

MOGARA SOLAR

Northern Cape Province

Social Impact Assessment (SIA) Report

October 2018

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REPORT DETAILS

Title	:	Social Impact Assessment (SIA) Report for Mogara Solar, a commercial PV energy facility and associated infrastructure near Kathu, in the Northern Cape Province
Authors	:	Savannah Environmental (Pty) Ltd Sarah Watson
Client	:	Cape EAPrac Dale Holder
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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

October 2018

Date



Signature

TABLE OF CONTENTS

	PAGE
REPORT DETAILS	i
SPECIALIST DECLARATION OF INTEREST	ii
TABLE OF CONTENTS	iii
ACRONYMS	v
1. INTRODUCTION	1
1.1. Project Description	1
1.2. Project Background	2
1.3. Details of the Independent Specialist	4
1.4. Structure of this SIA Report	4
2. METHODOLOGY AND APPROACH	6
2.1. Purpose of the Study	6
2.2. Approach to the Study	6
2.2.1. Stakeholder Identification and Analysis	7
2.2.2. Collection and Review of Existing Information	10
2.2.3. Collection of Primary Data	10
2.3. Impact Assessment Evaluation Method	11
2.4. Limitations and Assumptions	12
3. LEGISLATION AND POLICY REVIEW	13
3.1. National Policy and Planning Context	13
3.1.1. Constitution of the Republic of South Africa (1996)	13
3.1.2. National Environmental Management Act (No. 107 of 1998) (NEMA)	14
3.1.3. White Paper on the Energy Policy of the Republic of South Africa (1998)	15
3.1.4. White Paper on the Renewable Energy Policy of the Republic of South Africa (2003)	15
3.1.5. National Energy Act (No. 34 of 2008)	16
3.1.6. Integrated Energy Plan (IEP) (2016)	16
3.1.7. Integrated Resource Plan for Electricity (IRP) 2010 – 2030 (2011)	17
3.1.8. National Development Plan 2030 (2012)	18
3.1.9. Strategic Infrastructure Projects (SIPs)	19
3.2. Provincial Policies	19
3.2.1. Northern Cape Provincial Spatial Development Framework (PSDF) (2012)	19
3.3. District and Local Municipalities Policies	20
3.3.1. John Taolo Gaetsewe DM Final Draft Integrated Development Plan (IDP) 2018 – 2019 (2017)	20
3.3.2. John Taolo Gaetsewe DM Phase 5 Draft Spatial Development Framework (SDF) (2017)	21
3.3.3. Gamagara LM Integrated Development Plan (IDP) 2017 – 2022 (2017)	21
3.4. Conclusion	22
4. SOCIO-ECONOMIC PROFILE	23
4.1. Northern Cape Province	23
4.2. John Taolo Gaetsewe DM	24
4.3. Gamagara LM	25
4.4. Project Site	26
4.5. Adjacent Properties	26
4.6. Baseline Description of the Social Environment	30
4.6.1. Population Size	30
4.6.2. Population Group Dynamics	30

4.6.3.	Gender Profile	31
4.6.4.	Age Profile	32
4.6.5.	Dependency Ratio	34
4.6.6.	Education Levels	34
4.6.7.	Employment	35
4.6.8.	Annual Household Income levels	38
4.6.9.	Economic Activities	39
4.6.10.	Health	40
4.6.11.	Households	40
4.6.12.	Access to Basic Services	41
4.6.13.	Baseline summary.....	46
5.	KEY CONSIDERATIONS FOR SOLAR PV POWER PLANTS.....	48
5.1.	Construction Phase Impacts	48
5.2.	Water Usage.....	48
5.3.	Land Matters	48
5.4.	Landscape and Visual Impacts.....	49
5.5.	Ecology and Natural Resources	49
5.6.	Cultural Heritage	49
5.7.	Transport and Access	49
5.8.	Drainage / Flooding.....	50
5.9.	Consultation and Disclosure	50
5.10.	Environmental and Social Management Plan (ESMP).....	50
6.	SOCIAL IMPACT ASSESSMENT.....	51
6.1.	Detailed Design and Construction Phase.....	51
6.1.1.	Construction Phase Impacts Associated with Mogara Solar	53
6.2.	Operation Phase.....	61
6.2.1.	Operation Phase Impacts Associated with Mogara Solar.....	62
6.3.	Cumulative Impacts	66
6.3.1.	Cumulative Impacts associated with Mogara Solar.....	69
6.4.	Decommissioning Phase	70
6.5.	Assessment of Alternatives.....	70
6.6.	Assessment of Impacts for the No-Go Option	71
7.	CONCLUSION AND RECOMMENDATIONS	72
7.1.	Key findings.....	73
7.2.	Recommendations.....	73
7.3.	Overall Conclusion	74
8.	REFERENCES.....	75

APPENDICES:

Appendix A: Social Input into the Environmental Management Programme (EMPr)

ACRONYMS

AC	Alternating Current
B-BBEE	Broad-Based Black Economic Empowerment
BEE	Black Economic Empowerment
CLO	Community Liaison Officer
CPA	Communal Property Association
CSP	Concentrated Solar Power
DC	Direct Current
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
FMP	Fire Management Plan
GDP	Gross Domestic Product
GHG	Greenhouse 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
NDP	National Development Plan

NEMA	National Environmental Management Act (No. 107 of 1998)
NFA	National Forests Act (No. 84 of 1998)
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
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 Enterprises
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VIP	Ventilated Improved Pit

1. INTRODUCTION

K2018091776 (South Africa) (Pty) Ltd proposes the development of Mogara Solar, a commercial PV energy facility and associated infrastructure on a site near Kathu, in the Northern Cape Province. The proposed project comprises a commercial 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 Mogara Solar 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 full Scoping and EIA Process.

This Social Impact Assessment (SIA) Report has been prepared by Sarah Watson of Savannah Environmental (Pty) Ltd on behalf of Cape EAPrac, and is intended to provide input into the EIA being conducted for the project.

1.1. Project Description

Mogara Solar is to consist of solar photovoltaic (PV) technology with fixed, single or double axis tracking mounting structures, with a net generation (contracted) capacity of up to 75MW. The proposed project will comprise of the following key infrastructure and components:

- » Arrays of PV solar panels with a contracted capacity of up to 75MW.
- » Mounting structures to support the PV panels (utilising either fixed-tilt / static, single-axis tracking, or double-axis tracking systems).
- » On-site inverters to convert power from Direct Current (DC) to Alternating Current (AC).
- » An on-site switching station / substation to facilitate the connection between the solar facility and the Eskom grid connection point.
- » Inverter-stations, transformers and internal electrical reticulation (underground cabling).
- » A 132kV power line between the on-site switching station / substation and the Eskom grid connection point (i.e. the authorised Sekgame Switching Station).
- » Auxiliary buildings (gate-house and security, control centre, office, warehouse, canteen and visitors centre, staff lockers etc.).
- » Temporary construction laydown areas.
- » Access and internal road network.
- » Rainwater tanks.
- » Perimeter fencing and security infrastructure.

Table 1.1: Overview of technical details for Mogara Solar.

