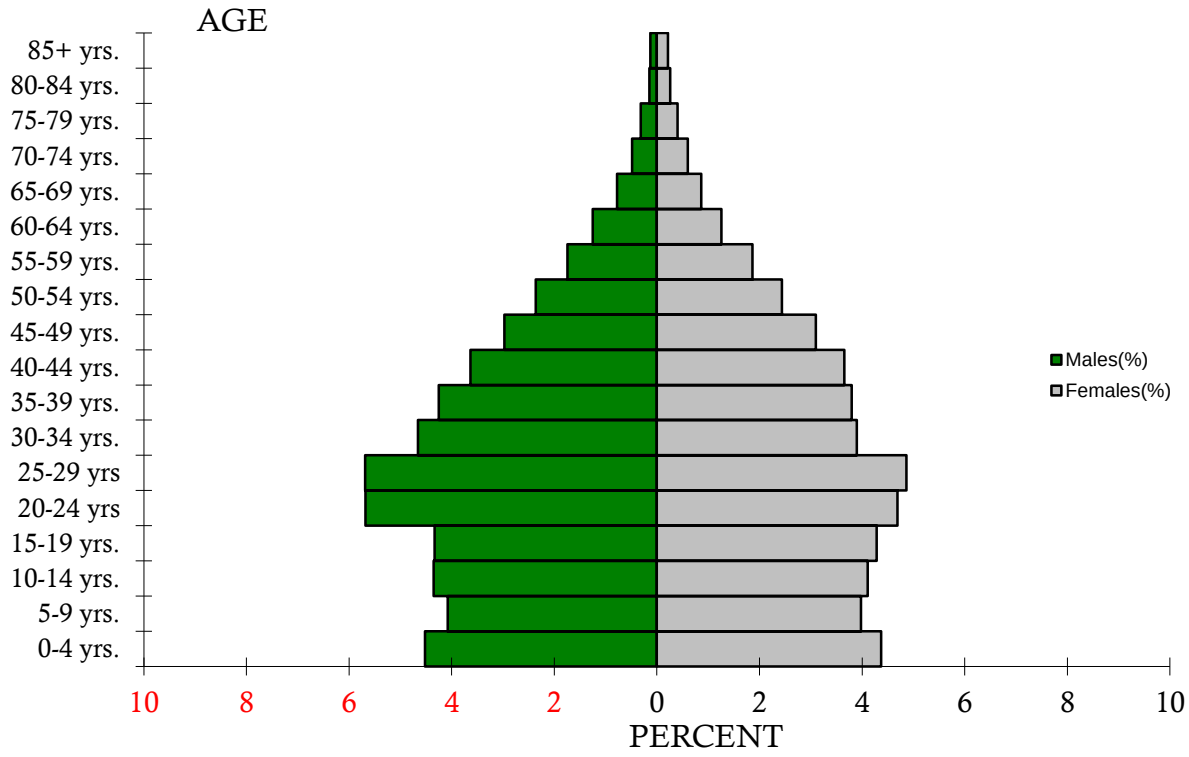
The municipality also administers the following rural areas:

- Agter-Witzenberg
- The northern portion of the Breede River Valley (Het Land van Waveren)
- Koue Bokkeveld and
- Warm Bokkeveld.

The following economic sectors form the basis of the municipal economy:

- Agriculture, forestry and fishing (29.1%)
- Finance, insurance
- Real estate and business services (22%)
- Manufacturing (16.2%)
- Wholesale and retail trade, catering and accommodation (10%)
- General government (8.4%)
- Transport, storage and communication (8%)
- Community, social and personal services (3.5%).

With a population of 115 946 people, the Witzenberg LM has a population density of 1 078/km^2. According to Census, 2011, the district has a sex ratio of 105.6 with 25.4% of the population being under 15 years; 70.4% being between 15 and 65 years and 4.2% being over 65 years of age. The population pyramid of Witzenberg Local Municipality is illustrated in **Figure 9**.



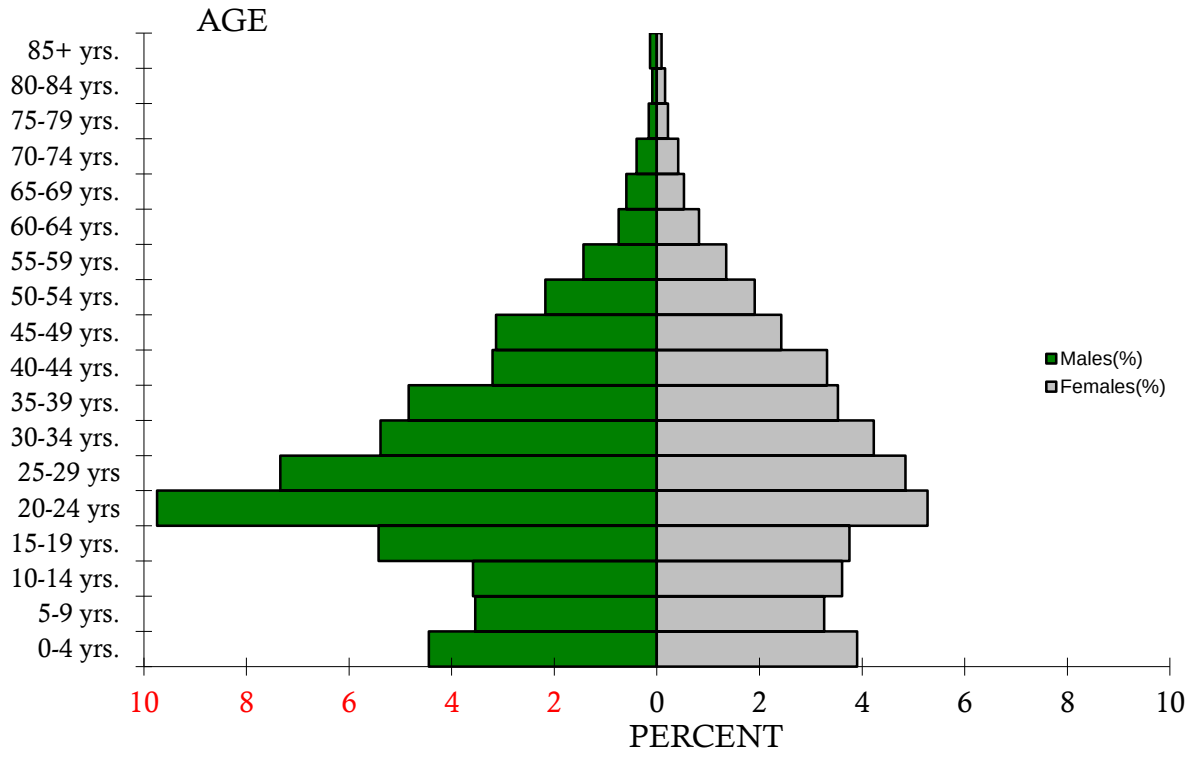
Source: (Statistics South Africa, 2011)

Figure 9: Population pyramid Witzenberg Local Municipality

The demographic data pertaining to the Witzenberg Local Municipality, based on both Census 2011 and Community Survey 2016, is presented below:

	Community Survey	Census
Population	130 548	115 946
Age Structure		
Population under 15	25.5%	25.4%
Population 15 to 64	70.9%	70.4%
Population over 65	3.5%	4.2%
Dependency Ratio		
Per 100 (15-64)	41.0	42.0
Sex Ratio		
Males per 100 females	108.4	105.6
Population Growth		
Per annum	2.70%	n/a
Labour Market		
Unemployment rate (official)	n/a	7.6%
Youth unemployment rate (official) 15-34	n/a	9.9%
Education (aged 20 +)		
No schooling	3.7%	6.6%
Matric	24.7%	18.2%
Higher education	5.9%	5.8%
Household Dynamics		
Households	35 976	27 419
Average household size	3.6	3.4
Female-headed households	29.3%	28.9%
Formal dwellings	83.3%	86.2%
Housing owned	42.8%	34.5%
Household Services		
Flush toilet connected to sewerage	92.4%	86.9%
Weekly refuse removal	87.1%	69.9%
Piped water inside the dwelling	82.2%	78.8%
Electricity for lighting	94.5%	93.4%

Ward 12 of Witzenberg Local Municipality: Statistics SA data available for Ward 12 of Witzenberg LM is only available in respect of Census 2011. On this basis, the Ward 12 covers an area of 6 551.2 km^2 and has a population of 8 096 people resulting in a population density of 1.2/km^2. The median age of the population is 26 years, with 27% being under 18; 70% being between 18 and 64 and 3% being 65 and over. With a sex ratio of 126.5, there are a higher proportion of males to females across the ward. The population pyramid for Ward 12 is illustrated in **Figure 10**.



Source: (Statistics South Africa, 2011)

Figure 10: Population pyramid Ward 12 of Witzenberg Local Municipality

In respect of population group, at 49% coloured people are the most prevalent population group in the ward followed by black African and white people at 42% and 8% respectively. At 54%, Afrikaans is the predominant home language spoken across the ward, followed by isiXhosa at 31%. Concerning levels of education, 41.8% of the population has completed Grade 9 or higher and 15% have completed Matric or higher with 82.6% of school-aged children, between 5 and 17 years, attending school.

There are 2 275 households within Ward 12 of which 13.1% live within informal dwellings; 9.5% of dwellings are fully owned or are being paid off, and 49% are occupied rent-free. The average annual household income of the ward is R 29 400. Of these households, 42.5% receive water from a regional or local service provider; 92% have access to flush or chemical toilets; 39.9% are receiving a refuse disposal service from a local authority or private company, while 45% utilise their own refuse dump.

