

MOEDING SOLAR PV FACILITY

North West Province

Social Impact Assessment

December 2018

savannah
environmental

t +27 (0)11 656 3237

f +27 (0)86 684 0547

e info@savannahsa.com

w www.savannahsa.com

Prepared for:

Moeding Solar (Pty) Ltd

Prepared by:

savannah
environmental

REPORT DETAILS

Title	:	Social Impact Assessment (SIA) Report for Moeding Solar PV Facility, near Vryburg in the North West Province
Authors	:	Savannah Environmental (Pty) Ltd Sarah Watson
External Peer Review	:	Dr. Neville Bews & Associates Dr. Neville Bews
Client	:	Moeding Solar (Pty) Ltd
Report Revision	:	Revision 0
Date	:	December 2018

When used as a reference this report should be cited as: Savannah Environmental (2018) Social Impact Assessment (SIA) Report for Moeding Solar PV Facility, near Vryburg in the North West Province.

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SPECIALIST DECLARATION OF INTEREST

I, Sarah Watson, declare that –

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

Sarah Watson

Name



Signature

December 2018

Date

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APPENDICES:

Appendix A: Environmental Management Programme (EMPr)

ACRONYMS

B-BBEE	Broad-Based Black Economic Empowerment
BA	Basic Assessment
CLO	Community Liaison Officer
CRU	Community Residential Units
CSP	Concentrated Solar Power
DEA	Department of Environmental Affairs (National)
DoE	Department of Energy
DM	District Municipality
EA	Environmental Authorisation
EAP	Economically Active Population
ECA	Environment Conservation Act (No. 73 of 1989)
ECO	Environmental Control Officer
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EP	Equator Principles
EPC	Engineering, Procurement and Construction
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
FGM	Focus Group Meeting
GDP	Gross Domestic Product
GHG	Greenhous Gas
GNP	Gross National Product
GNR	Government Notice
GVA	Gross Value Added
HDI	Historically Disadvantaged Individuals
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
IEP	Integrated Energy Plan
IFC	International Finance Corporation
IPP	Independent Power Producer
IRP	Integrated Resource Plan
km	Kilometre
kV	Kilovolt
LED	Local Economic Development
LM	Local Municipality
LRP	Livelihood Restoration Plan
MTS	Main Transmission Substation
MW	Megawatt
NEMA	National Environmental Management Act (No. 107 of 1998)
NDP	National Development Plan
O&M	Operation and Maintenance
OHS	Occupational Health and Safety

PDP	Provincial Development Plan
PGDS	Provincial Growth and Development Strategy
PICC	Presidential Infrastructure Coordinating Committee
PSDF	Provincial Spatial Development Framework
PV	Photovoltaic
RAP	Resettlement Action Plan
RBS	Revised Balanced Scenario
RE	Renewable Energy
READ	Department of Rural, Environment and Agricultural Development (North West Provincial)
REDZ	Renewable Energy Development Zone
REIPPP	Renewable Energy Independent Power Producer Procurement Programme
SDF	Spatial Development Framework
SIA	Social Impact Assessment
SIP	Strategic Infrastructure Project
SMME	Small, Medium and Micro Enterprise
VAC	Visual Absorption Capacity
VIP	Ventilated Improved Pit
VTSD	Villages, Townships and Small Dorpies

1. INTRODUCTION

Moeding Solar (Pty) Ltd proposes the development of the Moeding Solar PV Facility and associated infrastructure (known as Moeding Solar) on a site near Vryburg, in the North West Province (refer to **Figure 1.1**). The Moeding Solar PV Facility comprises a commercial photovoltaic (PV) solar energy facility and is intended to form part of the Department of Energy's (DoE's) Renewable Energy Independent Power Producer Procurement (REIPPP) Programme. The REIPPP Programme aims to secure 14 725MW of new generation capacity from renewable energy sources, while simultaneously diversifying South Africa's electricity mix, and positively contributing towards socio-economic and environmentally sustainable growth.

The proposed development of the Moeding Solar PV Facility requires Environmental Authorisation (EA) from the National Department of Environmental Affairs (DEA) in accordance with the National Environmental Management Act (No. 107 of 1998) (NEMA), and the 2014 Environmental Impact Assessment (EIA) Regulations (GNR 326) subject to the completion of a Basic Assessment (BA)¹ process.

Sarah Watson of Savannah Environmental (Pty) Ltd has been appointed as the independent social consultant responsible for undertaking a Social Impact Assessment (SIA) as part of the BA process being conducted for the project.

1.1. Project Description

Moeding Solar is proposed on Portion 01 of the Farm Champions Kloof No. 731, Portion 04 and the Remaining Extent of Portion 03 of the Farm Waterloo No. 730, and the Remaining Extent of the Farm Rosendal No. 673 (referred to as the affected properties), which is located approximately 8km south of Vryburg in the Naledi Local Municipality (LM), which is part of the Dr Ruth Segomotsi Mompati District Municipality (DM), in the North West Province. The project will make use of photovoltaic (PV) solar technology for the generation of electricity, will be designed to have a contracted capacity of up to 100MW, and will be equipped with battery storage.

The proposed project will comprise the following key infrastructure and components:

- » Arrays of PV panels (either a static or tracking PV system).
- » Mounting structures to support the PV panels.
- » Cabling between the project components, to be laid underground where practical.
- » On-site inverters to convert the power from a direct current to an alternating current.
- » An on-site substation to facilitate the connection between the solar energy facility and the Eskom electricity grid.
- » A new 132kV power line between the on-site substation and the Eskom grid connection point.
- » Battery storage with up to 6 hours of storage capacity.
- » Offices and workshop areas for maintenance and storage.
- » Temporary laydown areas.

¹ The project site is located within Zone 6 of the Department of Environmental Affairs' (DEA's) Renewable Energy Development Zones (REDZ), otherwise known as the Vryburg REDZ, which has been earmarked for the development of large scale solar photovoltaic energy facilities. Due to the fact that the proposed project and its associated infrastructure are proposed completely within a REDZ, a Basic Assessment (BA) process is required in accordance with Section 3 of GNR 114 (16 February 2016).

- » Internal access roads and fencing around the development area.

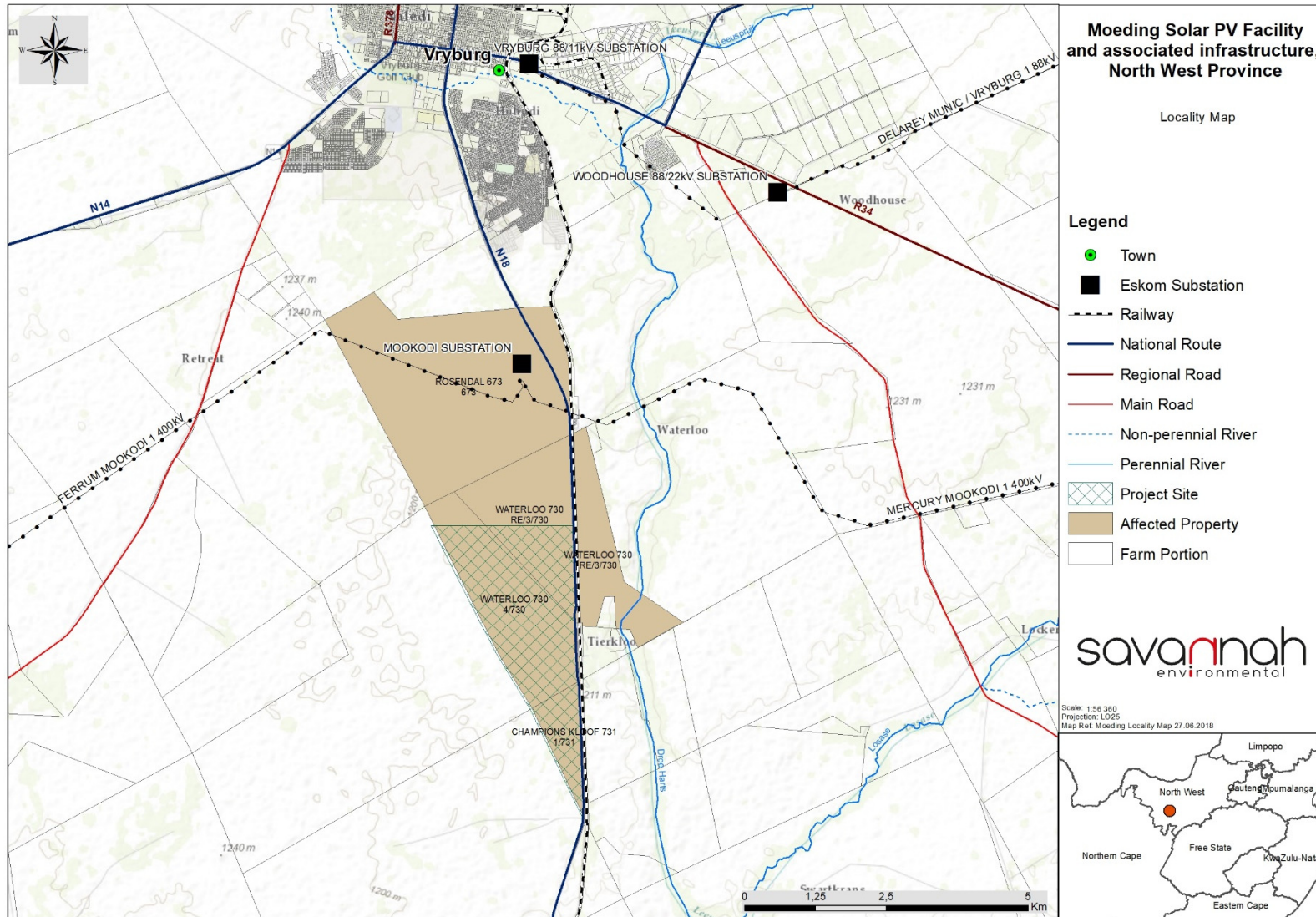


Figure 1.1: Locality Map showing the location of the Moeding Solar PV Facility in relation to Vryburg.

In addition to the solar energy facility, Moeding Solar also proposes the development of grid connection infrastructure required to evacuate power generated by the project into Eskom's national electricity grid. Two possible grid connection options have been identified and are being considered:

- » Direct connection to the existing Mookodi Main Transmission Substation (MTS) located in close proximity to the northern portion of the project site (Alternative 1).
- » A turn-in turn-out connection into the Mookodi - Magopela 132kV power line (to be constructed along the eastern boundary of the project site) (Alternative 2).

1.2. Details of the Independent Specialist

This SIA has been undertaken by Sarah Watson of Savannah Environmental (Pty) Ltd, and peer reviewed externally by Dr. Neville Bews of Dr. Neville Bews & Associates.

- » **Sarah Watson** is an Environmental Consultant at Savannah Environmental. Sarah has a Bachelor of Social Science Honours Degree in Geography and Environmental Management (B.Soc.Sci. Honours GEM) from the University of KwaZulu-Natal (UKZN). She has 8 years of experience as an Environmental Consultant in the field of Environmental Impact Assessment and Environmental Management. Sarah has experience conducting environmental assessment processes for a range of projects in the telecommunications, residential, industrial, bulk infrastructure, rural development, and energy sectors.
- » **Dr. Neville Bews** is a Senior Social Scientist and Human Resource professional at Dr. Neville Bews & Associates. Dr. Bews has a Doctorate in Literature and Philosophy (D. Litt. et Phil) from the Rand Afrikaans University (RAU) (now the University of Johannesburg (UJ)), and 37 years of experience in the fields of Social Impact Assessment and Research, and Human Resource Management. Dr. Bews has worked on a number of large infrastructure, mining and water resource projects. He also lectures on the Masters Social Impact Assessment course at University of Johannesburg..

1.3. Structure of the SIA Report

This SIA Report has been prepared in accordance with the requirements of Appendix 6 of the 2014 EIA Regulations (GNR 326). An overview of the contents of this SIA Report, as prescribed by Appendix 6 of the 2014 EIA Regulations (GNR 326), and where the corresponding information can be found within the report is provided in **Table 1.1**.

Table 1.1: Summary of where the requirements of Appendix 6 of the 2014 NEMA EIA Regulations (GNR 326) are provided within this Specialist Report.

Requirement	Location in Report
(a) Details of – (i) The specialist who prepared the report. (ii) The expertise of that specialist to compile a specialist report including a curriculum vitae.	Section 1
(b) A declaration that the specialist is independent in a form as may be specified by the competent authority.	Declaration of Interest
(c) An indication of the scope of, and the purpose for which, the report was prepared.	Section 2
(cA) An indication of the quality and age of base data used for the specialist report.	Section 4
(cB) A description of existing impacts on the site, cumulative impacts of the proposed	Section 6

Requirement	Location in Report
development and levels of acceptable change.	
(d) The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment.	Section 2
(e) A description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used.	Section 2
(f) Details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives.	Section 4 Section 6
(g) An identification of any areas to be avoided, including buffers.	N/A
(h) A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers	N/A
(i) A description of any assumptions made and any uncertainties or gaps in knowledge.	Section 2
(j) A description of the findings and potential implications of such findings on the impact of the proposed activity or activities.	Section 6
(k) Any mitigation measures for inclusion in the EMPr.	Appendix A
(l) Any conditions for inclusion in the environmental authorisation.	Section 7
(m) Any monitoring requirements for inclusion in the EMPr or environmental authorisation.	Appendix A
(n) A reasoned opinion – (i) Whether the proposed activity, activities or portions thereof should be authorised. (iA) Regarding the acceptability of the proposed activity or activities. (ii) If the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures.	Section 7
(o) A description of any consultation process that was undertaken during the course of preparing the specialist report.	Section 2
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto.	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

2. METHODOLOGY AND APPROACH

2.1. Purpose of the Study

The International Principles for Social Impact Assessment define SIA as:

"The processes of analysing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions".

The International Principles for Social Impact Assessment define social impacts as changes to one or more of the following:

- » People's way of life – that is, how they live, work, play and interact with one another on a day-to-day basis.
- » Their culture – that is, their shared beliefs, customs, values and language or dialect.
- » Their community – its cohesion, stability, character, services and facilities.
- » Their political systems – the extent to which people are able to participate in decisions that affect their lives, the level of democratisation that is taking place, and the resources provided for this purpose.
- » Their environment – the quality of the air and water people use, the availability and quality of the food they eat, the level of hazard or risk, dust and noise they are exposed to, the adequacy of sanitation, their physical safety, and their access to and control over resources.
- » Their health and wellbeing – health is a state of complete physical, mental, social and spiritual wellbeing and not merely the absence of disease or infirmity.
- » Their personal and property rights – particularly whether people are economically affected, or experience personal disadvantage which may include a violation of their civil liberties.
- » Their fears and aspirations – their perceptions about their safety, their fears about the future of their community, and their aspirations for their future and the future of their children.

The purpose of this SIA Report is therefore to:

- » Provide baseline information describing the social environment within which the project is proposed, and which may be impacted (both positively and negatively) as a result of the proposed development.
- » Identify, describe and assess possible social risks / fatal flaws and social impacts that may arise as a result of the proposed development (in terms of the detailed design and construction, operation, and decommissioning phases of the project).
- » Recommend ways in which negative impacts can be avoided, minimised, or their significance reduced, and positive impacts maximised or enhanced.

2.2. Approach to the Study

This SIA Report provides a snapshot of the current social setting within which the Moeding Solar PV Facility is proposed. It provides an overview of the manner and degree to which the current status quo is likely to change or be impacted on by the construction, operation and decommissioning of the project, as well as the manner in which the social environment is likely to impact on the development itself.

An overview of the assessment methodology utilised as part of this SIA is provided in **Section 2.3**.

The SIA process comprised the following:

- » Collection and review of existing information, including national, provincial, district, and local plans, policies, programmes, Census data, and available literature from previous studies conducted within the area. Project specific information was obtained from the project proponent.
- » Collection of primary data. Focus Group Meetings (FGMs) were conducted with directly affected and adjacent landowners, and key stakeholders (06 – 07 August 2018) as part of the Public Participation process being conducted for the BA process to gain their inputs on the project and its perceived social impacts and benefits on the affected community. In addition, telephonic interviews were conducted between the 04th and 10th of December with directly affected landowners and key stakeholders to gain their inputs on the project and its perceived social impacts and benefits on the affected community.
- » Identification of potential direct, indirect and cumulative impacts likely to be associated with the construction, operation, and decommissioning of the proposed project.
- » Where applicable mitigation measures with which to minimise impacts and enhance benefits associated with the project were identified.
- » Preparation of an SIA Report and inputs into the Environmental Management Programme (EMPr) to be prepared for the project.

2.2.1. Stakeholder Identification and Analysis

Stakeholders are defined as:

“Any group or organisation which may affect or be affected by the issue under consideration” (UN, 2001: 26).

These may be directly or indirectly impacted and may include organisations, institutions, groups of people or individuals, and can be at any level or position in society, from the international to regional, national, or household level (Franke and Guidero, 2012).

Stakeholder analysis involves the identification of affected or impacted people and their key grouping and sub-groupings (IFC, 2007). Identifying stakeholders that are directly and indirectly affected by the project is important to determine who might be impacted by the development and in what way. The key stakeholders in the proposed project have been identified, grouped / sub-grouped and described as per Ilse Aucamp's SIA methodology (Aucamp et al, 2011). There are immediate, direct, and indirect areas of influence to the proposed development. Affected stakeholders comprise sensitive social receptors that may potentially be affected by the proposed development based on their location.

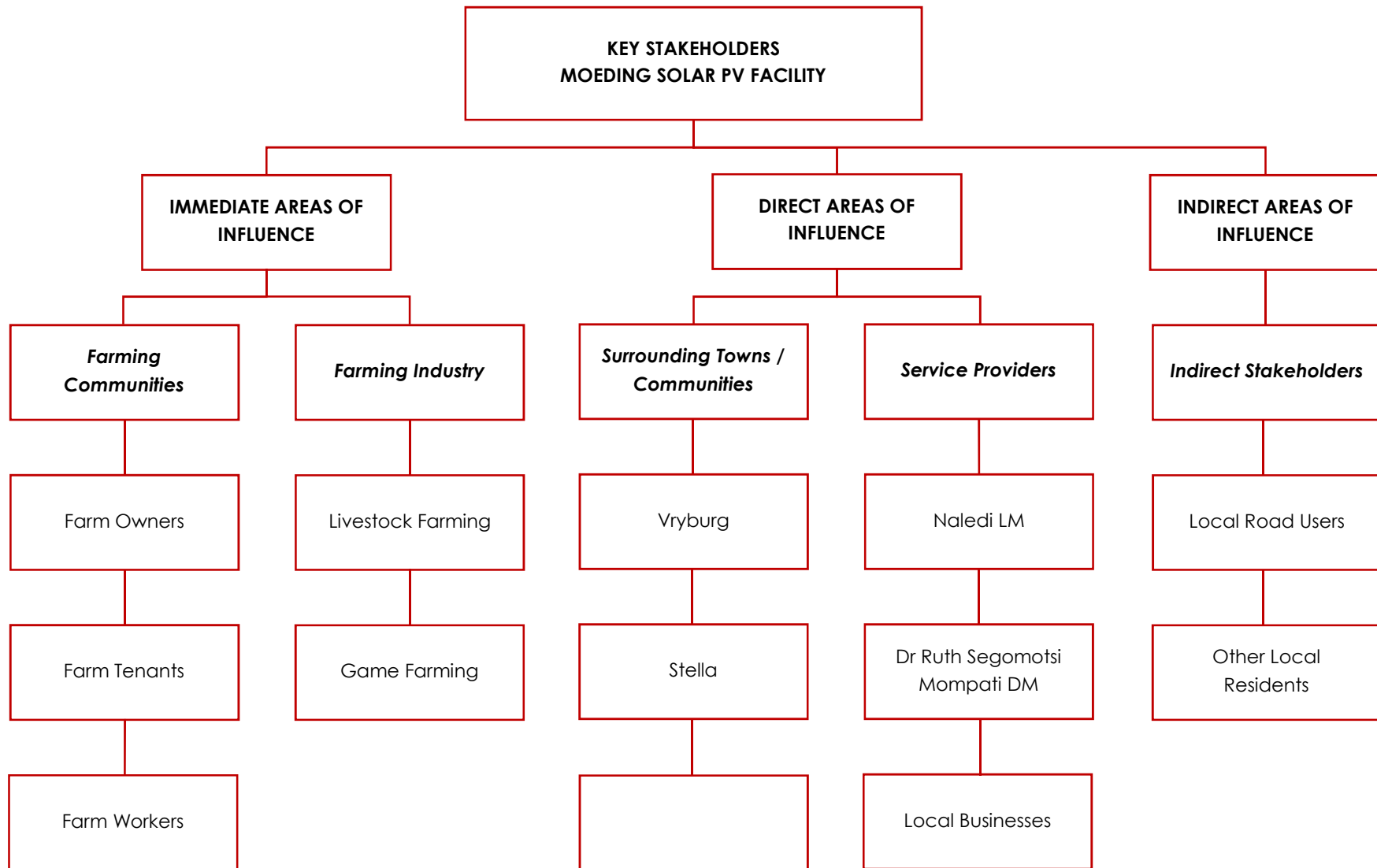


Figure 2.1: Key Stakeholders.

A description of each of the stakeholders' groups in relation to the Moeding Solar PV Facility is discussed below:

- » **Farming community:** The farming community can be grouped into three categories, namely farm owners, farm tenants, and farm workers. Farm owners comprise individuals who own and make a living off of their properties. Farm tenants are people who rent land and work on the land to earn an income. Farm workers are people who work, and also often reside on the farm with their families, and are seen as a vulnerable community. Impacts that may arise for the farming community include impacts on (and the potential loss of) agricultural land and infrastructure, potential nuisance impacts (as a result of dust and noise specifically during construction), safety and security impacts (as a result of an in-migration of people in search of employment opportunities), impacts on the area's sense of place (as a result of a the change in land use), visual impacts (as a result of construction equipment and activities), cultural and social changes (also as a result of an in-migration of people in search of employment opportunities and a change in land use), and additional traffic and road safety impacts (as a result of the movement of construction equipment and personnel).
- » **Farming industry:** There are potentially vulnerable farming activities in the study area. The primary agricultural activities include livestock and game farming. Impacts that may arise include stock theft and poaching from an increase of people in the area (especially during the construction phase), impacts on current farming practices, potential loss of agricultural land. Dust, noise and movement of people may also negatively impact on farming operations.
- » **Surrounding towns / affected communities:** The closest town to the project site is Vryburg, located approximately 8km north of the project site. The Huhudi informal / semi-formal settlement is located approximately 6.3km north of the project site. Residents in Vryburg and Huhudi may be positively and / or negatively affected by the proposed development. Employment opportunities will become available as a result of the construction and operation of the proposed development, and it is proposed that the labour force required for the project be sourced from (and accommodated within) these towns.
- » **Service providers:** Major service providers which will be affected by the project include the LM, DM, and local businesses in the area. The Naledi LM, and to a lesser extent the Dr Ruth Segomotsi Mompati DM are likely to be impacted by the proposed development. The Naledi LM is a Category B municipality, meaning that it shares municipal executive and legislative authority in its area with the Category C municipality within whose area it falls (i.e. the Dr Ruth Segomotsi Mompati DM). The Naledi LM will absorb a number of positive and negative social impacts in the form of employment creation, increased local expenditure, and increased revenue etc., as well as a potential negative impacts in the form of an in-migration of people and increased pressure being places on local services. Local businesses within the area could benefit from the proposed project in terms of an increase in demand for goods and services associated with the project.
- » **Stakeholders outside the direct area of influence:** There are a number of stakeholders that reside outside the direct area of influence but who may also be affected by the project. These include road users that utilise the N18 national road, and local gravel access roads on a frequent basis as part of their daily or weekly movement patterns. Construction vehicles and trucks will utilise these roads during construction, which will increase the traffic, create traffic disruptions, and may increase the wear and tear on these roads.

2.2.2. Collection and Review of Existing Information

Existing desktop information which has relevance to the proposed project, project site, and surrounds was collected and reviewed. The following sources of information were examined as part of this process:

- » Project maps and layouts.
- » Google Earth imagery.
- » A description of the project (as provided by the project applicant).
- » Information regarding employment, social upliftment, and local economic development opportunities (as provided by the project applicant).
- » Census data (2011), and the Local Government Handbook (2018).
- » Planning documentation such as Provincial Growth and Development Strategy (PGDS), LM and DM Integrated Development Plan (IDPs), Spatial Development Frameworks (SDFs), and development goals and objectives.
- » Relevant legislation, guidelines, policies, plans, and frameworks.
- » Available literature pertaining to social issues associated with the development and operation of solar PV power plants and associated infrastructure.

2.2.3. Collection of Primary Data

Primary data was collected in the form of minutes from Focus Group Meetings (FGMs) conducted with key stakeholders as part of the Public Participation process being conducted for the BA process (refer to **Table 2.1**), and from telephonic interviews (refer to **Table 2.2**).

Table 2.1: Overview of FGMS conducted as part of the Public Participation process being conducted for the BA process.

Focus Group Meeting	Attendees
Adjacent Landowners	<ul style="list-style-type: none"> » Mr. Flippie Kriel Owner of Hartsboom Farm » Dr. Chris van Zyl Owner of Waterloo Farm » Mr. Lucas and Mrs. Hester van Dyk Owners of Waterloo Farm » Ms. Adéle Oberholzer Owner of Edinburgh and Frankfort Farms
Naledi LM	<ul style="list-style-type: none"> » Mr Tshepo Bloom Municipal Manager » Cllr Lillian Bome Councillor Ward 5 (Dithakwaneng) » Cllr BJ Moholo Councillor Ward 9 » Mr Arnold Makuena Manager: Town Planning & Stormwater Management » Mr Gilbert Sehlolo Acting Manager: Electrical Services » Mr Lukas Ekhelton Mayoral Management Committee: Infrastructure
Tiger Kloof Educational Institution	<ul style="list-style-type: none"> » Ms Cecily Salmon Solon Foundation Executive Director » Ms Shirley Moulder Tiger Kloof Educational Institution Chairperson and Board Member

Focus Group Meeting	Attendees
	<ul style="list-style-type: none"> » Ms Gail du Toit Tiger Kloof Educational Institution Director » Mr Brian du Toit Tiger Kloof Educational Institution Maintenance Manager » Mr Maxwell Masasi Tiger Kloof Educational Institution Farm Manager

During the FGMs attendees were provided with background on the proposed project, and the environmental assessment and public participation process being undertaken in support of the application for EA.

Table 2.2: Summary of telephonic interviews conducted with landowners (directly affected and adjacent).

Comments
Some questions were perceived as being personal information and answers were not given as the general feeling was that the questions are too closely related to the current Land Claims situation.
Game and/or cattle farming takes place on the surrounding properties; applications for Environmental Authorisation for Renewable Energy projects were identified on some of the adjacent properties; one property is being utilised for horse riding lessons.
New and/or different activities on the properties would only be determined by the environmental condition of the properties i.e. if it is not suitable for game / cattle farming, other activities will have to be considered; those utilised as cattle farms could be utilised as game farms.
As above, information regarding employees was not provided as it is perceived to be associated with the current Land Claims situation.
Safety and security is a key concern for surrounding landowners and it was recommended that the property be properly fenced prior to construction to eliminate any possible access to adjacent properties from the development area.
The negative impact on groundwater is a major concern for all the adjacent landowners and the concern was raised that should the development drill for borehole water, this could severely influence the groundwater supply at their boreholes.
The proposed development will not have an impact on the current land use / activities on the adjacent properties Other than houses, stables, dams and barns, no significant features are located on these properties
There are currently hiking trails at the Tiger Kloof Educational Centre.
Dust from the construction site could negatively impact the grazing of the game / cattle and settled in the houses near the development area.
Overall, the proposed development is supported and it was mentioned that it would benefit the North West Province but it would be preferred if the proposed development could benefit Vryburg only.

During the telephonic interviews stakeholders were interviewed utilising a questionnaire to determine their perceptions, interests, and concerns regarding the project (refer to Appendix C5 of the Basic Assessment Report).

2.3. Impact Assessment Evaluation Method

The main objective of this SIA is to determine the social risks and opportunities, and positive and negative impacts which may be associated with the construction, operation, and decommissioning of the project. The methodology below (as provided by Savannah Environmental) allows for the evaluation of the overall

impact of a proposed project on the social environment. This includes an assessment of the significant direct, indirect, and cumulative impacts associated with the project. Social impacts were assessed in terms of their perceived extent (scale), duration, magnitude (severity), probability (certainty), and status (negative, neutral or positive).

- » The **nature**, which includes a description of what causes the effect, what will be affected and how it will be affected.
- » The **extent**, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 was assigned as appropriate (with 1 being low and 5 being high).
- » The **duration**, wherein it is indicated whether:
 - * The lifetime of the impact will be of a very short duration (0 – 1 years) – assigned a score of 1.
 - * The lifetime of the impact will be of a short duration (2 – 5 years) – assigned a score of 2.
 - * Medium-term (5 – 15 years) – assigned a score of 3.
 - * Long term (> 15 years) – assigned a score of 4.
 - * Permanent – assigned a score of 5.
- » The **magnitude**, quantified on a scale from 0 – 10, where 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- » The **probability** of occurrence, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale of 1 – 5, where 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
- » The **significance**, which is determined through a synthesis of the characteristics described above and can be assessed as low, medium or high.
- » The **status**, which will be described as either positive, negative or neutral.
- » The degree to which the impact can be reversed.
- » The degree to which the impact may cause irreplaceable loss of resources.
- » The degree to which the impact can be mitigated.

The **significance** was then calculated by combining the criteria in the following formula:

$$S = (E+D+M) \times P$$

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

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

- » < 30 points: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area).

- » 30 – 60 points: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated).
- » > 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area).

2.4. Limitations and Assumptions

The following assumptions and limitations are applicable to this SIA:

- » Data derived from the 2011 Census, North West Provincial Development Plan (PDP) 2030 (2013), North West Provincial Growth and Development Strategy (PGDS) 2004 – 2014 (2011), Renewable Energy Strategy for the North West Province (2012), North West Provincial Spatial Development Framework (PSDF) (2017), Dr Ruth Segomotsi Mompati DM Integrated Development Plan (IDP) 2017 – 2022 (2017), and Naledi LM IDP 2017 – 2022 (2017) was used to generate the majority of information provided in the baseline profile of the study area. The possibility therefore exists that the data utilised may be out of date, and may not provide an accurate reflection of the current status quo.
- » This SIA Report was prepared based on information which was available to the specialist at the time of preparing the report. The sources consulted are not exhaustive, and the possibility exists that additional information which might strengthen arguments, contradict information in this report, and / or identify additional information might exist.
- » Some of the project projections reflected in this SIA Report (i.e. with regards to job creation and local content) may be subject to change, and therefore may be higher or lower than those estimated by the project proponent.
- » It is assumed that the motivation for, and planning and feasibility study of the project were under-taken with integrity, and that information provided by the project proponent was accurate and true at the time of preparing this SIA Report.

3. LEGISLATION AND POLICY REVIEW

The legislative and policy context applicable to a project plays an important role in identifying and assessing the potential social impacts associated with the development. In this regard a key component of the SIA process is to assess a proposed development in terms of its suitability with regards to key planning and policy documents.

The following key pieces of documentation were reviewed as part of this legislation and policy review process:

National Policy and Planning Context:

- » Constitution of the Republic of South Africa (1996)
- » National Environmental Management Act (No. 107 of 1998) (NEMA)
- » White Paper on the Energy Policy of the Republic of South Africa (1998)
- » White Paper on the Renewable Energy Policy of the Republic of South Africa (2003)
- » National Energy Act (No. 34 of 2008)
- » Integrated Energy Plan (IEP) (2015)
- » Integrated Resource Plan (IRP) for Electricity 2010-2030 (2011) (and subsequent updates thereto)
- » National Development Plan (NDP) 2030 (2012)
- » Strategic Infrastructure Projects (SIPs)

Provincial Policy and Planning Context:

- » North West Provincial Development Plan (PDP) 2030 (2013)
- » North West Provincial Growth and Development Strategy (PGDS) 2004 – 2014 (2011)
- » Renewable Energy Strategy for the North West Province (2012)
- » North West Provincial Spatial Development Framework (PSDF) (2017)

Local Policy and Planning Context:

- » Dr Ruth Segomotsi Mompati DM Integrated Development Plan (IDP) 2017 – 2022 (2017)
- » Naledi LM Integrated Development Plan (IDP) 2017 – 2022 (2017)

3.1. National Policy and Planning Context

Any project which contributes positively towards the objectives mentioned within national policies could be considered strategically important for the country. A review of the national policy environment suggests that the increased utilisation of Renewable Energy (RE) sources is considered integral to reducing South Africa's carbon footprint, diversifying the national economy, and contributing towards socio-economic development and poverty reduction. Due to the fact that the project comprises a RE project, and would contribute positively towards RE targets set out and supported within these national policies, the Moeding Solar PV Facility is considered to fit within the national policy framework.

A brief review of the most relevant national policies is provided below.