Component	Description / Dimensions
Location of the site	Approximately 7km south-east of Kathu
PV panel area	200ha with a maximum total project footprint of approximately 225ha

Component	Description / Dimensions
Preferred site access	Access to the site will be at the existing access road from the N14 and along the western boundary of Portion 02 of the Farm Legoko No. 460.
Export capacity	75MW
Proposed technology	PV with fixed, single, or double axis tracking technology
Height of installed panels from ground level	PV Structures not more than 4m
Width and length of internal roads	Width: 4 – 5 m Length: 6km

The project is proposed on Portion 1 and Portion 02 of the Farm Legoko No. 460, which is located approximately 7km south-east of Kathu, and falls within the Gamagara Local Municipality (LM) of the John Taolo Gaetsewe District Municipality (DM) in the Northern Cape Province. The project site was identified on the basis of various technical criteria including the solar resource available in the area, the accessibility of the site, accessibility to Eskom's national electricity grid, and local site characteristics and topography. The larger project site is approximately 1917ha in extent. A total development footprint area of approximately 225ha in extent, equivalent to approximately 11.7% of the project site, is required for the development of Mogara Solar (refer to **Table 1.2**).

Table 1.2: Project component areas and percentage of total project area.

Project Component	Estimated Area	% of Total Area	% of Farm Area
PV structures / modules	~ 200ha	88.89%	10.43%
Permanent and construction and laydown areas	~ 5 ha	2.22 %	0.26 %
Internal roads	~ 6ha	2.67%	0.31%
Auxiliary buildings	~ 1ha	0.44%	0.05%
Substation	~ 1ha	0.44%	0.05%
TOTAL	~ 225ha	94.66%	11.7%

1.2. Project Background

Two other commercial PV facilities have been authorised for development on the same project site, namely:

- » AEP Legoko Solar (DEA Reference No.: 14/12/16/3/3/2/819)
The 75MW AEP Legoko PV Solar Facility on Portion 02 of the Farm Legoko No. 460.
- » AEP Mogobe Solar (DEA Reference No.: 14/12/16/3/3/2/820)
The 75MW AEP Mogobe PV Solar Facility on Portion 01 of the Farm Legoko No. 460 and the Farm Sekgame No. 461.

In addition, another commercial PV facility has been authorised on a neighbouring property, namely:

- » AEP Kathu Solar PV Energy Facility (DEA Reference No.: 14/12/16/3/3/2/911)
The 75MW AEP Kathu Solar PV Energy Facility on the Remainder of the Farm 460 Legoko near Kathu within the Gamagara local Municipality in the Northern Cape Province.



Figure 1.1: Location of Mogara Solar in relation to Legoko Solar (authorised) and Gaetsewe Solar (proposed) on Legoko 2/460 (project site).

Application is also being made for an additional (i.e. fourth) 75MW project (to be known as Gaetsewe Solar) to be developed on the project site. The development of Mogara Solar therefore constitutes the fifth commercial PV facility proposed within the immediate vicinity. Gaetsewe Solar forms part of a separate application for EA and is subject to a separate EIA process to be run in parallel to the current EIA process being undertaken for Mogara Solar.

1.3. Details of the Independent Specialist

This SIA Report has been prepared by Sarah Watson of Savannah Environmental (Pty) Ltd. 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.

1.4. Structure of this 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 1.3**.

Table 1.3: 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 development and levels of acceptable change.	Section 6
(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

Requirement	Location in Report
(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 Mogara Solar is proposed. It provides an overview of the manner and degree to which the current status quo is likely to change or be impacted 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 Scoping process completed to date 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 during a site visit. Meetings were conducted 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.