In 2011, 63% of the population was employed of which 33% was employed within the informal and 63% within the formal sectors.

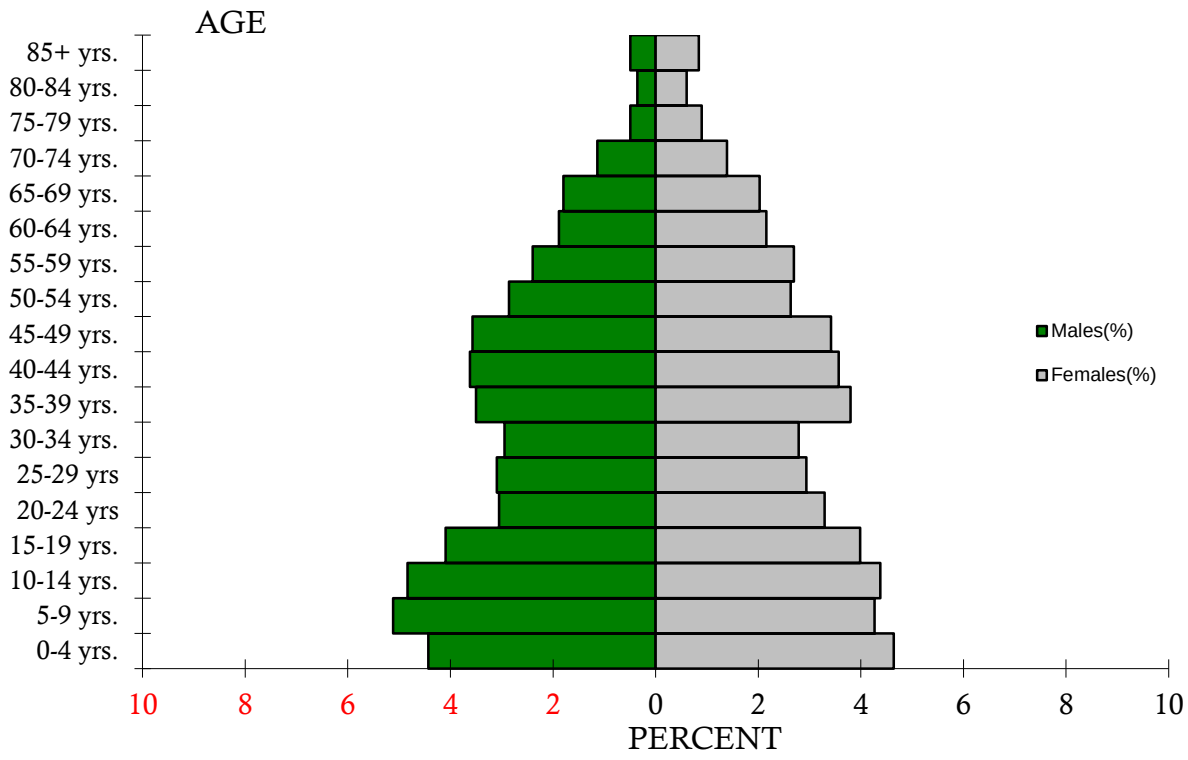
Karoo Hoogland Local Municipality: The Karoo Hoogland covers a geographical area of 30 230 km² and incorporates the following towns:

- Frasersburg
- Sutherland
- Williston

The economy of the area is based on:

- Community, social and personal services (42.5%)
- Transport, storage and communication (15%)
- Wholesale and retail trade, catering and accommodation (13.7%)
- Agriculture, forestry and fishing (13%)
- Finance, insurance, real estate and business services (8.8%)
- Manufacturing (5.9%).

With a population of 12 501 people in the Karoo Hoogland, the population density of the municipality is 0.41/km^2. Of this population, 27.8% were under 16 years of age in 2011, while 62.2% were between 15 and 64 years and 10% were over the age of 64 years. The population pyramid of the Karoo Hoogland is represented in **Figure 11**.



Source: (Statistics South Africa, 2011)

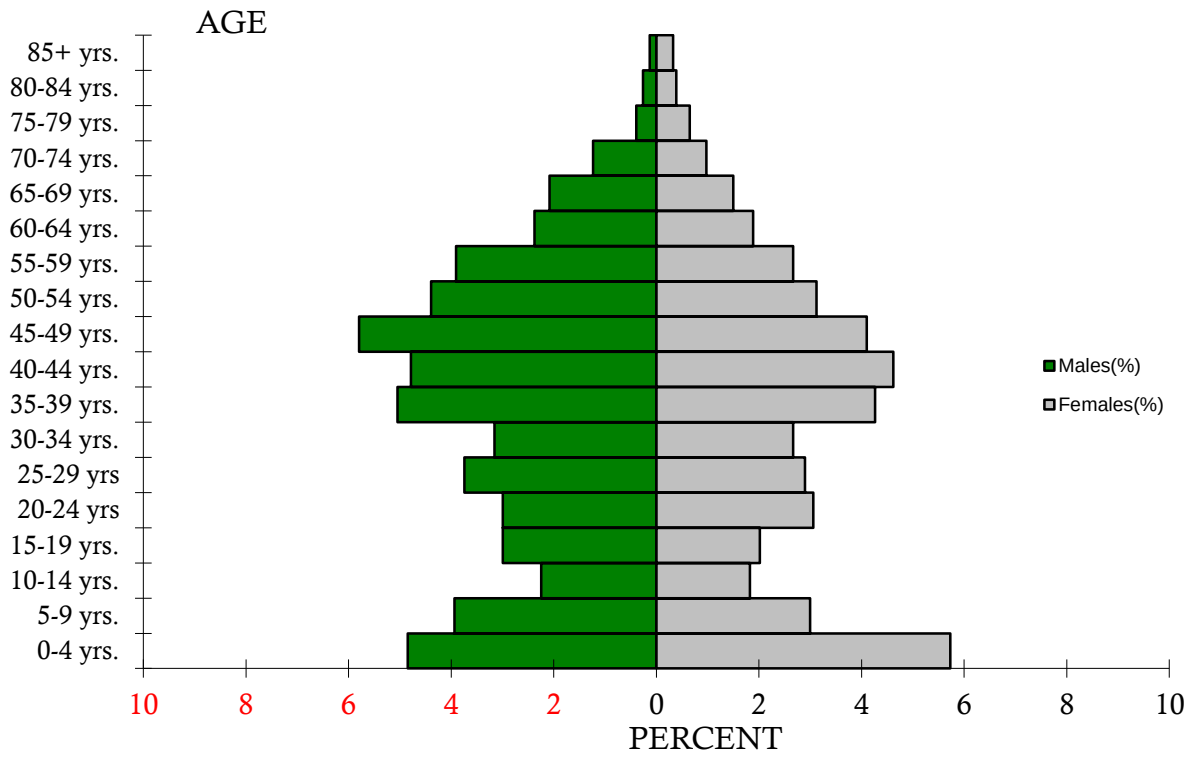
Figure 11: Population pyramid Karoo Hoogland

The demographic data pertaining to the Karoo Hoogland Local Municipality, based on both Census 2011 and Community Survey 2016 as sourced through Stats SA, is presented below.

	Community Survey	Census
Population	13 009	12 501
Age Structure		
Population under 15	25.0%	27.8%
Population 15 to 64	64.0%	62.2%
Population over 65	11.0%	10.0%
Dependency Ratio		
Per 100 (15-64)	56.2	60.8
Sex Ratio		
Males per 100 females	100.7	98.6
Population Growth		
Per annum	0.91%	n/a
Labour Market		
Unemployment rate (official)	n/a	n/a
Youth unemployment rate (official) 15-34	n/a	n/a
Education (aged 20 +)		
No schooling	13.1%	17.2%
Matric	25.8%	16.0%
Higher education	11.5%	7.9%
Household Dynamics		
Households	4 620	3 799
Average household size	2.8	3.0
Female-headed households	32.4%	31.0%
Formal dwellings	99.4%	96.9%
Housing owned	68.1%	47.4%
Household Services		
Flush toilet connected to sewerage	39.7%	39.7%
Weekly refuse removal	58.3%	63.4%
Piped water inside the dwelling	75.2%	59.7%
Electricity for lighting	67.5%	65.5%

Ward 3 Karoo Hoogland Local Municipality: Statistics SA data available for Ward 3 of Witzenberg LM is only available in respect of Census 2011. On this basis, the Ward 3 covers an area of 27 791.2 km^2 and has a population of 3 171 people resulting in a population density of 0.1/km^2. The median age of the population is 37.5 years with 24% being under 18; 67% being

between 18 and 64 and 9% being 65 and over. With a sex ratio of 118.1, there are a higher proportion of males to females across the ward. The population pyramid for Ward 3 is illustrated in **Figure 10**.



Source: (Statistics South Africa, 2011)

Figure 12: Population pyramid Ward 3 Karoo Hoogland LM

In respect of population group, at 68% coloured people are the most prevalent population group in the ward followed by white and black African people at 29% and 3% respectively. At 96% Afrikaans is the predominant home language spoken across the ward, followed by English at 2%. Concerning levels of education, 41.3% of the population has completed Grade 9 or higher and 28.8% have completed Matric or higher with 51.2% of school-aged children, between 5 and 17 years, attending school.

There are 1 405 households within Ward 3 of which 1.8% live within informal dwellings; 24% of dwellings are fully owned or are being paid off and 55% are occupied rent-free. The average annual household income of the ward is R 29 400. Of these households, 82% source water from a borehole; 56% have access to flush or chemical toilets; 11.4% are receiving a refuse disposal service from a local authority or private company, while 82% utilise their own refuse dump.