3.1.1. Constitution of the Republic of South Africa, 1996

The Constitution of the Republic of South Africa, 1996 is the supreme law of South Africa, and forms the foundation for a democratic society in which fundamental human rights are protected. The Bill of Rights contained in Chapter 2 of the Constitution enshrines the rights of all people in South Africa and affirms the democratic values of human dignity, equality, and freedom. Section 24 of the Constitution pertains specifically to the environment. It states that:

24. Everyone has the right –

- (a) To an environment that is not harmful to their health or well-being, and
- (b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:
 - (i) Prevent pollution and ecological degradation.
 - (ii) Promote conservation.
 - (iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

The Constitution outlines the need to promote social and economic development. Section 24 of the Constitution requires that development be conducted in such a manner that it does not infringe on an individual's environmental rights, health, or well-being. This is especially significant for previously disadvantaged individuals who are most at risk to the effects of environmental impacts.

The Moeding Solar PV Facility comprises a renewable energy generation facility which is intended to generate electricity utilising clean, renewable resources while simultaneously contributing towards socio-economic development in accordance with the bidding requirements of the REIPPP Programme. The development of the Moeding Solar PV Facility is therefore not anticipated to infringe on any individuals environmental rights enshrined in the Constitution.

3.1.2. National Environmental Management Act (No. 107 of 1998) (NEMA)

The National Environmental Management Act (No. 107 of 1998) (NEMA) is South Africa's key piece of environmental legislation, and sets the framework for environmental management in South Africa. It provides for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment. NEMA is founded on the principle that everyone has the right to an environment that is not harmful to their health or well-being as contained within the Bill of Rights. In accordance with this NEMA it states that:

- » *The State must respect, protect, promote and fulfil the social, economic and environmental rights of everyone and strive to meet the basic needs of previously disadvantaged communities.*
- » *Sustainable development requires the integration of social, economic and environmental factors in the planning, implementation and evaluation of decisions to ensure that development serves present and future generations.*
- » *Everyone has the right to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.*

In addition, the national environmental management principles contained within NEMA state that:

- » *Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.*
- » *Development must be socially, environmentally and economically sustainable.*
- » The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment

The need for environmental assessments to include consideration of the social environment is therefore enshrined within NEMA, and necessary for responsible and informed decision-making by government on the acceptability of environmental impacts. It must be noted that NEMA does not preclude development, but rather requires that development be socially, environmentally, and economically sustainable.

3.1.3. White Paper on the Energy Policy of the Republic of South Africa (1998)

The White Paper on Energy Policy places an emphasis on the expansion of energy supply options to enhance the country's energy security. This can be achieved through increased use of RE and encouraging new entries into the generation market. South Africa has an attractive range of cost effective renewable resources, taking into consideration social and environmental costs. Government policy on renewable energy is thus concerned with meeting the following challenges:

- » Ensuring that economically feasible technologies and applications are implemented,
- » Ensuring that an equitable level of national resources is invested in renewable technologies, given their potential and compared to investments in other energy supply options, and,
- » Addressing constraints on the development of the renewable industry.

The policy states that the advantages of RE include, minimal environmental impacts during operation in comparison with traditional supply technologies, generally lower running costs, and high labour intensities. Disadvantages include, higher capital costs in some cases, lower energy densities, and lower levels of availability, depending on specific conditions, especially with sun and wind based systems. Nonetheless, renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future. Therefore, the policy supports the advancement of RE sources at ensuring energy security through the diversification of supply.

Supporting the advancement of RE sources and ensuring diversification of supply is also a significant component of the REIPPP Programme, which the Moeding Solar PV Facility is intended to form part of.

3.1.4. White Paper on the Renewable Energy Policy of the Republic of South Africa (2003)

The White Paper on Renewable Energy Policy supplements the Government's predominant policy on energy as set out in its White Paper on the Energy Policy of the republic of South Africa (DME, 1998). The policy recognises the potential of RE, and aims to create the necessary conditions for the development and commercial implementation of RE technologies. The position of the White Paper on RE is based on the integrated resource planning criterion of:

“Ensuring that an equitable level of national resources is invested in renewable technologies, given their potential and compared to investments in other energy supply options.”

The White Paper on RE sets out Government's vision, policy principles, strategic goals and objectives for promoting and implementing RE in South Africa. The country relies heavily on coal to meet its energy needs because it is well-endowed with coal resources. However, massive RE resources that can be sustainable alternatives to fossil fuels, have so far remained largely untapped. This White Paper fosters the uptake of RE in the economy and has a number of objectives that include: ensuring equitable resources are invested in renewable technologies, directing public resources for implementation of RE technologies, introducing suitable fiscal incentives for RE and, creating an investment climate for the development of the RE sector. The White Paper on Renewable Energy of 2003 set a target of 10 000GWh to be generated from RE by 2013 to be produced mainly from biomass, wind, solar and small-scale hydro. The target was subsequently reviewed in 2009 during the renewable energy summit of 2009. The objectives of the White Paper on RE are considered in six focal areas, namely, financial instruments, legal instruments, technology development, awareness raising, capacity building and education, and market based and regulatory instruments. The policy supports the investment in RE facilities as they contribute towards ensuring energy security through the diversification of energy supply, reducing GHG emissions and the promotion of RE sources.

3.1.5. National Energy Act (No. 34 of 2008)

The purpose of the National Energy Act (No. 34 of 2008) is to ensure that diverse energy resources are available, in sustainable quantities and at affordable prices, to the South African economy in support of economic growth and poverty alleviation, while taking environmental management requirements into account. In addition, the Act also provides for energy planning, and increased generation and consumption of Renewable Energies (REs).

The objectives of the Act, are to amongst other things:

- » *Ensure uninterrupted supply of energy to the Republic.*
- » *Promote diversity of supply of energy and its sources.*
- » *Facilitate energy access for improvement of the quality of life of the people of the Republic.*
- » *Contribute to the sustainable development of South Africa's economy.*

The National Energy Act therefore recognises the significant role which electricity plays growing the economy while improving citizens' quality of life. The Act provides the legal framework which supports the development of RE facilities for the greater environmental and social good, and provides the backdrop against which South Africa's strategic planning regarding future electricity provision and supply takes place. It also provides the legal framework which supports the development of RE facilities for the greater environmental and social good.

3.1.6. Integrated Energy Plan (IEP) 2016

The Integrated Energy Plan (IEP) (which was developed under the National Energy Act (No. 34 of 2008)), recognises that energy is essential to many human activities and is critical to the social and economic development of a country. The purpose of the IEP is essentially to ensure the availability of energy resources, and access to energy services in an affordable and sustainable manner, while minimising the

associated adverse environmental impacts. Energy planning therefore needs to balance the need for continued economic growth with social needs and the need to protect the natural environment.

The IEP is a multi-faceted, long-term energy framework which has multiple aims, some of which include:

- » To guide the development of energy policies and, where relevant, set the framework for regulations in the energy sector.
- » To guide the selection of appropriate technologies to meet energy demand (i.e. the types and sizes of new power plants and refineries to be built and the prices that should be charged for fuels).
- » To guide investment in and the development of energy infrastructure in South Africa.
- » To propose alternative energy strategies which are informed by testing the potential impacts of various factors such as proposed policies, introduction of new technologies, and effects of exogenous macro-economic factors.

The 8 key objectives of the integrated energy planning process, are as follows:

- » Objective 1: Ensure security of supply.
- » Objective 2: Minimise the cost of energy.
- » Objective 3: Promote the creation of jobs and localisation.
- » Objective 4: Minimise negative environmental impacts from the energy sector.
- » Objective 5: Promote the conservation of water.
- » Objective 6: Diversify supply sources and primary sources of energy.
- » Objective 7: Promote energy efficiency in the economy.
- » Objective 8: Increase access to modern energy.

3.1.7. Integrated Resource Plan for Electricity (IRP) 2010-2030 (2011)

The Integrated Resource Plan (IRP) for Electricity 2010 – 2030 is a subset of the IEP and constitutes South Africa's National electricity plan. The primary objective of the IRP is to determine the long term electricity demand and detail how this demand should be met in terms of generating capacity, type, timing and cost. The IRP also serves as input to other planning functions, including amongst others, economic development and funding, and environmental and social policy formulation.

The current iteration of the IRP, led to the Revised Balanced Scenario (RBS) that was published in October 2010. Following a round of public participation which was conducted in November / December 2010, several changes were made to the IRP model assumptions. The document outlines the proposed generation new-build fleet for South Africa for the period 2010 to 2030. This scenario was derived based on a cost-optimal solution for new-build options (considering the direct costs of new build power plants), which was then "balanced" in accordance with qualitative measures such as local job creation.

The Policy-Adjusted IRP reflected recent developments with respect to prices for renewables. In addition to all existing and committed power plants, the plan includes 9.6GW of nuclear; 6.25GW of coal; 17.8GW of renewables; and approximately 8.9GW of other generation sources such as hydro, and gas.

An IRP 2010 – 2030 Update Report was prepared and released in November 2013, which estimated the energy demand in 2030 to be in the range of 345TWh – 416TWh as opposed to 454TWh as was originally expected in the policy-adjusted IRP. This equates to a reduction from 67 800MW to 61 200MW of reliable

generating capacity. This IRP Update report was not adopted by Parliament and was therefore never implemented.

In November 2016 a draft IRP Update – Assumption, Base Case Results and Observations (Revision 1) document was released for comment. The update process estimated that 18GW of PV generation capacity would be required by the end of 2050; in addition to 15GW of coal-fired generation capacity, 37GW of wind, 20GW of nuclear, 34GW of gas, and 2.5GW of import hydro. The 2030 figures in the Base Case excluded the capacity already procured or under procurement (i.e. 6.2GW of renewable energy and 900MW of coal from IPP projects), and therefore differ from those in the IRP 2010 – 2030 (2011).

On 27 August 2018 the Draft IRP 2018 was released for comment. The Draft IRP 2018 is based on least-cost supply and demand balance and takes into account security of supply and the environment (i.e. with regards to minimising negative emissions and water usage). According to the Draft IRP 2018 key input assumptions that changed from the promulgated IRP 2010 – 2030 (2011) include, amongst others, technology costs, electricity demand projection, fuel costs and Eskom's existing fleet performance and additional commissioned capacity. For the period ending 2030, the Draft IRP 2018 proposes a number of policy adjustments to ensure a practical plan that will be flexible to accommodate new, innovative technologies that are not currently cost competitive, the minimisation of the impact of decommissioning of coal power plants, and the changing demand profile.

The recommended updated Plan is as depicted in **Figure 3.1**.

	Coal	Nuclear	Hydro	Storage (Pumped Storage)	PV	Wind	CSP	Gas / Diesel	Other (CoGen, Biomass, Landfill)	Embedded Generation
2018	39 126	1 860	2 196	2 912	1 474	1 980	300	3 830	499	Unknown
2019	2 155					244	300			200
2020	1 433				114	300				200
2021	1 433				300	818				200
2022	711				400					200
2023	500									200
2024	500									200
2025					670	200				200
2026					1 000	1 500		2 250		200
2027					1 000	1 600		1 200		200
2028					1 000	1 600		1 800		200
2029					1 000	1 600		2 850		200
2030			2 500		1 000	1 600				200
TOTAL INSTALLED	33 847	1 860	4 696	2 912	7 958	11 442	600	11 930	499	2 600
Installed Capacity Mix (%)	44.6	2.5	6.2	3.8	10.5	15.1	0.9	15.7	0.7	

- Installed Capacity
- Committed / Already Contracted Capacity
- New Additional Capacity (IRP Update)
- Embedded Generation Capacity (Generation for own use allocation)

Figure 3.1: Proposed Updated plan for the Period Ending 2030 (Source: Draft IRP 2018).

Based on the Draft IRP 2018 there is currently 1 474MW of installed PV capacity, while an additional 814MW has been committed between 2020 and 2022, and an additional 5 670MW capacity has been allocated between 2025 and 2030.

3.1.8. National Development Plan 2030 (2012)

The National Development Plan (NDP) 2030 is a plan prepared by the National Planning Commission in consultation with the South African public which is aimed at eliminating poverty and reducing inequality by 2030. The NDP aims to achieve this by drawing on the energies of its people, growing and inclusive economy, building capabilities, enhancing the capacity of the state and promoting leaderships and partnerships throughout society. While the achievement of the objectives of the NDP requires progress on a broad front, three priorities stand out, namely:

- » Raising employment through faster economic growth.
- » Improving the quality of education, skills development and innovation.
- » Building the capability of the state to play a developmental, transformative role.

In terms of the Energy Sector's role in empowering South Africa, the NDP envisages that, by 2030, South Africa will have an energy sector that promotes:

- » Economic growth and development through adequate investment in energy infrastructure. The sector should provide reliable and efficient energy service at competitive rates, while supporting economic growth through job creation.
- » Social equity through expanded access to energy at affordable tariffs and through targeted, sustainable subsidies for needy households.
- » Environmental sustainability through efforts to reduce pollution and mitigate the effects of climate change.

The NDP aims to provide a supportive environment for growth and development, while promoting a more labour-absorbing economy. The Moeding Solar PV Facility will assist in reducing carbon emissions targets and creating jobs in the local area as well as assist in creating a competitive infrastructure based on terms of energy contribution to the national grid.

3.1.9. Strategic Infrastructure Projects (SIPs)

The Presidential Infrastructure Coordinating Committee (PICC) are integrating and phasing investment plans across 18 Strategic Infrastructure Projects (SIPs) which have the following 5 core functions:

- » To unlock opportunity.
- » Transform the economic landscape.
- » Create new jobs.
- » Strengthen the delivery of basic services.
- » Support the integration of African economies.

A balanced approach is being fostered through greening of the economy, boosting energy security, promoting integrated municipal infrastructure investment, facilitating integrated urban development, accelerating skills development, investing in rural development and enabling regional integration.

SIP 8 of the energy SIPs supports the development of RE projects as follow:

- » SIP 8: Green energy in support of the South African economy:

Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP 2010) and supports bio-fuel production facilities.

The development of the proposed project is therefore also aligned with SIP 8 as it constitutes a green energy initiative which would contribute clean energy in accordance with the IRP 2010 – 2030.

3.1.10. National Climate Change Response White Paper (2011)

South Africa's response to climate change as contained within the National Climate Change Response White Paper (2011) has two objectives. Namely:

- » To effectively manage the inevitable climate change impacts through interventions that build and sustain South Africa's social, economic, and environmental resilience and emergency response capacity, and
- » To make a fair contribution to the global efforts to stabilise greenhouse gas (GHG) concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe that enabled economic, social, and environmental development to proceed in a sustainable manner.

The National Climate Change Response White Paper proposes a number of approaches dealing with climate change impacts with respect to selected sectors. The energy sector is considered to be one of the key sectors that provides possible mitigations with which to address climate change. The White Paper provides support for the proposed PV facility which will contribute to managing climate change impacts, support the emergency response capacity, as well as assist in reducing GHG emissions in a sustainable manner.

3.2. Provincial Policies

This section provides a brief review of the most relevant provincial policies applicable to the project. The Moeding Solar PV Facility is considered to align with the aims of these policies, even if the proposed projects contributions to achieving the goals therein are only minor.

3.2.1. North West Provincial Development Plan (PDP) 2030 (2013)

The North West Provincial Development Plan (PDP) 2030, is largely based on, and intended to apply the objectives of, the National Development Plan (NDP) 2030. The overall targets of the PDP have been identified as follows:

By 2030:

- » Eliminate income poverty: reduce the percentage of the population living in poverty from 46% to 0% in 2030.
- » Reduce inequality: the Gini coefficient should fall from 0.61 to 0.53.

- » The targets for poverty reduction and the GINI coefficient compliments the national targets set out for the elimination of poverty and reduction of inequality.
- » The unemployment rate should fall from 24% in 2010 to 14% by 2020 and to 6% by 2030. This requires an additional 815 000 jobs. Total employment should rise from 748 000 to 1 563 000.
- » The NDP projects that total employment should rise from 13 million to 24 million in South-Africa. 7% of additional jobs that has to be created will be located in the North West Province. By 2030 the North West will be responsible for 6.5% of employment in South-Africa.
- » The provincial Gross Value Added (GVA) should increase by 2.9 times in real terms. Such growth will require an average annual Gross Value Added (GVA) growth of 5.4%.

The development of the Moeding Solar PV Facility has the potential to contribute towards a number of the targets set by the PDP, including:

- » Job creation and increased income, which would have a positive impact on the current unemployment rate, standard of living, levels of inequality, and poverty levels within the Province.
- » Contribute towards the capita income, and improve on labour force participation rates.
- » Production of clean energy.

3.2.2. North West Provincial Growth and Development Strategy (PGDS) 2004 – 2014 (2011)

The North West Provincial Growth and Development Strategy (PGDS) provides a framework for integrated and sustainable growth and economic development for the province and its people. Challenges facing the Province can be summarised as follows: the Province is mostly rural in nature, has a low population density, and relative inadequate infrastructure, especially in the remote rural areas, has inherited an enormous backlog in basic service delivery and maintenance that will take time to eradicate, the population is predominantly poor with high levels of illiteracy and dependency that seriously affect their productivity and ability to compete for jobs, is characterised by great inequalities between the rich and poor as well as disparities between urban and rural, is faced with HIV / AIDS as a social and economic challenge, available resources are unevenly distributed, and there is limited potential for improved delivery of services and growth. From the above, job creation and poverty eradication together with the low level of expertise and skills, stand out as the greatest challenges to be resolved within the Province.

Goals and objectives of the PGDS are to fight poverty and unemployment, improve the low level of expertise and skills which are classified as both immediate and long term goals and require primary goals for sustained growth and economic development. The proposed solar farm will contribute to employment creation and skills development which is in line with the goals and objectives of the North West PGDS.

The North West PGDS aims at building a sustainable economy to eradicate poverty and improve social development. Moeding Solar will contribute to growth and development of the local area by expanding the economic base and creating employment opportunities.

3.2.3. Renewable Energy Strategy for the North West Province (2012)

In 2012 the North West Province's then Department of Economic Development, Environment, Conservation and Tourism (DEDECT) developed the Renewable Energy Strategy for the North West Province. The strategy was developed in response to the need of the North West Province to participate meaningfully within South Africa's RE sector. The RE strategy aims to improve the North West Province's environment,

reduce its contribution to climate change, and alleviate energy poverty, whilst promoting economic development and job creation whilst developing its green economy.

According to the strategy the North West Province consumes approximately 12% of South Africa's available electricity, and is rated as the country's fourth largest electricity consuming province. This is mainly due to the high demand of the electrical energy-intensive mining and related industrial sector, with approximately 63% of the electricity supplied to the province being consumed in its mining sector.

While the strategy recognises that South Africa has an abundance of RE resources available, it is cognisant of the fact that the applicability of these RE resources depend on a number of factors and as a result are not equally viable for the North West Province. The RE sources that were identified to hold the most potential and a competitive strength for the North West Province are Solar Energy (photovoltaic as well as solar water heaters), Municipal Solid Waste, hydrogen and fuel cell technologies, bio-mass, and energy efficiency.

The advantages and benefits for the North West Province associated with the implementation and use of RE technologies include:

- » Provision of energy for rural communities, schools and clinics that are far from the national electricity grid.
- » Creation of an environment where access to electricity provides rural communities with the opportunity to create an economic base via agricultural and home-based industries and Small, Medium and Micro Enterprises (SMMEs) in order to grow their income-generating potential.
- » The supply of water within rural communities.
- » It would result in less time taken for the collection of wood and water, thus improving the quality of life within communities and specifically for women.
- » Improved health through the reduced use of fuelwood as energy source for cooking and heating that causes respiratory and other hazards.
- » Solar water heating for households in urban and rural settings, reducing the need for either electricity (in urban settings) and fuelwood (in rural settings) to heat water, thus lowering our National peak demand and conservation of woodlands in a sustainable manner.
- » Large-scale utilisation of renewable energy will also reduce the emissions of carbon dioxide, thus contributing to an improved environment.
- » The fact that RE go hand-in-hand with energy efficiency, it will result in additional financial benefit and the need for smaller RE systems.
- » The development of a strong localised RE industry within the North West Province holds substantial potential for Black Economic Empowerment (BEE) and job creation within the province.
- » The establishment of a strong RE base in the North West Province, especially in the manufacturing of fuel cells could stimulate the market for Platinum Group Metals, which would in turn help the local mining sector.

This is due to RE sources having considerable potential for increasing security of supply by diversifying the energy supply portfolio and increasingly contributes towards a long-term sustainable energy future. In terms of environmental impacts, RE results in the emission of less GHGs than fossil fuels, as well as fewer airborne particulates, and other pollutants. Furthermore, RE generation technologies save on water consumption in comparison with coal-fired power plants.

Solar Energy

With an average daily solar radiation of approximately 7 500 MJ/m² South Africa experiences some of the highest levels of solar radiation in the World. Most areas in South Africa average more than 2 500 hours of sunshine per year, which makes solar energy the most readily accessible resource in South Africa and specifically the North West Province which has a very good solar potential with an average daily solar radiation greater than 8 000 MJ/m².

The relative values for the annual solar radiation were determined for each of the four DMs in the North West Province compared to the maximum and minimum values for South Africa (refer to **Table 3.1**).

Table 3.1: Global annual solar radiation of the North West Province relative to South African Maximum and Minimum location values.

Description	Annual Solar Radiation Range (MJ/m²)		Relative to South African Maximum	Relative to South African Minimum
Maximum in South Africa	9 001	9 500	-	-
Dr Ruth Segomotsi Mompoti DM	8 501	9 000	-5%	40%
Ngaka Modiri-Molema DM	8 501	9 000	-5%	40%
Bojanala Platinum DM	8 001	8 500	-11%	32%
Dr Kenneth Kaunda DM	8 001	8 500	-11%	32%
Minimum in South Africa	6 000	6 500	-	-

While Upington in the Northern Cape Province is located within the area of maximum solar radiation, and is considered a prime location for solar energy projects, the Dr Ruth Segomotsi Mompoti DM of the North West Province receives on average only 5% less solar radiation than Upington. In addition, all four DMs on average receive 40% to 32% more solar radiation than the locations with the least solar radiation in South Africa (such as Durban). The North West Province therefore shows considerable potential for solar applications of RE as a whole, with the highest potential in the Dr. Ruth Segomotsi Mompoti and Ngaka Modiri-Molema Districts specifically. The development of commercial PV solar energy facilities within the Dr. Ruth Segomotsi Mompoti DM of North West Province is therefore strongly supported in terms of the Renewable Energy Strategy for the North West Province (2012).

3.2.4. North West Provincial Spatial Development Framework (2017)

As per the North West Provincial Spatial Development Framework (PSDF) (2017) electricity within the province is primarily provided by Eskom to re-distributors – mainly municipalities (10%), commercial (5%), agriculture (5%), mining (30%), industrial (30%) and Residential (20%). Electricity for supply to the North West Province is mostly generated by Eskom's Matimba coal-fired Power Station in Limpopo which will in future be augmented by Eskom's Medupi coal-fired Power Station.

According to the North West PSDF the proposed project site is located within the Vryburg Distribution Area, which is characterised by minor developments, including Residential, Industrial, and Major Electrification, and has a projected growth of 100MW (Eskom, 2015).

Eskom's Transmission Development Plan 2015 – 2024 represents the transmission network infrastructure investment requirements over the 10 year period between 2015 and 2024. Projects proposed for the North West Province for the next 10 years include the introduction of 400kV power lines and transformation to support or relieve the existing networks. Five transmission power corridors have been identified as critical to providing a flexible and robust network that could respond to meet the needs of future IPPs and IRP requirements. The location of the potential MTS substation projects for additional grid access and the transmission power corridor routes are shown in **Figure 3.2**.

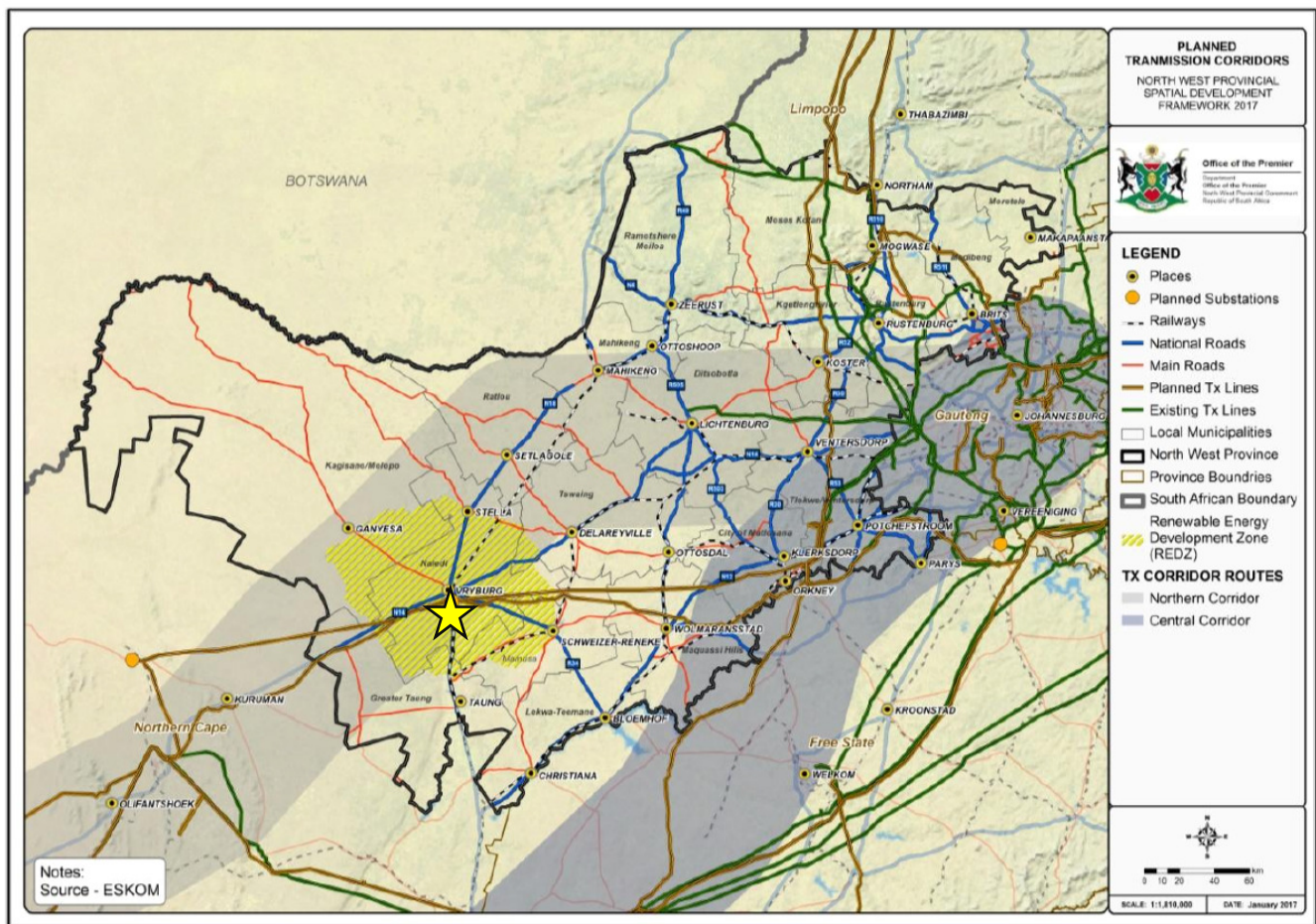


Figure 3.2: Planned Transmission Power Corridors (Source: North West PSDF, 2017). The proposed project location is indicated by the yellow star.

According to **Figure 3.2** the Moeding Solar PV Facility is proposed within an area which is characterised by both a transmission corridor route (i.e. the Northern Corridor Route) and a Renewable Energy Development Zone (REDZ) (i.e. the Vryburg REDZ).

According to the North West Province PSDF, and Statistics South Africa, the proposed project area is characterised by fairly low levels of access to electricity (i.e. 60% - 70%), when compared to other areas within the Province (refer to **Figure 3.3**). The implementation of the Moeding Solar PV Facility at the

proposed project site would result in the generation of additional electricity within an area which is characterised by a fairly low level of access (i.e. between 60% - 70%). In addition, the project has the potential to somewhat alleviate the Province's reliance on electricity generated by coal-fired power stations such as Eskom's Matimba and Medupi coal-fired Power Stations as is currently the case.

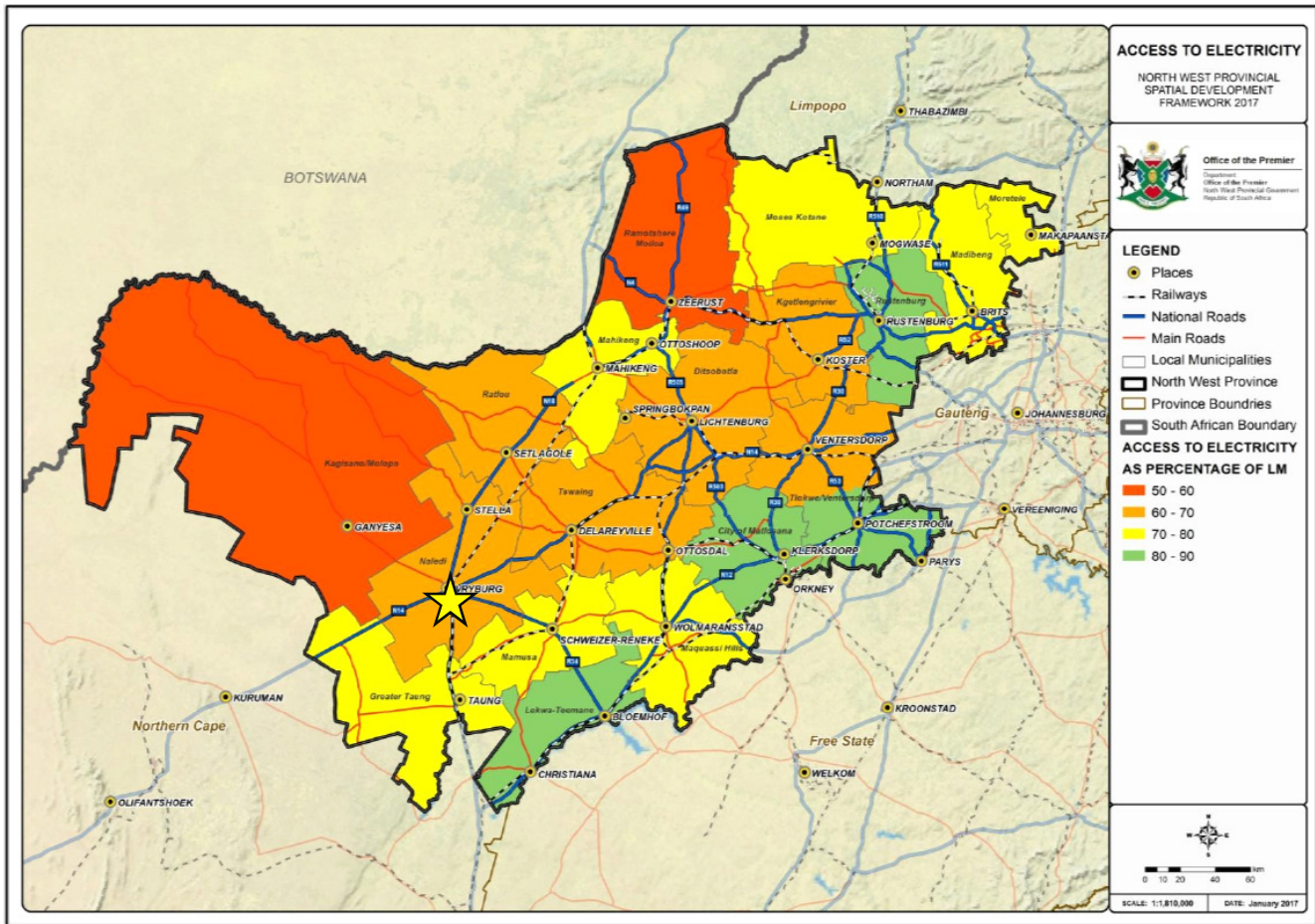


Figure 3.3: Access to Electricity (Source: North West PSDF, 2017). The proposed project location is indicated by the yellow star.

3.3. District and Local Municipalities Policies

The strategic policies at district and local level have similar objectives for the respective areas, namely to accelerate economic growth, create jobs, and uplift communities. The Moeding Solar PV Facility is considered to also align with the aims of these policies, even if contributions to achieving the goals therein are only minor.

3.3.1. Dr Ruth Segomotsi Mompati DM IDP 2017 – 2022 (2017)

The vision of the Dr Ruth Segomotsi Mompati DM as contained in its IDP 2017 – 2022 (2017) is:

"A Developmental district, where sustainable service delivery is optimised, prioritised and realised."

The mission of the Thabo Mofutsanyane DMs mission is:

"We provide efficient, effective and sustainable municipal service to the communities of the Dr Ruth Mompati District Municipality."

The existing level of development and challenges in Dr. Ruth Segomotsi Mompati DM are summarised as follows in the IDP:

- » The Dr. Ruth Segomotsi Mompati DM is endowed with minerals but this sector remains a small contributor to GDP of the Province.
- » The population is largely African with low education, low incomes, high unemployment, and with minimal access to water and sanitation.
- » The population is largely young with a small percentage of adults who are economically active.
- » Contamination of underground water source.
- » Heavy dependency on public administration as employer. There is a critical need to develop the private sector in agriculture and mining involvement. The development of the Small Medium Micro Enterprise (SMME) sector both in the formal and informal sectors is critical.
- » Current access to water and sanitation services is a concern.
- » Maintenance of Ventilated Improved Pit (VIP) toilets.
- » The DM is largely rural and there majority of population stays in rural areas.

The need for socio-economic development within the district has therefore been highlighted as a key factor in assisting the district to achieve its vision.