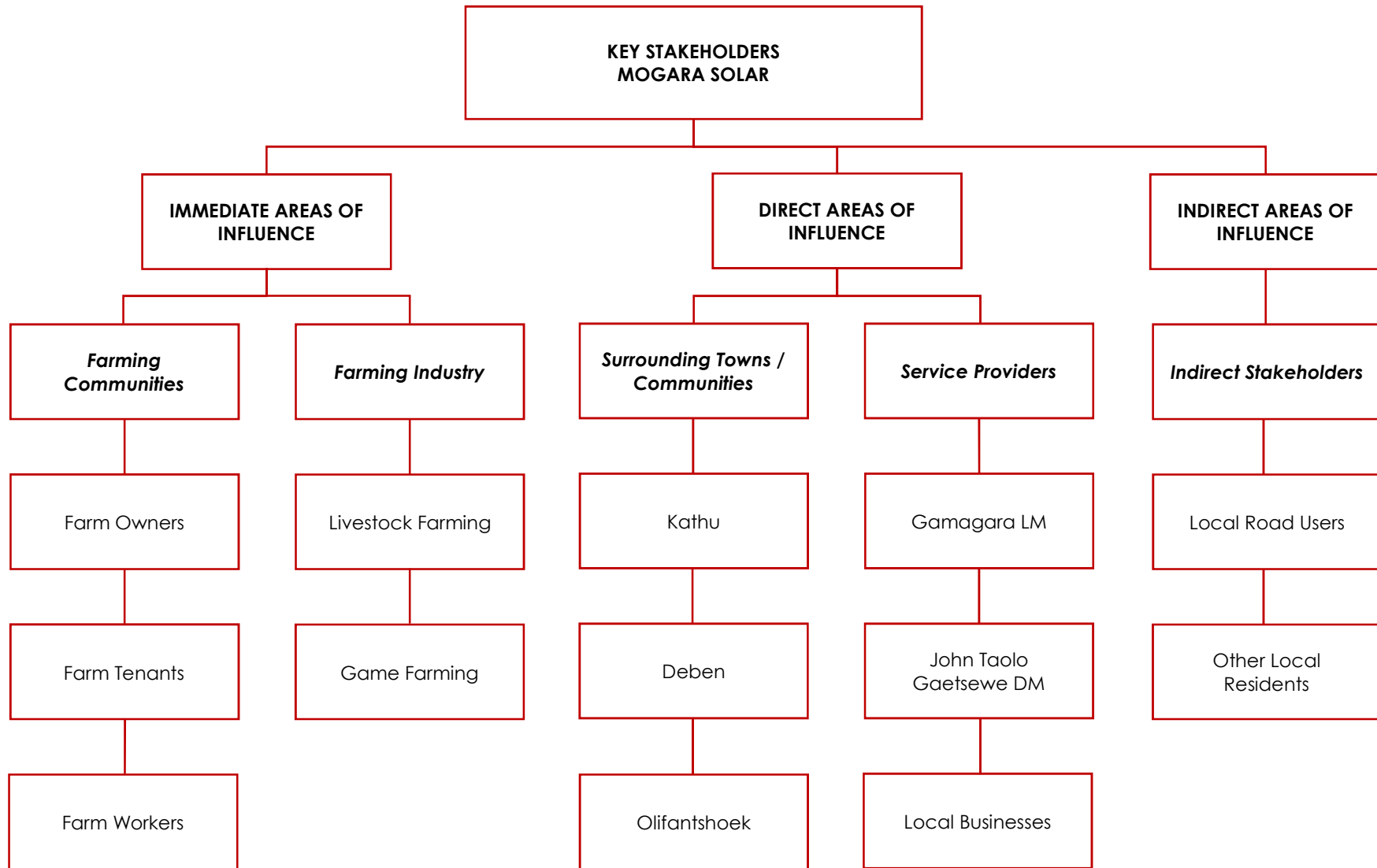


Figure 2.1: Key Stakeholders

A description of each of the stakeholders groups in relation to Mogara Solar 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 the property and, in most cases, 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 change in land use), visual impacts (as a result of construction equipment and activities and the presence of the PV facility infrastructure), 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:** The primary agricultural activity in the study area is livestock farming. Impacts that may arise as a result of the project include stock theft and poaching from an increase of people in the area (especially during the construction phase), impacts on current farming practices such as dust impacts which could affect grazing areas (especially during the construction phase), and potential loss of agricultural land as a result of the direct occupation of the land by the proposed facility and its associated infrastructure, which would remove the development footprint from agricultural production. Noise and movement of people may also negatively impact on farming operations.
- » **Surrounding towns / affected communities:** The closest town to the project site is Kathu, located approximately 7km north-west of the project site. Other towns within proximity of the project site include Deben, located approximately 26km north-west of the project site, and Olifantshoek located approximately 40km south-west of the project site. Residents within these towns may be positively and / or negatively impacted by the proposed development. Employment opportunities will become available as a result of the construction and operation of the proposed development, and it is probable that a portion of the labour force required for the project will be sourced from (and accommodated within) these towns, which will present a positive impact for the local community. In addition, contributions to Social Development of the local communities in terms of the DoE's requirements under the REIPPP Programme will result in local upliftment and positive impacts.
- » **Service providers:** Major service providers that will be affected by the project include the Gamagara LM, John Taolo Gaetsewe DM, and local businesses in the area. The Gamagara LM, and to a lesser extent the John Taolo Gaetsewe DM are likely to be impacted by the proposed development. The Gamagara 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 John Taolo Gaetsewe DM). The Gamagara 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 potential negative impacts in the form of an in-migration of people and increased pressure being placed 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 impacted by the project. These include road users that utilise the N14 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 result in increased traffic, which may create traffic disruptions, and which 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 proponent).
- » Information regarding employment, social upliftment, and local economic development opportunities (as provided by the project applicant).
- » SIA Report for the Proposed AEP Kathu Solar PV Energy Facility, Near Kathu, Northern Cape Province (Savannah Environmental, June 2016).
- » Census data (2011), and the Local Government Handbook (2018).
- » Planning documentation such as Provincial Growth and Development Strategies (PGDSs), LM and DM Integrated Development Plans (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

One-on-one meetings were conducted with affected landowners and key stakeholders identified within the area. Details of individuals interviewed are provided in **Table 2..**

Table 2.2: Overview of individuals interviewed

Representative	Interest
Carel Reitz	Affected landowner
Frans Briedenhann	Affected landowner
Kumba Iron Ore	Adjacent landowner
Petrus Duvenhage	Adjacent landowner
Dihan van Rensburg	Adjacent landowner
Abbie Wiid (SA Army Combat Training Centre)	Adjacent landowner

During the interviews, interviewees were provided with background on the proposed project, and the EIA and public participation process being undertaken in support of the application for EA. Interviewees were then interviewed utilising a questionnaire to determine their perceptions, interests, and concerns regarding the project.

The Gamagara LM and John Taolo Gaetsewe DM are being engaged and their comments obtained as part of the EIA process being undertaken for the project.

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 project. The methodology below allows for the evaluation of the overall effect of a proposed activity 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 Scoping Report:

- » Data available within the 2011 Census, Northern Cape Provincial Spatial Development Framework (PSDF) 2012, John Taolo Gaetsewe DM Final Draft Integrated Development Plan (IDP) 2018 – 2019 (2017), John Taolo Gaetsewe DM Phase 5 Draft Spatial Development Framework (SDF) (2017), and the Gamagara LM IDP 2017-2018 (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. Additional information available from the public participation undertaken during the EIA Phase will be included within the final report, where relevant.
- » Some of the project projections reflected in this SIA Report (i.e. with regards to job creation and local content) are based on information currently available and 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 undertaken 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) (2016)
- » Integrated Resource Plan for Electricity (IRP) 2010 – 2030 (2011) (and subsequent updates thereto)
- » National Development Plan (NDP) 2030 (2012)
- » Strategic Infrastructure Projects (SIPs)

Provincial Policy and Planning Context:

- » Northern Cape Provincial Spatial Development Framework (PSDF) (2012).

Local Policy and Planning Context:

- » John Taolo Gaetsewe DM Final Draft Integrated Development Plan (IDP) 2018 – 2019 (2017).
- » John Taolo Gaetsewe DM Phase 5 Draft Spatial Development Framework (SDF) (2017).
- » Gamagara LM 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 social upliftment and economic development. As the project comprises a RE project and would contribute RE supply to provincial and national targets set out and supported within these national policies, it is considered that the project fits within the national policy framework.

A brief review of the most relevant national legislation and 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 foundations 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 therefore 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 environmental impacts.

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 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 responsible and informed decision-making by government on the acceptability of environmental impacts is therefore enshrined within NEMA.

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

The White Paper on Energy Policy places emphasis on the expansion of energy supply options to enhance South Africa'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 RE 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.
- » 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. The White Paper on Energy Policy therefore supports the advancement of RE sources and ensuring energy security through the diversification of supply.

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 Government's predominant policy on energy as set out in the 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 due to its abundant, and fairly accessible and affordable coal resources. However, massive RE resources that can be sustainable alternatives to fossil fuels, have so far remained largely untapped. The White Paper on Renewable Energy Policy 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 RE summit of 2009. The objectives of the White Paper on Renewable Energy Policy 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, to:

- » 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 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.

A draft version of the Integrated Energy Plan (IEP) was released for comment on 25 November 2016. The purpose of the IEP is to provide a roadmap of the future energy landscape for South Africa which guides

future energy infrastructure investments and policy development. The development of the IEP is an ongoing continuous process. It is reviewed periodically to take into account changes in the macroeconomic environment, developments in new technologies and changes in national priorities and imperatives, amongst others.

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.

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	2600
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 Sectors 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 proposed project 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.

3.2. Provincial Policies

This section provides an overview of the most relevant provincial policies. Mogara Solar is considered to align with the aims of these policies, even if contributions to achieving the goals therein are only minor.

3.2.1. Northern Cape Provincial Spatial Development Framework (PSDF) (2012)

The Northern Cape Provincial Spatial Development Framework (PSDF) (2012) states that the overarching goal for the province is to enable sustainability through sustainable development. The province considers

social and economic development as imperative in order to address the most significant challenge facing the Northern Cape, which is poverty.

The PSDF considers the release of greenhouse gas (GHG) emissions created by human activity as the key cause of global warming, which in turn could result in major negative effects and disasters in the short- and medium-term. This effect would increasingly undermine human development gains. Innovative strategies would have to be implemented to reduce the impact of global deterioration.

The PSDF identifies key sectoral strategies and plans which are considered to be the key components of the PSDF. Sectoral Strategy 19 refers to a provincial renewable energy strategy. Within the PSDF a policy has been included which states that renewable energy sources (including the utilisation of solar energy) are to comprise 25% of the Province's energy generation capacity by 2020.

The overall energy objective for the province also includes promoting the development of renewable energy supply schemes which are considered to be strategically important for increasing the diversity of domestic energy supply and avoiding energy imports, while also minimising the detrimental environmental impacts. The implementation of sustainable renewable energy is also to be promoted within the Province through appropriate financial and fiscal instruments.