In 2011 64.4% of the population were employed of which 26% were employed within the informal and 65% within the formal sectors.

5.3 Project footprint

At a project footprint level, the project will cross the following properties:

- Portion 2 of the Farm Bakovens Kloof No 152 (2/152): C01900000000015200002
- Remainder of the Farm Bakovens Kloof No 152 (RE/152): C01900000000015200000
- Portion 3 of the Farm Baakens Rivier No 155 (3/155): C01900000000015500003
- Remainder of the Farm Baakens Rivier No 155 (RE/155): C01900000000015500000
- Portion 1 of the Farm Gats Rivier No 156 (1/156): C01900000000015600001
- Remainder of the Farm Gats Rivier No 156 (RE/156): C01900000000015600000
- Portion 1 of the Farm Amandelboom No 158 (1/158): C01900000000015800001
- Remainder of the Farm Oliviers Berg No 159 (RE/159): C01900000000015900000
- Portion 2 of the Farm Bantamsfontein No 168 (2/168): C01900000000016800002
- Portion 4 of the Farm Bantamsfontein No 168 (4/168): C01900000000016800004
- Portion 5 of the Farm Bantamsfontein No 168 (5/168): C01900000000016800005
- Portion 7 of the Farm Bantamsfontein No 168 (7/168): C01900000000016800007
- Portion 13 of the Farm Bantamsfontein No 168 (13/168): C01900000000016800013
- Remainder of the Farm Bantamsfontein No 168 (RE/168): C01900000000016800000
- Remainder of the Farm Lower Roodewal No 169 (RE/169): C01900000000016900000
- Remainder of the Farm Matjes Fontein No 194 (RE/194): C07200000000019400000
- The Farm Platfontein No 240 (240): C01900000000024000000
- The Farm Die Brak No 241 (241): C01900000000024100000
- Portion 1 of the Farm Rietpoort No 243 (1/243): C01900000000024300001
- Remainder of the Farm Rietpoort No 243 (RE/243): C01900000000024300000
- Remainder of the Farm Tooverberg No 244 (RE/244): C01900000000024400000

Most of these properties are located within Witzenberg non-urban (NU) area, Sub Place 165001001 (Census, 2011) and Ward 12 of the Witzenberg Local Municipality. However, one property; the Remainder of the Farm Matjes Fontein No 194 (RE/194) is located within the Karoo Hoogland NU Sub Place 367002001 (Census, 2011) and Ward 3 of the Karoo Hooglands Local Municipality.

The area is sparsely populated with Witzenberg NU having a population density of 4.91/km^2 and the Karoo Hoogland NU a population density of 0.10/km^2. The demographic data in respect of these areas are as follows.

Witzenberg NU listed as Sub Place 165001001 in respect of Census 2011:

Geographic area = 10 632.04 km²

Population = 52 200 people

Population density = 4.91/km²

Households = 11 278

Household density = 1.06/km²

Gender	**People**	**Percentage**
Male	28 097	53.83%
Female	24 103	46.17%
Age	**People**	**Percentage**
0–4	4 332	8.30%
5–9	3 844	7.36%
10–14	4 180	8.01%
15–19	4 310	8.26%
20–24	6 053	11.60%
25–29	6 088	11.66%
30–34	4 907	9.40%
35–39	4 483	8.59%
40–44	3 840	7.36%
45–49	3 129	5.99%
50–54	2 513	4.81%
55–59	1 743	3.34%
60–64	1 159	2.22%
65–69	689	1.32%
70–74	424	0.81%
75–79	253	0.48%
80–84	130	0.25%
85+	123	0.24%
Population group	**People**	**Percentage**
Coloured	33 864	64.87%
Black African	14 485	27.75%
White	3 577	6.85%
Other	204	0.39%
Indian or Asian	70	0.13%
First language	**People**	**Percentage**
Afrikaans	38 308	74.37%
isiXhosa	8 136	15.79%
Sesotho	3 347	6.50%
English	912	1.77%

Setswana	246	0.48%
Sign language	175	0.34%
Other	131	0.25%
isiNdebele	77	0.15%
SiSwati	62	0.12%
isiZulu	50	0.10%
Sepedi	35	0.07%
Tshivenda	17	0.03%
Xitsonga	15	0.03%
Not applicable	*688*	

Karoo Hoogland NU listed as Sub Place 367002001 in respect of Census 2011:

Geographic area = 32 061.07 km²

Population = 3 356 people

Population density = 0.10/km²

Households = 1 450

Household density = 0.05/km²

Gender	**People**	**Percentage**
Male	1 827	54.44%
Female	1 528	45.53%
Age	**People**	**Percentage**
0–4	352	10.49%
5–9	230	6.85%
10–14	134	3.99%
15–19	162	4.83%
20–24	235	7.00%
25–29	221	6.58%
30–34	198	5.90%
35–39	312	9.29%
40–44	322	9.59%
45–49	328	9.77%
50–54	250	7.45%
55–59	214	6.37%
60–64	134	3.99%
65–69	120	3.57%
70–74	80	2.38%
75–79	32	0.95%
80–84	20	0.60%
85+	13	0.39%

Population group	People	Percentage
Coloured	2 333	69.52%
White	870	25.92%
Black African	136	4.05%
Indian or Asian	13	0.39%
Other	4	0.12%
First language	**People**	**Percentage**
Afrikaans	3 210	97.21%
English	44	1.33%
Sign language	16	0.48%
Setswana	13	0.39%
isiXhosa	9	0.27%
Sesotho	5	0.15%
Sepedi	3	0.09%
isiNdebele	1	0.03%
Not applicable	*54*	

5.4 Towns in the Area

The closest urban areas to the site of the project are the towns of:

- Sutherland
- Matjiesfontein and
- Laingsburg.

Sutherland

The town of Sutherland, founded in 1857, served as a centre for the sheep farming industry in the area. Recent economic activates in the town have been spurred on by the establishment of the South African Astronomical Observatory in the area. This has resulted in an increase in tourism to the region which has driven up the demand for accommodation and eating establishments such as bars and restaurants. This greater interest being shown towards the region has also driven up property values in and around the town.

The demographic data regarding Sutherland, listed as Sub Place 367004001 in respect of Census 2011, is as follows:

Geographic area = 35.98 km²

Population = 2 836 people

Population density = 78.82/km²

Households = 718

Household density = 19.95/km²

Gender	People	Percentage
Female	1 513	53.35%
Male	1 323	46.65%
Population group	**People**	**Percentage**
Coloured	2 219	78.24%
White	360	12.69%
Black African	226	7.97%
Indian or Asian	23	0.81%
Other	8	0.28%
First language	**People**	**Percentage**
Afrikaans	2 360	95.90%
English	47	1.91%
isiXhosa	19	0.77%
Setswana	9	0.37%
Tshivenda	7	0.28%
isiNdebele	6	0.24%
Sesotho	4	0.16%
Sign language	3	0.12%
Sepedi	2	0.08%

Other data	
Young (0-14)	28,2%
Working Age (15-64)	57,6%
Elderly (65+)	14,2%
Dependency ratio	73,7
Sex ratio	87,4
Population density	79 persons/km^2
No schooling aged 20+	17,5%
Higher education aged 20+	8,2%
Matric aged 20+	15,1%
Average household size	3,4
Female-headed households	45,3%
Formal dwellings	94,4%

Housing owned/paying off	52,1%
Flush toilet connected to sewerage	19,4%
Weekly refuse removal	98,1%
Piped water inside the dwelling	43,2%
Electricity for lighting	95,4%

Matjiesfontein

The town of Matjiesfontein, which falls within the Laingsburg Local Municipality and owes its origins to the railway, was established in the 1880s. Matjiesfontein's Victorian character was preserved, and the town was declared a National Monument in 1975 with the railway station and cemetery subsequently being declared National Monuments in 1984 and 1994 respectively. On an economic basis, apart from serving as a centre for farmers in the area, the town also has a high tourist attraction associated with its preserved Victorian charm. This has resulted in the hospitality industry being relatively active in the area with such establishments as The Lord Milner Hotel regarded as attractive tourist destinations.

The demographic data regarding Matjiesfontein, listed as Sub Place 181003001 in respect of Census 2011, is as follows:

Geographic area = 1.22 km²
Population = 422 people
Population density = 346.26/km²
Households = 94
Household density = 77.13/km²

Gender	**People**	**Percentage**
Female	226	53.55%
Male	196	46.45%
Population group	**People**	**Percentage**
Coloured	412	97.63%
Black African	5	1.18%
White	3	0.71%
Other	2	0.47%
First language	**People**	**Percentage**
Afrikaans	409	97.38%
Setswana	5	1.19%
isiNdebele	4	0.95%

English	1	0.24%
Sesotho	1	0.24%
Not applicable	2	

Other data

Young (0-14)	30,3%
Working Age (15-64)	66,4%
Elderly (65+)	3,3%
Dependency ratio	50,7
Sex ratio	86,7
Population density	346 persons/km^2
No schooling aged 20+	9,4%
Higher education aged 20+	1,6%
Matric aged 20+	19,3%
Average household size	4,3
Female-headed households	48,9%
Formal dwellings	88,4%
Housing owned/paying off	35,1%
Flush toilet connected to sewerage	29,8%
Weekly refuse removal	98,9%
Piped water inside the dwelling	37,9%
Electricity for lighting	93,7%

Laingsburg

The town of Laingsburg, which together with the towns of Matjiesfontein, Bergsig and Goldnerville make up the Laingsburg Local Municipality, is located along the National Road 1 (N1), which runs the entire length of South Africa, between Cape Town and the Beit Bridge border post. On an economic level, Laingsburg serves as an agricultural centre for farmers in the region with agricultural activities such as livestock farming (goats and sheep) crops (alfalfa or Lucerne) as well as fruit and vegetables.