In terms of the Spatial Development Framework (2013) the following main issues have been identified for the district:

- » Planning and Financial Related Issues:
 - * Misalignment between IDP projects and national and provincial strategies as well as programs.
 - * Lack of financial management skills in some LMs.
- » Service Delivery:
 - * Insufficient healthcare facilities and schools in some of the LMs.
 - * Lack of rental units (Community Residential Units (CRU)) in the DM which discourages skilled and professional people from other areas.
 - * Large number of shacks in some of the LMs.
 - * Poor condition of some of the roads in the DM.
 - * Lack of tarred roads in some of the LM.
 - * Insufficient funds to provide basic services.
- » Socio-Economic Development:
 - * The DM has the lowest population in the province due to mass exodus of youth.
 - * Low levels of literacy amongst the members of the communities.
 - * Low household income in the DM.
 - * High rate of unemployment in the DM.
 - * Kagisano-Molopo further away from the major commercial markets in the region.
 - * Overdependence of the DM economy on the agricultural sector and community service sector.
 - * The underdevelopment of the tourism sector.
 - * Potential for xenophobia attacks due to lack of control and regulation of the informal and small business sub sector.

- » Rural Development:
 - * Overgrazed land in the tribal authorities.
 - * Inequality in terms of the provision of basic service delivery in the DM.
 - * No business space in rural areas.
- » Environmental Issues:
 - * High potential of the destruction of houses and roads as a result of heavy floods.
 - * Soil erosion as a result of overgrazing in the rural areas.
 - * Water contamination of ground water resources as a result of pit latrines in some of the LMs.
 - * Deforestation as a result of using the forest for firewood.

The development of the proposed Moeding Solar PV Facility has the potential to positively contribute towards alleviating to some extent some of the main issues identified by the Dr. Ruth Segomotsi Mompati DM in its SDF (2013). Specifically with regards to contributing towards revenue generation which could be utilised to increase service delivery within the DM, as well as making a positive contribution in terms of socio-economic development (i.e. low household income, high rate of unemployment, and overdependence of the DM economy on the agricultural sector and community service sector).

3.3.2. Naledi LM IDP 2017 – 2022 (2017)

The vision of the Naledi LM as contained within its 2017 – 2022 (2017) IDP is:

“To provide basic, quality, sustainable and equitable services through effective and efficient governance and financial management.”

Its mission is defined as follows:

“We will deliver adequate and sustainable services to our community by:

- » *Enhancing revenue and effective utilisation of resources*
- » *Promoting radical socio economic and infrastructure development*
- » *Instil corporate culture*
- » *To have motivated and representative workforce with high ethical standards*
- » *To apply good and transparent municipal governance (King III)*
- » *To render cost effective and sustainable services to all Villages, Townships and Small Dorpies (VTSD) areas*
- » *Adhering to Batho Pele Principles.”*

The Naledi LM's IDP recognises the LM's need to focus on “people not places” while ensuring that it plays its role in the national efforts to create a developmental state which addresses the primary needs relating to education, healthcare, safety and poverty alleviation while creating opportunities for economic growth and job creation. The development of the Moeding Solar PV Facility within the Naledi LM has the potential to contribute positively towards economic growth and job creation, while the socio-economic development component required of the project has the potential to contribute towards generating revenue which could be utilised to address primary needs within the surrounding area.

The following vision is proposed as part of developing a Local Economic Development (LED) strategy for the Naledi LM, and is contained within the IDP 2017 – 2022 (2017):

"To establish Naledi as an integrated regional economic node that is focused on intelligent support for business and community development embedded in a sustainable green environment."

The Naledi LM's SDF as contained within its IDP 2017 – 2022 (2017) is provided in **Figure 3.4**. According to the SDF, the Moeding Solar PV Facility is proposed within an area which has been characterised as an Ecological Support Area 2 (ESA 2), and is located within close proximity to the LM's First Order Node, Vryburg.

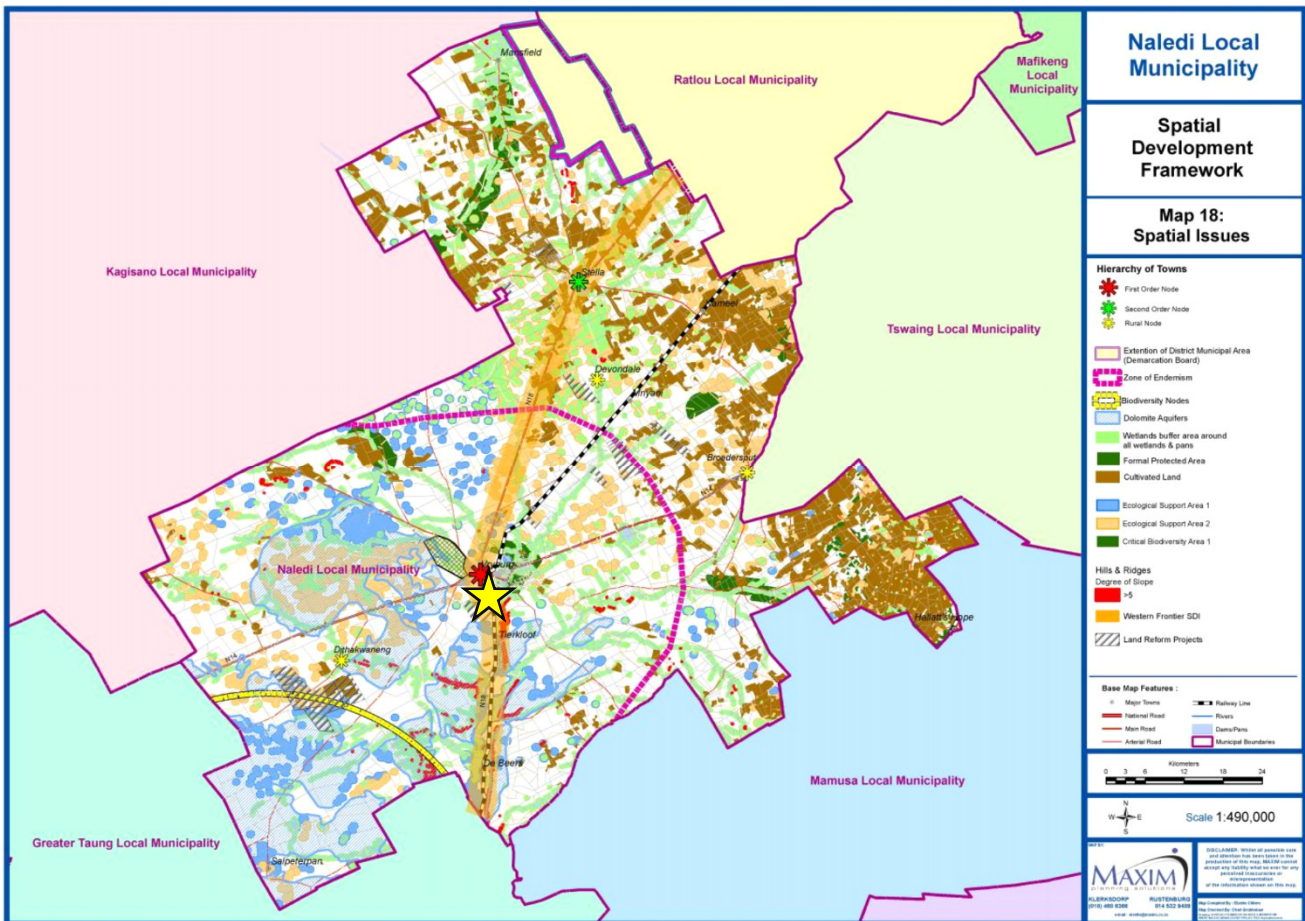


Figure 3.4: Naledi LM's SDF (Source: Naledi LM IDP 2017 – 2022). The proposed project location is indicated by the yellow star.

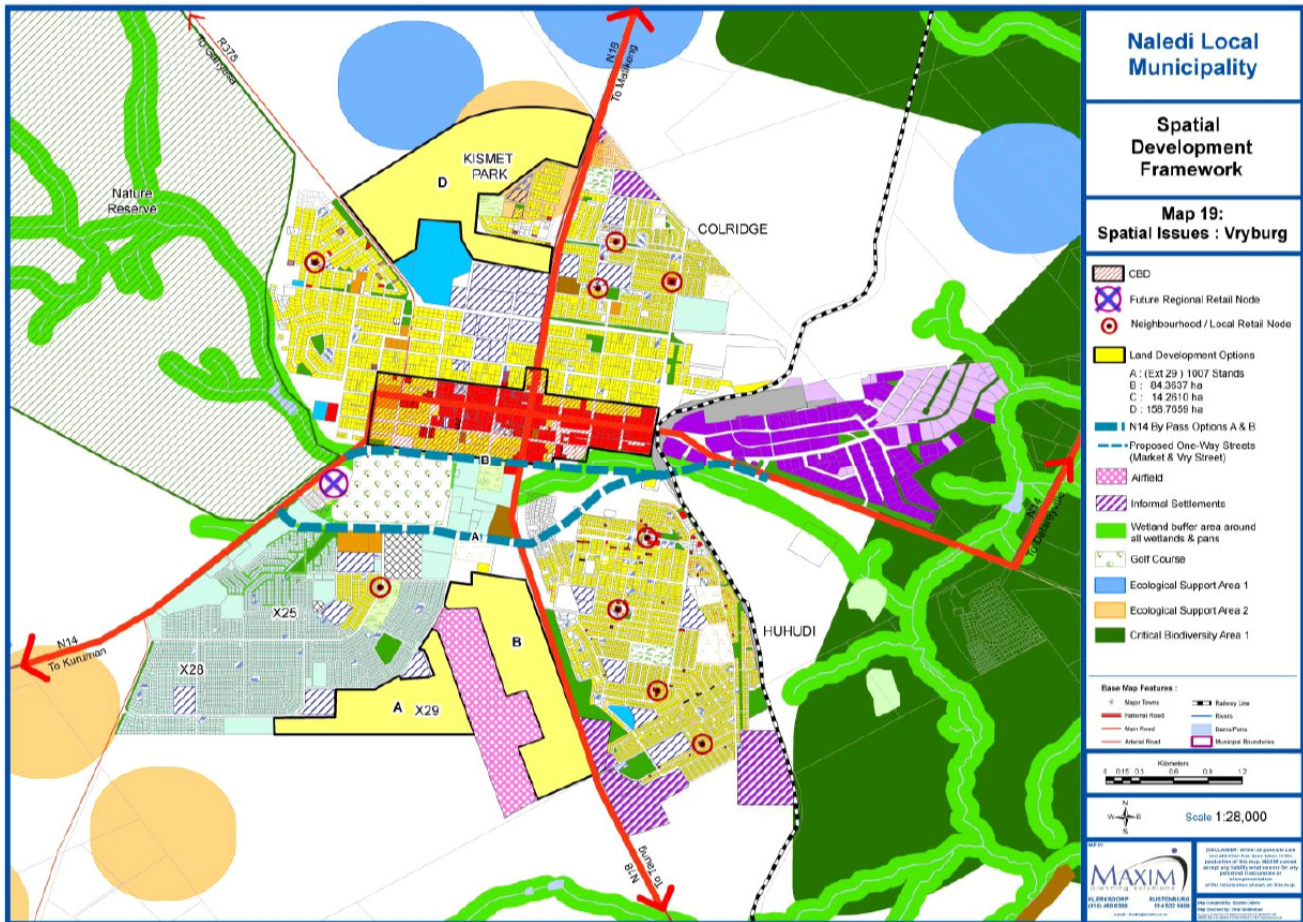


Figure 3.5: Naledi LM’s SDF’s Vryburg Spatial Proposal (Source: Naledi LM IDP 2017 – 2022).

The development of a RE facility at the proposed project site could be considered to be a complimentary land use provided that the necessary environmental impacts are appropriately identified and mitigated against.

3.4. Conclusion

The review of relevant policies and documentation pertaining to the energy sector therefore indicate that renewable or green energy (i.e. energy generated by naturally occurring renewable resources) and therefore the establishment of the Moeding Solar PV Facility is supported at a national, provincial, and local level, and that the proposed project will contribute positively towards a number of targets and policy aims. Specifically those relating to employment creation, social and economic development and upliftment, and an increase in RE and electricity supply which has the potential to further improve individuals' standard of living.

4. SOCIO-ECONOMIC PROFILE

The Moeding Solar PV Facility is proposed on a project site located approximately 8km south of Vryburg in Wards 05 and 09 of the Naledi LM of the Dr Ruth Segomotsi Mompati DM, in the North West Province (refer to **Table 4.1**).

Table 4.1: Spatial context of the proposed project site.

Province	North West Province
District Municipality	Dr Ruth Segomotsi Mompati DM
Local Municipality	Naledi LM
Ward Number(s)	5 and 9
Nearest town(s)	<ul style="list-style-type: none"> » Vryburg (8km north) » Amalia (38km south-east) » Pudimoe (40km south) » Stella (56km north) » Schweizer-Reneke (58km east)
Farm Portion(s), Name(s) and Number(s)	<ul style="list-style-type: none"> » Portion 01 of the Farm Champions Kloof No. 731 » Portion 04 of the Farm Waterloo No. 730 » Remaining Extent of Portion 03 of the Farm Waterloo No. 730 » Remaining Extent of the Farm Rosendal No. 673
SG 21 Digit Code(s)	<ul style="list-style-type: none"> » TOHN0000000073100001 » TOIN00000000073000004 » TOIN00000000073000003 » TOIN00000000067300000
Current zoning	Agriculture
Project Site Extent	642ha

This Chapter provides an overview of the socio-economic environment of the province, DM, and LM within which the Moeding Solar PV Facility is proposed for development, and provides the socio-economic basis against which potential issues can be identified.

4.1. North West Province

The North West Province is situated in the central-northern extent of South Africa. The province is bordered by the Northern Cape Province to the west, and south-west, the Free State Province to the south, Gauteng Province to the east, Limpopo Province to the north-east, and Botswana to the north. It occupies an area of land approximately 104 882km² in extent, making it South Africa's 6th largest in terms of land area. The province has a population of 3 509 953 (2011), and a population density of 33/km² (2011), making it South Africa's 7th most densely populated province.

The North West Province is characterised by altitudes ranging from 920 – 1 782m amsl, which makes it one of the provinces with the most uniform terrain. The central and western extents of the province are characterised by gently undulating plains, while the eastern extent is characterised as mountainous, and includes the Magaliesberg mountain range. Ancient igneous rock formations dominate the north-eastern and north-central extent of the Province, and the Gatsrand between Potchefstroom and Carletonville is considered to be one of the most ancient preserved landscapes in the world. The geology of the

province is significant given its mineral resources which are rich in platinum, gold, uranium, iron, chrome, manganese and diamonds.

In terms of land use patterns, approximately 69% of the North West Province is in a natural, or near-natural state, while 31% of the province is irreversibly modified as a result of croplands (25.6%), urban (3.5%), and mining (0.7%) activities. The province is predominantly rural with the main economic activities comprising mining and agriculture.

The North West Province comprises 4 DMs, namely Bojanala Platinum, Ngaka Modiri Molema, Dr Ruth Segomotsi Mompoti, and Dr Kenneth Kaunda (refer to **Figure 4.1**).

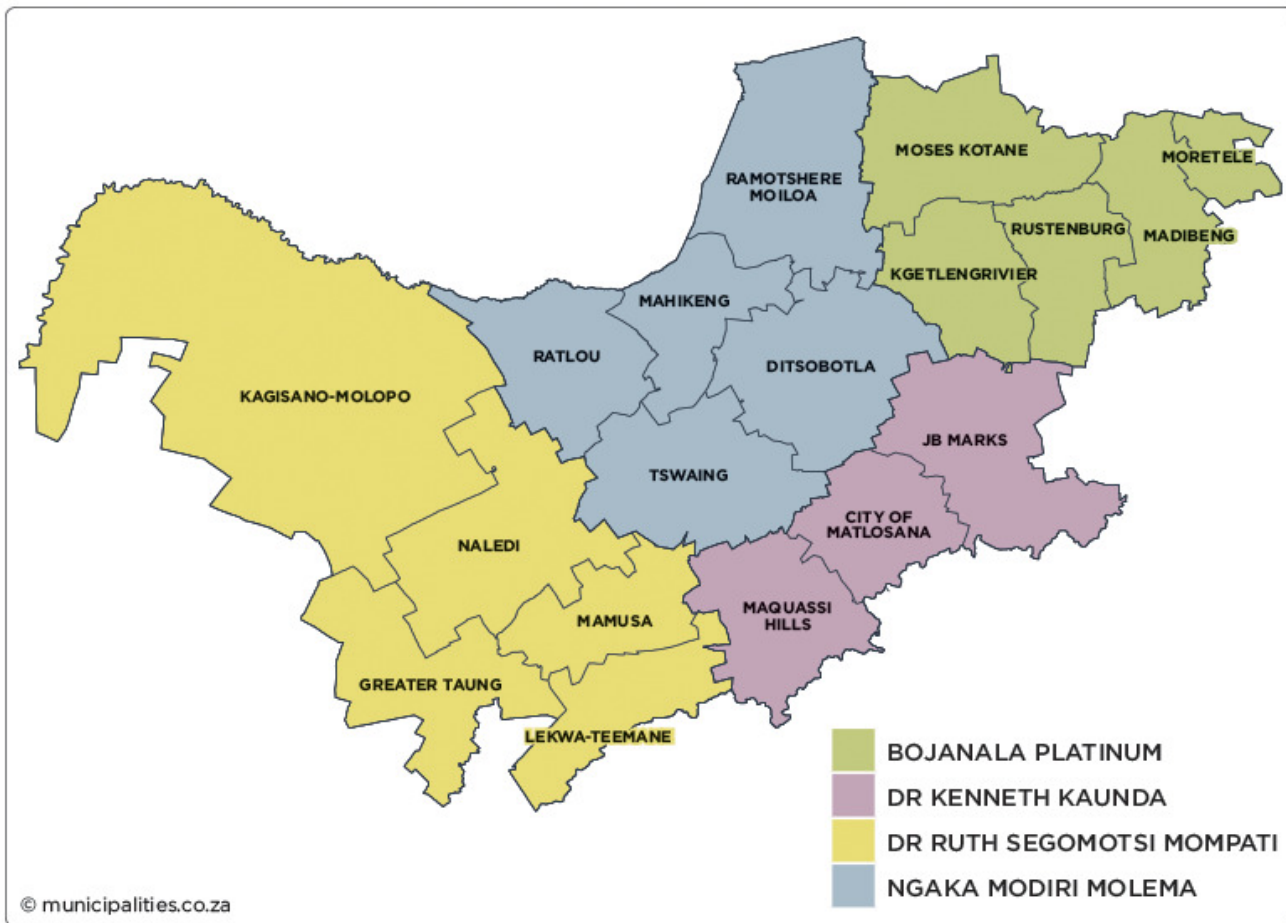


Figure 4.1: Districts of the North West Province (Source: Municipalities of South Africa).

4.2. Dr Ruth Segomotsi Mompoti DM

Dr Ruth Segomotsi Mompoti DM (formerly Bophirima DM) is located in the western extent of the North West Province. It is bordered by the Ngaka Modiri Molema and Dr Kenneth Kaunda DMs to the east, Lejweleputswa DM of the Free State Province to the south-east, Frances Baard and John Taolo Gaetsewe DMs of the Northern Cape Province to the south-west and west, and Botswana to the north. The DM occupies an area 44 052km² in extent, making it the largest DM in the North West Province. It is also the least populated DM with a population of 463 814 and a population density of 10.5/km² (equivalent to

almost one third of the Ngaka Modiri Molema DM which is the second least populated DM in the North West Province).

The Dr Ruth Segomotsi Mompati DM is largely rural in nature, with poor rural areas situated in the former Bophuthatswana homeland. The DM population reside in more than 470 villages and towns dispersed in a 250km radius (approximately 50km north to south and 200km east to west). The distribution pattern also presents unique management and organisational challenges. Prominent cities and towns within the DM include Amalia, Bloemhof, Christiana, Piet Plessis, Pomfret, Pudimoe, Reivilo, Schweizer-Reneke, Stella, Taung, and Vryburg. The main economic sectors include Community services (33.1%), agriculture (17.1%), finance (16.2%), trade (12.7%), transport (9%), manufacturing (4%), mining (3.2%), and construction (3.2%). The DM comprises five LMs, namely Naledi, Greater Taung, Kagisano-Molopo, Mamusa and Lekwa-Teemane LM's (refer to **Figure 4.2**).

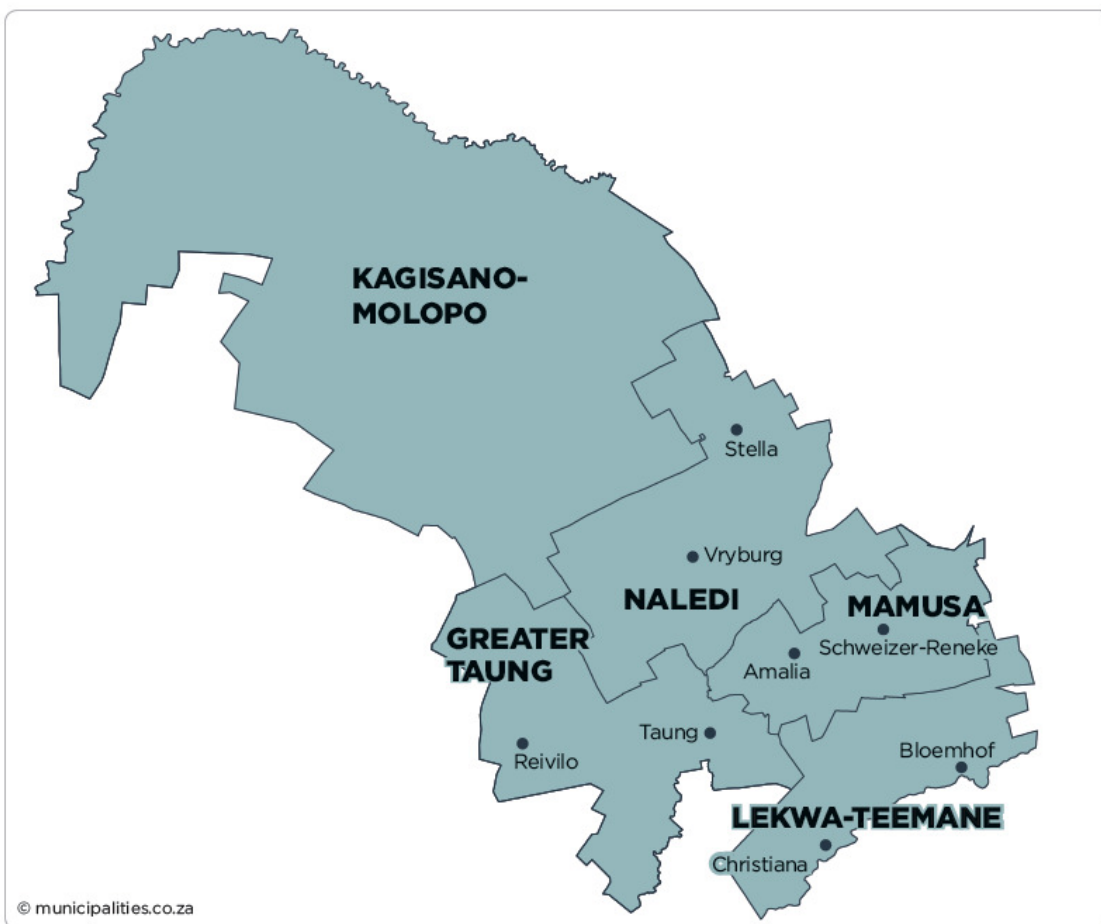


Figure 4.2: Local Municipalities of the Dr Ruth Segomotsi Mompati DM (Source: Municipalities of South Africa).

4.3. Naledi LM

The Naledi LM is located in the central-eastern extent of the Dr Ruth Segomotsi Mompati DM. It occupies an area approximately 7 258km² in extent which is equivalent to 15% of the Dr Ruth Segomotsi Mompati

DM, and constitutes the second largest LM in the DM. The Naledi LM is known as the “Texas of South Africa” due to the cattle breeding and other agricultural activities that occur there.

Predominant town, villages, and communities within the LM include Vryburg, Kismet Park, Huhudi, Colridge, Dithakwaneng, Stella, Devondale, Broedersput and the newly developed extension 25/28. The town of Vryburg constitutes the administrative centre of the Naledi LM, and is also considered the agricultural and industrial centre of the Dr Ruth Segomotsi Mompati DM. Vryburg is home to South Africa's 3rd largest agricultural show, namely the Vryburg Show, which attracts farmers from across South Africa, as well as farmers from neighbouring countries such as Namibia and Botswana.

The Naledi LM is characterised by 3 predominant settlement types, namely urban (76.8%), farm (19%), and tribal / traditional (4.1%).

4.4. Project Site

The Moeding Solar PV Facility is proposed on a project site located approximately 8km south of Vryburg in the North West Province. Other towns in proximity of the site include Amalia located approximately 38km south-east, Pudimoe located approximately 40km south, Stella located approximately 56km north, and Schweizer-Reneke located approximately 58km east. The Huhudi informal / semi-formal settlement is located adjacent to the N18 national road approximately 6.3km north of the project site.

The project site is approximately 642ha in extent and comprises four agricultural properties, which are utilised for grazing purposes. The surrounding area is also predominantly utilised for agricultural purposes (predominantly grazing for livestock (i.e. mostly cattle and to a lesser extent sheep)). There is little evidence of cultivated land within the surrounding area.

Access to the project site can be obtained via the N18 national road which runs in a north to south direction, in the eastern extent of the project site, forming the eastern boundary of the project site in the south-eastern extent, and dissecting the project site in the central and northern extent. The Kimberley-Mahikeng railway line is located immediately east of the N18 national road, and for the most part follows the N18 road alignment through the project site, diverting in an eastward direction in the northern extent of the site.

A 400kV power line (Mercury Mookodi 00kV power line) traverses the northern extent of the project site in a north-west to south-east direction, and connects to the Mookodi Transmission substation also located in the north-eastern extent of the project site (i.e. on the Remaining Extent of the Farm Rosendal No. 673). The Mookodi – Magopela 132kV power line is proposed to be construction along the eastern boundary of the project site. Other features within proximity of the proposed project site include the Arthington Memorial Church and the Tiger Kloof Educational Institution, which are located along the N18. The Tiger Kloof Educational Institution (i.e. the Tiger Kloof Combined School) was established in 1904 on Tierkloof Farm. The facility accommodates Pre-primary, Primary, and High School learners (both boarders and day scholars).

The project site is owned by the Tiger Kloof Educational Institution, and is managed by the Tiger Kloof Combined School Management. The purpose of the Tiger Kloof Educational Institution is to make land available for proposed developments to raise funds to facilitate improvements of facilities at the school.

4.5. Baseline Description of the Social Environment

The following subsections provide an overview of the socio-economic profile of the Naledi LM within which the Moeding Solar PV Facility is proposed. In order to provide context against which the LM's socio-economic profile can be compared, the socio-economic profiles of the Dr Ruth Segomotsi Mompati DM, North West Province, and South Africa as a whole have also been provided. The data presented in this section has been largely derived from the 2011 Census, North West PSDF, and the Dr Ruth Segomotsi Mompati DM and Naledi LM IDPs.²

4.5.1. Population Size

Understanding the population dynamics of an area is important as it provides an overview of the human capital present within an area. It therefore provides an insight into the potential labour pool, from which workers may be sourced, as well as the local communities which may either be impacted on, or benefit from, a particular project. Population trends within an area also affect economic growth, and the demand for goods and services.

The Naledi LM has a population of 66 781 which is equivalent to approximately 14.4% of the Dr Ruth Segomotsi Mompati DM population, 1.9% of the provincial population, and 0.1% of the national population. The LM occupies an area of land approximately 7 258km² in extent and has a population density of 9.5/km². Between 2001 and 2011 the LM experienced a positive population growth rate of 1.7% per year, which is more than double that of the DM population growth rate of 0.8% per year for the same period.

Table 4.2: Overview of general statistics for South Africa, North West Province, Dr Ruth Segomotsi Mompati DM, and Naledi LM (Source: Census 2011).

Census 2011	Area (km ²)	Population total	Male	Female	Population density/km ²	Population growth rate (2001 – 2011)
South Africa	1 229 341	51 770 560	25 188 791	26 581 769	42.1	1.5%
North West Province	105 238	3 509 953	1 779 903	1 730 049	33.4	1.6%
Dr Ruth Segomotsi Mompati DM	44 052	463 814	224 718	239 097	10.5	0.8%
Naledi LM	7 258	66 781	33 502	33 279	9.5	1.7%

4.5.2. Population Group

Information on population group dynamics provides a better understanding of the cultural dynamics which may be prevalent within the area. This is important in terms of determining the potential for community support, the likely community structure and appropriate / most-suited consultation practises to utilise when engaging with the local communities (and whether different communication strategies should be adopted for different community groups).

² While information was derived from the Local Government Handbook South Africa 2018, North West PSDF, and Dr Ruth Segomotsi Mompati DM and Naledi LM IDPs, these sources largely make use of statistical information derived from the Census 2011. The information presented in this Chapter may therefore be somewhat outdated, but is considered sufficient for the purposes of this assessment (i.e. to provide an overview of the socio-economic characteristics against which impacts can be identified and their significance assessed).

According to Census 2011, almost three quarters (74%) of the Naledi LM population are Black African, followed by 14.7% which are Coloured, 9.5% which are White, and 1.1% which are Indian / Asian. The population structure of the Naledi LM differs somewhat from that of the Dr Ruth Segomotsi Mompati DM, and North West Province population structures given the lower proportion of Black African, and the higher proportion of the Coloured population within the LM.

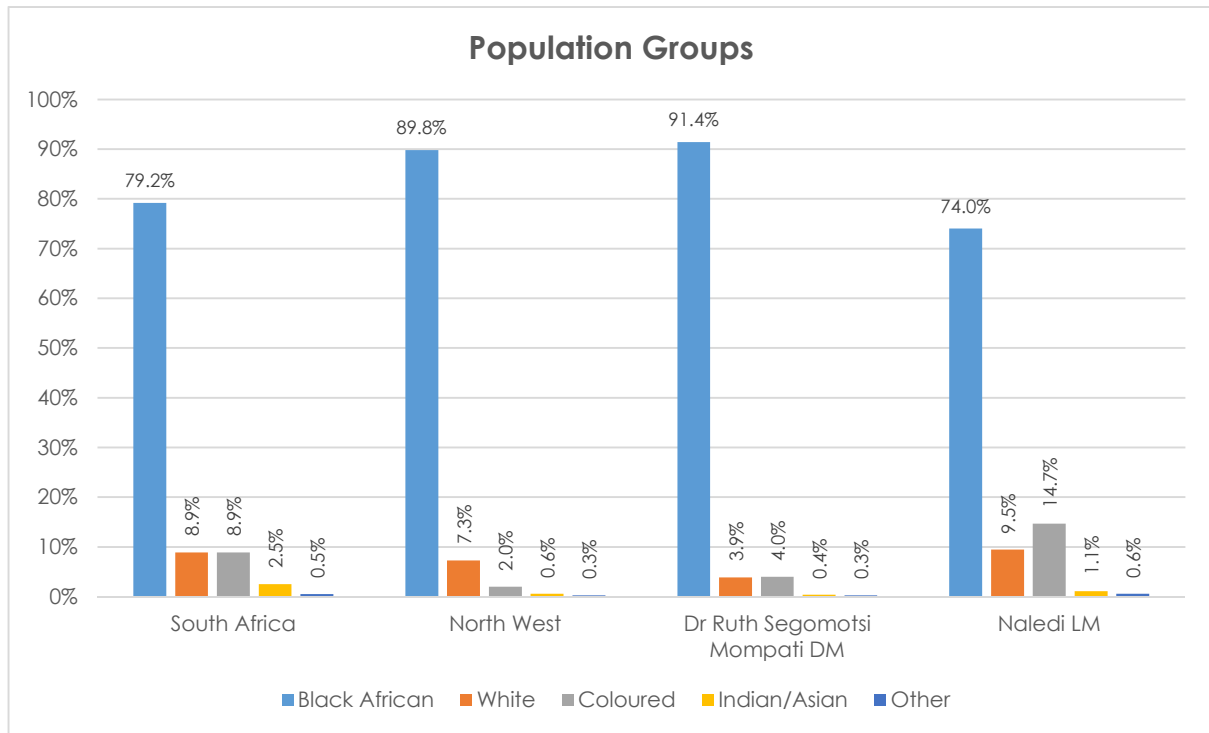


Figure 4.3: Population groups of South Africa, North West Province, Dr Ruth Segomotsi Mompati DM, and Naledi LM (Source: Census 2011).

4.5.3. Gender Profile

The gender profile of a population has significance in terms of gender distribution, and understanding the gender roles prevalent within the area. The Naledi LM is slightly male dominated with males making up just over half (50.2%) of the municipal population, and females the remaining 49.8% of the population. This correlates with the provincial population which is also slightly male dominated (comprising 50.7% males, and 49.3% females), but differs from the DM and national populations which are both female dominated.