Considering the need for the development of renewable energy facilities in order to achieve the objective of sustainability the development of the proposed solar energy facility within the Northern Cape and within the study area is considered to be aligned with the Northern Cape PSDF.

3.3. District and Local Municipalities Policies

The strategic policies at DM and LM level have similar objectives for the respective areas, namely to accelerate economic growth, create jobs, and uplift communities. Mogara Solar 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. John Taolo Gaetsewe DM Final Draft Integrated Development Plan (IDP) 2018 – 2019 (2017)

The vision of the John Taolo Gaetsewe DM as contained within the Final Draft IDP 2018 – 2019 (2017) is:

"Working together for a better life for all in the district."

The mission statement of John Taolo Gaetsewe DM reflects what the DM will do in an ongoing manner to strive towards achieving its vision. The mission of the John Taolo Gaetsewe DM is:

"Accelerating the implementation of integrated development initiatives and providing support to local municipalities."

In terms of development priorities the Final Draft IDP 2018 – 2019 (2017) determined that the results of the 2016 Community Survey suggest that the number of people residing within the DM is increasing, as a direct result of mining related activities. Implications for the DM in this regard include:

- » The scope and extent of the DM's Spatial Development Framework (SDF).
- » Service delivery demands placed on the DM and its LMs.

» The grading of the LMs, and the resources (i.e. grants and subsidies) made available to them.

The activities of the DM need to reflect its population demographics, both in terms of service delivery, as well as in terms of employment equity. Gender, racial and disability population demographics have been identified as being of particular importance in this regard. As a result, special interest groups, such as the youth, women, and persons with disabilities require specific focus in the strategic priorities of the DM.

The implementation of Mogara Solar would contribute towards addressing some of the John Taolo Gaetsewe DM's development priorities through the creation of new employment opportunities which could support a portion of the increasing population, while the increase in revenue from the project could assist in the municipality in addressing service delivery demands.

3.3.2. John Taolo Gaetsewe DM Phase 5 Draft Spatial Development Framework (SDF) (2017)

The main economic sectors applied within the John Taolo Gaetsewe DM include eco-tourism, agriculture, mining and community services. Even though the development of RE is not specifically mentioned as part of the framework, the development of a solar energy facility within the area will add to the current economic sectors. That specifically includes community services as the development of a solar energy facility will aid in the provision of electricity, as well as employment opportunities and skills development on a local level.

The SDF states that one of the key objectives for the DM is to attract new business. With the proposed development of a solar energy facility within the area, other developers might be encouraged to consider the area as a viable location for further development. This could attract new business to the area and promote financial and socio-economic development within the DM.

3.3.3. Gamagara LM Integrated Development Plan (IDP) 2017 – 2022 (2017)

The vision for the Gamagara LM as contained within the IDP 2017 – 2022 (2017) is as follows:

"Build prosperous and sustainable communities."

The Mission of the Gamagara LM is as follows:

"To provide universal, sustainable services to the community in order to attain a safe and healthy environment, as well as socio-economic development by exploiting economic benefits and strengthening stakeholder relations."

The following strength, weaknesses, threats and opportunities have been identified for the Gamagara LM:

Strengths:	Weaknesses:
<ul style="list-style-type: none"> » High potential for economic growth: <ul style="list-style-type: none"> * The LM is at the centre of all economic activities around the mining industry in the region. The industrial area growth and development is phenomenal as many small industries and big industry come to the area to serve the mining needs in the area. 	<ul style="list-style-type: none"> » Infrastructure: <ul style="list-style-type: none"> * Inadequate infrastructure to cater for the rapid development in the LM. * Ageing infrastructure. » Ineffective internal systems and controls: <ul style="list-style-type: none"> * Communicating available systems and controls to junior officials is lacking and leading to some

Strengths:	Weaknesses:
<ul style="list-style-type: none"> * Small businesses have the potential to grow and serve the improving commercial and mining economic set-up. These businesses either provide mines with equipment or the sub-contract to big contractors in the mine. » High tourism potential: <ul style="list-style-type: none"> * Gamagara LM has a vast number of heritage sites that still need to be exploited. These include religious monuments and heritage sites, the oasis of the Kalahari, the caves, etc. » Political maturity and stability: <ul style="list-style-type: none"> * Co-operation between political parties in delivering services is a progressive one. * Ward Committees are functional and meeting their obligations as required. * There is strong political leadership and support to the municipal functioning. 	<p>of the crucial tasks not being performed accordingly e.g. delegation of power.</p> <ul style="list-style-type: none"> * Culture of non-payment is prevalent in the LM because credit control policy is not fully implemented. * The LM does not have a culture of retaining skilled personnel due to inconsistent implementation of policies or lack of induction of new employees. * Lack of by-laws to guide and enforce compliance e.g. credit control.
Opportunities:	Threats:
<ul style="list-style-type: none"> » Developmental potential: <ul style="list-style-type: none"> * Integration of stakeholder contribution to the development of the LM is possible e.g. sector departments, mining industry, commercial industry, agricultural industry and tourism industry. * There is a potential to acquire more land for development. * Improve infrastructure and create jobs. » Internal systems could be improved: <ul style="list-style-type: none"> * Can improve on the credit control system to encourage culture of payment for services and increase municipal revenue. * Improve customer care and uphold to the Batho Pele Principle. * Enhance the LED and Tourism markets by disseminating the LED and Tourism strategy to members of the community using various methods of awareness. 	<ul style="list-style-type: none"> » National and International economic trends may destabilise the municipality to achieve its goals. » Retrenchments from the mines may affect the municipal revenue. » Influx of job seekers in the area is causing infrastructure system failure as they overload the system.

The implementation of Mogara Solar would contribute somewhat towards addressing some of the weaknesses and threats identified for the Gamagara LM. Specifically with regards to contributing towards Local Economic Development (LED) market, municipal revenue, and job creation.

3.4. Conclusion

The review of relevant legislation, policies and documentation pertaining to the energy sector indicate that renewable or green energy (i.e. energy generated by naturally occurring renewable resources) and therefore the establishment of Mogara Solar is supported at a national, provincial, DM, and LM level, and that the proposed project will contribute positively towards a number of targets and policy aims. Specifically those relating to social and economic development and upliftment, and employment creation.

4. SOCIO-ECONOMIC PROFILE

Mogara Solar is proposed on Portion 02 of the Farm Legoko No. 460 within Ward 01 of the Gamagara LM of the John Taolo Gaetsewe DM in the Northern Cape Province (refer to **Table 4.1**).

Table 4.1: Spatial Context of the proposed project site.