The demographic data regarding Laingsburg, listed as Sub Place 181002001 in respect of Census 2011, is as follows:

Geographic area = 723.72 km²
Population = 5 667 people
Population density = 7.83/km²
Households = 1 512
Household density = 2.09/km²

Gender	**People**	**Percentage**

Female	2 943	51.93%
Male	2 725	48.09%
Population group	**People**	**Percentage**
Coloured	4 665	82.32%
White	481	8.49%
Black African	466	8.22%
Other	39	0.69%
Indian or Asian	16	0.28%
First language	**People**	**Percentage**
Afrikaans	5 052	93.59%
English	90	1.67%
isiXhosa	86	1.59%
Setswana	42	0.78%
isiZulu	35	0.65%
Sesotho	27	0.50%
Other	17	0.31%
Sign language	15	0.28%
Tshivenda	9	0.17%
Xitsonga	9	0.17%
Sepedi	7	0.13%
SiSwati	5	0.09%
isiNdebele	4	0.07%
Not applicable	*269*	

Other data	
Young (0-14)	29,6%
Working Age (15-64)	63%
Elderly (65+)	7,4%
Dependency ratio	58,8
Sex ratio	92,6
Population density	8 persons/km^2
No schooling aged 20+	10,4%
Higher education aged 20+	8,4%
Matric aged 20+	17,6%
Average household size	3,5
Female-headed households	40,6%
Formal dwellings	97,9%
Housing owned/paying off	44%

Flush toilet connected to sewerage	95,2%
Weekly refuse removal	87,4%
Piped water inside the dwelling	71,8%
Electricity for lighting	97,6%

6 IDENTIFICATION OF IMPACTS

The social impact variables considered across the project are in accordance with Vanclay's list of social impact variables clustered under the following main categories as adapted by Wong (Vanclay, 2002; Wong, 2013) and include:

1. Health and social well-being
2. Quality of the living environment (Liveability)
3. Economic
4. Cultural

These categories are not exclusive and at times tend to overlap, as certain processes may have an impact within more than one category.

6.1 Health and Social Wellbeing

The health and social wellbeing impacts related to the project include.

- Annoyance, air quality and noise
- Electromagnetic Fields (EMFs)
- Increase in crime
- Increased risk of HIV infections
- An influx of construction workers
- Hazard exposure

These impacts are addressed separately below.

6.1.1 Annoyance, air quality and noise

Annoyance, dust and noise will be more evident during the construction phase of the project, as construction activities will result in the generation of dust and noise from construction vehicles and equipment. Due to the scale and duration of the project, it is unlikely that this impact will be significant.

It is most unlikely that there will be any significant impact associated with annoyance, dust and noise over the operational phase of the project as this will be associated with maintenance and repair activities, which will be sporadic and limited.

6.1.2 Electromagnetic Fields

There has been increasing public concern regarding the health effects that the exposure to electromagnetic fields can cause. Symptoms reported by the public range from the less severe, such as headaches; fatigue; nausea; loss of libido and anxiety, to the more severe depression; suicide; Alzheimer's and childhood cancers amongst others. Despite these perceptions, the World Health Organisation (WHO) concludes that:

> "*To date, scientific evidence does not support a link between these symptoms and exposure to electromagnetic fields. At least some of these health problems may be caused by noise or other factors in the environment, or by anxiety related to the presence of new technologies*" (Electromagnetic fields (EMF), 2020).

Notwithstanding this, with regard to the impact that EMFs are likely to have in respect of this project, the more relevant issue is the perceptions that people hold regarding the general health effects of EMFs. In this regard, it is quite clear that many people perceive EMFs to be hazardous to health (Fernandez, Ng, & Kaur, 2019; Zeleke, et al., 2019; Gallastegi, et al., 2019). Consequently, given the choice, people will tend to avoid exposure to EMFs rather than take the risk and are quite likely to avoid facilities that have power lines, transformers and cellular phone towers within close proximity. Apart from the potential health hazards associated with EMFs, perceptions regarding EMFs are likely to have a negative impact on the sense of place of the area. In this regard, the impact of EMFs associated with the project can only be considered at a superficial level. Any in-depth understanding in this regard falls within the disciplines of medicine and physics. For further details regarding health risks associated with EMFs, including a comprehensive list of references, see the following source.[10]

6.1.3 Increase in crime

The Witzenberg municipal area falls under the Ceres Police Precinct which recorded 2 542 crimes across the precinct between 1st January and 25th October 2020[11]. Although the project largely falls within this precinct, a small section lies within the Sutherland Precinct, which recorded 94 crimes over the same period as Ceres. The Laingsburg Police Precinct[12], which includes the towns of Laingsburg and Matjiesfontein, recorded 703 crimes between January and October 2020. Considering the potential for criminal activities associated with the project, it is often opportunistic

[10] National Cancer Institute at the National Institutes of Health https://www.cancer.gov/about-cancer/causes-prevention/risk/radiation/electromagnetic-fields-fact-sheet#what-do-expert-organizations-conclude-about-the-cancer-risk-from-emfs
[11]According to Crime Stats SA as at 19 July 2020 https://www.crimestatssa.com/index.php

crime such as, stock theft; the abuse of alcohol and relationship-related crime that is associated with construction activities.

Although the construction phase of the project is likely to carry a higher risk of associated criminal activities than the operational phase, due to the nature of the project and limited workforce, the magnitude of these risks is likely to be limited during construction and negligible over the operational phase.

6.1.4 Increased risk of HIV infections

Considering the project location within the Witzenberg municipality being rather remote and close to the Namaqua and Central Karoo districts, the area is most likely to have one of the lowest HIV prevalence rates in the country; with the Namaqua District Municipality having a prevalence rate of 2.3% followed by the Central Karoo District with a prevalence rate of 6.9%. The fact that sexually transmitted diseases tend to be spread by construction and transport workers, together with the high prevalence of HIV across the rest of South Africa, opens the area to a high risk of HIV infections (Singh & Malaviya, 1994; Ramjee & Gouws, 2002; Meintjes, Bowen, & Root, 2007; World Bank Group, 2016; Bowen, Dorrington, Distiller, Lake, & Besesar, 2008; Bowen P. , Govender, Edwards, & Cattell, 2016; Kikwasi & Lukwale, 2017; Bowen P. , Govender, Edwards, & Lake, 2018).

Although this risk is likely to be at its highest level during the construction phase of the project, as the construction workforce increases and materials and equipment are delivered to the site; because of the limited nature of the project and small workforce, it is most likely to be limited. Over the operational phase of the project, the risk of this impact is likely to be extremely low.

6.1.5 An influx of construction workers

It is estimated that over the construction period, which will stretch over ~8 to 24 month, the peak construction workforce will reach approximately 50 workers; of these, the majority are likely to be recruited locally. Consequently, the size of the workforce and relatively short duration of the construction phase are likely to result in this impact remaining low during construction with little to no effect associated with the operational phase.

6.1.6 Hazard exposure

The use of heavy equipment and vehicles and an increase in vehicle traffic within the vicinity of the construction site will result in an increased risk to the personal safety of people and animals. Of particular concern are increased hazards faced by pedestrians, cyclists and motorists with emphasis on vulnerable groups such as children and the elderly. However, due to the low population numbers within the vicinity of the proposed development and the limited nature and duration of construction,

this risk is likely to be low with the appropriate mitigation measure reducing this impact to very low. There is, however, an increased risk of fires brought about through construction workers lighting fires for cooking and warmth during cold periods. Successful implementation of the recommended mitigation measures will result in this risk remaining at acceptable levels.

6.2 Quality of the Living Environment

The following quality of the living environment impacts are related to the project.

- Disruption of daily living patterns
- Transformation of the sense of place.

6.2.1 Disruption of daily living patterns

If there are any disruptions to daily living patterns these are likely to be minimal and restricted to the construction phase of the project. This impact will be mainly associated with the site and the main access roads. These disruptions are only likely to be associated with the delivery of materials and machinery to site and the transportation of workers to and from the site. Living patterns are most unlikely to be adversely affected over the operational phase of the project.

6.2.2 Transformation of the sense of place

The overhead power lines are visible and will result in a transformation of the landscape from that of a rural setting to what some may consider having more of an industrial aura. This issue remains controversial, as a sense of place is personal and subjective and is therefore difficult to assess. However, in this regard the visual specialist points out that:

> "*The area is not however typically valued for its tourism significance and there is limited human habitation resulting in relatively few potentially sensitive receptors in the area. A total of twenty-three (23) potentially sensitive receptors were identified in the study area, two (2) of which are considered to be sensitive receptors as they are linked to leisure/nature-based tourism activities in the area"* " (SiVEST SA (Pty) Ltd, 2020, p. 77).

From a social perspective, visual characteristics are one aspect of a sense of place, which is influenced by an array of sensory stimuli.

6.3 Economic

The economic impacts related to the project include.

- Job creation and skills development
- Socio-economic stimulation.

6.3.1 Job creation and skills development

Over the construction phase, the project will lead to the creation of both direct and indirect jobs. The impact of this, in respect of both job creation and skills development, will be limited as only 33 temporary jobs will be created during construction.