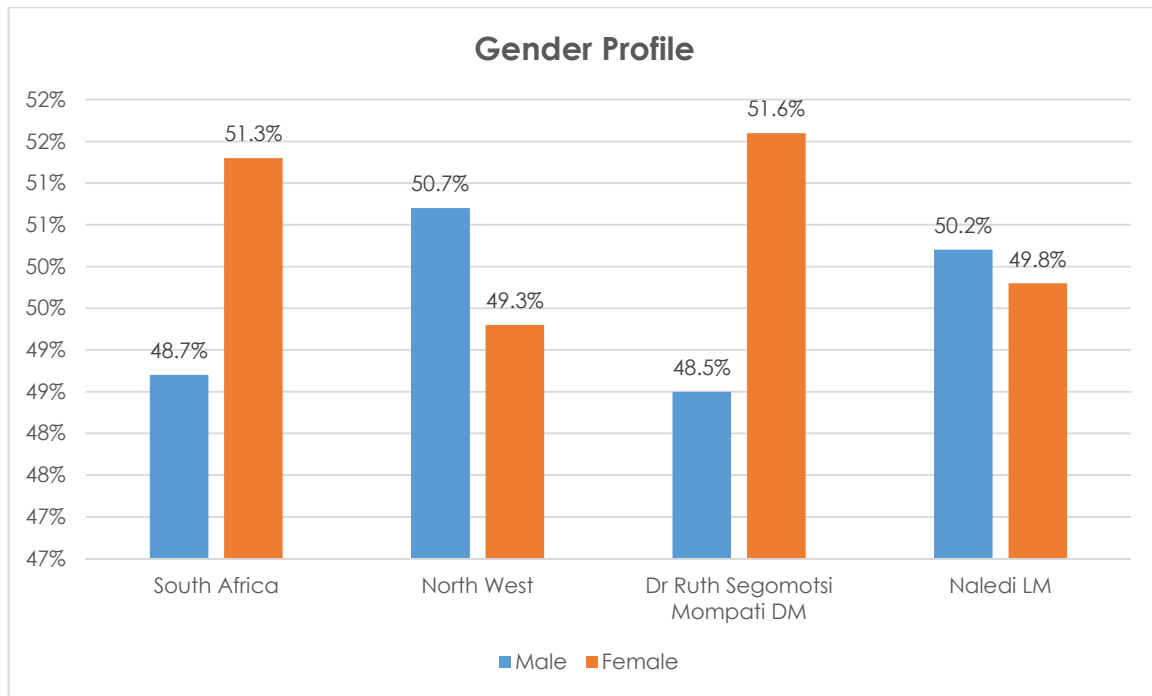


Figure 4.4: Sex profile of South Africa, North West Province, Dr Ruth Segomotsi Mompoti DM, and Naledi LM (Source: Census 2011).

4.5.4. Age Profile

The age structure of a population is important for planning purposes, as it provides insight into what services may be required, and the level to which such services are required. For example, populations which are youth dominated (between 0 and 14 years of age) indicate a large school going population, and highlight the need for youth care and education (i.e. crèche, primary, secondary, and tertiary) facilities across different levels. Similarly populations which are dominated by an economically active age group (between 15 and 64 years of age) highlight the need to provide suitable employment and business opportunities, while populations with a predominately aged structure (i.e. over 65 years of age) indicate a high proportion of the population which are of retirement age. Such a portion of the population would no longer be economically active, and would indicate a need for services which cater to elderly members of society, including the provision of adequate health care and nursing facilities.

According to **Figure 4.5** the age structure of the Naledi LM correlates more closely with that of the North West Province, than with the Dr Ruth Segomotsi Mompoti DM. When assessing the Naledi LM population in five year age groups the largest proportion of the population are between the ages of 0 to 4 years old. The proportion of the population within the respective five year age groups decreases fairly uniformly as age increases. There is a slight decrease in the male population aged 20 to 24 years old, and a slight increase in males and females aged 25 to 29 years old. The age structure of the Dr Ruth Segomotsi Mompoti DM differs slightly from that of the Naledi LM, as it is characterised by a more significant decrease in the male population between the ages of 15 to 19, and 20 to 24 years old. The proportion of the population within the respective five year age groups also appears to decrease more uniformly as age increases with no significant outliers in any one five year age group.

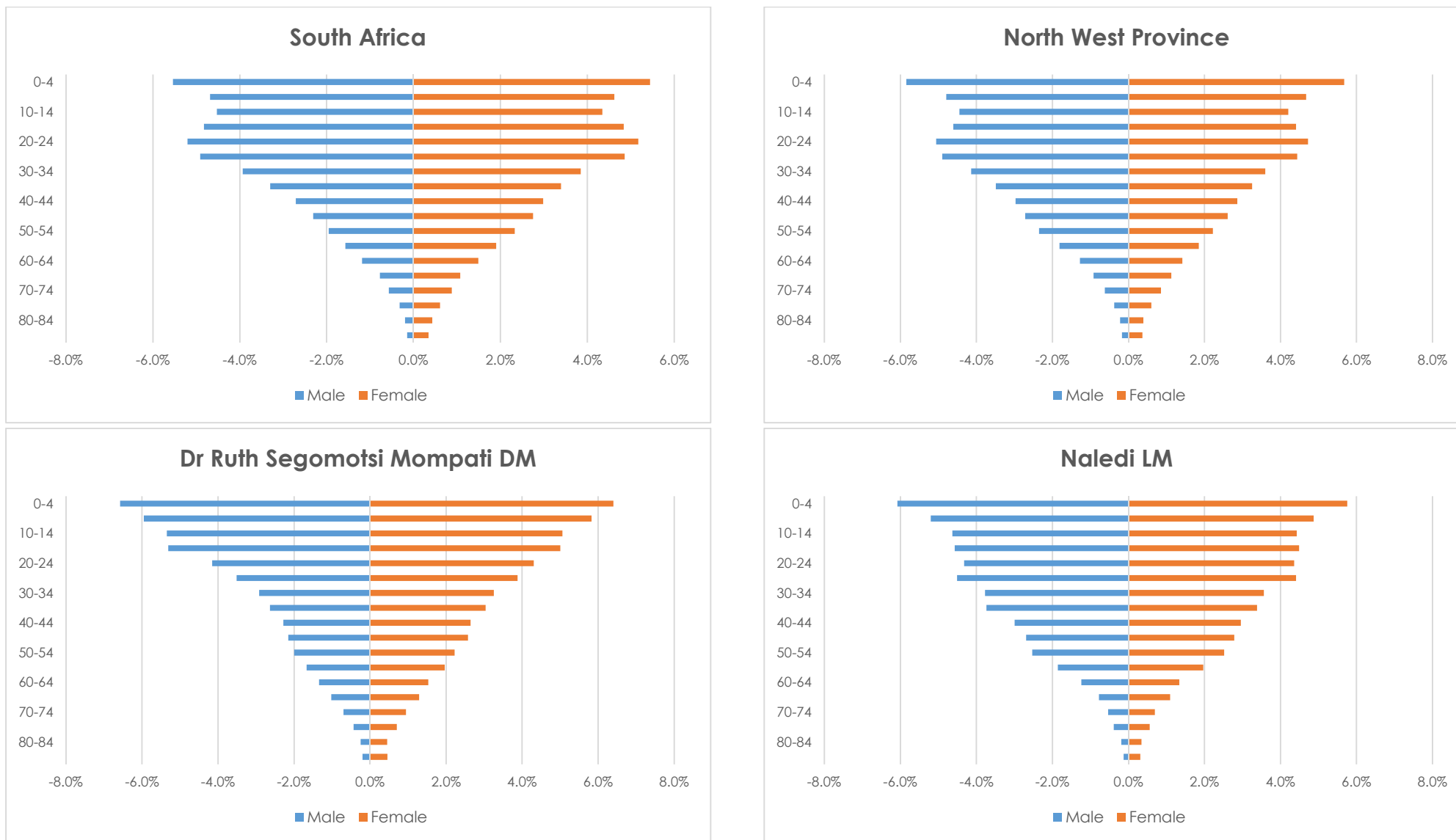


Figure 4.5: Age profile of South Africa, North West Province, Dr Ruth Segomotsi Mompati DM, and Naledi LM (Source: Census 2011).

The age pyramids for the provincial and national populations reflects populations which are characterised by a large proportion of youth specifically between 0 to 4 years, and 15 to 29 years in age (as represented by the convex shape), and a smaller proportion of the population comprising age groups 5 to 14 years of age. The high proportion of potentially economically active persons within the Naledi LM implies that there is a sufficient human resource base for development projects to involve the local population. The youth (below 35 years of age) represents the largest proportion of the population, which indicates that focus needs to be placed on youth development.

4.5.5. Dependency Ratio

An area's dependency ratio provides an indication of the portion of the population which is dependent on the economically active portion of the population based on functional age groups. The dependent portion of the population typically comprises youth below 15 years of age which are yet to enter the workforce, and individuals 65 years and older which would typically already have retired from the workforce. In addition to not contributing towards the economy, such individuals are also likely to have additional needs which need to be catered for, such as access to suitable education facilities for the school going population, and access to health care facilities in the case of the aged population. The dependency ratio is calculated by combining the number of children aged under 15 years, and the number of adults aged 65 years and older, and dividing this by the working age population (i.e. those ages between 15 and 64 years of age).

The Naledi LM has a dependency ratio of 36, implying that for every 100 people within the Naledi LM, over one third (i.e. 36) of them are considered dependent on the remaining approximately two thirds (i.e. 64). This figure is lower than the Dr Ruth Segomotsi Mompati DM (41.6), but higher than the provincial (35.3) and national (34.5) dependency ratios.

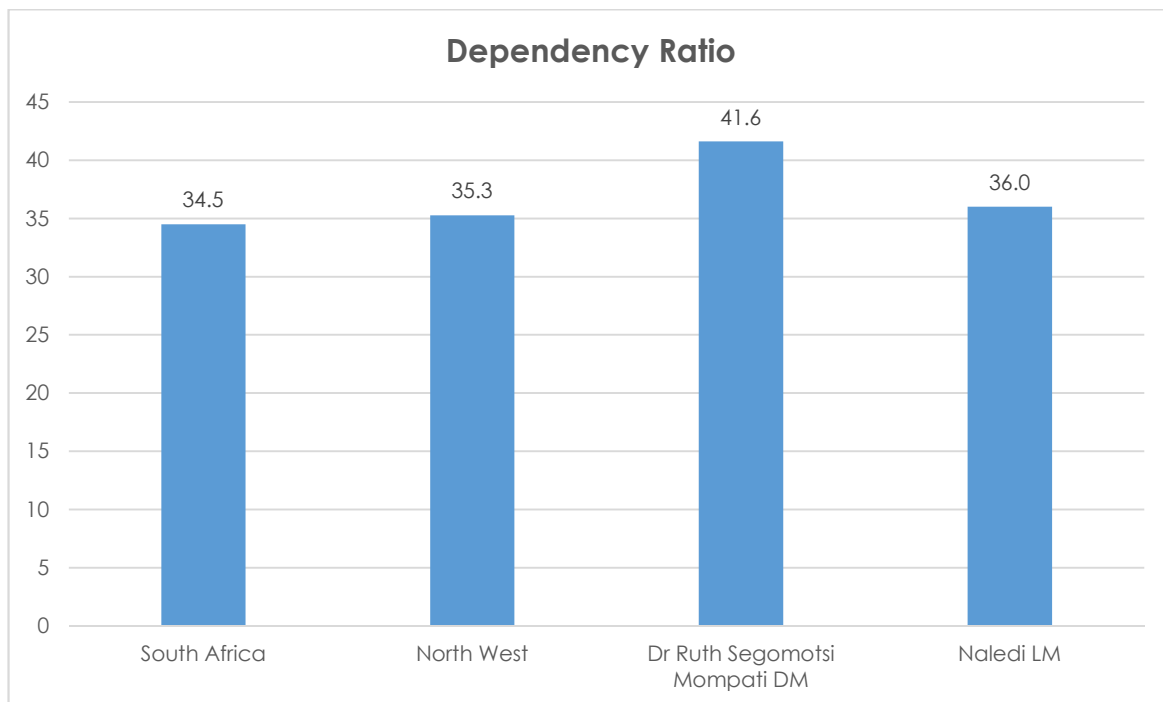


Figure 4.6: Dependency ratio in South Africa, North West Province, Dr Ruth Segomotsi Mompati DM, and Naledi LM (Source: Census 2011).

4.5.6. Education Levels

Education plays a pivotal role in community development. The level of education influences growth and economic productivity of a region. As a result, there is a positive correlation between a higher level of education and the level of development, and standard of living. Education levels in any given population will influence both economic and human development. For example, while low levels of education typically lead to a low level skills base within an area, high levels of education have the opposite effect, resulting in a skilled or highly skilled population. Household and personal income levels are also either positively or adversely affected by education levels.

Figure 4.7 depicts the highest level of education received by the adult population aged 20 years and older in South Africa, the North West Province, Dr Ruth Segomotsi Mompoti DM, and Naledi LM.

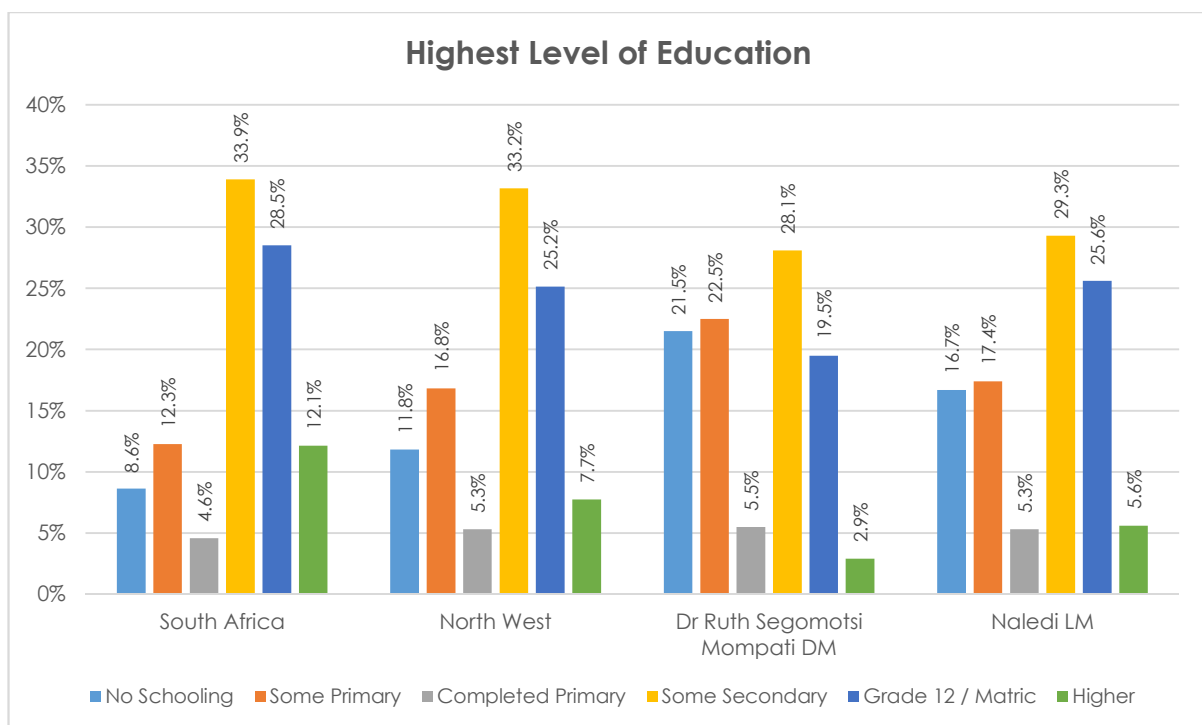


Figure 4.7: Highest Level of Education in South Africa, North West Province, Dr Ruth Segomotsi Mompoti DM, and Naledi LM (Source: Census 2011).

The largest proportion of the Naledi LM population aged 20 years and older have received some secondary schooling (29.3%), while just over one quarter (25.6%) have completed Grade 12 / Matric. Approximately 16.7% of the Naledi LM population aged 20 years and older have received no formal form of schooling. The proportion of the LM population which has received no schooling is lower than the DM average where over one fifth (21.5%) of the adult population aged 20 years and over have received no form of schooling, but higher than the provincial (11.8%) and national (8.6%) averages. Given the fact that over two thirds (68.8%) of the Naledi LM population have not completed Grade 12 / Matric or received any higher form of education, it can be expected that a large proportion of the population will either be unskilled or have a low-skill level, and would therefore either require employment in non-skilled or low-skilled sectors, or alternatively would require skills development opportunities in order to improve the skills levels of the area.

4.5.7. Employment

The employment profile of an area is an important indicator of human development, as poverty and unemployment are closely correlated. The quality of labour is reflected, amongst other things, by the educational profile of the economically active population and the availability of training facilities in the region. The term labour force refers to those people who are available for employment in a certain area. According to Statistics South Africa, the definitions of the following employment indicators are:

- » Economically active person: “A person of working age (between 15 and 65 years inclusive) who is available for work, and is either employed, or is unemployed but has taken active steps to find work in the reference period.”
- » Employed: “Those who performed work for pay, profit or family gain for at least one hour in the seven days prior to the interview or who were absent from work during these seven days, but did have some form of paid work to return to.”
- » Official and expanded definition of unemployment: “The unemployed are those people within the economically active population who:
 - (a) did not work during the seven days prior to the interview,
 - (b) want to work and are available to start work within two weeks of the interview, and
 - (c) have taken active steps to look for work or start some form of self-employment in the four weeks prior to the interview.”
- » Labour force: “All employed and unemployed persons of working age”.
- » Unemployment rate: “The percentage of the economically active population that is unemployed.”

The employment profile of an area is also an important indicator of the level of disposable income and subsequently the expenditure capital of the residing population.

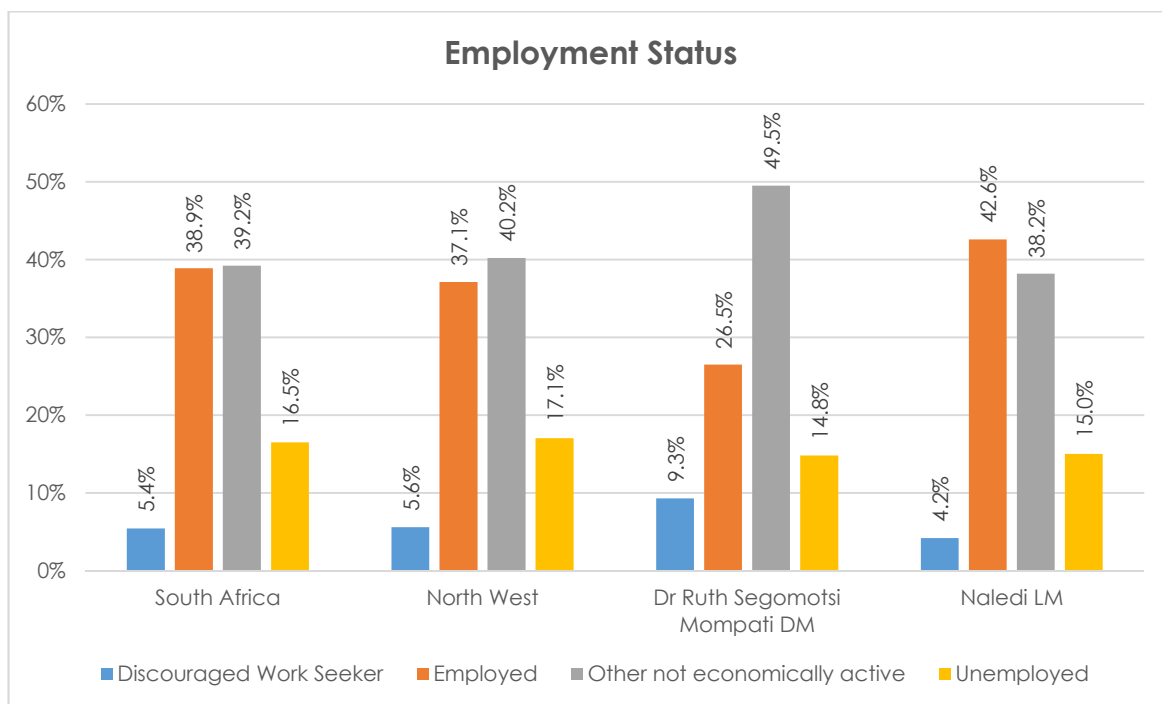


Figure 4.8: Employment Status in South Africa, North West Province, Dr Ruth Segomotsi Mompoti DM, and Naledi LM (Source: Census 2011).

Of the Naledi LM's labour force (i.e. individuals ages between 15 and 64 years of age) the majority of 42.6% are employed, while 38.2% are not economically active. This refers to the economically inactive portion of the population who are able and available to work, but who do not work, and who are not looking for work. Such a figure is significant as it demonstrates a population's willingness and desire to find employment. The economically inactive proportion of the Naledi LM's labour force is lower than the Dr Ruth Segomotsi Mompati DM where almost half (49.5%) of the labour force are not economically active. This high proportion of the economically inactive population implies that irrespective of the size of the LM and DM labour force, a smaller proportion would be available to absorb employment opportunities. The possibility therefore exists that labour may need to be sourced from elsewhere (i.e. from outside of the Dr Ruth Segomotsi Mompati DM and Naledi LM). This also implies that there is limited human capital available within the Dr Ruth Segomotsi Mompati DM and Naledi LM, without the provision of training and development of young and economically active people in occupations in the relevant fields needed.

Approximately 15% of the Naledi LM's labour force is unemployed. This means that of the economically active population within the LM 15% are currently unemployed, but are willing and able to work, and are actively seeking employment. The unemployment rate for the LM is slightly higher than the DM average (14.8%).

In order to fully understand the employment levels within an area it is also important to gain an understanding of the type of employment available. Specifically whether the employed population are employed in the formal or informal sector. The informal sector refers to that portion of the economy that is not taxed or monitored by government. The contribution made by the informal sector also does not contribute towards a country's Gross Domestic Product (GDP) or Gross National Product (GNP). South Africa's informal sector provides income for more than 2.5 million workers and business owners, with approximately 1 in every 6 employed South African's being employed in the informal sector.

Of the employed population of the Naledi LM, approximately 57.3% are employed within the formal sector. This figure correlates closely with and is only fractionally higher than that of the Dr Ruth Segomotsi Mompati DM (57%). Approximately 18.8% of the Naledi LM's employed population are employed in the informal sector, while over one fifth (21.6%) are employed in private households, whereas over one fifth (21.7%) of the Dr Ruth Segomotsi Mompati DM's employed population are employed in the informal sector, while approximately 18.6% are employed in private households.

The creation of employment opportunities within the formal sector as a result of the Moeding Solar PV Facility could therefore contribute towards growing employment within the formal sector in both the LM and DM, which could lead to greater levels of job security than may typically be associated with employment in the informal sector.

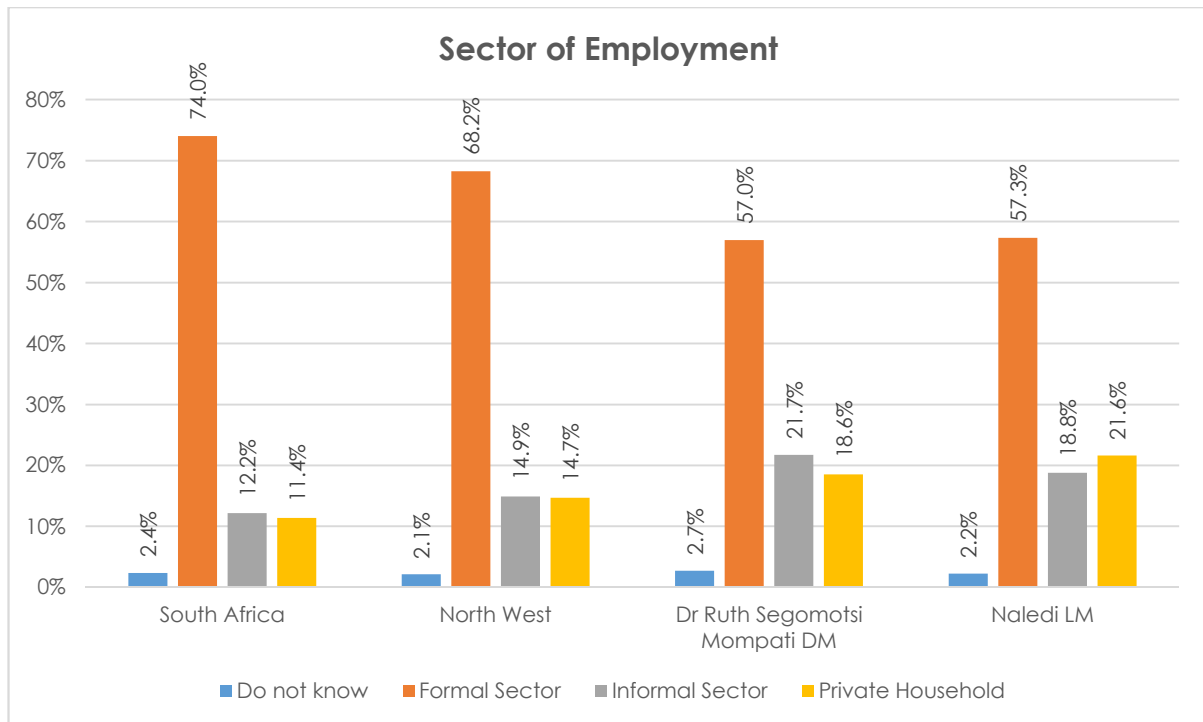


Figure 4.9: Employment Sector for the employed population in South Africa, North West Province, Dr Ruth Segomotsi Mompoti DM, and Naledi LM (Source: Census 2011).

4.5.8. Annual Average Household Income Levels

The income levels of the employed population are analysed in order to determine the population's standard of living as well as their ability to pay for basic services. Average annual household income levels are one avenue for determining poverty levels within a community. Households that have either no income or low income (i.e. R0 – R38 400 per annum) fall within the low income / poverty level, indicating the difficulty to meet basic need requirements. Middle-income households are classified as earning between R38 401 – R307 200 per annum, while high income households are classified as earning R307 201 or more per annum.

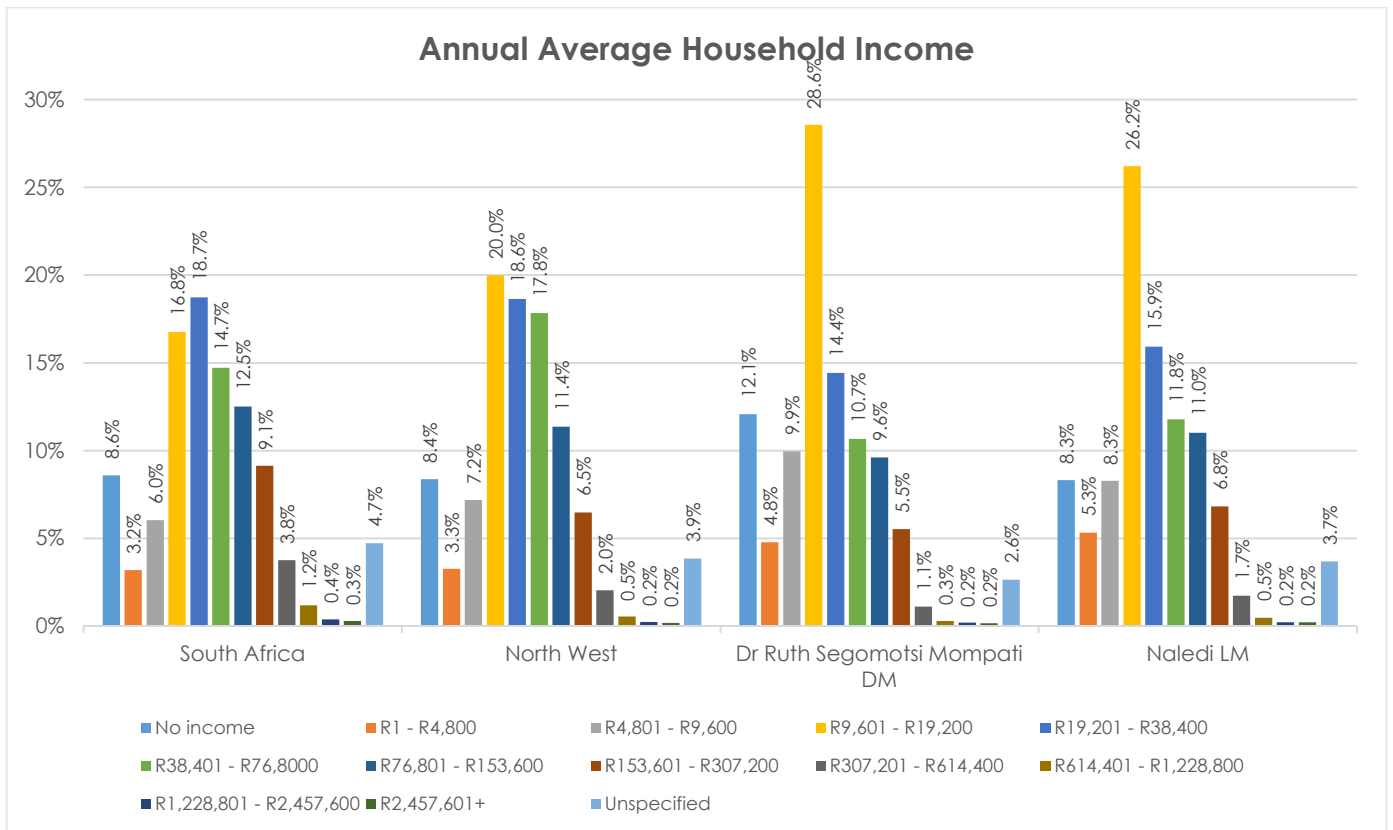
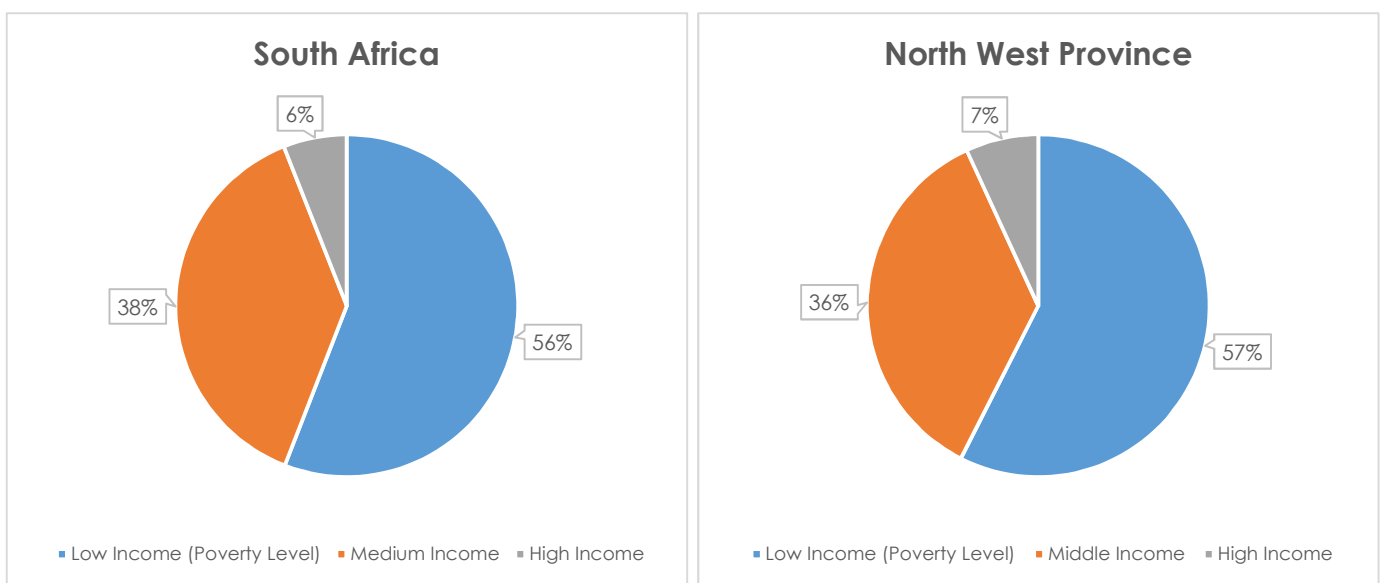


Figure 4.10: Average Annual Income in South Africa, North West Province, Dr Ruth Segomotsi Mompoti DM, and Naledi LM (Source: Census 2011).

Almost two thirds (64%) of households within the Naledi LM fall within the low income (poverty level) bracket (i.e. with an annual average household income of below R38 400 per annum). This figure is lower than the Dr Ruth Segomotsi Mompoti DM (70%), but higher than the North West provincial (57%) and South African national (56%) averages. Approximately 30% of households within the Naledi LM fall within the medium income bracket, while the remaining 6% fall within the high income bracket.