Province	Northern Cape Province
District Municipality	John Taolo Gaetsewe DM
Local Municipality	Gamagara LM
Ward Number(s)	Ward 01
Nearest Town(s)	Kathu (approximately 7km north-west of the project site)
Farm Portion(s), Name(s) and Number(s)	Portion 1 and Portion 02 of the Farm Legoko No. 460
SG 21 Digit Code (s)	Portion 1: C04100000000004600001 Portion 2: C04100000000004600002
Current Zoning	Agriculture
Current land use	Agriculture (i.e. grazing)
Site Extent	Portion 1: 1060ha Portion 2: 856ha

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

4.1. Northern Cape Province

The Northern Cape Province is located in the north-western extent of South Africa, and comprises South Africa's largest Province, occupying an area approximately 372 889km² in extent, equivalent to nearly one third (30.5%) of the country's total land mass. It is also South Africa's most sparsely populated province with a population of 1 145 861, and a population density of 3.1/km². It is bordered by the Western Cape and Eastern Cape Provinces to the south and south-east, by Free State and North West Provinces to the east, by Botswana and Namibia to the north, and by the Atlantic Ocean to the west. The Northern Cape is the only South African province which borders Namibia, and therefore plays an important role in terms of providing linkages between Namibia and the rest of South Africa. The Orange River is a significant feature, and is also the main source of water in the province. The Orange River also constitutes the international border between the Northern Cape and Namibia.

The Northern Cape offers unique tourism opportunities including wildlife conservation destinations, natural features, historic sites, festivals, cultural sites, star gazing, adventure tourism, agricultural tourism, ecotourism, game farms, and hunting areas, etc. The province is home to the Richtersveld Botanical and Landscape World Heritage Site, which comprises a United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Heritage Site under the World Heritage Convention. The Northern Cape is also home to 2 Transfrontier National Parks, namely the Kgalagadi Transfrontier Park, and the Richtersveld /Ai-Ais Transfrontier Park, as well as 5 national parks, and 6 provincial reserves.

The Northern Cape also plays a significant role in South Africa's science and technology sector, as it is home to the Square Kilometre Array (SKA), the Southern African Large Telescope (SALT), and the Karoo Array Telescope (MeerKAT).

The Northern Cape makes the smallest contribution to South Africa's economy (having contributed only 2% to South Africa's Gross Domestic Product per region (GDP-R) in 2007). The mining sector is the largest contributor to the provincial GDP, contributing 26% thereto. The Northern Cape's mining industry is of national and international importance, as it produces approximately 37% of South Africa's diamond output, 44% of its zinc, 70% of its silver, 84% of its iron-ore, 93% of its lead and 99% of its manganese.

In 2007, the agricultural sector contributed 5.8% to the Northern Cape GDP-R which was equivalent to approximately R1.3 billion. The agricultural sector also employs approximately 19.5% of the total formally employed individuals within the province (LED Strategy). The sector is experiencing significant growth in value-added activities, including game-farming, while food production and processing for the local and export market is also growing significantly (PGDS, July 2011). Approximately 96% of the land is used for stock farming, including cattle and sheep or goats, as well as game farming, while approximately 2% of the Province is used for crop farming, mainly under irrigation in the Orange River Valley and Vaalharts Irrigation Scheme (LED Strategy).

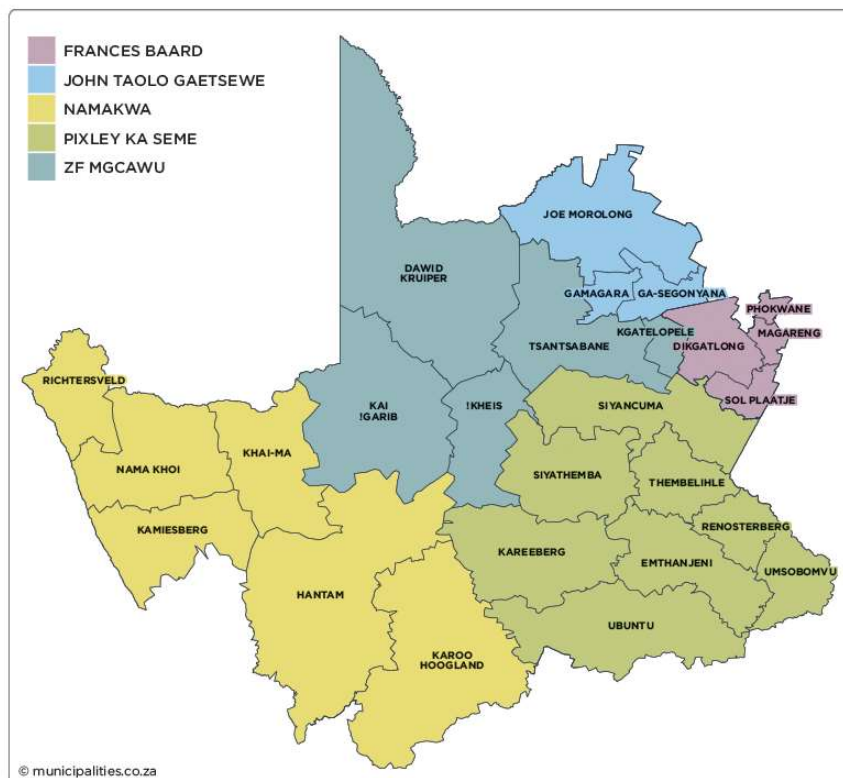


Figure 4.1: Map showing the DMs of the Northern Cape Province (Source: www.municipalities.co.za).

4.2. John Taolo Gaetsewe DM

The John Taolo Gaetsewe DM (previously known as the Kgalagadi DM) is situated in the north-eastern extent of Northern Cape Province. It is the second smallest DM in the province in terms of land mass (i.e. 27 283km²,

equivalent to 7.32% of the total provincial land mass), and third largest in terms of population (224 799, equivalent to 19.62% of the total provincial population), with the second highest population density of 8.2/km². The John Taolo Gaetsewe DM is bordered by ZF Mgcawu DM to the south-west, and south, Frances Baard DM to the south-east, Dr Ruth Segomotsi Mompati DM of North West Province to the east, and Botswana to the north. The DM comprises 3 LMs, namely: Gamagara, Ga-Segonyana, and Joe Morolong. In 2006 the boundaries of the John Taolo Gaetsewe DM were demarcated to include the once north-western extent of Gamagara and Olifantshoek, along with its surrounds, into the Gamagara LM.

The John Taolo Gaetsewe DM comprises 186 towns and settlements, approximately 80% of which comprise villages. Predominant towns within the DM include: Bankhara-Bodulong, Deben, Hotazel, Kathu, Kuruman, Mothibistad, Olifantshoek, Santoy, and Van Zylsrus. It is characterised by a mixture of land uses, of which agriculture and mining are dominant. The main economic sectors within the DM include agriculture, mining, and retail. The DM holds potential as a viable tourist destination and has numerous growth opportunities in the industrial sector.