6.3.2 Socio-economic stimulation

Apart from job creation and procurement spend; the project will also have broader positive socio-economic impacts. In this sense, the greatest benefit attached to the project is that it will provide the infrastructure required to connect the proposed Oya Energy Facility, and potentially other nearby developments, into the National Grid. This will have significant economic benefit associated with the security of electricity supply across the country over the operational phase of the project.

6.4 Cultural Impacts

At a social level, it is likely that any cultural impacts would be associated with sensitive archaeological and/or heritage sites that may be found. In this regard, archaeological, palaeontological and heritage impact assessments were undertaken, and it was found that:

Archaeological:

> "*Based on the assessment completed, the area proposed for development has an overall low archaeological sensitivity. It is unlikely that the proposed development of the 132kV overhead power line will negatively impact on significant archaeological heritage as the footprint of the powerline infrastructure is limited*" (CTS Heritage, 2020a, p. 26).

Heritage:

> "*The proposed development is unlikely to have a negative impact on significant heritage resources situated within the corridor for the proposed Oya OHL on condition that the proposed mitigation measures including buffer areas and no-go areas are implemented*" (CTS Heritage, 2020b, p. 72).

Palaeontological:

"The proposed OHL development may proceed. It is unlikely that this construction will have a great effect on significant palaeontological heritage" (CTS Heritage, 2020c, p. 18).

7 OVERALL IMPACT RATING

The impacts are assessed below as they apply to the following project phases:

- Planning / pre-construction
- Construction
- Operation and
- Decommissioning.

Where appropriate optimisation and mitigation measures are also suggested.

7.1 Planning / Pre-construction

The need for Eskom to purchase a specified amount of electricity from independent power producers has recently been gazetted (Government Gazette No. 43734 Notice No. 1015 Department of Mineral Resources and Energy, 2020). In addition, a review of applicable policy and legislation shows support on an international; national; regional and local government level for the provision of renewable energy into the National Grid. In this sense, the project is a necessary component in meeting these requirements by providing the necessary infrastructure to connect the proposed Oya Energy Facility (DEFF Ref No.: 14/12/16/3/3/2/2009), and potentially other nearby developments, into the National Grid and consequently positively fitting with relevant planning criteria.

A sensitivity verification, undertaken on 08 October 2020, did not identify any socially linked restrictions, exclusions or prohibitions that apply to the proposed development site or any socially sensitive features on the site. It is therefore unlikely that any negative social impacts will be associated with the planning/pre-construction phase of the project.

7.2 Construction Phase

Most of the impacts discussed above apply over the short-term to the construction phase of the project and include:

- Health and social wellbeing impact;
  - Annoyance, air quality and noise
  - Increase in crime
  - Increased risk of HIV infections
  - An influx of construction workers

    - Hazard exposure.
- Quality of the living environment;
    - Disruption of daily living patterns.
- Economic
    - Job creation and skills development
    - Socio-economic stimulation.

These impacts are assessed and presented, together with mitigation and optimisation measures, in **Table 2** below.

Table 2: Construction impacts

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Construction																				
Health & social wellbeing	Air quality	1	3	1	1	1	1	7	-	Low	Ensure that dust suppression measures, such as damping down of unsealed roads where necessary are applied.	1	3	1	1	1	1	7	-	Low
	Noise	1	1	1	1	1	1	5	-	Low	Ensure that no construction activity occurs near residences between 18:30 and 06:30 during the week and between 08:30 and 16:30 over weekends.	1	1	1	1	1	1	5	-	Low
	Increase in crime	1	2	3	2	1	2	18	-	Low	Ensure that construction workers are identifiable. All workers should carry identification cards and wear identifiable clothing. Encourage local people to report any suspicious activity associated with the construction sites through the establishment of a community liaison forum. Prevent loitering within the vicinity of the construction camp and construction sites.	1	2	3	2	1	2	18	-	Low
	Increased risk of HIV infections	3	2	3	3	3	3	42	-	Medium	Ensure that an onsite HIV Infections Policy is in place and that construction workers have easy access to condoms. Expose workers to a health and HIV/AIDS awareness educational program.	3	2	3	3	3	3	42	-	Medium
	Influx of construction workers	1	4	1	1	1	1	8	-	Low	Communicate the limitation of opportunities created by the project through Community Leaders and Ward Councillors. Draw up a recruitment policy in consultation with the Community Leaders and Ward Councillors of the area and ensure compliance with this policy.	1	4	1	1	1	1	8	-	Low

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Construction																				
	Hazard exposure	2	2	2	2	1	2	18	-	Low	Ensure all construction equipment and vehicles are properly maintained at all times. Ensure that operators and drivers are properly trained and make them aware, through regular toolbox talks, of any risk they may pose to the community. Place specific emphasis on the vulnerable sector of the population, such as children and the elderly. Ensure that fires lit by construction staff are only ignited in designated areas and that the appropriate safety precautions, such as not lighting fires in strong winds and completely extinguishing fires before leaving them unattended, are strictly adhered to. Make staff aware of the dangers of fire during regular toolbox talks.	2	2	2	2	1	2	18	-	Low
Quality of the living environment	Disruption of daily living patterns	2	2	1	2	1	1	8	-	Low	Ensure that, at all times, people have access to their properties and to social facilities.	2	2	1	2	1	1	8	-	Low
Economic	Job creation and skills development	2	4	2	2	1	1	11	+	Low	Wherever feasible, local residents should be recruited to fill semi and unskilled jobs. Women should be given equal employment opportunities and encouraged to apply for positions. A skills transfer plan should be put in place at an early stage and workers should be given the opportunity to develop skills which they can use to secure jobs elsewhere post-construction.	2	4	2	2	1	1	11	+	Low
	Socio-economic stimulation	3	4	2	3	1	1	13	+	Low	A procurement policy promoting the use of local business should, where possible, be put in place to be applied throughout the construction phase.	3	4	2	3	1	1	13	+	Low

7.3 Operational Phase

The social impacts that apply to the operational phase of the project are:

- Health and wellbeing
  - Electromagnetic fields
- Quality of the living environment
  - Transformation of the sense of place and
- Economic
  - Socio-economic stimulation

These impacts are assessed and presented, together with mitigation and optimisation measures, in **Error! Not a valid bookmark self-reference.**

Table 3: Operational impacts

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR)	S
Operational Phase																				
Health & wellbeing	Electromagnetic fields	1	3	1	3	3	2	22	-	Low	Ensure that were ever possible the power line is routed away from areas of high human and animal habitat. Establish a grievance mechanism and deal with grievances transparently.	1	2	1	3	3	2	20	-	Low
Quality of the living environment	Transformation of the sense of place	3	4	3	3	3	2	32	-	Medium	Apply the mitigation measures suggested in the Visual Impact Assessment Report. A Grievance Mechanism should be initiated and all grievances should be dealt with transparently. The mitigation measures recommended in the Heritage and Palaeontology Impact Assessment should be followed.	3	4	3	3	3	2	32	-	Medium
Economic	Socio-economic stimulation	4	4	2	3	3	2	32	+	Medium	The power line will revert to Eskom and become an Eskom asset over the operational phase. Consequently, optimisation measures as they apply in respect to similar Eskom assets would also apply in this in this case.	4	4	2	3	3	2	32	+	Medium

7.4 Decommissioning

Considering the time to decommissioning, the uncertainty of what would exactly occur over this period and the significance of the impact in isolation; it would be rather meaningless to attach assessment criteria to decommissioning at this point. Apart from this, once the project is commissioned it will become an Eskom and as such could have an extended life span.

7.5 'No-go' Impact

The 'no-go' option would mean that the social environment would not be affected, as the status quo would remain intact. The impact of this is that the opportunity to connect the proposed Oya Energy Facility as well as the potential of connecting other nearby developments to the national grid will be lost. This will have a negative social impact, as it will compromise national efforts in ensuring the security of energy supply. In addition, national efforts to reduce CO_2 emissions through increasing renewable energy capacity would also be compromised without the means of connecting these renewable energy facilities in the area to the National Grid. The 'no-go' alternative is assessed in **Table 4**.

Table 4: 'No-go' impacts

IMPACT TABLE	
Environmental Parameter	No project alternative
Issue/Impact/Environmental Effect/Nature	No project (i.e. Status quo)
Extent	National
Probability	Possible
Reversibility	Completely reversible
Loss of resources	Significant loss of resources
Duration	Long-term
Intensity/magnitude	Medium
Significance Rating	Medium negative
Impact rating	
Extent	4
Probability	4
Reversibility	3
Irreplaceable loss	3
Duration	3
Intensity/magnitude	3
Significance rating	-51 (high negative)

7.6 Cumulative Impacts

The projects (associated power lines and substaions) listed in **Table 5** and illustrated in **Figure 13** are within a 35 km radius of the project site.