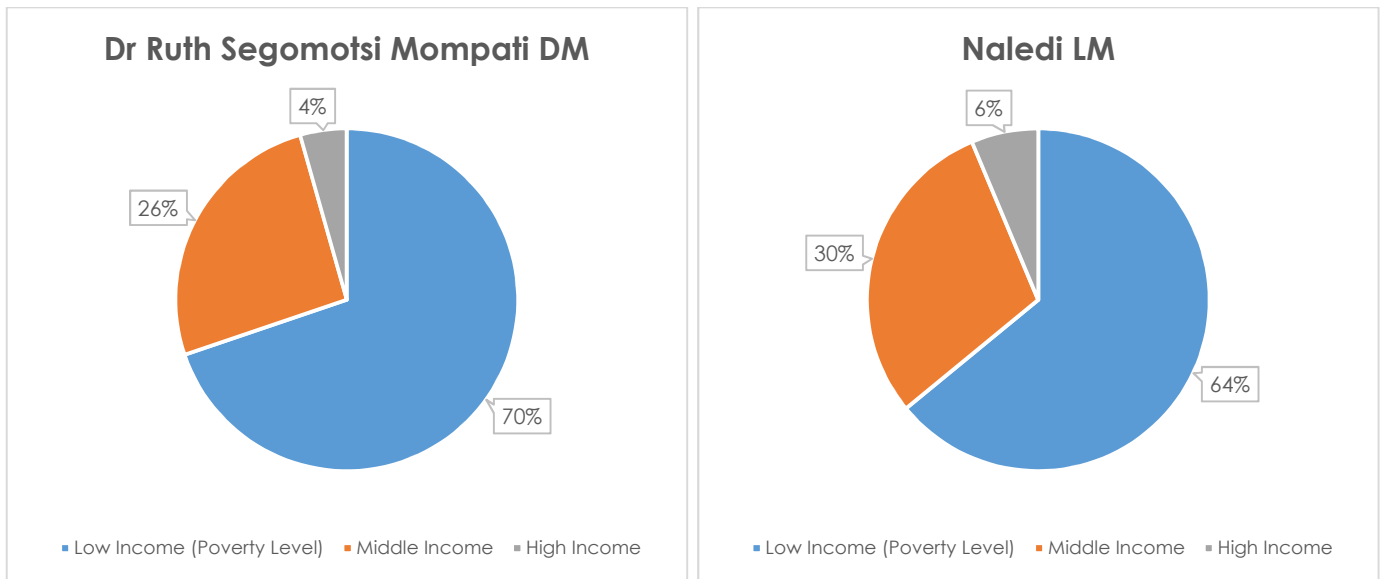


Figure 4.11: Average Income Levels in South Africa, North West Province, Dr Ruth Segomotsi Mompati DM, and Naledi LM (Source: Census 2011).

The high poverty level prevalent within the Naledi LM can be attributed with social consequences such as an inability to pay for basic needs and services, which in turn has influence on an individuals' standard of living.

4.5.9. Economic Activities

According to the Naledi LM's IDP 2017 – 2022 (2017), the LM's main macro-economic activities are agriculture and hunting which contribute 27.8% to the LM's economy. Other important job creating sectors include finance and insurance, public administration, health and social, and transport. Government is the main employer (as well as the most significant contributor to the GDP).

This can largely be attributed to the fact that the Naledi LM is also host to all district government sector departments. After government, private sector business (i.e. banks, retail-trade, hospitality) play a significant role as employer and source of income.

4.5.10. Health

South Africa's health sector is most concerned with communicable, non-communicable, pre-natal and maternal, and injury-related conditions. According to the Naledi LM IDP 2017 – 2022 (2017) health facilities available within the LM are located within close proximity to, and are easily accessible by, the communities which they serve, except for health facilities in Huhudi which are located approximately 3km from the furthest house in Wards 4, 9, and 10 in Huhudi.

Health infrastructure available within the Naledi LM is listed in **Table 4.3**.

Table 4.3: Health infrastructure in the Naledi LM (Source: Naledi LM IDP 2017 – 2022 (2017)).

Area	Hospital	Clinic	Mobile Clinic	Community Health Centre	Local Aids Council	Medical Centre
Vryburg	2		1	1		

Colridge		1				
Huhudi		1	1			
Stella				1		
Tlhakeng			1			
Devondale			1			
Dithakwaneng			1			
Geduldspan			1			
TOTAL	2	2	6	2		

In terms of health infrastructure the Naledi LM is equipped with 2 hospitals, both of which are located within Vryburg, 2 clinics, 6 mobile clinics, and 2 community health centres.

4.5.11. Type of Households

As of 2011 there were a total of 19 286 households within the Naledi LM. This is equivalent to approximately 15.1% of the total number of households within the Dr Ruth Segomotsi Mompati DM (127 388), 1.8% of the total number of households within North West Province (1 098 220), and 0.1% of the total number of households within South Africa (15 065 018). Of the total number of households within the Naledi LM the majority of 71.7% comprise houses (i.e. house or brick / concrete block structure on a separate stand or yard or on a farm), followed by 12.5% which comprise informal dwellings (i.e. a shack not in a back yard).

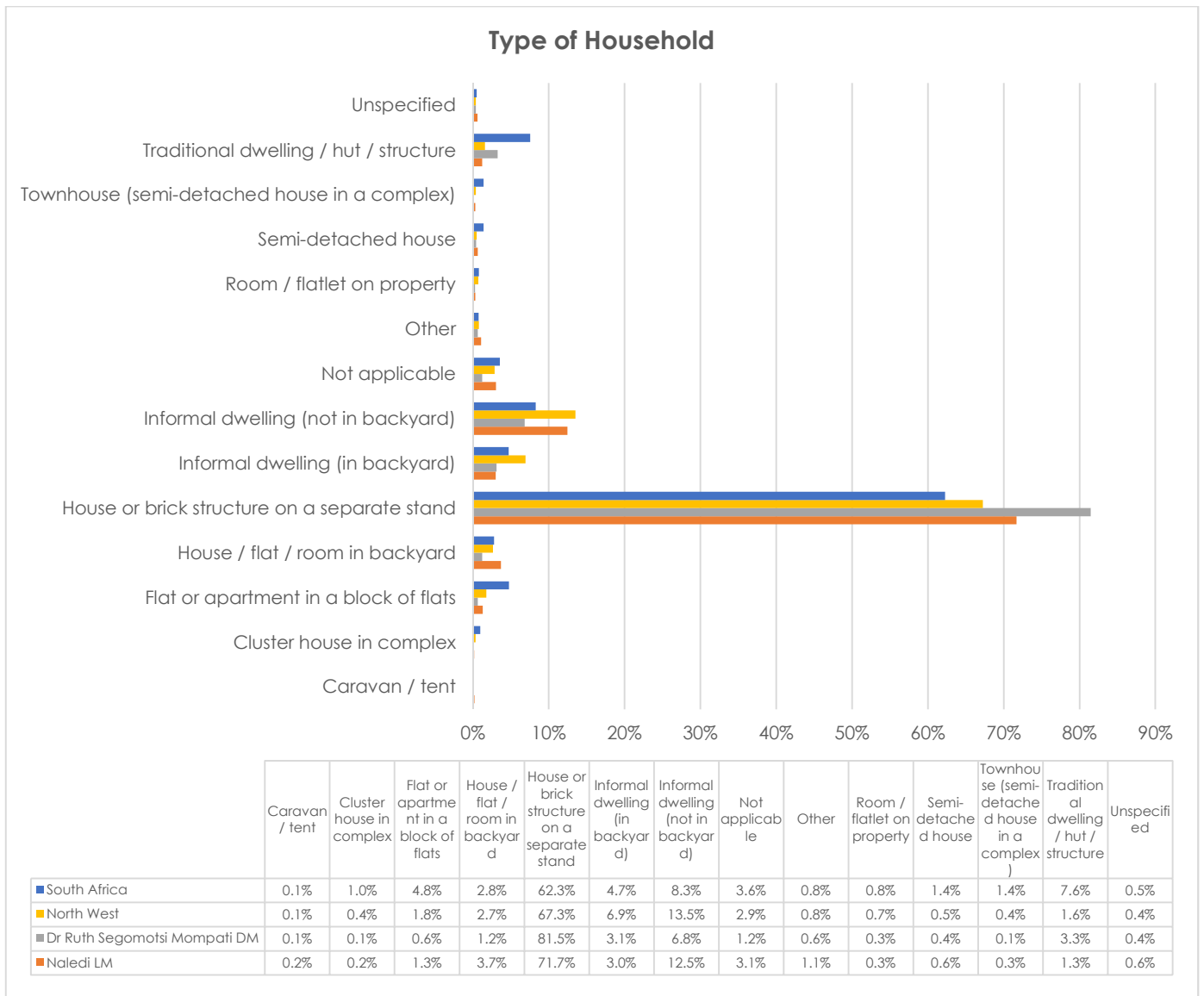


Figure 4.12: Households by Type of Dwelling within South Africa, North West Province, Dr Ruth Segomotsi Mompoti DM, and Naledi LM (Source: Census 2011).

4.5.12. Access to Basic Services

Basic services such as electricity, water and sanitation, and refuse and waste removal are considered critical for the improvement of people's quality of life, and adequate supplies of basic services are also necessary to ensure life, well-being, and human dignity (Stats SA, 2017). Individuals' rights to basic services is largely enshrined in Section 24 of the Constitution which states that everyone has the right to an environment that is not harmful to their health or well-being. The accessibility of basic services is closely related to social inclusion and social capital, and the failure of municipalities to deliver services can have a detrimental impact on social and economic development (IDASA, 2010 in Stats SA, 2017). In terms of Section 73 of the Local Government Municipal Systems Act (No. 32 of 2000), municipalities have a general duty to give effect to the provisions of the Constitution and give priority to the basic needs of the local community, promote the development of the local community, and ensure that all members of the local community have access to at least the minimum level of basic municipal services. In addition, municipal services must be equitable and accessible, be provided in a manner that is conducive to the prudent,

economic, efficient and effective use of available resources, and the improvement of standards of quality over time, be financially sustainable, be environmentally sustainable, and be regularly reviewed with a view to upgrading, extension and improvement. **Table 4.4** provides the classification of infrastructure quality and different levels of service provision developed by Statistics South Africa following World Bank studies (Stats SA, 2017).

Table 4.4: Classification of infrastructure quality (Stats SA, 2017).

Service Level	Water	Sanitation	Solid Waste	Electricity
None	No access to piped water.	No sanitation.	No facilities / dump anywhere	No access to electricity
Minimal	Communal standpipe > 200m.	Bucket toilets.	Communal / own refuse dump	Generator / solar
Basic	Communal standpipe < 200m	Pit toilet without ventilation pipe.	Communal container / collection point	Access to electricity don't pay for
Intermediate	Piped water in the yard.	VIP, Chemical, or ecological toilets.	Removed less than once per week	Connected to source and paid for
Full	Piped water in dwelling	Conventional waterborne	Removed once per week	In-house pre- and post-paid meters.

4.5.12.1. Access to Water

The Dr Ruth Segomotsi Mompati DM comprises the water service authority, while the Naledi LM is the water service provider within the municipal area. The Dr Ruth Segomotsi Mompati DM is therefore responsible for the implementation of all water projects and planning processes, and the provision of infrastructure, whereas the Naledi LM is responsible for the operation and maintenance of bulk and reticulated water and sanitation infrastructure, including the extraction, purification, reticulation, billing and connecting of new customers. The LM is also responsible for operating and maintaining the waste water reticulation scheme.

Over three quarters (78.2%) of households within the Naledi LM have access to water via a regional or local water scheme (which is equivalent to the basic level of service provision), while 14% have access to water via a borehole. Approximately one fifth (20.8%) do not have access to water at or above the basic service level provision.

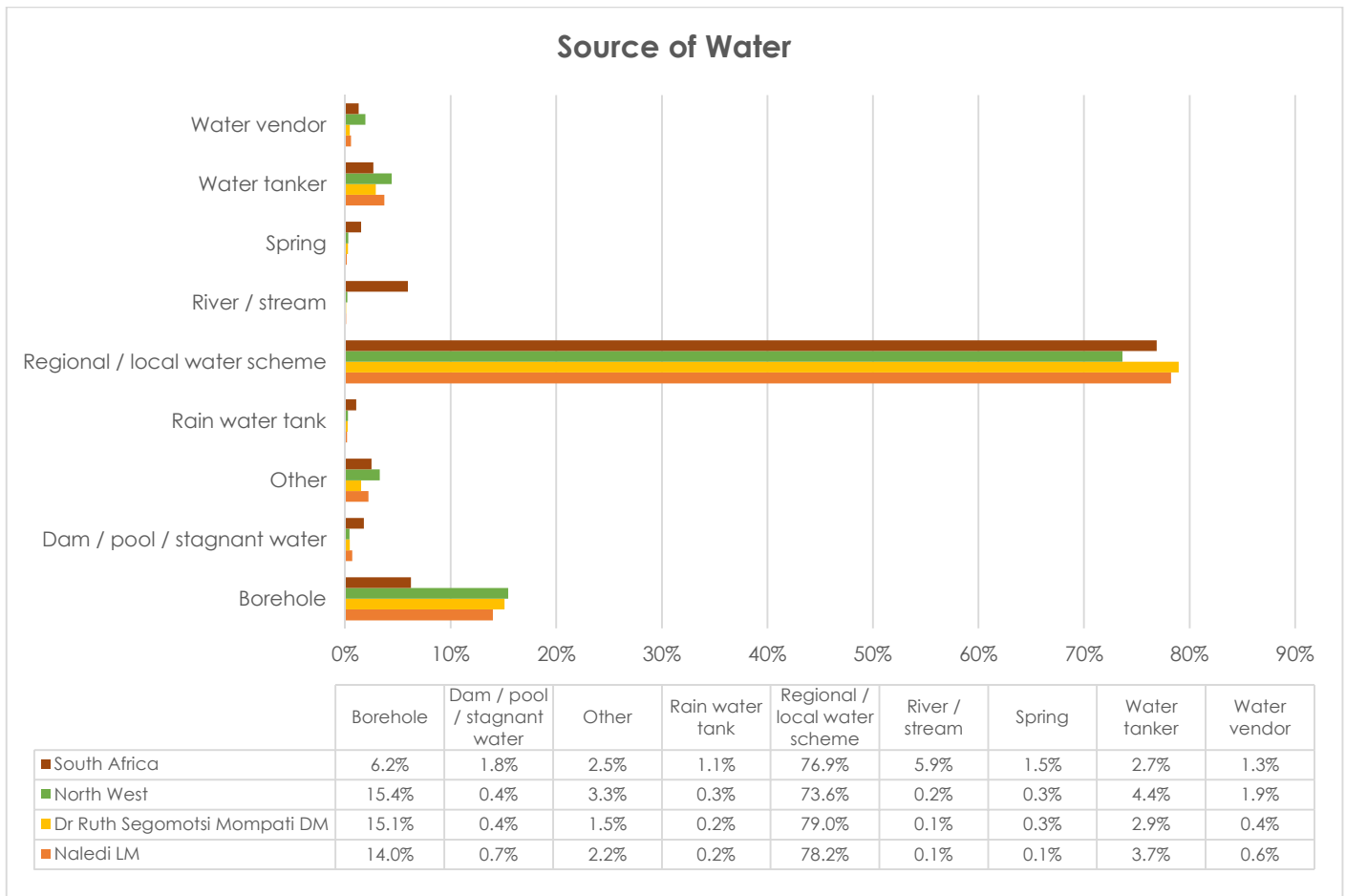


Figure 4.13: Access to Water within South Africa, North West Province, Dr Ruth Segomotsi Mompoti DM, and Naledi LM (Source: Census 2011).

4.5.12.2. Access to Sanitation

Almost two thirds (64.3%) of households within the Naledi LM have access to a flush toilet connected to a sewerage system, while 3.6% of household have access to a flush toilet connected to a septic tank. Approximately 4.4% of households make use of the bucket system, while 6.1% of households have access to pit latrines without ventilation, and 13% of households indicated they have no access to sanitation services. Approximately 20.2% of households within the LM experience access to sanitation services below basic service level provision.

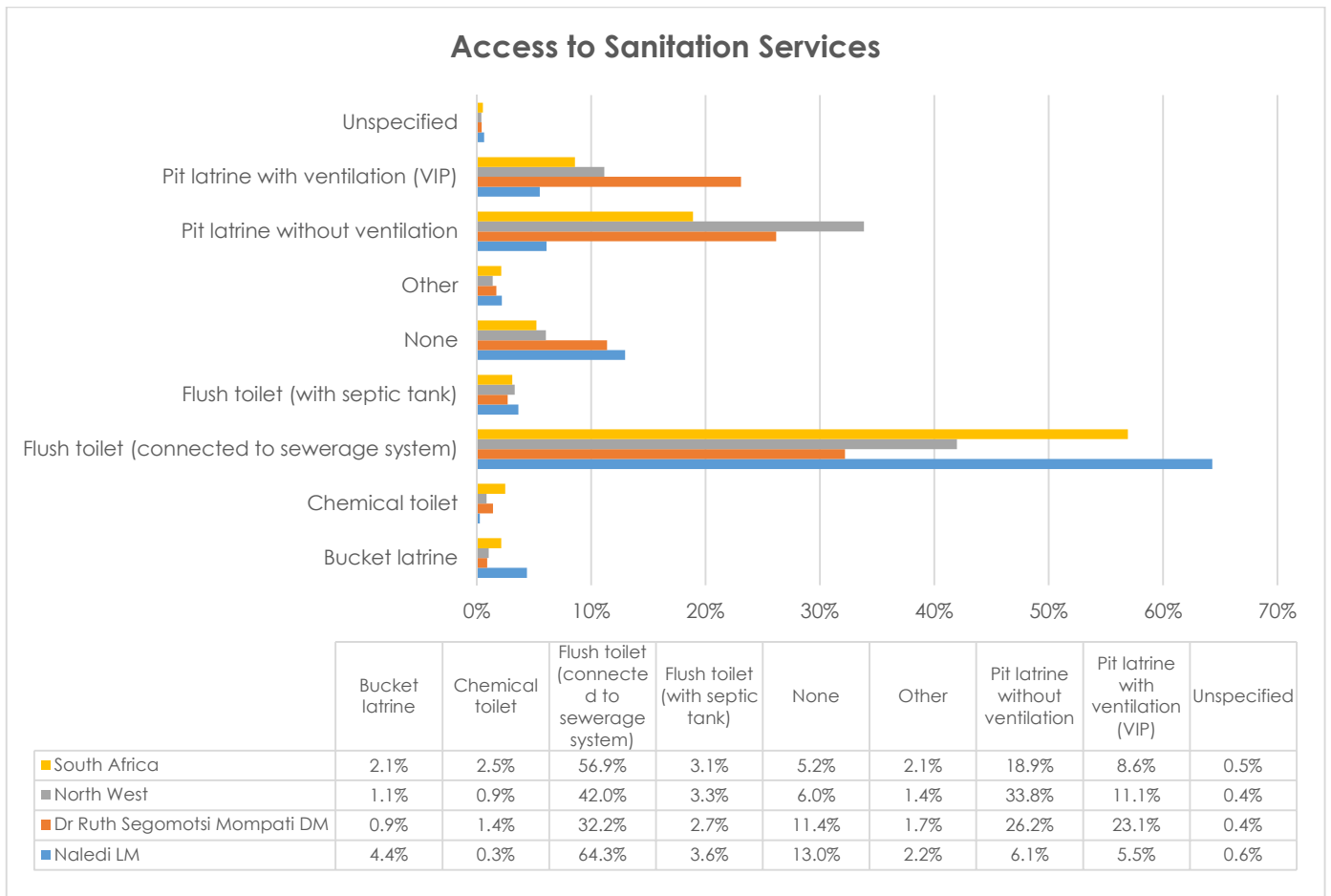


Figure 4.14: Access to Sanitation Services within South Africa, North West Province, Dr Ruth Segomotsi Mompoti DM, and Naledi LM (Source: Census 2011).

4.5.12.3. Access to Electricity

Energy is required for cooking, heating, and lighting purposes. Individuals' access to different energy sources for cooking, heating, and lighting purposes is significant, as the burning of fuel sources such as wood, coal, and / or animal dung over extensive periods of time could result in negative health impacts for household members. Health impacts would be most significantly experienced by those vulnerable members of society, such as young children, pregnant women, and the elderly.

Approximately 76.7% of households within the Naledi LM have access to electricity for lighting purposes, 50.7% have access to electricity for heating purposes, and 64.5% of households have access to electricity for cooking purposes. According to the Naledi LM IDP 2017 – 2022 (2017) the LM is responsible for electricity reticulation. According to information derived from the Community Survey of 2016 the majority of 16 612 households surveyed as part of the community survey indicated that they had access to electricity, while 3 856 indicated they had no access to electricity. In addition 50 households indicated that they were connected to other source which the household was not paying for, 83 households has access to a solar home system, and 91 households indicated that they has access to other energy sources.

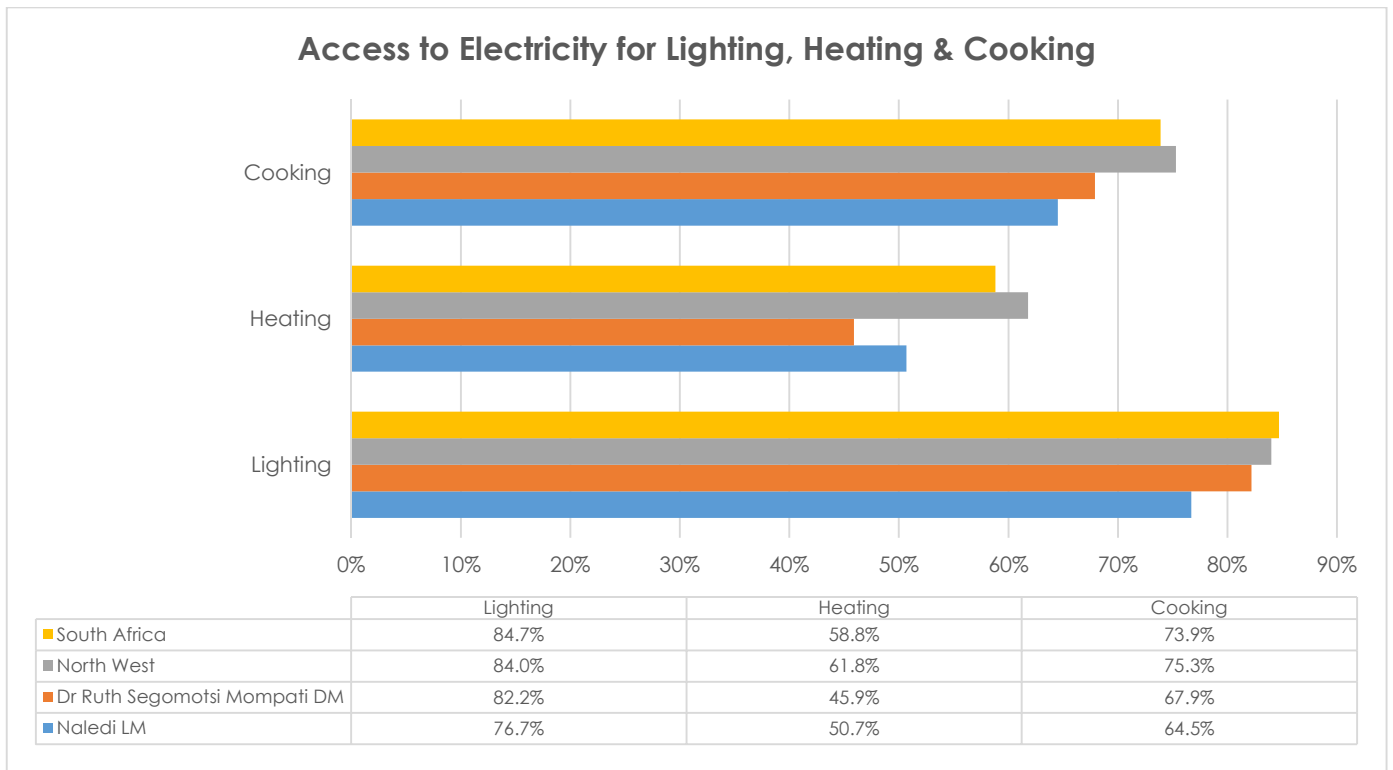


Figure 4.15: Access to Electricity for Lighting, Heating and Cooking in South Africa, North West Province, Dr Ruth Segomotsi Mompoti DM, and Naledi LM (Source: Census 2011).

4.5.12.4. Access to Refuse Removal

Approximately two thirds (65.3%) of households within the Naledi LM have their refuse removed by a local authority at least once a week. Approximately one fifth (20.1%) dispose of their refuse by making use of their own refuse dump, which is considered to be below the basic level of service provision for refuse removal, while 7.2% of households indicated that they have no form of refuse removal.

According to the Naledi LM IDP 2017 – 2022 (2017) the following constitute key challenges in respect of waste management:

- » No access to Waste and refuse disposal at Dithakwaneng and Devondale,
- » No licensed landfill site at Stella,
- » Illegal Dumping,
- » Insufficient number of refuse bins in Naledi, and
- » Insufficient number of transfer Stations.

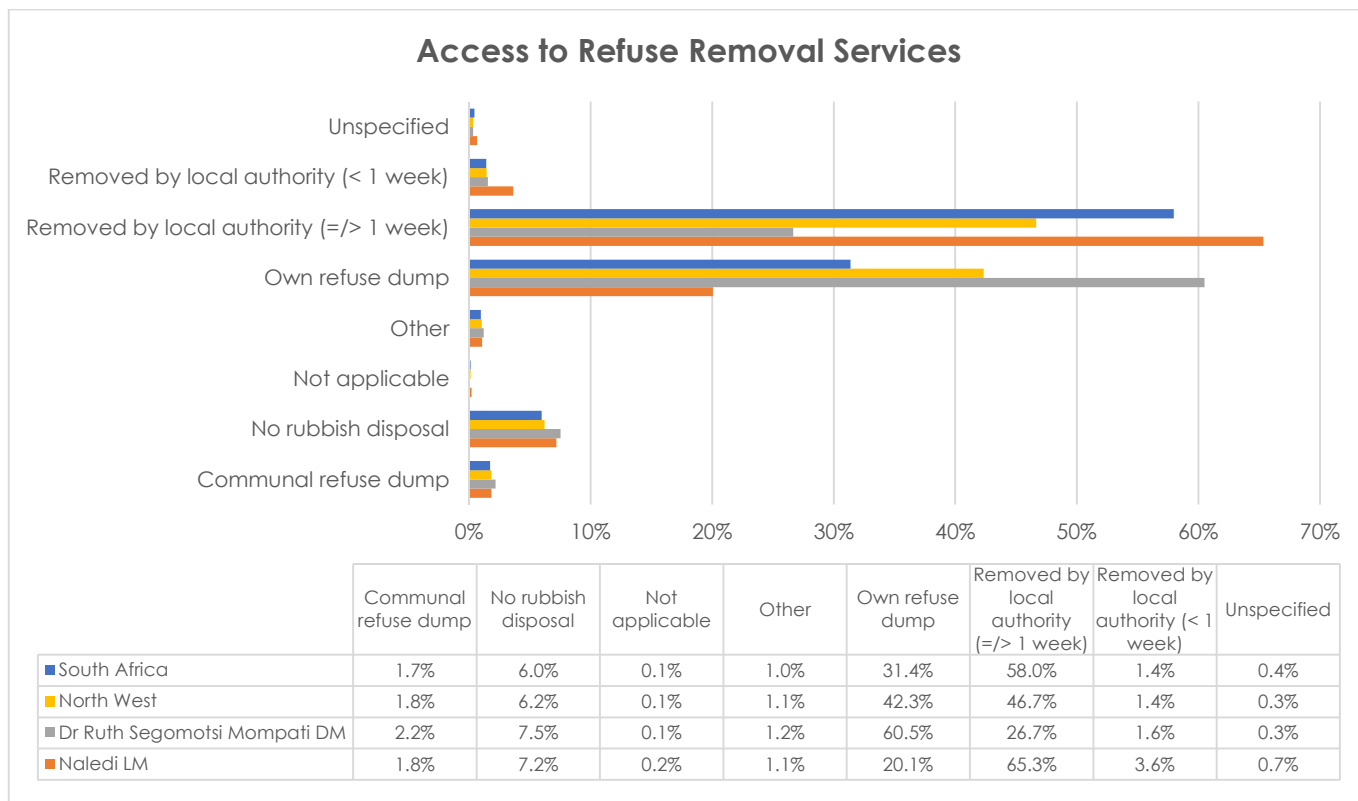


Figure 4.16: Access to Refuse Removal Services within South Africa, North West Province, Dr Ruth Segomotsi Mompoti DM, and Naledi LM (Source: Census 2011).

The following service delivery backlogs up to the 2016 – 2017 financial year have been identified and are reflected in the Naledi LM IDP 2017 – 2022.

Sector	Backlogs Census 2011	Backlogs eradicated to date (up to end 30 June 2015)	Backlogs planned to be eradicated in 2015 / 16	Backlogs planned to be eradicated in 2016 / 17	Balance
Water	2 130	200	400	1 000	2 030
Sanitation	4 395	200	738	1 500	2 957
Refuse	4 060	500	1 500	800	3 260
Electricity	3 281	882	950	1 400	2 571
Housing	6 608	1 000	2 300	950	2 358
Roads	157km	3km	4km	9km	141km

Based on the information contained in the table above there appears to be significant backlogs in service delivery within the Naledi LM which require addressing.

4.6. Societal Challenges

In terms of societal challenges the Naledi LM IDP 2017 – 2022 (2017) identified the following difficulties as being faced by households within the Naledi LM as derived from the Community survey of 2016 (Stats SA). For ease of reference the difficulties identified by households have been ranked in order from most severe (i.e. difficulty reported by the highest number of households within the LM) to least severe (i.e. difficulty reported by the least number of households within the LM).

Table 4.5: Societal challenges faced by households

Type of difficulty	Number of Households	Percentage of Households
Lack of / inadequate employment opportunities	4431	26.6%
Cost of electricity	1908	11.5%
Inadequate roads	1526	9.2%
Cost of water	1454	8.7%
Inadequate housing	1317	7.9%
Inadequate sanitation / sewerage / toilet services	1132	6.8%
None	1001	6.0%
Lack of reliable electricity supply	956	5.7%
Lack of / inadequate healthcare services	701	4.2%
Violence and crime	689	4.1%
Corruption	347	2.1%
Other	272	1.6%
Lack of / inadequate educational facilities	194	1.2%
Lack of / inadequate public transport	185	1.1%
Lack of / inadequate parks and recreational areas	172	1.0%
Inadequate refuse / waste removal	110	0.7%
Inadequate street lights	87	0.5%
Gangsterism	85	0.5%
Alcohol abuse	66	0.4%
Drug abuse	26	0.2%

Over one quarter (26.6%) of households which participated in the 2016 Community Survey identified Lack of / inadequate employment opportunities as a societal challenge. This is largely followed by challenges faced by either the lack of, or inadequate supply, or cost of basic service provision such as electricity, roads, water, housing, and sanitation.

4.7. Baseline Summary

In summary, the area was found to have the following socio-economic characteristics:

- » The project is proposed within the North West Province, which is South Africa's 6th largest, and 7th most densely populated Province.
- » Between 2001 and 2011 the Naledi LM experienced a positive population growth rate of 1.7% per year, which is more than double that of the Dr Ruth Segomotsi Mompati DM which experienced a population growth rate of 0.8% per year for the same period.
- » Black Africans comprise the predominant population group within the Naledi LM, Dr Ruth Segomotsi Mompati DM, North West Province, and South Africa as a whole. Coloureds comprise the second largest population group accounting for approximately 14.7% of the Naledi LM population.
- » Both the Naledi LM and North West provincial populations are slightly male dominated, whereas the Dr Ruth Segomotsi Mompati DM and South African national populations are both female dominated.

- » The Naledi LM, Dr Ruth Segomotsi Mompati DM, North West provincial and South African national populations are all heavily youth dominated, with the population age structures comprising predominantly of the economically active population between the ages of 15 – 64. This implies that there is sufficient human resource base for development projects to involve the local populations.
- » The Naledi LM has a lower dependency ratio (36) than that of the Dr Ruth Segomotsi Mompati DM (41.6), but higher than the North West provincial (35.3) and South African national (34.5) dependency ratios.
- » There are relatively low education levels within the area, with the majority of the Naledi LM (29.3%) and Dr Ruth Segomotsi Mompati DM (28.1%) having received some secondary schooling. Approximately 16.7% of the Naledi LM population ages 20 years and older have received no form of schooling, and 68.8% have not completed Grade 12 / Matric. The majority of the population can be expected to have a relatively low-skill level and would either require employment within low-skilled sectors, or skills development opportunities in order to improve the skills level of the area, and therefore income levels.
- » The unemployment rate of the economically active population within the Naledi LM (15.0%) is fractionally higher than that of the Dr Ruth Segomotsi Mompati DM (14.8%). The proportion of economically inactive population is considerably higher in the Dr Ruth Segomotsi Mompati DM (49.5%) than in the Naledi LM (38.2%). The proportion of the economically inactive population has an impact with regards to the proportion of local human capital who are available and willing to work.
- » Household income levels are low within the area, with the vast majority falling within the poverty level (64% in the Naledi LM and 70% in the Dr Ruth Segomotsi Mompati DM). The area can therefore be expected to have a high poverty level with associated social consequences such as not being able to pay for basic needs and services and poor living conditions.
- » The primary economic activities within the Naledi LM comprise agriculture and hunting which contribute 27.8% to the LM's economy. Other important job creating sectors include finance and insurance, public administration, health and social, and transport. Government is the main employer (as well as the most significant contributor to the GDP).
- » The Naledi LM is equipped with 2 hospitals, both of which are located within Vryburg, 2 clinics, 6 mobile clinics, and 2 community health centres.
- » Approximately 71.7% of households within the Naledi LM comprise houses (i.e. house or brick / concrete block structure on a separate stand or yard or on a farm), followed by 12.5% which comprise informal dwellings (i.e. a shack not in a back yard).
- » The majority of households within the Naledi LM are adequately serviced with regards to water, sanitation, electricity, and refuse removal. However there are sufficient backlogs which have been identified within the LM which require addressing.