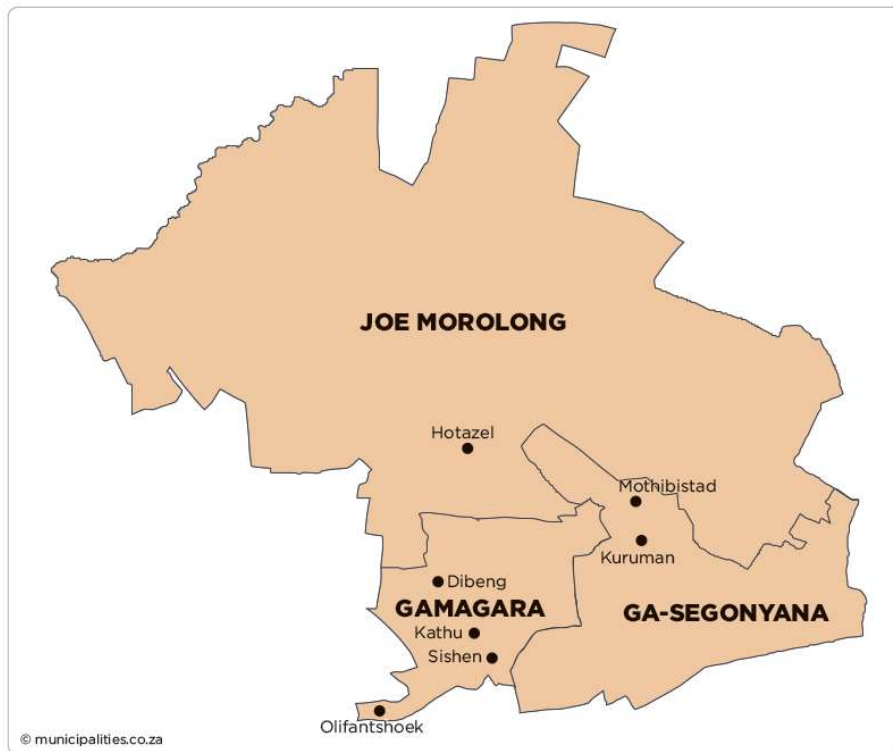


Figure 4.2: Map showing the LMs of the John Taolo Gaetsewe DM (Source: www.municipalities.co.za).

4.3. Gamagara LM

The Gamagara LM occupies an area approximately 2 619km² in extent, equivalent to approximately 10% of the John Taolo Gaetsewe DM land mass, and is the smallest of the 3 LMs which comprise the John Taolo Gaetsewe DM. The Gamagara LM has the smallest population (41 617), and is the second most densely populated LM of the John Taolo Gaetsewe DM with a population density of 16/km². The Gamagara LM is situated approximately 200km north-east of Upington and 280km north-west of Kimberley in the southern to south-western extent of the John Taolo Gaetsewe DM. It is bordered by the Joe Morolong LM to the north, the Ga-Segonyana LM to the east, and the Tsantsabane LM of the ZF Mgcawu DM to the south and west.

The Gamagara LM comprises five towns, namely: Kathu, Shesheng, Dibeng, Dingleton, and Olifantshoek. Kathu is the largest town, and is also the administrative centre of the Gamagara LM. Olifantshoek is the second largest town, and is located near the Gamagara River to the north-west of Kathu. Dingleton is the smallest of the five towns, and is located in the centre of the mining activities directly south of Kathu.

The Gamagara LM has experienced considerable population growth, increasing from 23 202 people in 2001 to 41 617 people in 2011 (Census 2011). Such an increase in population can be attributed to an in-migration of people (predominantly men) in search of employment opportunities from the mining activities within the LM.

In terms of tourist attractions, the Gamagara LM is home to an endemic camel-thorn tree forest known as the Kathu Forest, which was registered as a National Heritage site in 1995. The Kathu Forest, which is situated north of the town of Kathu, has been declared a protected woodland in terms of Section 12(1) (c) of the National Forests Act (No. 84 of 1998) (NFA). The Kathu Forest is a unique woodland of exceptionally large camel-thorn trees (*Acacia erioloba*). The woodland is approximately 4 000ha in extent and comprises one of only two such woodlands in the world. In addition to the Kathu Forest other tourist attractions within the Gamagara LM include the mines (the area boasts the largest single pit, open cast iron ore mine in the world, and is the starting point of the Sishen – Saldanha railway line), and the Kathu archaeological complex comprising three heritage sites in and around the town of Kathu, which includes the Kathu town lands, Kathu pan and the Bestwood pan.

4.4. Project Site

Mogara Solar is proposed on Portion 01 and Portion 02 of the Farm Legoko No. 460 within Ward 01 of the Gamagara LM of the John Taolo Gaetsewe DM in the Northern Cape Province. The project site is located approximately 7km south-east of Kathu. The site is approximately 1917ha in extent and comprises two agricultural properties. Portions of both properties are currently being utilised for livestock farming. The landowners of both properties each reside on their respective farms; the main farmhouse on Portion 01 is located in the centre of the property, and the main farmhouse on Portion 02 is located in the south-western extent of the farm.

The development of AEP Legoko Solar, a 75MW commercial PV facility has been authorised in the northern extent of Portion 02 (DEA Reference No.: 14/12/16/3/3/2/819). The project site currently under investigation for the development of Mogara Solar is located adjacent to, and immediately south of the AEP Legoko Solar project area.

The 75MW AEP Legoko Solar Energy Facility located on the northern portion of Portion 02 has received environmental authorisation. The existing Ferrum-Olien 2 275kV and proposed Hotazel-Kuruman 132kV power lines traverse the properties.

The N14 national road is located approximately 2km east of the project site, and traverses the area in a north to south direction, while a number of gravel roads occur within the project site. The Sishen iron ore mine is located approximately 4km east of the N14 national road, and 6km east of the eastern boundary of the project site.

4.5. Adjacent Properties

The Majority of the surrounding area has a low number of farmsteads/buildings that are sparsely populated. The area is located within a livestock farming agricultural region, and the immediate area is presently used mainly for small livestock farming as well as proposed renewable energy facilities. Table 4.2 provides a summary of the current land uses and characteristics of the adjacent properties.

Table 4.2: Current land uses and characteristics of the adjacent farmlands

Farm Name & Portion	Location	Landowner Names	Any residents living on farm (i.e. farm workers, tenants, landowners)	Homesteads / Buildings on farm	Current activities taking place on the farm (sheep farming etc.) and any prominent features.	Comments noted
Farm Legoko 2/460	Affected property	Carel Reitz	Landowner resides on farm. Labourer on property during daytime. Resides in Kathu.	Main farmhouse	No current activities on the property. Environmental Authorisation (EA) has been received for the AEP Legoko Solar PV Facility on the northern section of the farm.	No issues or concerns with the proposed PV facility. In support of renewable energy development and the project. Landowner not aware of any land claims on the property. Aware of a mining right registered on the property.
Farm Legoko 1/460	Affected property	Frans Briedenhann	Landowners resides on farm with his family. 2 permanent farmworkers reside on the property.	Main farmhouse Workers accommodation Function hall which can cater for up to 60 people.	The farm is utilised for livestock and game farming (not for commercial purposes). EA has been received for the AEP Mogobe Solar PV Facility over the centre of the farm.	No issues or concerns with the proposed PV facility or power line.
Farm 461 (The proposed self-build 132kV power line is proposed to traverse the southern corner of this farm)	Adjacent to the west	Kumba Iron Ore	A portion of the Kathu town falls within this farm portion	N/A	Sishen iron ore mine, includes large waste rock dump landforms, large infrastructure and buildings.	No issues with the proposed development and associated infrastructure.
Farm Bestwood 1/459	Adjacent to the north	Petrus Duvenhage	Landowners reside on farm.	Main farmhouse (occupied by landowners) and few other buildings (farm workers and farm infrastructure)	Livestock farming, primarily cattle and goats farming. Environmental authorisation has been received for a PV solar facility on the south west	No issues or concerns with proposed PV facility and power line. Concerns regarding safety and security. Requested that facility is fenced such as the other facilities in the area. Noted that heritage sites were recorded on the property during the EIA for the solar facility.