Table 5: Renewable energy developments within a 35 km radius of the site

Applicant	Project	Technology	Capacity	Status of Application / Development
Oya Energy (Pty) Ltd	Oya Energy Facility	Hybrid Facility (FBGF)	305 MW	EIA Process underway
Brandvalley Wind Farm (Pty) Ltd	Brandvalley WEF	Wind	140 MW	Approved
Biotherm Energy (Pty) Ltd	Esizayo WEF	Wind	140 MW	Approved
African Clean Energy Developments Renewables	Hidden Valley (Karusa & Soetwater) WEF	Wind	140 MW	Under Construction
Karreebosch Wind Farm (Pty) Ltd	Kareebosch WEF	Wind	140 W	Approved
Rondekop Wind Farm (Pty) Ltd	Rondekop WEF	Wind	325 MW	Approved
Kudusberg Wind Farm (Pty) Ltd	Kudusberg WEF	Wind	325 MW	Approved
South Africa Mainstream Renewable Power	Perdekraal West WEF	Wind	150 MW	Approved
South Africa Mainstream Renewable Power	Perdekraal East WEF	Wind	110 MW	Operational
Rietkloof Wind Farm (Pty) Ltd	Rietkloof WEF	Wind	186 MW	Approved
Roggeveld Wind Power (Pty) Ltd	Roggeveld WEF	Wind	140 MW	Under Construction
ENERTRAG SA (Pty) Ltd	Tooverberg WEF	Wind	140 MW	Approved

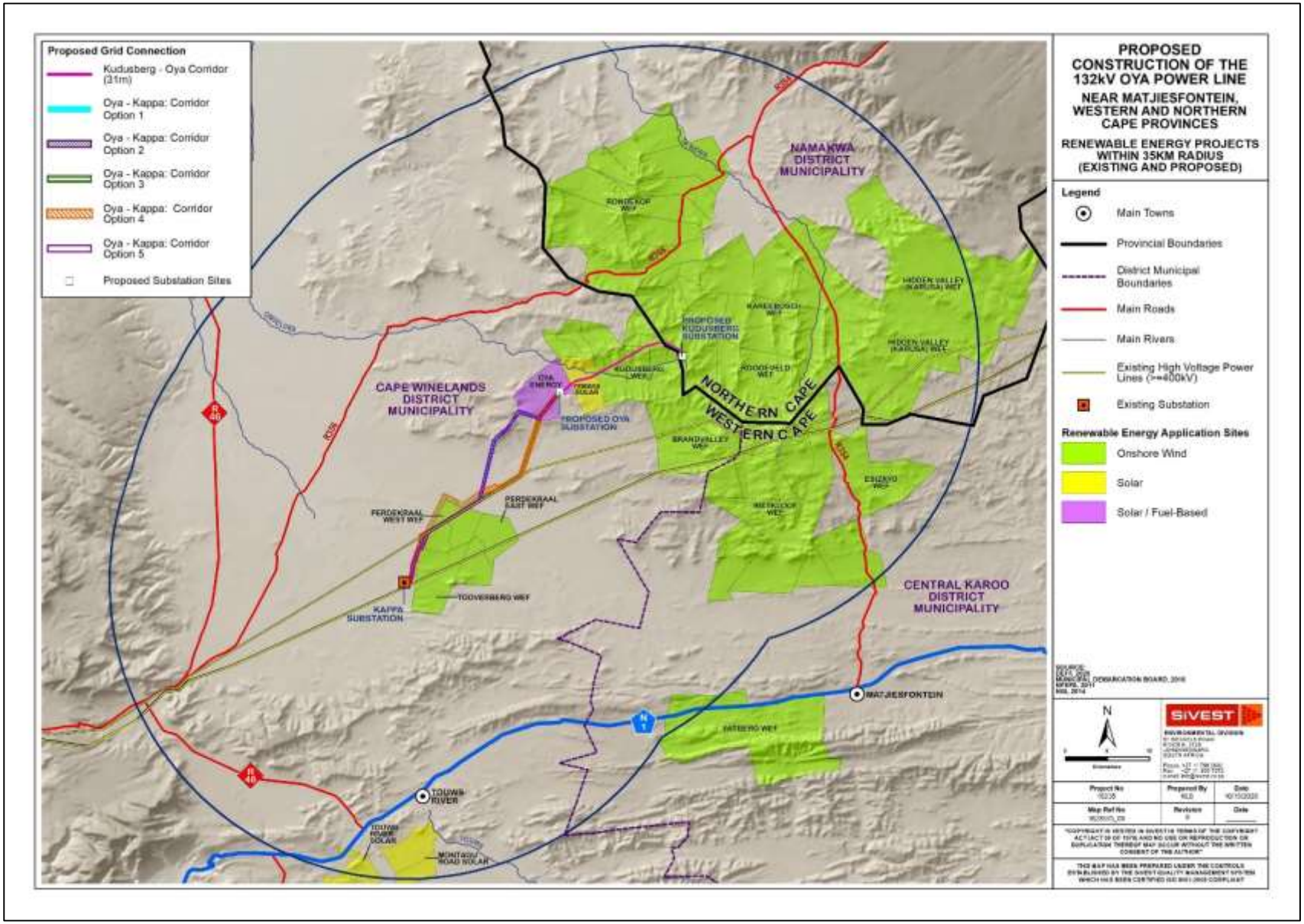


Figure 13: Renewable energy developments within a 35 km radius of the site

The following social issues were raised in the specialist reports pertaining to some of the renewable energy initiatives (including associated grid connections) identified above:

- **Positive impacts**
  - Stimulation of economy
  - Job creation; impacts associated with the construction phase are generally short term
  - Increased demand for services
  - Increased government revenue
  - Skills development
  - Local upliftment initiatives
  - Sustainable household income
  - Establishment of renewable energy infrastructure.
- ***Negative impacts***
  - Potential increase in criminal activity
  - Impact on surrounding land uses
  - Sense of place
  - An influx of construction workers
  - Impact on family and community relations – STDs and HIV
  - Risk of stock theft, poaching, and damage to farm infrastructure.
- **Indirect impacts**
  - Skills and development – increased employability
- **Decommissioning Phase**
  - Local economy stimulation
  - Temporary increase in employment and income.
- **Cumulative impacts**
  - Stimulation of economy
  - Impact associated with increases in traffic
  - Development of additional renewable energy facilities – the increased potential for job creation
  - Impact on family and community relations – STDs and HIV
  - Sense of place
  - Pressure on municipal and social services
- **No-Go option**
  - Loss of renewable energy infrastructure
  - High carbon emissions
  - Unsustainable way to produce electricity

- Overall social impact

The details of the reports from which these impacts have been sourced are provided in **Table 6**.

Table 6: List of some SIA reports for projects within a 35 km radius

Date	Title of report	Consultant responsible for the report
January 2016	Rietkloof Wind Farm (Pty) Ltd	Tony Barbour Environmental Consulting and Research
January 2016	Brandvalley Wind Farm (Pty) Ltd	Tony Barbour Environmental Consulting and Research
March 2015	Karreeboch Wind Farm (Pty) Ltd	Tony Barbour Environmental Consulting and Research
October 2018	Kudusberg Wind Energy	Urban-Econ Development Economists
October 2020	Oya Energy Facility	Dr Neville Bews & Associates

In response to the various developments within the Karoo, there has been a counter-reaction amongst some communities opposed to this relatively sudden change to what was previously an isolated, tranquil and pristine environment. In this vein, the Heritage Association of South Africa published an undated appeal to the Department of Environment Forestry and Fisheries to consider the need for a cumulative impact assessment with regard to the cumulative effect of mining and energy developments within the area[13]. Another article cited in the Karoo News Group appeal is a criticism of the cumulative effects of the renewable energy sector, highlighting environmental questions regarding wind farms[14]. Apart from the general reaction towards the cumulative effects of renewable energy projects the following more specific social issues need to be considered, these relate to the effects on:

- Risk of HIV;
- Sense of place;
- Service supplies and infrastructure; and
- The economy.

7.6.1 Risk of HIV infections[15]

With respective HIV prevalence rates of 18.7 and 17.5 percent, both the Western and Northern Cape provinces have the lowest HIV prevalence rates across the country. At a district level, the Cape Winelands has the fifth-lowest HIV prevalence across all districts in South Africa, with a prevalence rate of 15% and most significantly, the Namaqua district has the lowest HIV prevalence

[13] Heritage Association of South Africa: Karoo News Group – Undated, Appeal to Minister. http://heritagesa.org/wp/2222-2/

[14] Tilting at windmills: Power politics and Wind farms in South Africa. http://reprobate.co.za/tilting-at-windmills-power-politics-and-wind-farms-in-south-africa/

[15] HIV prevalence rates are at 2013 figures based on The 2013 National Antenatal Sentinel HIV Prevalence Survey, South Africa.

rate in the country at 2.3%, followed by the Central Karoo which has the second-lowest HIV prevalence rate in the country at 6.9%. Consequently, the district within which the project is located, and the neighbouring districts, all have the lowest HIV prevalence rates across the country.

These figures are significantly low compared to other areas of the country which range from a rate of 20.3% in Limpopo and 40.1% in KwaZulu-Natal with the iLembe District Municipality having an HIV prevalence rate of 45.9% in 2013. The provinces sharing common borders with the Western and Northern Cape Provinces all have relatively high HIV prevalence rates as indicated below;

- North West = 28.2%
- Free State = 29.8%;
- Eastern Cape = 31.1%.

With the influx of labour, particularly following the construction of the various renewable energy projects within the region, the risk of HIV infections in the area is likely to rise significantly. It is well documented on both an international and local basis that the construction industry carries a high level of HIV (Meintjes, Bowen, & Root, 2007; Bowen, Dorrington, Distiller, Lake, & Besesar, 2008; Wasie, et al., 2015; Bowen P. , Govender, Edwards, & Cattell, 2016; Kikwasi & Lukwale, 2017; Bowen P. , Govender, Edwards, & Lake, 2018) which can be spread amongst the local communities, particularly through the spread of prostitution that follows the availability of disposable income. It is also well documented on both an international and local level that HIV is also spread by truck drivers (Singh & Malaviya, 1994; Ramjee & Gouws, 2002; Strauss, et al., 2018) and there is likely to be an increase in truck drivers in the area as equipment and material is delivered to the various construction sites.