5. KEY CONSIDERATIONS FOR SOLAR PV POWER PLANTS

While no industry sector Environmental, Health and Safety (EHS) Guidelines have been developed for PV Solar Power, the International Finance Corporation (IFC) has published a Project Developer's Guide to Utility-Scale Solar Photovoltaic Power Plants (IFC, 2015). Section 8 of the Project Developer's Guide pertains to Permits, Licensing and Environmental Considerations, and states that in order to deliver a project which will be acceptable to international lending institutions, environmental and social assessments should be carried out in accordance with the requirements of the key international standards and principles, namely the Equator Principles and IFC's Performance Standards (IFC PS).

Some of the key environmental considerations for solar PV power plants contained within the Project Developer's Guide are provided below:

5.1. Construction Phase Impacts

Construction activities lead to temporary air emissions (dust and vehicle emissions), noise related to excavation, construction and vehicle transit, solid waste generation and wastewater generation from temporary building sites and worker accommodation. In addition, Occupational Health and Safety (OHS) is an issue that needs to be properly managed during construction in order to minimise the risk of preventable accidents leading to injuries and / or fatalities. Proper OHS risk identification and management measures should be incorporated in every project's management plan and standard Engineering, Procurement and Construction (EPC) contractual clauses.

5.2. Water Usage

Although water use requirements are typically low for solar PV plants, clusters of PV plants may have a high cumulative water use requirement in arid areas where local communities rely upon scarce groundwater resources. In such scenarios, water consumption should be estimated and compared to local water abstraction by communities (if any), to ensure no adverse impacts on local people. Operation and Maintenance (O&M) methods in relation to water availability and use should be carefully reviewed where risks of adverse impacts to community usage are identified.

5.3. Land Matters

As solar power is one of the most land-intensive power generation technologies, land acquisition procedures and in particular the avoidance or proper mitigation of involuntary land acquisition / resettlement are critical to the success of the project. This includes land acquired either temporarily or permanently for the project site itself and any associated infrastructure – i.e. access roads, powerlines, construction camps (if any) and switchyards. If involuntary land acquisition is unavoidable, a Resettlement Action Plan (RAP) (dealing with physical displacement and any associated economic displacement) or Livelihood Restoration Plan (LRP) (dealing with economic displacement only) will be required. This is often a crucial issue with respect to local social license to operate, and needs to be handled with due care and attention by suitably qualified persons.

5.4. Landscape and Visual Impacts

Key impacts can include the visibility of the solar panels within the wider landscape and associated impacts on landscape designations, character types and surrounding communities. Common mitigation measures to reduce impacts can include consideration of layout, size and scale during the design process and landscaping / planting in order to screen the modules from surrounding receptors. Note that it is important that the impact of shading on energy yield is considered for any new planting requirements. Solar panels are designed to absorb, not reflect, irradiation. However, glint and glare should be a consideration in the environmental assessment process to account for potential impacts on landscape / visual and aviation aspects.

5.5. Ecology and Natural Resources

Potential impacts on ecology can include habitat loss / fragmentation, impacts on designated areas and disturbance or displacement of protected or vulnerable species. Receptors of key consideration are likely to include nationally and internationally important sites for wildlife and protected species such as bats, breeding birds and reptiles. Ecological baseline surveys should be carried out where potentially sensitive habitat, including undisturbed natural habitat, is to be impacted, to determine key receptors of relevance to each site. Mitigation measures can include careful site layout and design to avoid areas of high ecological value or translocation of valued ecological receptors. Habitat enhancement measures could be considered where appropriate to offset adverse impacts on sensitive habitat at a site, though avoidance of such habitats is a far more preferable option.

5.6. Cultural Heritage

Potential impacts on cultural heritage can include impacts on the setting of designated sites or direct impacts on below-ground archaeological deposits as a result of ground disturbance during construction. Where indicated as a potential issue by the initial environmental review / scoping study, field surveys should be carried out prior to construction to determine key heritage and archaeological features at, or in proximity to, the site. Mitigation measures can include careful site layout and design to avoid areas of cultural heritage or archaeological value and implementation of a 'chance find' procedure that addresses and protects cultural heritage finds made during a project's construction and/or operation phases.

5.7. Transport and Access

The impacts of transportation of materials and personnel should be assessed in order to identify the most appropriate transport route to the site while minimising the impacts on project-affected communities. The requirement for any oversized vehicles / abnormal loads should be considered to ensure access is appropriate. Onsite access tracks should be permeable and developed to minimise disturbance to agricultural land. Where project construction traffic has to traverse local communities, traffic management plans should be incorporated into the environmental and social management plan and EPC requirements for the project.

5.8. Drainage / Flooding

A review of flood risk should be undertaken to determine if there are any areas of high flood risk associated with the site. Existing and new drainage should also be considered to ensure run-off is controlled to minimise erosion.

5.9. Consultation and Disclosure

It is recommended that early stage consultation is sought with key authorities, statutory bodies, affected communities and other relevant stakeholders. This is valuable in the assessment of project viability, and may guide and increase the efficiency of the development process. Early consultation can also inform the design process to minimise potential environmental impacts and maintain overall sustainability of the project. The authorities, statutory bodies and stakeholders that should be consulted vary from country to country but usually include the following organisation types:

- » Local and / or regional consenting authority.
- » Government energy department / ministry.
- » Environmental agencies / departments.
- » Archaeological agencies / departments.
- » Civil aviation authorities / Ministry of Defence (if located near an airport).
- » Roads authority.
- » Health and safety agencies / departments.
- » Electricity utilities.
- » Military authorities.

Community engagement is an important part of project development and should be an on-going process involving the disclosure of information to project-affected communities. The purpose of community engagement is to build and maintain over time a constructive relationship with communities located in close proximity to the project and to identify and mitigate the key impacts on project-affected communities. The nature and frequency of community engagement should reflect the project's risks to, and adverse impacts on, the affected communities.

5.10. Environmental and Social Management Plan (ESMP)

Whether or not an Environmental and Social Impact Assessment (ESIA) or equivalent has been completed for the site, an ESMP should be compiled to ensure that mitigation measures for relevant impacts of the type identified above (and any others) are identified and incorporated into project construction procedures and contracts. Mitigation measures may include, for example, dust suppression during construction, safety induction, training and monitoring programs for workers, traffic management measures where routes traverse local communities, implementation of proper waste management procedures, introduction of periodic community engagement activities, implementation of chance find procedures for cultural heritage, erosion control measures, fencing off of any vulnerable or threatened flora species, and so forth. The ESMP should indicate which party will be responsible for (a) funding, and (b) implementing each action, and how this will be monitored and reported on at the project level. The plan should be commensurate to the nature and type of impacts identified.

6. SOCIAL IMPACT ASSESSMENT

This section provides a detailed description and assessment of the potential social impacts which have been identified for the detailed design and construction, operation, and decommissioning phases, of the Moeding Solar PV Facility and associated infrastructure.

6.1. Detailed Design and Construction Phase

The detailed design and construction phase is expected to take approximately 12 to 18 months to complete. It is anticipated that the following activities would be included and would form part of the detailed design and construction phase:

- » **Pre-planning:** Several post-authorisation factors are expected to influence the final design of the facility and could result in small-scale modifications of the PV array or associated infrastructure. The construction process is dynamic and unforeseen changes to the project specifications may occur. The final facility design is required to be approved by DEA prior to any construction activities commencing on-site. Should any substantive changes or deviations from the original scope or layout of the project reflected in the BA process have occurred, DEA would need to be notified thereof, and where applicable additional approval may need to be obtained.
- » **Conduct surveys:** Prior to initiating construction, a number of surveys will be required. These include, but are not limited to confirmation of the micro-siting footprint (i.e. confirming the precise location of the PV panels, substation, and the plant's associated infrastructure), and a geotechnical survey, as well as any other surveys that may be required.
- » **Procurement and employment:** The number of employment opportunities likely to be generated by the project can only be determined after a detailed assessment of the size and technology deployed on the site. While no employment figures were available at the time of undertaking the SIA, it is anticipated however that the project is likely to create up to 800 employment opportunities at the peak of construction. These employment opportunities will be temporary in nature, and will last for a period of up to 12 to 18 months (i.e. the length of construction). Employment opportunities generated during the construction phase will include unskilled, semi-skilled, and highly-skilled opportunities. It is understood that the majority of the labour force is expected to be sourced from the local area, and that no labour will be accommodated on-site during the construction period.
- » **Establishment of an access road to the site:** Access to the project site can be obtained via the N18 national road which runs in a north to south direction, in the eastern extent of the project site, forming the eastern boundary of the project site in the south-eastern extent, and dissecting the project site in the central and northern extent. Within the facility development footprint itself, access will be required from new / existing roads for construction purposes (and limited access for maintenance during operation). The final access road layout will be determined following the identification of site related sensitivities.
- » **Undertake site preparation:** Site preparation activities will include clearance of vegetation. These activities will require the stripping of topsoil which will need to be stockpiled, backfilled and / or spread on site.
- » **Transport of components and equipment to site:** The national, regional, secondary and proposed internal access roads will be used to transport all components and equipment required during the construction phase of the solar facility. Some of the components (i.e. substation transformer) may be defined as abnormal loads in terms of the National Road Traffic Act (No. 93 of 1996) (NRTA) by virtue of

the dimensional limitations. Typical civil engineering construction equipment will need to be brought to the site (e.g. excavators, trucks, graders, compaction equipment, cement trucks, etc.) as well as components required for the mounting of the PV support structures, construction of the substation and site preparation.

- » **Establishment of laydown areas on site:** Laydown and storage areas will be required for typical construction equipment. Once the required equipment has been transported to site, a dedicated equipment construction camp and laydown area will need to be established adjacent to the workshop area. The equipment construction camp serves to confine activities and storage of equipment to one designated area to limit the potential ecological impacts associated with this phase of the development. The laydown area will be used for the assembly of the PV panels and the general placement / storage of construction equipment.
- » **Erect PV arrays and construct substation and invertors:** The construction phase involves installation of the solar PV panels and structural and electrical infrastructure required for the operation of the facility. In addition, preparation of the soil and improvement of the access roads is likely to continue for most of the construction phase. The construction of the on-site substation will require a survey of the site, site clearing and levelling and construction of access road(s) (where applicable), construction of a level terrace and foundations, assembly, erection, installation and connection of equipment, and rehabilitation of any disturbed areas, and protection of erosion sensitive areas.
- » **Establishment of ancillary infrastructure:** Ancillary infrastructure will include workshop, storage and laydown areas, gatehouse and security complex, as well as a temporary contractor's equipment camp. The establishment of the ancillary infrastructure and support buildings will require the clearing of vegetation and levelling of the development site, and the excavation of foundations prior to construction. Laydown areas for building materials and equipment associated with these buildings will also be required.
- » **Undertake site rehabilitation:** Once construction is completed and all construction equipment has been removed, the site will be rehabilitated where practical and reasonable. In addition, on full commissioning of the solar facility, any access points which are not required during operation must be closed and rehabilitated accordingly.

The majority of social impacts associated with the project are anticipated to occur during the construction phase of development, and are typical of the type of social impacts generally associated with construction activities. Impacts associated with the detailed design and construction phase of a project are usually of a short duration and temporary in nature, but could have long-term effects on the surrounding social environment if not planned or managed appropriately. It is therefore necessary that the detailed design phase be conducted in such a manner so as not to result in permanent impacts associated with the ill-placement of project components or associated infrastructure.

6.1.1. Construction Phase Impacts Associated with the Moeding Solar PV Facility

6.1.1.1. Direct and Indirect employment opportunities

It is anticipated that the proposed project will result in the creation of approximately 800 employment opportunities at the peak of construction. Employment opportunities likely to be generated by the construction of the project will comprise a mixture of highly skilled, semi-skilled, and unskilled opportunities. Of the approximately 800 employment opportunities likely to be generated, approximately 60% (i.e. 480) would accrue to unskilled workers. Employment opportunities generated as a result of the project will be temporary in nature, and will last for the duration of the construction period (i.e. approximately 12 to 18

months). The project proponent anticipates that the majority of the general labour force will as far as possible be sourced from the local labour pool. Where relevant skills are unavailable from the local labour pool, these would need to be sought elsewhere. Solar PV projects make use of high levels of unskilled and semi-skilled labour so there will be good opportunity to use local labour. The injection of income into the area in the form of wages will represent an opportunity for the local economy and businesses in the area.

In addition to direct employment opportunities associated with the construction of the project a number of indirect employment opportunities will also be created. Indirect employment opportunities will predominantly be created in the service industry, through the opportunity for the provision of secondary services to the construction team. Services may include for example accommodation, catering, and laundry services. Indirect employment opportunities created as a result of the construction of the project would also be temporary in nature and would last for the duration of the construction period (i.e. approximately 12 to 18 months). The creation of employment opportunities is considered to be of moderate magnitude given the levels of unemployment within the area, the low average income, and the fact that the majority of employment within the surrounding area is of a seasonal nature as it is associated with the agricultural sector.

While difficult to quantify, indirect employment opportunities are significant in that they provide greater opportunity for women to be included and benefitted, albeit it indirectly. Other indirect employment opportunities that will be created during construction relate to increased demand for transportation, equipment rental, sanitation and waste removal etc. which may benefit local service providers.

Where feasible local suppliers and contractors should be used as far as possible to ensure that the benefits resulting from the project accrue as far as possible to the local communities which are also likely to be most significantly impacted / affected by the project.

Table 6.1: Impact assessment on direct and indirect employment opportunities

Nature: The creation of direct and indirect employment opportunities during the construction phase of the project.

	Without mitigation	With mitigation
Extent	Local-Regional (3)	Local-Regional (3)
Duration	Short term (2)	Short term (2)
Magnitude	Minor (2)	Moderate (6)
Probability	Highly probable(4)	Definite (5)
Significance	Low (28)	Medium (55)
Status (positive or negative)	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	

Mitigation:

- » A local employment policy should be adopted to maximise opportunities made available to the local labour force.
- » Labour should be sourced from the local labour pool, and only if the necessary skills are unavailable, should labour be sourced from (in order of preference) the greater Naledi LM, Dr Ruth Segomotsi Mompati DM, North West Province, South Africa, or elsewhere.
- » Where feasible, training and skills development programmes should be initiated prior to the commencement of the construction phase.

- » As with the labour force suppliers should also as far as possible be sourced locally.
- » As far as possible local contractors that are compliant with Broad-Based Black Economic Empowerment (B-BBEE) criteria, should be used.
- » The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.

Cumulative impacts:

- » Opportunity to decrease the local unemployment levels and increase the levels of income and spending power within the region.
- » Opportunity to upgrade and improve skill levels in the area.
- » Opportunity for local entrepreneurs to develop their businesses (which could result in the creation of additional employment opportunities, levels of income and spending power through sustainable growth).

Residual impacts:

- » Improved pool of skills and experience in the local area.
- » Economic growth for small-scale entrepreneurs.
- » Temporary employment during construction phase will result in job losses and struggles for construction workers to find new employment opportunities.

6.1.1.2. Economic multiplier effects

There are likely to be opportunities for local businesses and service providers to provide services and materials for, and in doing so benefit from, the construction phase of the proposed project. Off-site accommodation in the nearest town (i.e. Vryburg) may be required for contract workers and certain employees. The economic multiplier effects from the use of local goods and services will include, but is not limited to, construction materials and equipment, and workforce essentials such as catering, trade clothing, safety equipment, accommodation, transportation and other goods.

In terms of business opportunities for local companies, expenditure during the construction phase will create business opportunities for the regional and local economy. The increase in demand for new materials and services in the nearby area may stimulate local business and local economic development. There is likely to be a direct increase in industry and indirect increase in secondary businesses.

The project proponent should source services needed from the local area as much as possible. These necessities should be sourced from nearby towns and local service providers. Potential opportunities for local economies, a decrease in current level of unemployment, and an increase in incomes will in turn stimulate further expenditure and sales within the local economies.

The injection of income into the area in the form of wages will represent an opportunity for the local economy and businesses in the area. Through the stimulation of employment and income new demand may be created within local and regional economies. With increased income comes additional income for expenditure on goods and services supplied. Indirect impacts would occur as a result of the new economic development, and would include new jobs at businesses that may support the construction workforce or provide project materials, and associated income. The intention should therefore be to maximise local labour employment opportunities, which is likely to have a positive impact on local communities and downstream benefits with regards to household income, education and other social aspects. Such benefits may however be limited given the very short construction period (i.e. approximately 12 to 18 months).

Table 6.2: Economic multiplier effects impact assessment

Nature: Significance of the impact from the economic multiplier effects from the use of local goods and services.

	Without mitigation	With mitigation
Extent	Local-Regional (3)	Local-Regional (3)
Duration	Short term (2)	Short term (2)
Magnitude	Low (4)	Moderate (6)
Probability	Highly probable (4)	Definite (5)
Significance	Medium (36)	Medium (55)
Status (positive or negative)	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	

Mitigation:

- » It is recommended that a local procurement policy is adopted to maximise the benefit to the local economy.
- » A database of local companies, specifically Historically Disadvantaged Individuals (HDIs) which qualify as potential service providers (e.g. construction companies, security companies, catering companies, waste collection companies, transportation companies etc.) should be created and companies listed thereon should be invited to bid for project-related work where applicable.
- » Local procurement is encouraged along with engagement with local authorities and business organisations to investigate the possibility of procurement of construction materials, goods and products from local suppliers where feasible.

Cumulative impacts:

- » Opportunity for local capital expenditure, potential for the local service sector.

Residual impacts:

- » Improved local service sector, growth in local business.

6.1.1.3. Influx of jobseekers and change in population

Construction projects have the potential to attract jobseekers which may move into an area in search of employment opportunities. An influx of people looking for employment or other economic opportunities could result in increased pressure being placed on economic and social infrastructure, and a change in the local population. Population change refers to the size, structure, density as well as demographic profile of the local community.

An influx of jobseekers into an area, could lead to a temporary increase in the level of crime, cause social disruption and put pressure on basic services. This includes municipal services such as sanitation, electricity, water, waste management, health facilities, transportation and the availability of housing. It could also potentially create conflict between locals and outsiders due to potential differences in racial, cultural and ethnic composition. A further negative impact that could result due to an influx of jobseekers into an area is an increase in unemployment levels due to an oversupply of available workforce, particularly with respect to semi and unskilled workers.

Given the relatively small labour force required for the project (i.e. approximately 300 opportunities at the peak of construction comprising highly skilled, semi-skilled, and unskilled), the short duration of the construction period (i.e. approximately 12 to 18 months), and the close proximity of the site to the town of Vryburg and Huhudi (from which the majority of labour is likely to be sourced), the construction of the project is not anticipated to result in changes to the population within the site or its surrounds. In addition

due to the fact that no man camps will be established on site the potential for an influx of people into the area or change in population demographics is anticipated to be minimal. The labour force is therefore also not anticipated to place significant pressure on local resources and social networks, or existing services and infrastructure, as they would already be accessing services at their places of residence.

Table 6.3: Assessment of impacts from an influx of jobseekers and change in population in the study area

Nature: In-migration of labourers in search of employment opportunities, and a resultant change in population, and increase in pressure on local resources and social networks, or existing services and infrastructure.

	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Short-term (2)	Short-term (2)
Magnitude	Low (4)	Low (4)
Probability	Very Improbable (1)	Very Improbable (1)
Significance	Low (7)	Low (7)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	

Mitigation:

- » Develop and implement a local procurement policy which prioritises "locals first" to prevent the movement of people into the area in search of work.
- » Engage with local community representatives prior to construction to facilitate the adoption of the local's first procurement policy.
- » Provide transportation for workers (from Vryburg and surrounds) to ensure workers can easily access their place of employment and do not need to move closer to the project site.
- » Working hours should be kept between daylight hours during the construction phase, and / or as any deviation that is approved by the relevant authorities.
- » Compile and implement a grievance mechanism.
- » Appoint a Community Liaison Officer (CLO) to assist with the procurement of local labour.
- » Prevent the recruitment of workers at the project site.
- » Implement a method of communication whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process.
- » Establish clear rules and regulations for access to the proposed site.
- » Appoint a security company and implement appropriate security procedures to ensure that workers do not remain onsite after working hours.
- » Inform local community organisations and policing forums of construction times and the duration of the construction phase.
- » Establish procedures for the control and removal of loiters from the construction site.

Cumulative impacts:

- » Additional pressure on natural resources, services, infrastructure and social dynamics in the area due to an increased in people and change in population.
- » Possible increase in criminal activities and economic losses in area for property owners.

Residual impacts:

- » Possibility of outside workers remaining in the area after construction is completed and subsequent pressures on local infrastructure, resources and services.

6.1.1.4. Safety and security impacts

The commencement of construction activities can be associated with an increase in crime within an area. The perceived loss of security during the construction phase of a project due to an influx of workers and / or outsiders to the area (as in-migration of newcomers, construction workers or jobseekers are usually associated with an increase in crime), may have indirect effects such as increased safety and security concerns for neighbouring properties, damage to property, increased risk of veld fire, stock theft, poaching, crime and so forth.

Given the fact that a man camp will not be established onsite, and the labour force will therefore not permanently reside within the area, or have any reason to be onsite after hours, it is anticipated that the probability and significance of such safety and security impacts occurring will be reduced.

The project proponent should strive to develop and maintain good relationships and ongoing and open communication with neighbouring landowners. Suitable grievance control mechanisms must be developed and implemented, and the local community informed of the grievance mechanism to be followed. In addition, a security company must be appointed and appropriate security measures implemented prior to the commencement of construction activities onsite.

Table 6.4: Assessment of safety and security impacts

Nature: Temporary increase in safety and security concerns associated with the influx of people during the construction phase.

	Without mitigation	With mitigation
Extent	Local (2)	Local (2)
Duration	Short term (2)	Short term (2)
Magnitude	High (8)	Moderate (6)
Probability	Probable (3)	Improbable (2)
Significance	Medium (36)	Low (20)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	

Mitigation:

- » Working hours should be kept between daylight hours during the construction phase, and / or as any deviation that is approved by the relevant authorities.
- » Provide transportation for workers (from Vryburg and surrounds) to prevent loitering within or near the project site outside of working hours.
- » The perimeter of the construction site should be appropriately secured to prevent any unauthorised access to the site, the fencing of the site should be maintained throughout the construction period.
- » The appointed EPC contractor must appoint a security company and appropriate security procedures and measures are implemented.
- » Access in and out of the construction camp should be strictly controlled by a security company appointed to the project.
- » A CLO should be appointed as a grievance mechanism. A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process.
- » The implementation of a stakeholder management plan by the EPC contractor to address neighbouring farmer concerns regarding safety and security.

Cumulative impacts:

- » Possible increase in crime levels (with influx of people) with subsequent possible economic losses.

Residual impacts:

- » None anticipated.

6.1.1.5. Impacts on daily living and movement patterns

Project components and equipment will be transported to site using road transport. The N18 national road which links the towns of Vryburg and Mahikeng to Ramatlabama on the border with Botswana provides the primary access to the area. Local farmers and residents utilise gravel access roads to access their farms.

Increased traffic due to construction vehicles could cause disruptions to the local community and increase safety hazards. The use of local roads and transport systems may cause road deterioration and congestion. This impact will be magnified since farm roads are not designed to carry heavy traffic and are prone to erosion. Noise, vibrations, dust and visual pollution from heavy vehicle traffic during the construction phase could also negatively impact local residents and road users.

The upgrading of access roads may damage the fences along the access road. Infrastructure such as roads and fencing should be maintained in the present condition and repaired immediately, if damaged as a result of construction activities. The contractor should be responsible for managing this impact on private property.

Impacts on daily living and movement patterns is of particular concern given the location of the Tiger Kloof Educational Institution (i.e. the Tiger Kloof Combined School) along the N18 national road and within close proximity to the project site. The potential therefore exists for disruptions to occur to school goers who either walk or travel to school by taxi, bus, or private vehicle. In addition, the fact that the Tiger Kloof Combined School accommodates boarders implies that there is likely to be a number of youth within close proximity to the site at all times.

Table 6.5: Assessment of impacts on daily living and movement patterns.

Nature: Temporary increase in traffic disruptions and movement patterns during the construction phase.

	Without mitigation	With mitigation
Extent	Local-Regional (3)	Local-Regional (3)
Duration	Short term (2)	Short term (2)
Magnitude	High (8)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	Medium (39)	Medium (33)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	

Mitigation:

- » Working hours to be appropriately arranged during the construction phase, and / or as any deviation that is approved by the relevant authorities.
- » All vehicles must be road worthy and drivers must be qualified, obey traffic rules, follow speed limits and made aware of the potential road safety issues.
- » Heavy vehicles should be inspected regularly to ensure their road safety worthiness.
- » Provision of adequate and strategically placed traffic warning signs and control measures along the N18 and

- gravel farm access roads to warn road users of the construction activities taking place for the duration of the construction phase. Warning signs must be visible at all times, and especially at night.
- » Implement penalties for reckless driving as a way to enforce compliance to traffic rules.
 - » Avoid heavy vehicle activity during “peak” hours (when children are taken to school, or people are driving to work).
 - » The developer and EPC contractor must ensure that all fencing along access roads is maintained in the present condition or repaired if disturbed due to construction activities.
 - » The developer and EPC Contractor must ensure that the roads utilised for construction activities are either maintained in the present condition or upgraded if disturbed due to construction activities.
 - » The developer and EPC Contractor must ensure that any damage / wear and tear to the roads caused by construction related traffic / project activities is repaired.
 - » A method of communication must be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process.

Cumulative impacts:

- » Possible increased traffic and traffic disruptions impacting local communities.

Residual impacts:

- » None anticipated.

6.1.1.6. Nuisance Impacts (noise and dust)

Impacts associated with construction related activities include noise, dust, and possible disruption to adjacent properties. Site clearing activities increase the risk of dust and noise being generated, which can in turn negatively impact on adjacent properties. The movement of heavy construction vehicles and construction activities and equipment also have the potential to create noise at the project site, as well as along the N18 national road, and other local access roads. The primary sources of noise during construction would be from construction equipment, vehicle / truck traffic, and ground vibration. Noise levels can be audible over a large distance however are generally short in duration. Dust would be generated from construction activities as well as trucks / vehicles driving on gravel access roads. This impact will negatively impact sensitive receptors, and could also potentially negatively impact surrounding land users. The impact of noise and dust on surrounding land users and local farmsteads can be reduced through the application of appropriate mitigation measures.

Table 6.6: Assessment of nuisance impacts (noise and dust)

Nature: Nuisance impacts in terms of temporary increase in noise and dust, and wear and tear on access roads to the site.

	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Short-term (2)	Short-term (2)
Magnitude	Moderate (6)	Low (4)
Probability	Highly probable (4)	Probable (3)
Significance	Medium (36)	Low (21)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	

Mitigation:

- » The movement of heavy vehicles associated with the construction phase should be timed to avoid weekends, public holidays and holiday periods where feasible.

- » The contractor must ensure that damage / wear and tear caused by construction related traffic to the access roads is repaired before the completion of the construction phase.
- » Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers.
- » Ensure all vehicles are road worthy, drivers are qualified and are made aware of the potential noise and dust issues.
- » A CLO should be appointed. A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process.

Cumulative impacts:

- » If damage to roads is not repaired then this will affect other road users and result in higher maintenance costs for vehicles of road users.
- » Other construction activities in area will heighten the nuisance impacts, such as noise, dust and wear and tear on roads.

Residual impacts:

- » Only damage to roads that are not fixed could affect road users.

6.1.1.7. Visual Impacts and Sense of Place Impacts

Intrusion impacts such as aesthetic pollution (i.e. building materials, construction vehicles, etc.), noise and light pollution, and impacts on the rural nature of the site will impact the “sense of place” for the local community. Construction related activities have the potential to negatively impact a local areas “sense of place”. Such an impact is likely to be more prevalent during the construction phase, but will also persist to a lesser extent during the operation of the project. The sense of place will be disrupted during the operational phase of the project, particularly when considering the cumulative impact due to the transmission corridor route (i.e. the Northern Corridor Route) and a Renewable Energy Development Zone (REDZ) (i.e. the Vryburg REDZ).

Given the nature of the surrounding area within which the project is proposed it can be anticipated that the areas “sense of place” would similarly be impacted already in terms of noise and light pollution. The visual and sense of place impacts associated with the construction of the facility are therefore anticipated to be of low significance.

Table 6.7: Assessment of impacts on the sense of place

Nature: Intrusion impacts from construction activities will have an impact on the areas “sense of place”.

	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Short-term (2)	Short-term (2)
Magnitude	Low (4)	Low (4)
Probability	Highly probable (4)	Probable (3)
Significance	Low (28)	Low (21)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	Yes
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	

Mitigation:

- » Implement mitigation measures identified in the Visual Impact Assessment (VIA) prepared for the project.
- » Limit noise generating activities to normal daylight working hours and avoid weekends and public holidays.

- » The movement of heavy vehicles associated with the construction phase should be timed to avoid weekends, public holidays and holiday periods where feasible.
- » Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers.
- » All vehicles must be road-worthy and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits.
- » Communication, complaints and grievance channels must be implemented and contact details of the CLO must be provided to the local community in the study area.

Cumulative impacts:

- » Other construction activities in the area will heighten the intrusion impacts, such as noise, dust and aesthetic pollution and further negatively impact the areas 'sense of place'.

Residual impacts:

- » None anticipated.

6.2. Operation Phase

The Moeding Solar PV Facility is anticipated to operate for a minimum of 20 years. The facility will operate continuously, 7 days a week, during daylight hours. While the solar facility will be largely self-sufficient, monitoring and periodic maintenance activities will be required. Key elements of the Operation and Maintenance (O&M) plan include monitoring and reporting the performance of the solar facility, conducting preventative and corrective maintenance, receiving visitors, and maintaining security.

The potential positive and negative social impacts which could arise as a result of the operation of the proposed project include the following:

6.2.1. Operation Phase Impacts Associated with the Moeding Solar PV Facility

6.2.1.1. Direct and Indirect employment opportunities

It is anticipated that the operation of the project is likely to create 8 to 10 skilled employment opportunities, while training opportunities would be available for local community members for areas such as security, electricians, etc. These employment opportunities will include highly skilled, semi-skilled and unskilled opportunities. The employment opportunities generated as a result of the project will be long term and will last for the duration of operation (i.e. approximately 20 years). None of the employment opportunities will be permanently stationed onsite. In addition to the direct employment opportunities it is anticipated that additional indirect employment opportunities will be generated during the operation of the project.

Table 6.8: Employment opportunities and skills development

Nature: The creation of employment opportunities and skills development opportunities during the operation phase for the country and local economy.

	Without mitigation	With mitigation
Extent	Local-Regional (3)	Local-Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Low (4)
Probability	Highly probable(4)	Definite (5)
Significance	Medium (44)	Medium (55)
Status (positive or negative)	Positive	Positive

Reversibility	N/A
Irreplaceable loss of resources?	No
Can impacts be enhanced?	Yes

Enhancement:

- » It is recommended that local employment policy is adopted to maximise the opportunities made available to the local community.
- » The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.
- » Vocational training programmes should be established to promote the development of skills.

Cumulative impacts:

- » Opportunity to reduce unemployment rates.

Residual impacts:

- » Improved pool of skills and experience in the local area.

6.2.1.2. Development of non-polluting, renewable energy infrastructure

South Africa currently relies predominantly on coal-generated electricity to meet its energy needs. As a result, the country's carbon emissions are considerably higher than those of most developed countries partly because of the energy-intensive sectors which rely heavily on low quality coal, which is the main contributor to GHG emissions. The use of solar technology for power generation is considered a non-consumptive use of a natural resource which produces zero GHG emissions during its operation. The generation of RE utilising solar power will contribute positively to South Africa's electricity market. Given South Africa's reliance on Eskom as a power utility, the benefits associated with a REIPPP Programme are regarded as an important contribution, and the advancement of RE has been identified as a priority for South Africa.

Increasing the contribution of the RE sector to the local economy would contribute to the diversification of the local economy and provide greater economic stability. The growth in the RE sector as a whole could introduce new skills and development into the area. This is especially true with regards to solar power specifically considering the number of other solar power projects proposed within the broader area.

The development of RE projects have the potential to contribute to the stability of the economy, and could contribute to the local economy through employment generation (direct, indirect, and local service providers) and revenue generation for the LM. While the overall contribution of the project to South Africa's total energy requirements is small, the facility will also contribute towards offsetting the total carbon emissions associated with energy generation in South Africa. It should however be noted that such a benefit is associated with all RE projects and not only solar power projects in particular.

Table 6.9: Assessment of the development of non-polluting, renewable energy infrastructure

Nature: Development of non-polluting, renewable energy infrastructure.

	Without mitigation	With mitigation
Extent	Local-Regional-National (4)	Local-Regional-National (4)
Duration	Long term (4)	Long term (4)
Magnitude	Minor (2)	Minor (2)
Probability	Definite (5)	Definite (5)
Significance	Medium (50)	Medium (50)

Status (positive or negative)	Positive	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	Yes (impact of climate change)	
Can impacts be mitigated?	No	

Enhancement:

» None identified.

Cumulative impacts:

» Reduce carbon emissions through the use of renewable energy and contribute to reducing global warming.