Farm Name & Portion	Location	Landowner Names	Any residents living on farm (i.e. farm workers, tenants, landowners)	Homesteads / Buildings on farm	Current activities taking place on the farm (sheep farming etc.) and any prominent features.	Comments noted
					corner of the farm. The Bestwood Solar farm is located on the portion north of portion 1, the Remainder of the Farm Bestwood 459.	Landowner not aware of any land claims on the property. Not aware of any mining right registered on the property.
Farm Legoko RE/460	Adjacent to the east	Dihan van Rensburg	Landowner resides on the property. 3 permanent farm workers reside on the property	Main farmhouse Workers accommodation	Low density livestock and game farming (for local commercial use). The authorised AEP Kathu Solar Facility is located in the south-western corner of this property.	No issues or concerns with proposed PV facility and power line. Concerns regarding safety and security. Reiterated that crime in the area should not increase as a result of the project. A concern was raised regarding the location of the access to the site and the potential to open up the area as a thoroughfare. Appropriate management of issue must be implemented.
Farm 548	To the east	Abbie Wiid (SA Army Combat Training Centre)	A small rural community resides in the centre of the farm.	N/A	Army Combat Training Centre over 158 000ha.	No issues with the proposed development and associated infrastructure.

4.6. Baseline Description of the Social Environment

The following subsections provide an overview of the socio-economic profile of the Gamagara LM within which Mogara Solar is proposed. In order to provide context against which the LM's socio-economic profile can be compared, the socio-economic profiles of the John Taolo Gaetsewe DM, Northern Cape Province, and South Africa as a whole have also been provided where applicable. The data presented in this section have been derived from the 2011 Census, the Local Government Handbook South Africa 2018, the Northern Cape Provincial Spatial Development Framework (PSDF), and the John Taolo Gaetsewe DM and Gamagara LM IDPs.¹

4.6.1. 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 Gamagara LM has a population of 41 617, which is equivalent to approximately 18.5% of the DM population, 3.6% of the Provincial population, and less than 0.1% of the National population. The Gamagara LM also has a population density of 4.4/km², which is almost half of the DM's population density (8.2/km²).

Between 2001 and 2011, the LM experienced a population growth rate of 5.8% per year. This is in contrast to the DM, Province, and South Africa as a whole, which all experienced population growth rates of 1.6%, 1.4% and 1.5% per year respectively. The Gamagara LM's considerable population growth rate can be attributed to individuals moving into the area in search of employment opportunities as a result of the significant mining activities occurring within the region.

Table 4.3: Overview of general statistics of South Africa, Northern Cape, John Taolo Gaetsewe DM, and Gamagara LM (Source: Census 2011).

Census 2011	Area (km ²)	Population total	Male	Female	Population density/km ²	Population growth rate (2001 – 2011)
South Africa	1 220 813	51 770 560	25 188 791	26 581 769	42.4	1.5%
Northern Cape	372 889	1 145 861	564 972	580 889	3.1	1.4%
John Taolo Gaetsewe DM	27 283	224 801	108 966	115 835	8.2	1.6%
Gamagara LM	2 619	41 617	22 710	18 907	4.4	5.8%

4.6.2. Population Group Dynamics

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

¹ These sources largely made use of statistical information derived from the Census 2011. The information presented in this Chapter may therefore be outdated, but is considered sufficient for the purposes of providing an overview of the socio-economic characteristics against which potential impacts can be identified and their significance assessed).

engaging with the local communities (and whether different communication strategies should be adopted for different community groups).

According to Census 2011, approximately 55% of the Gamagara LM population are Black African, followed by 28.7% which are Coloured, 14% which are White, and 0.6% which are Indian / Asian. This population structure differs from that of the John Taolo Gaetsewe DM which is characterised by 84.8% Black African, followed by 9.3% Coloured, and 5% White, but is somewhat similar to the Northern Cape Provincial population structure, which is also characterised by a much more predominant split between African and Coloured populations, and a much larger proportion of the population (40.3%) comprising Coloured individuals.

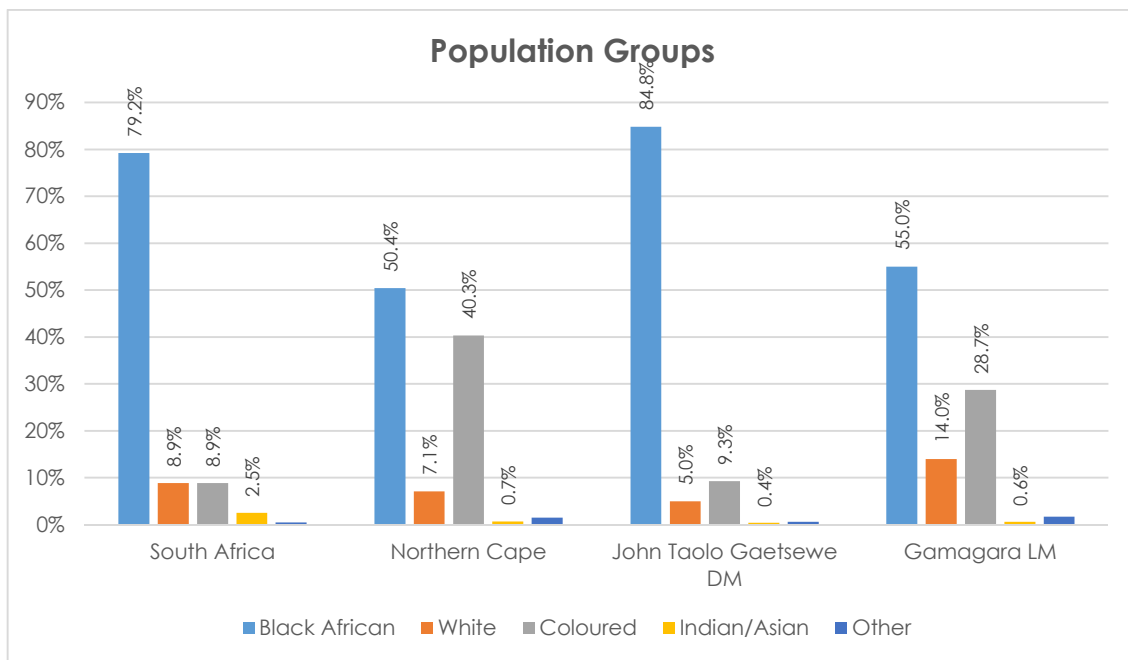


Figure 4.3: Population groups of South Africa, Northern Cape, John Taolo Gaetsewe DM, and Gamagara LM (Source: Census 2011).

4.6.3. 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 Gamagara LM is male dominated with males making up 54.6% of the population, and females make up the remaining 45.4%. This differs from the DM, Provincial and National populations, which are all female dominated. Such a profile can again be attributed to the fact that a significant number of male individuals may have moved into the LM in search of employment opportunities, thus resulting in a male dominated population.