These issues associated with the area being extremely poor and the associated disposable income that will follow the construction workers and truck drivers to the area will heighten the risk of the spread of HIV infections across what is a rather remote region. In this regard, The World Bank (2009, pp. 367-368) had indicated a strong link between infrastructure projects and health as:

> "*Transport, mobility, and gender inequality increase the spread of HIV and AIDS, which along with other infectious diseases, follow transport and construction workers on transport networks and other infrastructure into rural areas, causing serious economic impacts.*"

7.6.2 Sense of place

There is also a concern amongst various interest groups that the proliferation of renewable energy facilities (including associated grid connection), particularly when considered in association with

other industrial activities such as mining, will have a significant and negative cumulative social impact on the area[16]. In this regard issues such as the noise from blades; aesthetic associated with highly visible wind farms, solar parks and mines; the loss of bird and bat life and its effect on tourism; as well as the disruption of social networks have all been cited amongst these concerns. For more project-specific cumulative impacts see the Visual Impact Assessment Report.

This is, however, a complex issue as there are varying opinions in respect of the aesthetic appearance of solar PV facilities and wind farms with some regarding them in a far more positive light than others (Firestone, Bidwell, Gardner, & Knapp, 2018; Schneider, Mudra, & Kozumplíková, 2018; Bergquist, Konisky, & Kotcher, 2020). In a study of public attitudes towards onshore windfarms in south-west Scotland, it was found that many regarded the visual impact of these developments in a positive light. It must, however, be noted that this was linked with community ownership having a positive impact on public attitudes towards wind farm developments in Scotland (Warren & McFadyen, 2010). The same is also likely to be true with regard to solar PV facilities (Carley, Konisky, Atiq, & Land, 2020). A further and important consideration in this regard is of an ethical nature associated with community acceptance and energy justice and raises the question of the incorporation of public acceptance, particularly that of the underrepresented, into energy policy (Roddisa, Carvera, Dallimerb, Normana, & Ziva, 2018, pp. 362-363; Bergquist, Konisky, & Kotcher, 2020).

7.6.3 Services, supplies and infrastructure

With the proliferation of renewable energy facilities in the area, it is quite likely that the local authorities, currently hard-pressed to deliver services, will find it difficult to keep up with this development. The influx of construction workers is likely to place pressure on accommodation and the need for both services and supplies. Sutherland, Matjiesfontein and Laingsburg, being either within or just outside of the 70 km radius of these projects, are likely to bear the brunt of the demand for accommodation, services and supplies. On this basis market demands could inflate costs that may have a negative effect on local communities, particularly the poor, who may be forced to pay higher prices for essential supplies resulting in an escalation of the cost of living in the area. Social services such as medical and educational facilities could also be placed under pressure because of increased demand. Although this may reach its peak during the construction phase it should be

[16] Amongst others see for instance:
1. Heritage South Africa's Karoo News Group http://heritagesa.org/wp/2222-2/
2. Alternative sources of energy for South Africa in various shades of green (Smit, 2011)
3. Social media sites such as the Facebook Karoo Energy Debate https://www.facebook.com/TheKarooEnergyDebate/
4. Why the Karoo. (Research Chair in the Sociology of Land, Environment and Sustainable Development. Department of Sociology and Social Anthropology, Stellenbosch University, 2016).

mitigated somewhat by the fact that the construction of the various projects will be spread across different timelines, with some projects commencing while others reach completion. Where numerous projects are entering construction phase simultaneously, the project companies should engage to align efforts. Employing local people across the various projects and project phases may also assist in reducing the stress placed on services, supplies and infrastructure in the area.

During the operational phases, it is likely that these demands will continue as operational staff take up more long-term residency in the area and are supported by service and maintenance personnel who may spend some time on site on a contractual basis. An influx of temporary maintenance and service workers is likely to last over the operational phase of the projects but is likely to settle within the medium term as the economy adjusts and the municipal authorities can respond to this growth.

7.6.4 Economic

The cumulative economic impact of the project will be both positive and negative. The negative economic impacts, associated with a possible rise in living costs driven by market demand, are considered under the section above. Under this section, the positive economic impacts will be addressed.

From a positive perspective, the proliferation of renewable energy facilities within the region is likely to result in significant and positive cumulative impacts in the area in terms of both direct and indirect job creation, skills development, training opportunities, and the creation of business opportunities for local businesses. In this regard it is indicated in the IPPPP Quarterly Report, as at 31 March 2018, that in respect of South Africa as a whole and through the Independent Power Producers Procurement Programme, " ..*the REIPPPP is targeting broader economic and socio-economic developmental benefits*" and that "[t]*o date, a total of 48 334 job years have been created for South African citizens, of which 39 312 were in construction and 9 021 in operations*" (Independent Power Producer Office, 2020a, p. 37 & 41). In addition to this "[t]*he combined (construction and operations) procurement value is projected as R149.9 billion, of which R75.8 billion has been spent to date. For construction, of the R65.7 billion already spent to date, R51.4 billion is from the 64 projects which have already been completed. These 64 projects had planned to spend R50.4 billion. The actual procurement construction costs have therefore exceeded the planned costs by 2% for completed projects*" The district and local municipalities within the area have identified renewable energy as a strategic economic opportunity in a region that previously had few such opportunities. This is indicated in the various IDPs and LEDs pertaining to the affected municipalities.

7.6.5 Assessment of cumulative impacts

The cumulative impacts discussed above are assessed in **Table 7Error! Reference source not found.**. It must, however, be noted that this assessment is at a superficial level as any in-depth investigation of the cumulative effects of the various developments being planned for the region are beyond the scope of this study as they would require a broad-based investigation on a far larger scale. The assessment of the cumulative impacts takes into consideration the impacts associated with all renewable energy facilities and associated grid connection infrastructure in the area and on this basis; no fatal flaws associated with the cumulative impacts are evident at a social level. It is also important to note that it is not within the capacity of individual developers to address these impacts as they falls within the scope of control of the appropriate authorities.

All impacts as assessed across all project phases above are summarised and a pre and post-mitigation comparison is presented below in **Table 8**.

Table 7: Rating of cumulative impacts

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ O	S
Health	Risk of HIV	4	4	4	3	4	3	57	-	High	Mitigation can only be implemented at a regional level and will need to be driven on a provincial and municipal basis. In this sense, the following mitigation measures would need to be considered. Ensure that all companies coming into the area have, and are, implementing an effective HIV/AIDS policy. Introduce HIV/ADS awareness programs to schools and youth institutions. Carefully monitor and report on the HIV status of citizens in the region. Be proactive in dealing with an increase in the HIV prevalence rate in the area.	4	4	3	3	4	3	54	-	High
Quality of the living environment	Sense of place	3	4	4	3	4	3	54	-	High	Mitigation can only be implemented at a regional level and will need to be driven on a provincial and municipal basis. In this sense, the following mitigation measures would need to be considered. Consider undertaking a cumulative impact assessment to evaluate the changes taking place across the area on a broader scale. Form a regional workgroup tasked with addressing the effect of changes to the sense of place of the region. Establish grievance mechanisms to deal with complaints associated with changes to the area. Enlighten the public about the need and benefits of renewable energy.	3	4	4	3	4	3	54	-	High

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ O	S
Quality of the living environment	Service supplies and infrastructure	2	4	2	3	2	2	26	-	Medium	Mitigation can only be implemented at a regional level and will need to be driven on a provincial and municipal basis. In this sense, the following mitigation measures would need to be considered. Engage with the municipal authorities to ensure that they are aware of the expansion planned for the area and the possible consequences of this expansion Ensure that local labour is recruited in respect of these developments in the area.	2	4	2	2	2	2	24	-	Medium
Economic	Positive economic impacts	4	4	3	3	3	4	68	+	Very High	Mitigation can only be implemented at a regional level and will need to be driven on a provincial and municipal basis. In this sense, the following mitigation measures would need to be considered. Implement a training and skills development programme amongst the local community. Ensure that the procurement policy supports local enterprises. Establish a social responsibility programme. Work closely with the appropriate municipal structures regarding establishing a social responsibility programme. Ensure that any trusts or funds are strictly managed in respect of outcomes and funds allocated.	4	4	3	3	3	4	68	+	Very High

Table 8: Impact summary

Construction Phase			
Environmental parameter	**Issues**	**Rating prior to mitigation**	**Rating post-mitigation**
Health & social wellbeing	Air quality	-7	-7
	Noise	-5	-5
	Increase in crime	-18	-18
	Increased risk of HIV infections	-42	-42
	An influx of construction workers	-8	-8
	Hazard exposure.	-18	-18
Quality of the living environment	Disruption of daily living patterns	-8	-8
Economic	Job creation and skills development	+11	+11
	Socio-economic stimulation	+13	+13
Operational Phase			
Health & Wellbeing	Electromagnetic fields	-22	-20
Quality of the living environment	Transformation of the sense of place	-32	-32
	Socio-economic stimulation	+32	+32
Decommissioning Phase			
Considering a time period of 20 years prior to decommissioning and the dynamics of social variables, it would be rather meaningless to attach assessment criteria to decommissioning at this point due to the high level of uncertainty such assessment would be based upon.			
No Project Alternative			
No project		-51	No mitigation measures
Cumulative Impacts			
Health & social wellbeing	Risk of HIV	-57	-54
Quality of the living environment	Sense of place	-54	-54
	Services, supplies & infrastructure	-26	-24
Economic	Economic	+68	+68

8 MEASURES TO BE INCLUDED IN EMPr

It is recommended that the following measures are included in the EMPr and EA, should such authorisation be granted by DEFF.