Residual impacts:

» Reduce carbon emissions through the use of renewable energy and contribute to reducing global warming.

6.2.1.3. Contribution to Local Economic Development (LED) and social upliftment

Projects which form part of the DoE's REIPPP Programme are required as part of their bidding requirements to contribute towards LED and social upliftment initiatives within the area in which they are proposed. In addition, they are required to spend a percentage of their revenue on socio-economic and enterprise development, as well as allocate ownership shares to local communities that benefit previously disadvantaged communities around the project. A portion of the dividends generated by each development also need to be invested into LED projects and programmes. The proposed development therefore has the potential to contribute positively towards socio-economic development and improvements within the local area.

Socio-economic spin-offs from the proposed development could therefore contribute towards better infrastructure provision, and the investment in education and skills development. An in-depth Community Needs Assessment (CNA) is required to ensure that the beneficiary community's needs are understood and sufficiently addressed by the proposed development programmes in order to contribute meaningfully towards local economic growth and development. It should be noted however that such a benefit would be associated with all RE projects and not just solar power projects in particular.

Table 6.10: Assessment of the contribution to LED and social upliftment

Nature: Contribution to LED and social upliftment during the operation of the project.

	Without mitigation	With mitigation
Extent	Local-Regional-National (4)	Local-Regional-National (4)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate to High (7)
Probability	Highly probable (4)	Highly probable (4)
Significance	Medium (56)	High (60)
Status (positive or negative)	Positive	Positive
Reversibility	N/A	
Irreplaceable loss of resources?	No	
Can impacts be enhanced?	Yes	

Enhancement:

» A CNA must be conducted to ensure that the LED and social upliftment programmes proposed by the project are meaningful.

» Ongoing communication and reporting is required to ensure that maximum benefit is obtained from the

programmes identified, and to prevent the possibility for such programmes to be misused.

- » The programmes should be reviewed on an ongoing basis to ensure that they are best suited to the needs of the community at the time (bearing in mind that these are likely to change over time).

Cumulative impacts:

- » Significant LED and social upliftment of the local communities as a result of other IPP projects within the area.

Residual impacts:

- » Social upliftment of the local communities through the development and operation of the project.

6.2.1.4. Visual impact and sense of place impacts

An area's sense of place is created through the interaction of various characteristics of the environment, including atmosphere, visual resources, aesthetics, climate, lifestyle, culture, and heritage. An area's sense of place is however subjective and largely dependent on the demographics of the population residing within the area and their perceptions regarding trade-offs. For example, while some individuals may prefer not to see any form of infrastructure development, others may have an interest in large-scale infrastructure, or engineering projects, and the operation of such facilities, and consider the impact to be less significant. Such a scenario may especially be true given that the project comprises a RE project, and could therefore be seen as benefitting the local environment, when compared to non-renewable energy generation projects.

An impact on the sense of place is one that alters the visual landscape to such an extent that the user experiences the environment differently, and more specifically, in a less appealing or less positive light. The social impacts associated with the impact on sense of place relate to the change in the landscape character and visual impact of the Moeding Solar PV Facility. The alteration of the sense of place in view of the local residents and road users will start during the construction phase and remain for the project's operational lifetime.

The Visual Impact Assessment (VIA) Report for the Proposed Moeding Solar PV Facility, near Vryburg in the North West Province (Environmental Planning and Design, October 2018) which forms part of the BA process currently being undertaken for the project by Savannah Environmental, provided an assessment of the visual impacts associated with the project. In terms of the visual impact of the proposed development on the general landscape character, the VIA indicated that the proposed solar project will introduce industrial elements into the rural landscape immediately south of Vryburg. The area is already highly influenced by infrastructure development and with the development of currently authorised projects this influence is likely to increase. The majority of receptors will view the project from the N18 which runs along the eastern boundary of the proposed site north from where the fronts of the PV panels will be visible. From the south the development is largely screened by landform. Views of the proposed development are also likely to be possible from the Tiger Kloof Combined School located on the eastern side of the N18 close to the southern extent of the proposed development. From most viewpoints to the north, there is a degree of Visual Absorption Capacity (VAC) provided by existing vegetation, and for areas close to the southern edge of Vryburg by other infrastructure development. This will help to soften the view of the development until the viewer is close to the northern edge of the proposed development. There will be no high level overview of the project possible although from some areas an acute angle overview will be possible. The above factors will result in the project being seen as an obvious hard geometric form that extends the developed area. It has to be considered however that the character of the affected area is already influenced by infrastructure development including a railway line, the N18, several power lines and the Mookodi Substation. There are also a number of other solar PV projects which will transform the

landscape. It is obvious therefore that the rural character of the landscape has been and will be highly modified. The proposed development will not therefore impact on relatively cohesive rural character areas.

Table 6.11: Assessment of the visual impact and impacts on sense of place

Nature: Visual impacts and sense of place impacts associated with the operation phase of the Moeding Solar PV Facility.

	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	Low (27)	Low (21)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	

Mitigation:

- » The following mitigation measures were provided in the VIA Report:
 - * Reinststate any areas of vegetation that have been disturbed during construction.
 - * Remove all temporary works.
 - * Monitor rehabilitated areas post-construction and implement remedial actions.
 - * Minimise disturbance and maintain existing vegetation as far as is possible both within and surrounding the development area.
 - * Maintain natural buffer areas adjacent to the N18 and on the northern boundary.

Cumulative impacts:

- » Potential impact on the current sense of place in the area due to other solar power developments within the area.

Residual impacts:

- » The visual impact of the Moeding Solar PV Facility will remain.

6.2.1.5. Impacts associated with the loss of agricultural land

The development of the proposed project on an agricultural property would result in the area of land required to support the development footprint being removed from potential agricultural production. This could threaten jobs of workers employed in the agricultural activities.

The Soil, Land Use and Land Capability Assessment for the Moeding Solar PV Facility and Associated Infrastructure, North West Province (Terra Africa Environmental Consultants, July 2018) which forms part of the BA process currently being undertaken for the project by Savannah Environmental, provided an assessment of the land capabilities, soil properties, and current land uses associated with the project site. It was determined that the largest portion of the proposed development area has low to moderately low grazing land capability because of the shallow, rocky profiles. No areas of the study site are currently used for crop production but cattle farming has been observed on site. The proposed Moeding Solar PV Facility and its associated infrastructure will have medium to minor impacts upon soil and land capability properties as well as current land uses in the areas where the footprint will cause surface disturbance. Cumulative impacts are also related to an increase in the disturbed land areas in addition to the areas

already used for mining infrastructure. These impacts can be reduced by keeping the footprint minimised where possible and strictly following soil management measures pertaining to erosion control and management and monitoring of any possible soil pollution sources such as vehicles traversing over the site.

Table 6.12: Assessment on the loss of agricultural land and overall productivity

Nature: Loss of agricultural land and overall productivity as a result of the operation of the proposed project on an agricultural property.

	Without mitigation	With mitigation
Extent	Site (1)	Site (1)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (5)	Low (3)
Probability	Definite(5)	Probable(3)
Significance	Medium (50)	Low (24)
Status (positive or negative)	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	

Mitigation:

- » The following mitigation measures were provided in the Soil, Land Use and Land Capability Assessment Report:
 - * Keep the project footprint as small as possible.
 - * Avoid areas with wetland land capability.

Cumulative impacts:

- » Loss of agricultural land as a result of the number of solar energy facilities proposed within the area.
- » Decrease in overall productivity as a result of the loss of grazing land.

Residual impacts:

- » Economically unviable portions of agricultural land which may reduce overall productivity.

6.3. Cumulative Impacts

The 2014 EIA Regulations (GNR 326) define a cumulative impact as follows:

“Cumulative impact in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities.”

The Moeding Solar PV Facility is proposed within REDZ 6, and is therefore within close proximity to a number of other solar energy facilities (refer to **Table 6.13** and **Figure 6.1**).

Table 6.13: Other solar energy projects / developments approved within proximity of the Moeding Solar PV Facility

Project Name	Location	Approximate distance from the project site	Project Status
Sonbesie Solar Power Plant	Remaining Extent of the Farm Retreat No. 671	6,2km north-west	Authorised
Sediba Solar Energy Facility	Remaining Extent of the Farm	Located within the	Authorised

Project Name	Location	Approximate distance from the project site	Project Status
(Rosendal)	Rosendal No. 673	project site	
Protea Solar Power Plant	Remaining Extent of the Farm Hartsboom No. 734	Located adjacent (west)	Authorised
Waterloo Solar Park	Remaining Extent of the Farm Waterloo No. 992	Located adjacent (east)	Authorisation granted (Preferred Bidder Round 4)
Khubu Solar Power Plant	Portion 05 of the Farm Championskloof No. 731	Located adjacent (south-east)	Authorised
Gamma Solar Power Plant	Portion 04 of the Farm Championskloof No. 731	5,9km east	Authorised
Sendawo PV 1 Facility	Portion 01 of the Farm Edinburgh No. 735	Located adjacent (west)	Authorised
Sendawo PV 2 Facility	Portion 01 of the Farm Edinburgh No. 735	Located adjacent (west)	Authorised
Sendawo PV 3 Facility	Portion 01 of the Farm Edinburgh No. 735	Located adjacent (west)	Authorised
Tiger Kloof Solar Energy Facility	Remaining Extent of Portion 03 and Portion 04 of the Farm Waterloo No. 730	Located within the project site	Authorised
Woodhouse Solar 1 PV Facility	Remaining Extent of the Farm Woodhouse No. 729	8km east	Authorised
Woodhouse Solar 2 PV Facility	Remaining Extent of the Farm Woodhouse No. 729	8km east	Authorised
Alpha Solar Power Plant	Remaining Extent of farm Middelpa No. 605	30km west	Authorised
Klondike PV1 Facility	Remaining Extent of the Farm Klondike No. 670	8,5km north-west	Authorised
Klondike PV2 Facility	Remaining Extent of the Farm Klondike No. 670	8,5km north-west	Authorised
Klondike PV3 Facility	Remaining Extent of the Farm Klondike No. 670	8,5km north-west	Authorised
Meerkat Solar Power Plant	Portion 03 of the Farm Vyflings Pan No. 598	28,5km west	Authorised
Carocraft Solar Park	Remaining Extent of the Farm Weltevrede No. 681	19km north-east	Authorised
60MW Carocraft PV Solar Park	Remaining Extent of the Farm Weltevrede No. 681	19km north-east	Authorised
Vryburg Solar 1	Portion 2 of Farm Frankfort 672	5km west of the site	Authorised
Vryburg Solar 2	Portion 1 of Farm Retreat 671	7.7km north west of the site	Authorised
Vryburg Solar 3	Portion 1 of Farm Retreat 671	8.3km north west of the site	Authorised

The potential for cumulative impacts to occur as a result of the projects is therefore likely. Potential cumulative impacts identified for the project include positive impacts on the economy, business development, and employment, as well as negative impacts such as an influx jobseekers and change in the areas sense of place.

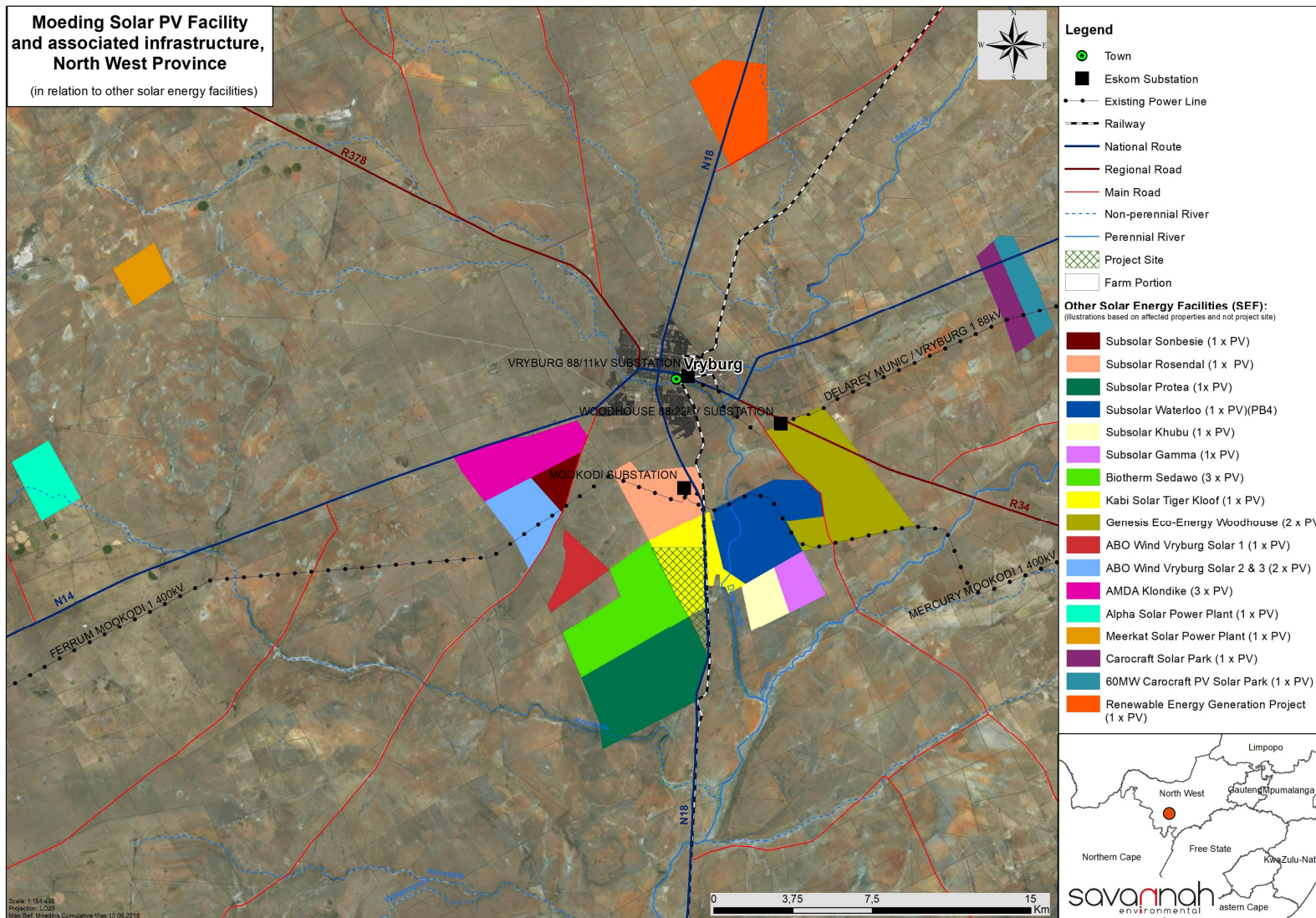


Figure 6.1: Cumulative map showing the location of other solar energy facilities within proximity of the project site.

6.3.1. Cumulative Impacts associated with the Moeding Solar PV Facility

6.3.1.1. Cumulative impact from employment, skills and business opportunities

The Moeding Solar PV Facility and the establishment of other solar power projects within the area has the potential to result in significant positive cumulative impacts, specifically with regards to the creation of a number of socio-economic opportunities for the region, which in turn, can result in positive social benefits. The positive cumulative impacts include creation of employment, skills development and training opportunities, and downstream business opportunities. The cumulative benefits to the local, regional, and national economy through employment and procurement of services are more considerable than that of the Moeding Solar PV Facility alone.

Table 6.14: Cumulative impacts of employment opportunities, business opportunities and skills development

Nature: An increase in employment opportunities, skills development and business opportunities with the establishment of more than one solar power facility at one time.

	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Local-Regional (3)	Local-Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Moderate to High (7)
Probability	Highly probable(4)	Highly Probable (4)
Significance	Medium (44)	Medium (56)
Status (positive or negative)	Positive	Positive
Reversibility	N/A	
Irreplaceable loss of resources?	N/A	
Can impacts be enhanced?	Yes	
Confidence in findings	High	

Enhancement:

The establishment of a number of solar power projects under the REIPPP Programme in the area has the potential to have a positive cumulative impact on the area in the form of employment opportunities, skills development and business opportunities. The positive benefits will be enhanced if local employment policies are adopted and local services providers are utilised by the developers to maximise the project opportunities available to the local community.

Residual impacts:

- » Improved pool of skills and experience in the local area.
- » Economic growth for small-scale entrepreneurs.

6.3.1.2. Cumulative impact with large scale in-migration of people

While the development of a single solar power project may not result in a major influx of people into an area, the development of several projects may have a cumulative impact on the in-migration and movement of people. In addition, the fact that the project is proposed within REDZ 6, which has specifically been earmarked for the development of large scale solar PV energy facilities, implies that the surrounding area is likely to be subject to considerable future applications for PV energy facilities. Levels of

unemployment, and the low level of earning potential may attract individuals to the area in search of better employment opportunities and standards of living.

It is very difficult to control an influx of people into an area, especially in a country where unemployment rates are high. It is therefore important that the project proponent implement and maintain strict adherence with a local employment policy in order to reduce the potential of such an impact occurring as well as to be able to communicate the process for employment so that people know how and where to apply.

Table 6.15: Cumulative impact with large-scale in-migration of people

Nature: Negative impacts and change to the local economy with an in-migration of labourers, businesses and jobseekers to the area.

	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Local (1)	Local-Regional (3)
Duration	Short-term (2)	Long term (4)
Magnitude	Low (4)	Moderate (6)
Probability	Very Improbable (1)	Probable (3)
Significance	Low (7)	Medium (39)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Confidence in findings	High	

Mitigation:

- » Develop a recruitment policy / process (to be implemented by contractors), which will source labour locally.
- » Work together with government agencies to ensure service provision is in line with the development needs of the local area.
- » Forming joint ventures with community organisations, through Trusts, which can provide local communities with benefits, such as employment opportunities and services.

Residual impacts

- » Possibility of outside workers remaining in the area after construction is completed and subsequent pressures on local infrastructure, services and poverty problems.

6.4. Decommissioning Phase

Typically, major social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income and will be similar to the impacts during the construction phase. This has implications for the households who are directly affected, the communities within which they live, and the relevant local authorities. However, in the case of the Moeding Solar PV Facility it is anticipated that the proposed facility will be refurbished and upgraded to prolong its life. No decommissioning of the facility is proposed.

6.5. Assessment of Alternatives

While no site alternatives have been identified for the project, two power line alternatives have been identified (refer to **Figure 6.2**) and can be summarized as follows:

Alternative	Description
Power Line Alternative 1	A direct connection to the existing Mookodi Main Transmission Substation located within the northern portion of the project site on the Remaining Extent of the Farm Rosendal 673. A new 132kV power line will be constructed over a distance of ~4km. A 300m power line corridor has been assessed for Alternative 1.
Power Line Alternative 2	A turn-in turn-out connection into the proposed Mookodi - Magopela 132kV power line (to be constructed along the eastern boundary of the project site). A new turn-in and out 132kV power line will be constructed over a distance of ~335m.

Based on the nature of impacts identified for the project from a social perspective, Power Line Alternative 2 has the shortest length and may lead to fewer disruptions on a farming area. Both proposed power line alternatives as detailed above are considered to be acceptable. It is anticipated that the final location of the power line alignment will be informed by technical considerations and inputs from other specialist studies being undertaken as part of the BA process. The recommendation is therefore made that information derived from the remaining specialist studies be utilised in informing the preferred layout from an environmental perspective.

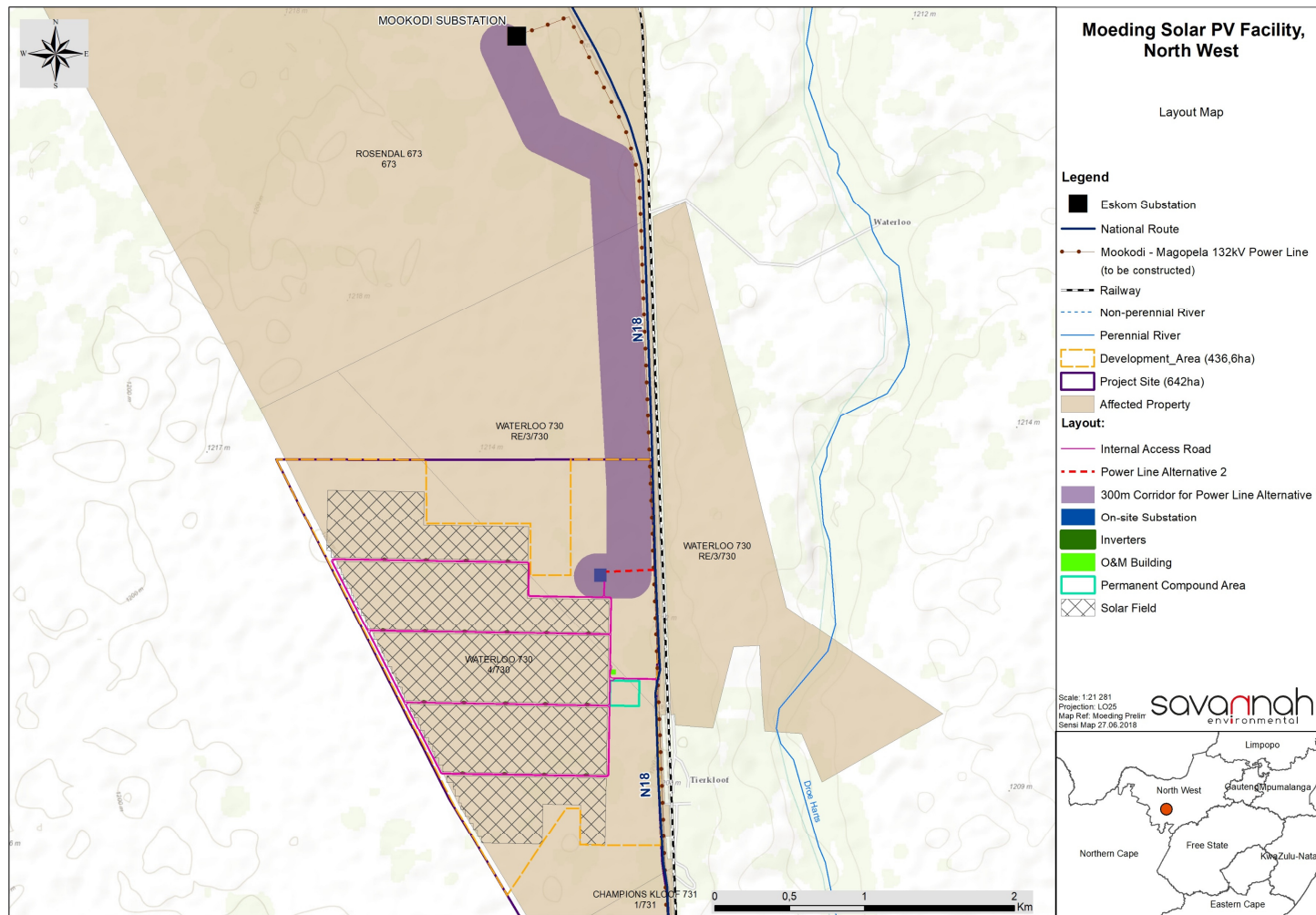


Figure 6.2: Layout map for Moeding Solar showing proposed alternatives.

6.6. Assessment of Impacts for the No-Go Option

The “no-go” alternative is the option of not constructing the Moeding Solar PV Facility. The implementation of the Moeding Solar PV Facility is expected to result in a number of positive and negative social impacts. The majority of negative impacts identified for the project are associated with the construction phase of the project, while the positive impacts are associated with both the construction and operation phase of the project.

Potential negative social impacts associated with the construction and operation of the project include the following:

- » Potential influx of job seekers and an associated change in population and increase in pressure on basic services.
- » Potential safety and security impacts.
- » Potential impacts on daily living and movement patterns.
- » Potential nuisance impacts (noise and dust).
- » Potential impact on the sense of place.
- » Potential visual impact.

Potential positive social impacts associated with the construction and operation of the project include the following:

- » Potential direct and indirect employment opportunities.
- » Potential economic multiplier effect.
- » Development of clean, renewable energy infrastructure.

The impacts of pursuing the “no-go” alternative can therefore be summarised as follows:

- » The benefits would be that there is no disruption from, nuisance impacts (noise and dust during construction), visual impacts and safety and security impacts. The impact is therefore neutral.
- » There would also be an opportunity loss in terms of job creation, skills development, and associated economic business opportunities for the local economy.

The option of not developing the Moeding Solar PV Facility would not compromise the development of RE facilities in South Africa, however the socio-economic benefits for local communities would be forfeited.

7. CONCLUSION AND RECOMMENDATIONS

This SIA focused on the collection of data to identify and assess social issues and potential social impacts associated with the development of the Moeding Solar PV Facility. Secondary data was collected and presented in a literature review and primary data was collected through consultations with affected and adjacent landowners and key stakeholders. The environmental assessment framework for assessment of impacts and the relevant criteria were applied to evaluate the significance of the potential impacts. A summary of the potential positive and negative impacts identified for the detailed design and construction, and operation phase are presented in **Table 7.1** and **Table 7.2**. A summary of the potential positive and negative cumulative social impacts identified for the project is provided in **Table 7.3**.

Table 7.1: Summary of potential social impacts identified for the detailed design and construction phase.

Impact	Significance Without Mitigation	Significance With Mitigation
Positive Impacts		
Creation of direct and indirect employment and skills development opportunities.	Low (28)	Medium (55)
Economic multiplier effects	Medium (36)	Medium (55)
Negative Impacts		
In-migration of people (non-local workforce and jobseekers).	Low (7)	Low (7)
Safety and security impacts	Medium (36)	Low (20)
Impacts on daily living and movement patterns	Medium (39)	Medium (33)
Nuisance impact (noise and dust)	Medium (36)	Low (21)
Visual and sense of place impacts	Low (28)	Low (21)

Table 7.2: Summary of potential social impacts identified for the operation phase.

Impact	Significance Without Mitigation	Significance With Mitigation
Positive Impacts		
Direct and indirect employment and skills development opportunities	Medium (44)	Medium (55)
Development of non-polluting, renewable energy infrastructure	Medium (50)	Medium (50)
Contribution to LED and social upliftment	Medium (56)	High (60)
Negative Impacts		
Visual and sense of place impacts	Low (27)	Low (21)
Impacts associated with the loss of agricultural land.	Medium (50)	Low (24)

Table 7.3: Summary of potential cumulative social impacts identified for the project.

Cumulative Impact	Significance Without Mitigation	Significance With Mitigation
Positive Cumulative Impacts		
Cumulative impact from employment, skills and business opportunities and skills development	Medium (44)	Medium (56)
Negative Cumulative Impacts		
Cumulative impact with large-scale in-migration of people	Low (7)	Medium (39)

7.1. Key findings

Traditionally, the construction phase of a PV solar development is associated with the majority of social impacts. Many of the social impacts are unavoidable and will take place to some extent, but can be managed through the careful planning and implementation of appropriate mitigation measures. A number of potential positive and negative social impacts have been identified for the project, however an assessment of the potential social impacts indicated that there are no perceived negative impacts that are sufficiently significant to allow them to be classified as "fatal flaws".

Based on the social impact assessment, the following general conclusions and findings can be made:

- » The potential negative social impacts associated with the construction phase are typical of construction related projects and not just focussed on the construction of solar PV projects (these relate to an influx of non-local workforce and jobseekers, intrusion and disturbance impacts (i.e. noise and dust, wear and tear on roads) and safety and security risks), and could be reduced with the implementation of the mitigation measures proposed. The significance of such impacts on the local communities can therefore be mitigated.
- » The development will introduce employment opportunities during the construction phase (temporary employment) and a limited number of permanent employment opportunities during operation phase.
- » The proposed project could assist the local economy in creating entrepreneurial growth and opportunities, especially if local business is involved in the provision of general material, goods and services during the construction and operational phases. This positive impact is likely to be compounded by the cumulative impact associated with the development of several other solar facilities within the surrounding area, and as a result of the projects location within REDZ 6 which has been earmarked for the development of large scale solar PV energy facilities.
- » The proposed development also represents an investment in infrastructure for the generation of clean, RE, which, given the challenges created by climate change, represents a positive social benefit for society as a whole.
- » When considering the Moeding Solar PV Facility, it is also important to consider the cumulative social impacts that may arise with other proposed solar PV projects in the area.
- » It should be noted that the perceived benefits associated with the project which include RE generation, and local economic and social development outweigh the perceived impacts associated with the project.
- » Both power line alternatives are considered to be acceptable.

7.2. Recommendations

The following recommendations are made on the basis of the SIA. The proposed mitigation measures should be implemented to limit the negative impacts and enhance the positive impacts associated with the project. Based on the social assessment, the following recommendations are made:

- » The appointment of a CLO to assist with the management of social impacts and to deal with community issues, if feasible.
- » It is imperative that local labour be sourced, wherever possible, to ensure that benefits accrue to the local communities. Efforts should be made to involve local businesses during the construction activities where possible. Local procurement of labour and services / products would greatly benefit the community during the construction and operational phases of the project.

- » Local procurement of services and equipment is required where possible in order to enhance the multiplier effect.
- » Involve the community in the process as far as possible (encourage co-operative decision making and partnerships with local entrepreneurs).
- » Employ mitigation measures to minimise the dust and noise pollution and damage to existing roads.
- » Safety and security risks should be taken into account during the planning / construction phase of the proposed project. Access control, security and management should be implemented to limit the risk of crime increasing in the area.

7.3. Overall Conclusion

The proposed project and associated infrastructure is unlikely to result in permanent damaging social impacts. From a social perspective it is concluded that the project could be developed subject to the implementation of recommended mitigation measures and management actions identified for the project.

8. REFERENCES

- Department of Energy (DoE). (2015). Integrated Energy Plan. Republic of South Africa.
- Department of Energy (DoE). (2011). Integrated Resource Plan for Electricity 2010 – 2030. Republic of South Africa.
- Department of Energy (DoE). (2008). National Energy Act (No. 34 of 2008). Republic of South Africa.
- Department of Energy (DoE). (2011). National Integrated Resource Plan for Electricity 2010-2030. Republic of South Africa.
- Department of Energy (DoE). (2003). White Paper on Renewable Energy. Republic of South Africa.
- Department of Energy (DoE). (1998). White Paper on the Energy Policy of the Republic of South Africa. Republic of South Africa.
- Department of Environmental Affairs (DEA). (1998). National Environmental Management Act 107 of 1998 (No. 107 of 1998). Republic of South Africa.
- Department of Environmental Affairs (DEA). (2010). National Climate Change Response Green Paper. Republic of South Africa.
- Department of Justice (DoJ). (1996). The Constitution of the Republic of South Africa (Act 108 of 1996). ISBN 978-0-621-39063-6. Republic of South Africa.
- Department of Minerals and Energy (DME). (1998). White Paper on Energy Policy of the Republic of South Africa. Republic of South Africa.
- Dr Ruth Segomotsi Mompati District Municipality. (2017). Dr Ruth Segomotsi Mompati District Municipality Integrated Development Plan 2017 – 2022.
- International Finance Corporation (IFC). (2015). IFC's Project Developer's Guide to Utility-Scale Solar Photovoltaic Power Plants (2015)
- International Finance Corporation (IFC). (2007). Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets. International Finance Corporation: Washington.
- Interorganizational Committee on Principles and Guidelines for Social Impact Assessment. US Principles and Guidelines – Principals and guidelines for social impact assessment in the USA. Impact Assessment and Project Appraisal, 21(3): 231-250.
- Marshall, J. (2018). Visual Impact Assessment (VIA) Report for the Proposed Moeding Solar PV Facility, near Vryburg in the North West Province.

- McKay, T. (2013). Report on Adventure Tourism and Adventure Sport on the Ash River, Clarens, in response to the proposed Boston HEP Station submission. University of Johannesburg.
- Naledi Local Municipality. (2017). Naledi Local Municipality Integrated Development Plan 2017 – 2022.
- National Development Agency (NDA). (2014). Beyond 10 years of unlocking potential. Available from: http://www.nda.org.za/?option=3&id=1&com_id=198&parent_id=186&com_task=1
- National Planning Commission. (2012). National Development Plan 2030. ISBN: 978-0-621-41180-5. Republic of South Africa.
- North West Provincial Government. (2013). North West Provincial Development Plan 2030.
- North West Provincial Government. (2011). North West Provincial Growth and Development Strategy (PGDS) 2004 – 2014.
- North West Provincial Government. (2017). North West Provincial Spatial Development Framework.
- North West Provincial Government. (2012). Renewable Energy Strategy for the North West Province.
- Pienaar, M. (2018). Soil, Land Use and Land Capability Assessment for the Moeding Solar PV Facility and Associated Infrastructure, North West Province
- Statistics South Africa. (2011). Census 2011 Community Profiles Database. Pretoria.
- United Nations Environment Programme (UNEP). (2002). EIA Training Resource Manual. 2nd Ed. UNEP.
- United Nations Economic and Social Commission for Asia and the Pacific (UN). (2001). Guidelines for Stakeholders: Participation in Strategic Environmental Management. New York, NY: United Nations.
- Vanclay, F. (2003). Conceptual and methodological advances in Social Impact Assessment. In Vanclay, F. & Becker, H.A. 2003. The International Handbook for Social Impact Assessment. Cheltenham: Edward Elgar Publishing Limited.