Pre-Construction / Design Phase:

No measures are recommended to be included in the EMPr and EA for the pre-construction and/or design phase.

Construction Phase:

- **Air quality**
  - Ensure that dust suppression measures, such as damping down of unsealed roads where necessary, are applied.
- **Noise**
  - Ensure that no construction activity occurs near residences between 18:30 and 06:30 during the week and between 08:30 and 16:30 over weekends.
- **Increase in crime**
  - Ensure that construction workers are identifiable. All workers should carry identification cards and wear identifiable clothing.
  - Encourage local people to report any suspicious activity associated with the construction sites through the establishment of a community liaison forum.
  - Prevent loitering within the vicinity of the construction camp and construction sites.
- **Increased risk of HIV infections**
  - Ensure that an onsite HIV Infections Policy is in place and that construction workers have easy access to condoms.
  - Expose workers to a health and HIV/AIDS awareness educational program.
- **An influx of construction workers**
  - Communicate the limitation of opportunities created by the project through Community Leaders and Ward Councillors.
  - Draw up a recruitment policy in consultation with the Community Leaders and Ward Councillors of the area and ensure compliance with this policy.
- **Hazard exposure**
  - Ensure all construction equipment and vehicles are properly maintained at all times.
  - Ensure that operators and drivers are properly trained and make them aware, through regular toolbox talks, of any risk they may pose to the community. Place

specific emphasis on the vulnerable sector of the population, such as children and the elderly.

- Ensure that fires lit by construction staff are only ignited in designated areas and that the appropriate safety precautions, such as not lighting fires in strong winds and completely extinguishing fires before leaving them unattended, are strictly adhered to.
- Make staff aware of the dangers of fire during regular toolbox talks.

- **Disruption of daily living patterns**
  - Ensure that, at all times, people have access to their properties as well as to social facilities.
- **Job creation and skills development**
  - Wherever feasible, local residents should be recruited to fill semi and unskilled jobs.
  - Women should be given equal employment opportunities and encouraged to apply for positions.
  - A skills transfer plan should be established at an early stage and workers should be given the opportunity to develop skills, which they can use to secure jobs elsewhere post-construction.
- **Positive economic impacts**
  - A procurement policy promoting the use of local business should, where possible, be installed and applied throughout the construction phase.

Operational Phase:

- **Electromagnetic fields**
  - Ensure that were ever possible the power line is routed away from human and animal habitat.
  - A Grievance Mechanism should be established and all grievances should be dealt with transparently.
- **Transformation of the sense of place**
  - Apply the mitigation measures suggested in the Visual Impact Assessment Report.
  - A Grievance Mechanism should be initiated and all grievances should be dealt with transparently.
  - The mitigation measures recommended in the Heritage and Palaeontology Impact Assessment should be followed.
- **Socio-economic stimulation**

- The power line will revert to Eskom and become an Eskom asset over the operational phase. Consequently, optimisation measures as they apply in respect to similar Eskom assets would also apply in this in this case.

Decommissioning Phase:

The time lag between constructing and decommissioning the project is extensive and, as the social environment is highly dynamic, it is meaningless to attach measurements. In addition, once the project is commissioned it becomes an Eskom asset, which could extend the life of the power line.

Cumulative Impacts:

No measures are suggested in respect of cumulative impacts as these impacts would, in large, need to be addressed by the responsible authorities as they are beyond the control of project developers. For instance, the policing authorities can only address an increase in crime, due to a proliferation of activity in the area as it is beyond the scope of individual project developers. In much the same vein, an increased risk of HIV in the area would need to be addressed by the relevant health authorities.

Construction Phase Monitoring:

A public grievance and incident register should be established and should be monitored internally by the developer and made available for public scrutiny if requested. Any incident should be immediately recorded and reported to management and all actions pertaining to that incident, as well as the final outcome of the complaint, should be recorded and signed off by management. If an independent environmental monitor is appointed this register should be audited on at least a monthly basis.

Operation Phase Monitoring:

The project will become an Eskom asset after commissioning and would fall under the control of Eskom. Consequently, it must be subjected to the same monitoring protocol applied to all similar Eskom assists.

9 COMPARATIVE ASSESSMENT OF ALTERNATIVES

With only one available technical option, there are no alternatives for the section of proposed line connecting the Kudusberg and Oya on-site substations (i.e. Kudusberg to Oya route).

However, the following five power line route alternatives were considered and compared in respect of the section of power line connecting the Oya on-site substation to the Kappa substation (i.e. Oya to Kappa route).

- **Power Line Corridor Alternative 1 (Oya to Kappa):** Approximately 34.14 km in length and runs along the RE/155, RE/152, 2/152, RE/169, RE/243, 241, 240 and RE/244 properties to the Kappa substation
- **Power Line Corridor Alternative 2 (Oya to Kappa)**: Approximately 32.43 km in length and runs along the RE/155, 3/155, RE/152, 2/152, RE/169, 13/168, 5/168, 1/243, RE/243, 241 and 240 properties to the Kappa substation
- **Power Line Corridor Alternative 3 (Oya to Kappa):** Approximately 30.56 km in length and runs along the RE/155, 4/168, 13/168, 5/168, 1/243, 240 and RE/244 properties to the Kappa substation
- **Power Line Corridor Alternative 4 (Oya to Kappa):** Approximately 32.94 km in length and runs along the RE/155, 4/168, 13/168, RE/169, RE/243, 241 and 240 properties to the Kappa substation
- **Power Line Corridor Alternative 5 (Oya to Kappa):** Approximately 32.26 km in length and runs along the RE/155, RE/152, 2/152, RE/169, 5/168, 1/243 and 240 properties to the Kappa substation.

Considered purely on a social basis, no clear route alternatives emerge in respect of any of these routes. Taking into account the results of other specialist studies that may have secondary social consequences, such as the archaeological; heritage; palaeontological and visual, no least preferred route emerges. Consequently, no social preference has emerged in respect of these 5 route alternatives as indicated in **Table 9**.

Table 9: Comparative assessment of alternatives

Key

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

Alternative	Preference	Reasons (incl. potential issues)
POWER LINE CORRIDOR ROUTE ALTERNATIVES		
Power Line Corridor Alternative 1 (Oya to Kappa)	No Preference	Considering both the social and other specialist studies, no clear route alternatives emerge in respect of any of these routes.
Power Line Corridor Alternative 2 (Oya to Kappa)	No Preference	
Power Line Corridor Alternative 3 (Oya to Kappa)	No Preference	
Power Line Corridor Alternative 4 (Oya to Kappa)	No Preference	
Power Line Corridor Alternative 5 (Oya to Kappa)	No Preference	

10 SUMMARY AND CONCLUSION

The objective of the proposed development is to feed electricity generated by the proposed Oya Energy Facility into the National Grid and, as such, it is an integral component required to ensure the success of the Oya Energy Facility. An additional advantage of the power line is that it provides a potential opportunity to connect nearby developments to the grid, thus eliminating any need for additional infrastructure in the area. Once commissioned, the power line will be absorbed; operated and maintained by Eskom; thus, resulting in the power line becoming an Eskom asset and eliminating any risk attached to privately owned transmission grid infrastructure. In this regard, Eskom indicates a commitment " …*to developing the electricity supply industry by facilitating the integration of independent power producers (IPPs) into the national grid and buying electricity from IPPs for national distribution*".

The entire extent of the proposed overhead power line and substations is located within the Central Strategic Transmission Corridor[17] while also remaining within the boundaries of Renewable Energy Development Zone, Komsberg – REDZ 2[18]. This should mitigate the impact that the project will have on the sense of place of the area; as these areas have been set aside for such projects to ensure the security of the National Grid.

Regarding the negative impacts associated with the project, it is evident that most apply over the short term and are confined to the construction phase of the project. Of these impacts, all are within acceptable ranges and there are no fatal flaws associated with the construction or operation of the project. Although over the operational phase, the project will be visible and is likely to alter the sense

[17] Formally gazetted on 16 February 2018 (GN 113)

[18] Formally gazetted on 16 February 2018 (GN 114)

of place of the area, this should be limited to the extent that it is placed within a REDZ and Strategic Transmission Corridor.

In accordance with international and governmental requirements, the project will shift the country away from a high reliance on fossil fuels towards a far greener and cleaner energy generation mix. The proposed development also supports the objectives of the RMIPPPP, which serves as an "emergency" power generation programme for accelerated assistance to the national grid amid electricity supply constraints. The DMRE issued an RFP for the emergency procurement of 2000 MW of electricity. Due to the emergency nature of the RMIPPPP, the objective is to procure energy from projects that are near ready and can connect to the grid quickly. The proposed development is deemed to meet these requirements and can reduce the risk of load shedding. Grid capacity is also available and no deep grid works are required, which are beneficial for the connection timelines of the RMIPPPP

The Minister of Mineral Resources and Energy also recently welcomed the concurrence by the NERSA to the second Section 34 Ministerial Determination, which enables the Department to undertake procurement of additional electricity capacity in line with the IRP (2019). 6 800 MW of capacity is determined to be generated from renewable energy sources (PV and Wind), 513 MW from storage and 3 000 MW from gas. The proposed development will be able to contribute to this diverse electricity requirement and will thus actively contribute to the commitments made to increase generation capacity and ensure the security of energy supply to society rapidly and significantly.

10.1 impact statement

Considering all social impacts associated with the project, it is evident that the positive elements outweigh the negative and that the project carries with it a significant social benefit. In addition, the project fits with international and governmental policy and legislation. Consequently, the Proposed 132 kV Oya Power Line and Substations development is supported at the social level.

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