**APPENDIX A:
ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)**

» Construction Phase

OBJECTIVE: Maximise local employment and skills opportunities associated with the construction phase

Project component/s	Construction of the proposed project and associated infrastructure
Potential Impact	Opportunities and benefits associated with the creation of local employment and skills development to be maximised.
Activity/risk source	<ul style="list-style-type: none"> » Construction procurement practice employed by the EPC Contractor » Developers investment plan
Mitigation: Target/Objective	The developer should aim to employ as many low-skilled and semi-skilled workers from the local area as possible. This should also be made a requirement for all contractors.

Mitigation: Action/control	Responsibility	Timeframe
» Employ local contractors that are compliant with Broad Based Black Economic Empowerment (B-BBEE) criteria	» The Proponent & EPC Contractors	» Pre-construction & construction phase
» Adopt a local employment policy to maximise the opportunities made available to the local labour force	» The Proponent & EPC Contractors	» Pre-construction & construction phase
» In the recruitment selection process, a minimum percentage of women must be employed	» EPC Contractors	» Pre-construction & construction phase
» Set realistic local recruitment targets for the construction phase.	» The Proponent & EPC Contractors	» Pre-construction & construction phase
» Training and skills development programmes to be initiated prior to the commencement of the construction phase	» The Proponent	» Pre-construction & construction phase

Performance Indicator	<ul style="list-style-type: none"> » Employment and business policy document that sets out local employment and targets completed before construction phase commences. » Employ as many local semi and unskilled labour as possible. » Training and skills development programme undertaken prior to the commencement of construction phase.
Monitoring	» The developer and EPC Contractor must keep a record of local recruitments and information on local labour to be shared with the ECO for reporting purposes.

OBJECTIVE: Maximise the local economic multiplier effect during construction phase

Project component/s	Construction of the proposed project and associated infrastructure
Potential Impact	Potential local economic benefits
Activity/risk source	Developers procurement plan
Mitigation: Target/Objective	Increase the procurement of goods and services especially within the local economy

Mitigation: Action/control	Responsibility	Timeframe
» A local procurement policy to be adopted to maximise the benefit to the local economy	» The Proponent & EPC Contractor	» Pre-construction & construction phase
» Develop a database of local companies, specifically Historically Disadvantaged (HD) which qualify as potential service providers (e.g. construction companies, security companies, catering companies, waste collection companies, transportation companies etc.) prior to the tender process and invite them to bid for project-related work where applicable	» The Proponent & EPC Contractor	» Pre-construction & construction phase
» Source as much goods and services as possible from the local area. Engage with local authorities and business organisations to investigate the possibility of procurement of construction materials, goods and products from local suppliers where feasible	» The Proponent	» Pre-construction & construction phase

Performance Indicator	» Local procurement policy is adopted » Local goods and services are purchased from local suppliers where feasible
Monitoring	» The developer must monitor indicators listed above to ensure that they have been met for the construction phase

OBJECTIVE: Reduce the pressure on resources, service delivery, infrastructure and social dynamics from a population change as a result of an increase of construction workers during the construction phase

Project component/s	Construction of the proposed project and associated infrastructure
Potential Impact	Population changes resulting in additional pressure on resources, service delivery, infrastructure maintenance and social dynamics during the construction phase as a result of an influx of construction workers into the study area
Activity/risk source	Influx of construction workers
Mitigation: Target/Objective	To avoid or minimise the potential impact on local infrastructure, services and communities and their livelihoods

Mitigation: Action/control	Responsibility	Timeframe
» Implement a grievance and communication system for community issues and appoint community liaison officer	» The Proponent & EPC Contractor	» Pre-construction & construction phase

Performance Indicator	» Community Liaison Officer (CLO) is appointed
Monitoring	» The developer and EPC contractor must monitor the indicators listed above to ensure that they have been met for the construction phase

OBJECTIVE: Reduce the pressure on economic and social infrastructure and social conflicts from an influx of jobseekers during the construction phase

Project component/s	Construction of the proposed project and associated infrastructure
Potential Impact	Decline on local economic and social infrastructure and services as well as a rise in social conflicts from an influx of jobseekers
Activity/risk source	Influx of jobseekers
Mitigation: Target/Objective	To avoid or minimise the potential impact on local infrastructure, services and communities and their livelihoods

Mitigation: Action/control	Responsibility	Timeframe
» A 'locals first' policy should be utilised for employment opportunities, especially for semi and low-skilled job categories.	» The Proponent & EPC Contractor	» Pre-construction & construction phase
» Tender document is to stipulate the use of local labour as far as possible	» EPC Contractor	» Pre-construction & construction phase
» Inform local community members of the construction schedule and exact size of workforce (e.g. Ward Councillor, surrounding landowners)	» The Proponent & EPC Contractor	» Pre-construction & construction phase
» Recruitment of temporary workers onsite is not to be permitted. A recruitment office with a Community Liaison Officer (CLO) should be established to deal with jobseekers.	» EPC Contractor	» Pre-construction & construction phase
» Set up labour desk in a secure and suitable area to discourage the gathering of people at the construction site.	» EPC Contractor	» Pre-construction & construction phase
» Have clear rules and regulations for access to the proposed site.	» EPC Contractor	» Pre-construction & construction phase
» Local community organisations and policing forums must be informed of construction times and the duration of the construction phase. Also procedures for the control and removal of loiters at the construction site should be established.	» The Proponent & EPC Contractor	» Pre-construction phase & Construction phase
» Security Company to be appointed and appropriate security procedures to be implemented.	» The Proponent & EPC Contractor	» Pre-construction phase & Construction phase

Performance Indicator	<ul style="list-style-type: none"> » Ensure 'locals first' policy is adopted » Ensure no recruitment takes place onsite » Control/removal of loiters
Monitoring	» The developer must keep a record of local recruitments and information on local labour to be shared with the ECO for reporting purposes

OBJECTIVE: To avoid or reduce traffic disruptions and movement patterns of local community during the construction

phase

Project component/s	Construction of the proposed project and associated infrastructure
Potential Impact	Increase in traffic disruptions, safety hazards, and impacts on movement patterns of local community as well as impact on private property due to the upgrade of the existing road and heavy vehicle traffic in the local area
Activity/risk source	Construction activities affecting daily living and movement patterns
Mitigation: Target/Objective	To avoid or minimise the potential impact on local communities and their livelihoods

Mitigation: Action/control	Responsibility	Timeframe
» Working hours must be kept during daylight hours as per the ECA during the construction phase, and/or as any deviation that is approved by the relevant authorities.	» EPC Contractor	» Construction phase
» All vehicles must be road worthy and drivers must be qualified, obey traffic rules, follow speed limits and made aware of potential road safety issues.	» EPC Contractor	» Pre-construction phase & Construction phase
» Heavy vehicles should be inspected regularly to ensure their road safety worthiness. Records pertaining to this must be maintained and made available for inspection as necessary.	» EPC Contractor	» Construction phase
» Provision of adequate and strategically placed traffic warning signs and control measures along access roads to warn road users of the construction activities taking place for the duration of the construction phase. Ensure that all signage is visible at all times (especially at night).	» EPC Contractor	» Construction phase
» Implement penalties for drivers of heavy vehicles for reckless driving or speeding as a way to enforce compliance to traffic rules.	» EPC Contractor	» Construction phase
» Infrastructure such as fencing and gates along access routes must be maintained in the present condition or repaired if disturbed due to construction activities.	» The Proponent & EPC contractor	» Construction phase
» Ensure roads utilised are either maintained in the present condition or restored if disturbed from construction activities.	» The Proponent & EPC Contractor	» Construction phase
» Provide adequate signage along access roads to warn motorists of the construction activities taking place and displaying road safety messages and speed limits.	» EPC Contractor	» Pre-construction phase & Construction phase
» Appoint a Community Liaison Officer (CLO) who will be responsible for implementing the grievance mechanism. A method of communication should be implemented whereby procedures to lodge complaints are set out in	» EPC Contractor	» Pre-construction phase & Construction phase

order for the local community and landowners to express any complaints or grievances with the construction process

Performance Indicator	<ul style="list-style-type: none"> » Vehicles are roadworthy, inspected regularly and speed limits are adhered to. » Ensure that there are traffic warning signs along access roads, and ensure that these are well illuminated (especially at night). » Roads and electric fencing are maintained or improved upon if disturbed from project activities. » A CLO is appointed for the project.
Monitoring	<ul style="list-style-type: none"> » The developer and EPC Contractor must monitor the indicators listed above to ensure that they have been met for the construction phase

OBJECTIVE: To avoid or minimise the potential intrusion impacts such as aesthetic pollution, and noise and light pollution during the construction phase

Project component/s	Construction of the proposed project and associated infrastructure
Potential Impact	Intrusion impacts could impact the areas "sense of place"
Activity/risk source	Construction activities
Mitigation: Target/Objective	To avoid or minimise the potential intrusion impacts such as aesthetic pollution, noise, dust and light pollution during the construction phase

Mitigation: Action/control	Responsibility	Timeframe
» Limit noise generating activities to normal daylight working hours and avoid undertaken construction activities on weekends and public holidays.	» EPC Contractor	» Construction phase
» The movement of heavy vehicles associated with the construction phase should be timed to avoid weekends, public holidays and holiday periods where feasible.	» EPC Contractor	» Construction phase
» Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport building materials are fitted with tarpaulins or covers.	» EPC Contractor	» Construction phase
» All vehicles must be road-worthy and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits.	» EPC Contractor	» Construction phase
» Ensure all vehicles are road worthy, drivers are qualified and are made aware of the potential noise and dust issues.	» EPC Contractor	» Construction phase
» Communication, complaints and grievance channels must be implemented and contact details of the Community Liaison Officer (CLO) are to be provided to the local community.	» EPC Contractor	» Construction phase

Performance Indicator	<ul style="list-style-type: none"> » Limit noise generating activities » Dust suppression measures implemented for all heavy vehicles that require such measures during the construction phase » Enforcement of strict speeding limits » Community liaison officer available for community grievances and communication channel
Monitoring	<ul style="list-style-type: none"> » The EPC contractor must monitor the indicators to ensure that they have been met for the construction phase

OBJECTIVE: To avoid or minimise the potential impacts of noise and dust from construction activities during the construction phase

Project component/s	Construction of the proposed project and associated infrastructure
Potential Impact	Heavy vehicles and construction activities can generate noise and dust impacts.
Activity/risk source	Construction activities
Mitigation: Target/Objective	To avoid and or minimise the potential noise and dust impacts associated with construction activities

Mitigation: Action/control	Responsibility	Timeframe
» The movement of heavy vehicles associated with the construction phase must be timed to avoid weekends and holiday periods, where feasible.	» EPC Contractor	» Construction phase
» Ensure that damage caused by construction related traffic/ project activities to the existing roads is repaired before the completion of the construction phase.	» EPC Contractor	» Construction phase
» Implement dust suppression measures for heavy vehicles such as wetting the roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers.	» EPC Contractor	» Construction phase
» Ensure all vehicles are road worthy, drivers are qualified and are made aware of the potential noise and dust issues.	» EPC Contractor	» Construction phase
» Ensure that drivers adhere to speed limits	» EPC Contractor	» Construction phase
» Implement a grievance and communication system for community issues and appoint community liaison officer.	» The Proponent & EPC contractor	» Pre-construction & construction phase

Performance Indicator	<ul style="list-style-type: none"> » Dust suppression measures implemented for all heavy vehicles that require such measures during the construction phase » Enforcement of strict speeding limits » Road worthy certificates in place for all vehicles » Community liaison officer available for community grievances and communication channel
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Monitoring	» The EPC contractor must monitor the indicators to ensure that they have been met for the construction phase
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OBJECTIVE: To avoid or reduce the possibility of the increase in crime and safety and security issues during the construction phase

Project component/s	Construction of the proposed project and associated infrastructure
Potential Impact	Increase in crime due to influx of non-local workforce and job seekers into the area
Activity/risk source	Safety and security risks associated with construction activities
Mitigation: Target/Objective	To avoid or minimise the potential impact on local communities and their livelihoods

Mitigation: Action/control	Responsibility	Timeframe
» Working hours to be kept between daylight hours as per the ECA during the construction phase, and/or as any deviation that is approved by the relevant authorities.	» EPC Contractor	» Construction phase
» The perimeter of the construction site is to be appropriately secured to prevent any unauthorised access to the site. The fencing of the site is to be maintained throughout the construction period.	» The Proponent & EPC Contractor	» Pre-construction phase & Construction phase
» Local community organisations and policing forums must be informed of construction times and the duration of the construction phase.	» The Proponent & EPC Contractor	» Pre-construction phase & Construction phase
» Access in and out of the construction camp should be strictly controlled by a security company.	» EPC Contractor	» Construction Phase
» A security company is to be appointed and appropriate security procedures are to be implemented.	» EPC Contractor	» Construction Phase
» No unauthorised entry to the site is to be allowed. Access control is to be implemented.	» EPC Contractor	» Construction Phase
» Open fires on the site for heating, smoking or cooking are not allowed, except in designated areas.	» EPC Contractor	» Construction phase
» Contractor must provide adequate firefighting equipment on site and provide firefighting training to selected construction staff.	» EPC Contractor	» Pre-construction phase & Construction phase
» A comprehensive employee induction programme to be developed and utilised to cover land access protocols, fire management and road safety.	» EPC Contractor	» Pre-construction phase & Construction phase
» Have a personal trained in first aid on site to deal with smaller incidents that require medical attention.	» EPC Contractor	» Pre-construction phase & construction phase

Performance Indicator	<ul style="list-style-type: none"> » Employee induction programme, covering land access protocols, fire management and road safety » The construction site is appropriately secured with a controlled access system » Ensure a security company is appointed and appropriate security procedures and measures are implemented
Monitoring	<ul style="list-style-type: none"> » The developer and EPC contractor must monitor the indicators listed above to ensure that they have been met for the construction phase

» Operation Phase

OBJECTIVE: Maximise local employment and skills opportunities associated with the operation phase of the project

Project component/s	Operation and maintenance of the proposed project and associated infrastructure
Potential Impact	Loss of opportunities to stimulate production and employment of the local economy
Activity/risk source	Labour practices employed during operations
Mitigation: Target/Objective	Maximise local community employment benefits in the local economy

Mitigation: Action/control	Responsibility	Timeframe
» Adopt a local employment policy to maximise the opportunities made available to the local labour force.	» The Proponent & O&M Contractor	» Operation phase
» Establish vocational training programmes for the local labour force to promote the development of skills.	» The Proponent	» Operation phase

Performance Indicator	<ul style="list-style-type: none"> » Percentage of workers that were employed from local communities » Number of people attending vocational training on an annual basis
Monitoring	<ul style="list-style-type: none"> » The developer must keep a record of local recruitments and information on local labour to be shared with the ECO for reporting purposes

SOCIAL IMPACT ASSESSMENT PEER REVIEW

Dr Neville Bews & Associates

Social Impact Assessors

Committed to building high trust environments

P. O. Box 145412
Bracken Gardens
Alberton
South Africa
1452

Tel: +27 11 867-0462
Fax: +27 86 621-8345
Mobile: +27 82 557-3489
Skype: neville.bews
Email: bewsco@netactive.co.za

URL: <http://www.socialassessment.co.za/>

18 December, 2018

Attention: Thalita Koster

Savannah Environmental Pty Ltd

5 Woodlands Drive Office Park
Cnr Woodlands Drive and Western Service Road
Woodmead

**Re: Peer review of the Social Impact Assessment for the Moeding Solar PV Facility,
North West Province**

Having reviewed the above report I find that in essence it provides a description of the project and the social environment within which the project will unfold. It also provides an indication of the social impacts that are likely to arise as a result of the proposed project and suggests appropriate optimisation and mitigation measure. The review was concluded on 18 December, 2018 and the following comments are made.

1. The terms of reference are acceptable;
2. The methodology is clearly explained and acceptable;
3. The findings are based on acceptable evidence;
4. The mitigation measures and recommendations are with appropriate recommendation being suggested;
5. No apparent shortcomings are identified;
6. The reference literature is appropriate;
7. No site-inspection was carried out as part of this peer review;
8. The article is well-written and easy to understand. Certain structural changes were suggested in this respect.

It can be concluded in considering the SIA scoping report that that the process and assessment followed was adequate providing a fair indication of the social impacts likely to arise as a result of the project. Attached is a schedule, in accordance with Appendix 6 of the National Environmental Management Act, 1998 (ACT NO. 107 OF 1998). Environmental Impact Assessment Regulations, 2014, indicating the level of compliance of the report in respect of this regulation.

DECLARATION OF INDEPENDENCE

I, Neville Bews, as authorised representative of Dr Neville Bews & Associates hereby confirm my independence as a specialist and declare that neither I nor Dr Neville Bews & Associates have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which Dr Neville Bews & Associates was appointed as social impact assessment specialists in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), other than fair remuneration for work performed. This declaration is specifically in connection with the review of the Social Impact Report for the Proposed Moeding Solar PV Facility, North West Province.

Signed: 

Date: 18 December, 2018

Proposed Moeding PV Project, North West Province

Appendix 6: Specialist reports	Check	Comment
A specialist report prepared in terms of these Regulations must contain-		
(a) details of-		
(i) the specialist who prepared the report; and	Section 1.2 Page 3	
(ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;	Section 1.2 Page 4	
(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Page ii	
(c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 2.1 Page 6	
(d) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Not applicable	
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process;	Section 2 Pages 6-13	
(f) the specific identified sensitivity of the site related to the activity and its associated structures and infrastructure;	Section 4. Pages 30-52 Section 6. Pages 57-77	
(g) an identification of any areas to be avoided, including buffers;	None	
(h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	N/A	
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 2.4 Page 11	
(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;	Sections 6 Pages 57-77 Section 7.1 Page 78-79	
(k) any mitigation measures for inclusion in the EMPr;	Appendix A	
(l) any conditions for inclusion in the environmental authorisation;	Appendix A	
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Appendix A	
(n) a reasoned opinion-		
(i) as to whether the proposed activity or portions thereof should be authorised; and		
(ii) if the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	Section 7 Pages 78-79	
(o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	Section 2.2.3 Tables 2.1 Pages 10-11	Insert dates of interviews into these tables.
(p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Section 2.2.3 Table 2.2 Page 11	
(q) any other information requested by the competent authority.	None	



Dr. Neville Bews & Associates – Johannesburg, South Africa

EDUCATION

- *B.A. (Soc), University of South Africa, 1980*
- *B.A. (Soc) (Hons), University of South Africa, 1984*
- *The Henley Post Graduate Certificate in Management, Henley Management College, United Kingdom*
- *M.A. (Cum Laude), Rand Afrikaans University, 1999*
- *D. Litt. et Phil., Rand Afrikaans University, 2000*

Dr Neville Bews is a senior social scientist and human resource professional with 36 years' experience. He consults in the fields of Social Impact Assessments and research, and human resource management. He has worked on a number of large infrastructure, mining and water resource projects. He at times lectures at both the Universities of Pretoria and Johannesburg and is a Senior Fellow in the Centre for Sociological Research, Department of Sociology, University of Johannesburg.

EMPLOYMENT HISTORY

Dr Neville Bews & Associates, Johannesburg, South Africa

Social Impact Assessment consultant and part-time lecturer, 2001 – date.

Leads social impact assessments, provides strategic social management advice to clients, acts as reviewer and mentor to young social scientists.

S A Eagle Company Ltd, Johannesburg, South Africa

Employee Relations Manager, 1992 - 2001

Human Resource management and administration; industrial relations; human resource related research projects; designing and leading implementation of research strategies; disciplinary and grievance hearings; negotiating with unions; corporate social responsibility.

Status Management Services

Human Resources Consultant, 1986 – 1992

Management training; employee assistance programmes; industrial relations; recruitment; disciplinary and grievance hearings; negotiating with unions; job evaluation.

City of Johannesburg

Professional Officer - Human Resources, 1977 - 1986

Industrial relations; disciplinary and grievance hearings; negotiating with unions; recruitment, selection and placement; management training; job evaluation.

EXPERIENCE – EXAMPLES

Water resources and regional planning Social Impact Assessments

Department of Water Affairs and Forestry

South Africa

Social impact assessment for the Mokolo and Crocodile River (West) Water Augmentation Project for increased and assurance of water supply. Research socio-economic circumstances, data analysis, assessment, authored report.

The Aveng (Africa) Group Limited (Grinaker LTA)

South Africa

Assisting the construction company with the social management of the Mokolo and Crocodile River (West) Water Augmentation Project. Consult and mediate between contractors and affected parties advise on strategies to reduce tensions between contractors and the public.

Department of Water Affairs and Forestry

South Africa

Ncwabeni Off-Channel Storage Dam for security of water supply in Umzumbe, KwaZulu-Natal. Research socio-economic circumstances, data analysis, assessment, authored report.

Sedibeng District Municipality

South Africa

Social impact assessment for the Environmental Management Plan for the Sedibeng District, on behalf of Felehetsa Environmental (Pty) Ltd. Research socio-economic circumstances, data analysis, assessment, authored report.

Felehetsa Environmental (Pty) Ltd

South Africa

Social Impact Assessment for Waterfall Wedge housing and business development situated in Midrand Gauteng. Research socio-economic circumstances, data analysis, assessment, authored report.

NEMAI Consulting Environmental & Social Consultants

South Africa

Ncwabeni: Off-Channel Storage Dam, KwaZulu-Natal. Research socio-economic circumstances, data analysis, assessment, authored report.

Department of Water and Sanitation

South Africa

Mzimvubu Water Project Eastern Cape. Research socio-economic circumstances, data analysis, assessment, authored report.

Social Assessments for mining clients

Vale

Mozambique

Socio-economic impact assessment of proposed Moatize power plant, Tete. Research socio-economic circumstances, data analysis, assessment, authored report.

Exxaro Resources Limited **South Africa**
Social impact assessment for the social and labour plan for Leeuwpan Coal Mine, Delmas. Research socio-economic circumstances, data analysis, assessment, authored report.

Exxaro Resources Limited **South Africa**
Social impact assessment for the social and labour plan for Glen Douglas Dolomite Mine, Henley-on-Klip. Research socio-economic circumstances, data analysis, assessment, authored report.

Exxaro Resources Limited **South Africa**
Social impact assessment for the social and labour plan for Grootegeluk Open Cast Coal Mine, Lephalale. Research socio-economic circumstances, data analysis, assessment, authored report.

Exxaro Resources Limited **South Africa**
Social and labour plan for the Paardekraal Project, Belfast. Research socio-economic circumstances, data analysis, assessment, authored report.

Exxaro Resources Limited **South Africa**
Social impact assessment for the Paardekraal Belfast Project Belfast. Research socio-economic circumstances, data analysis, assessment, authored report.

Kumba Resources Ltd **South Africa**
Social Impact Assessments for the Sishen Iron Ore Mine in Kathu Northern Cape. Research socio-economic circumstances, data analysis, assessment, authored report.

Kumba Resources Ltd **South Africa**
Social Impact Assessments for the Sishen South Project in Postmasburg, Northern Cape. Research socio-economic circumstances, data analysis, assessment, authored report.

Kumba Resources Ltd **South Africa**
Social Impact Assessments for the Dingleton resettlement project at Sishen Iron Ore Mine Kathu, Northern Cape. Research socio-economic circumstances, data analysis, assessment, authored report.

Gold Fields **South Africa**
Social Impact Assessment for the Gold Fields West Wits Project. Research socio-economic circumstances, data analysis, assessment, authored report.

Anglo Coal **South Africa**
Review of social impact assessment for the proposed Waterberg Gas 37-spot coalbed methane (CBM) bulk yield test project.

Sekoko Mining

South Africa

Sekoko Wayland Iron Ore, Molemole Local Municipalities in Limpopo Province. Research socio-economic circumstances, data analysis, assessment, authored report.

Memor Mining (Pty) Ltd

South Africa

Langpan Chrome Mine, Thabazimbi, Limpopo. Research socio-economic circumstances, data analysis, assessment, authored report.

Prescali Environmental Consultants (Pty) Ltd

South Africa

Vlakpoort Open Cast Mine – Thabazimbi, Limpopo. Research socio-economic circumstances, data analysis, assessment, authored report.

Afrimat Ltd

South Africa

1. Marble Hall Lime Burning Project: Social Impact Assessment – Limpopo.
2. Glen Douglas Lime Burning Project: Social Impact Assessment - Henley-on Klip, Midvaal

Social assessments for regional and linear projects

Gautrans

South Africa

Social impact for the Gautrain Rapid Rail Link, Pretoria to Johannesburg and Kempton Park. Managed a team of 10 field workers, research socio-economic circumstances, data analysis, assessment, and co-authored report.

South African National Road Agency Limited

South Africa

Social Impact of tolling the Gauteng Freeway Improvement Project. Research socio-economic circumstances, data analysis, assessment, authored report.

South African National Road Agency Limited

South Africa

Social Impact of the N2 Wild Coast Toll Highway. Managed a team of three specialists. Research socio-economic circumstances, data analysis, assessment, co-authored report.

South African National Road Agency Limited

South Africa

SIA for the N3 Keversfontein to Warden (De Beers Pass Section). Research socio-economic circumstances, data analysis, assessment, authored report.

Transnet

South Africa

Social impact assessment for the Transnet New Multi-Product Pipeline Project (555 km) (Commercial Farmers). Research socio-economic circumstances, data analysis, assessment, authored report.

Eskom Holdings Limited

South Africa

Social Impact Assessment for the Ubertas 88/11kV Substation in Sandton, Johannesburg. Research socio-economic circumstances, data analysis, assessment, authored report.

Eskom Holdings Limited

South Africa

Nuclear 1 Power Plant. Assisted with the social impact assessment consulting to Arcus GIBB Engineering & Science. Peer review and adjusted the report and assisted at the public participation feedback meetings.

Eskom Holdings Limited, Transmission Division **South Africa**

Social impact assessment for Eskom Holdings Limited, Transmission Division's Neptune-Poseidon 400kV Power Line in the Eastern Cape. Research socio-economic circumstances, data analysis, assessment, authored report.

Eskom Holdings Limited, Transmission Division **South Africa**

Social Impact assessment for Eskom Holdings Limited, Transmission Division, Forskor-Mernsky 275kV±130km Powerline and Associated Substation Works in Limpopo Province. Research socio-economic circumstances, data analysis, assessment, authored report.

MGTD Environmental **South Africa**

Social impact assessment for a 150MW Photovoltaic Power Plant and Associated Infrastructure in Mpumalanga. Research socio-economic circumstances, data analysis, assessment, authored report.

MGTD Environmental **South Africa**

10MWp Photovoltaic Power Plant & Associated Infrastructure, North West Province. Research socio-economic circumstances, data analysis, assessment, authored report.

eThekweni Municipality **South Africa**

Social impact assessment for the proposed infilling of the Model Yacht Pond at Blue Lagoon, Stiebel Place, Durban. Research socio-economic circumstances, data analysis, assessment, authored report.

MGTD Environmental **South Africa**

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. Research socio-economic circumstances, data analysis, assessment, authored report.

MGTD Environmental **South Africa**

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;

Assessments for social projects and social research

Australia – Africa 2006 Sport Development Program **South Africa**

To establish and assess the impact of the Active Community Clubs Initiative on the communities of NU2 (in the township of Mdantsane)* and Tshabo (a rural village). Lead researcher social, data collection and analysis, assessment.

United Nations Office on Drugs and Crime **South Africa**

Evaluation of a Centre for Violence Against Women in Upington. Research socio-economic circumstances, data analysis, assessment, co-authored report.

University of Johannesburg

South Africa

Research into research outputs of academics working in the various departments of the university.
Research socio-economic circumstances, data analysis, assessment, authored report.

Human Resource and management training

Various national companies

South Africa

Developed and run various management courses such as, recruitment selection & placement; industrial relations / disciplinary hearings; team building workshops; multiculturalism workshop.

1986-2007

University of South Africa, Department of Industrial Psychology

South Africa

Developed the performance development study guide for industrial psychology 3.

2000

Authored Chapters in HR books

South Africa

In Slabbert J.A. de Villiers, A.S. & Parker A (eds.). Managing employment relations in South Africa.

Teamwork within the world-class organisation.

2005

In Muchinsky, P. M. Kriek, H. J. & Schreuder, A. M. G. Personnel Psychology 3rd Edition

Chapter 9 – Human resource planning.

Chapter 10 – The changing nature of work.

2005.

In Rossouw, G. J. and van Vuuren, L. Business Ethics - Made in Africa 4th Edition.

Chapter 11 – Building Trust with Ethics.

South African Management Development Institute (SAMDI) Democratic Republic of the Congo

Developed a course on Strategic Human Resource Planning for SAMDI and the Democratic Republic of the Congo as well as trainer's manuals for this course.

2006.

Competition Tribunal

South Africa

Developed a Performance Management System and Policy for the Competition Tribunal South Africa.

2006

PUBLICATIONS

Bews, N. & Martins, N. 2002. An evaluation of the facilitators of trustworthiness. SA Journal of Industrial Psychology. 28(4), 14-19.

Bews, N. Martins, N. & von der Ohe, H. 2002. Editorial. SA Journal of Industrial Psychology. 28(4), 1.

Bews, N. & Rossouw, D. 2002. Contemporary organisational change and the importance of trust. SA Journal of Industrial Psychology. 28(4), 2-6.

Bews, N. & Uys, T. 2002. The impact of organisational restructuring on perceptions of trustworthiness. SA Journal of Industrial Psychology. 28(4), 21-28.

Bews, N & Rossouw, D. 2002. A role for business ethics in facilitating trustworthiness. Journal of Business Ethics. 39: 377-390.

Bews, N. 2009. A matter of trust – Gaining the confidence of the public and client. IAIA Newsletter Forthcoming (Spring 2009).

Bews, N. 2009. Does he who pays the bill call the shots? Sitting astride client and public interest – the dilemma of maintaining credibility in impact assessments. IAIA Newsletter Winter – 2009.

Bews, N. 2002. Reducing your company's risk of sexual harassment claims. HR Future. (2) 2 10-11.

Bews, N. & Martins, N. von der Ohe, H. 2002. Organisational change and trust: Experiences here and abroad. Management Today, (18) 8 34-35.

Martins, N. Bews, N. & von der Ohe, H. 2002. Organisational change and trust. Lessons from Europe and South African organisations. HR Future, (2)9 46-47.

Rossouw, D. & Bews, N. 2002. The importance of trust within a changing business environment. Management Today. 18(2) 26-27.

Bews, N. 2001. You can put a value to trust in the new economy. HR Future, (1)1 48-49.

Bews, N. 2001. Maintaining trust during organisational change. Management Today, (17) 2 36-39.

Bews, N. 2001. Business ethics, trust and leadership: how does Africa fare? Management Today, (17) 7 14-15.

Rossouw, D & Bews, N. 2001. Trust is on the decline in the workplace, yet it's vital for modern organisational success. People Dynamics. (18) 6 28-30.

Bews, N. & Uys, T. 2001. The effects of restructuring on organisational trust. *HR Future*, (1)8 50-52.

Rossouw, G. J. & Bews, N. F. 2010. Building Trust with Ethics. In Rossouw, G. J. and van Vuuren, L. *Business Ethics - Made in Africa 4th Edition*. Cape Town: Oxford University Press.

Bews N. 2005. Teamwork within the world-class organisation. In Slabbert J.A. de Villiers, A.S. & Parker A (eds.). *Managing employment relations in South Africa*. Durban : Butterworths.

Bews, N. F. 2005. Human resource planning. In Muchinsky, P. M. Kriek, H. J. & Schreuder, A. M. G. 2005. *Personnel Psychology 3rd Edition*. Cape Town; Oxford University Press.

Bews, N. F. 2005. The changing nature of work. In Muchinsky, P. M. Kriek, H. J. & Schreuder, A. M. G. 2005. *Personnel Psychology 3rd Edition*. Cape Town; Oxford University Press.

Bews, N. F. 2005. Chapter 9 & 13. In Muchinsky, P. M. Kriek, H. J. & Schreuder, A. M. G. 2005. *Instructor's Manual. Personnel Psychology 3rd Edition*. Cape Town; Oxford University Press.

Bews, N. F., Schreuder, A. M. G. & Vosloo, S. E. 2000. *Performance Development. Study guide for Industrial Psychology 3*. Pretoria: University of South Africa.

Uys, T. and Bews, N. 2003. "Not in my Backyard": Challenges in the Social Impact Assessment of the Gautrain. Department of Sociology Seminar, RAU. 23 May 2003.

Bews, N. 2002. The value of trust in the new economy. Industrial Relations Association of South Africa (Irasa). Morning seminar 21 August 2002.

Bews, N. 2002. The issue of trust considered. Knowledge Recourses seminar on Absenteeism. The Gordon Institute of Business. 27 August 2002.

Bews, N. & Uys, T. 2001. The impact of organisational trust on perceptions of trustworthiness. South African Sociological Association Conference. Pretoria.

Bews, N. 2001. Business Trust, Ethics & Leadership:- Made in Africa. International Management Today/Productivity Development Conference. Hosted by Productivity Development (Pty) Ltd & Management Today. Best Knowledge in Leadership Practice Conference 23-24 July 2001.

Bews, N. 2001. Charting new directions in leading organisational culture and climate change. Workplace Transformation and Organisational Renewal. Hosted by The Renaissance Network. November 2001.

Bews, N. 2000. Towards a model for trust. South African Sociological Association Conference. Saldanha.

Bews, N. 2003. 'Social Impact Assessments, theory and practice juxtaposed – Experience from a South African rapid rail project.' New Directions in Impact Assessment for Development: Methods and Practice Conference. University of Manchester, Manchester, England.

MEMBERSHIP OF PROFESSIONAL BODIES

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