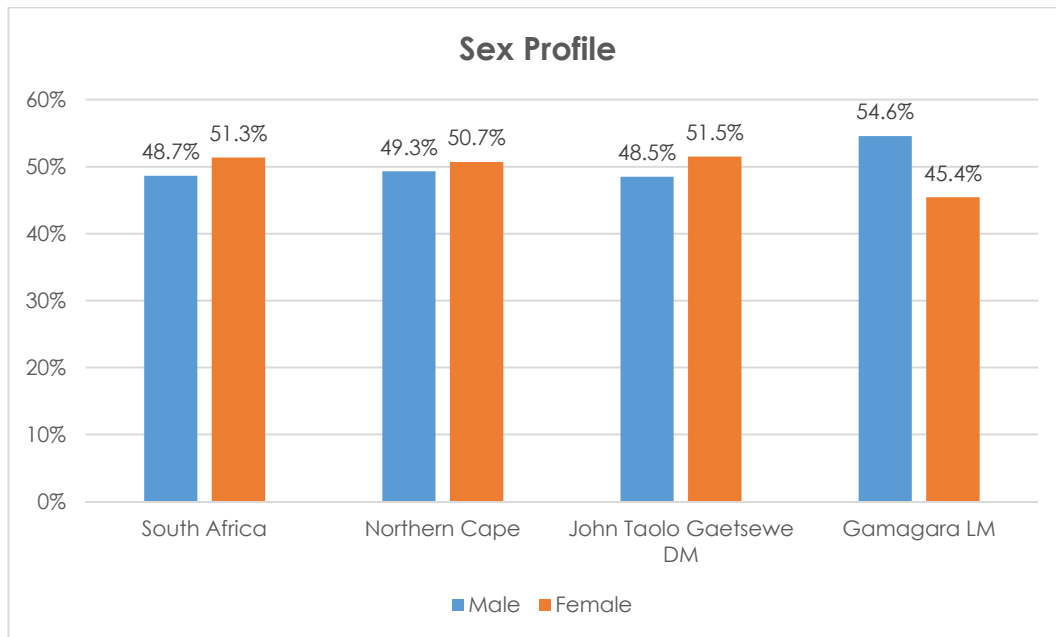


Figure 4.4: Sex profile within South Africa, Northern Cape, John Taolo Gaetsewe DM, and Gamagara LM (Source: Census 2011).

4.6.4. 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 the elderly members of society, including the provision of adequate health care and nursing facilities.

According to **Figure 4.5** the age structure of the Gamagara LM differs significantly from that of the John Taolo Gaetsewe DM, Northern Cape Province and South African National populations. The South African National population is characterised by a large proportion of youth specifically between 0 – 4 years, and 15 – 29 years as represented by the convex shape. The Northern Cape Provincial population and John Taolo Gaetsewe DM while also youth dominated, are far more uniform in their distribution with no significant outliers in any one population group. Conversely however, the Gamagara LM is characterised by a much larger proportion of males aged between 20 and 39 years of age, and to a smaller extent females of the same age group, as reflected by a convex shape in the population age graph.

The higher proportion of potentially economically active persons within the Gamagara LM implies that there is a considerable human resource base for development projects to involve local population. The economically active population represents the largest proportion of the population, which means that focus needs to be placed on employment creation.

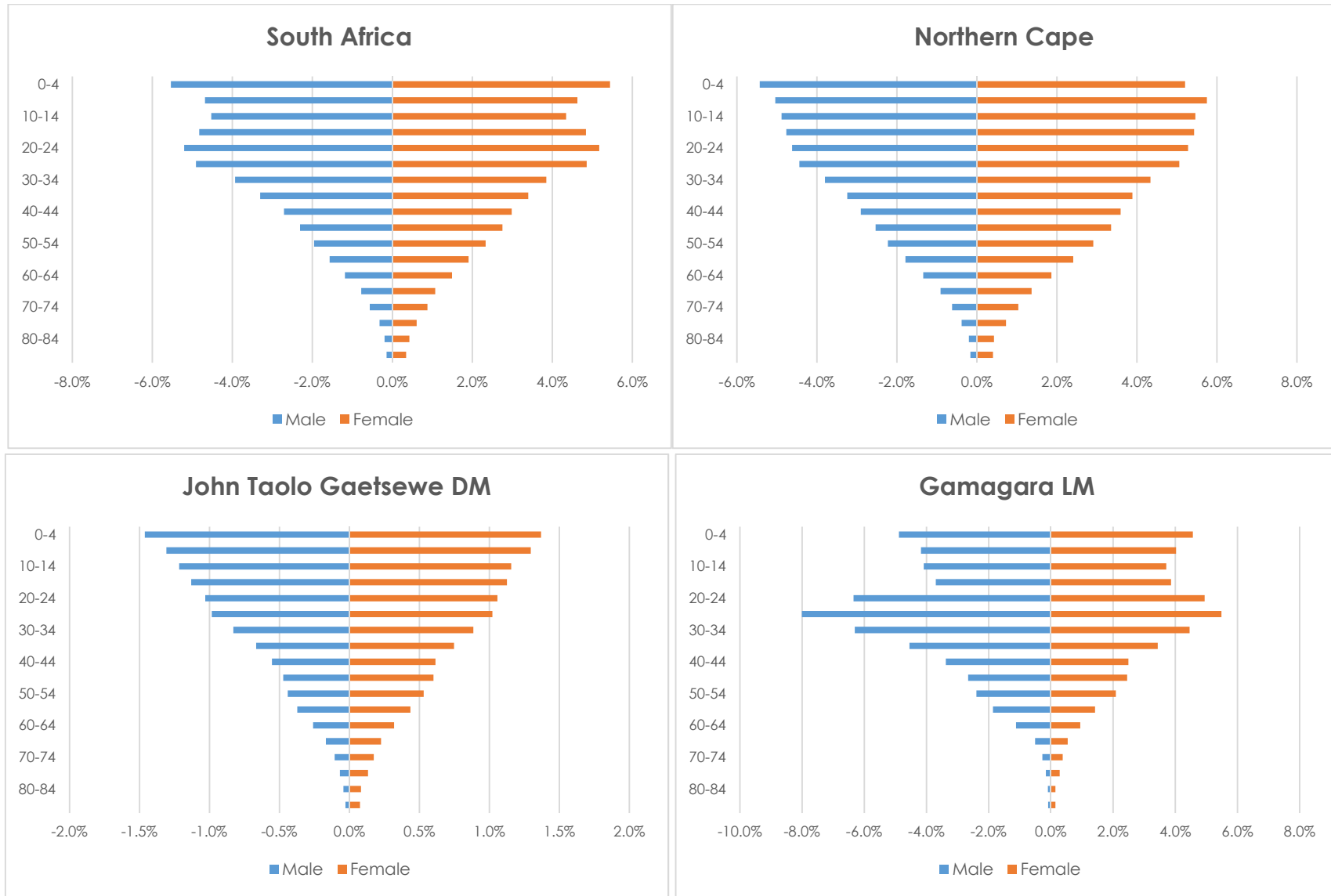


Figure 4.5: Age profile within South Africa, Northern Cape, John Taolo Gaetsewe DM, and Gamagara LM (Source: Census 2011).

4.6.5. Dependency Ratio

An area's dependency ratio provides an indication of that 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 Gamagara LM has a dependency ratio of 28.1, implying that for every 100 people within the Gamagara LM, 28.1 (i.e. over a quarter) of them are considered dependent. This figure is considerably lower than that of the John Taolo Gaetsewe DM (i.e. 38.8), Provincial (35.8) and National (34.5) dependency ratios.

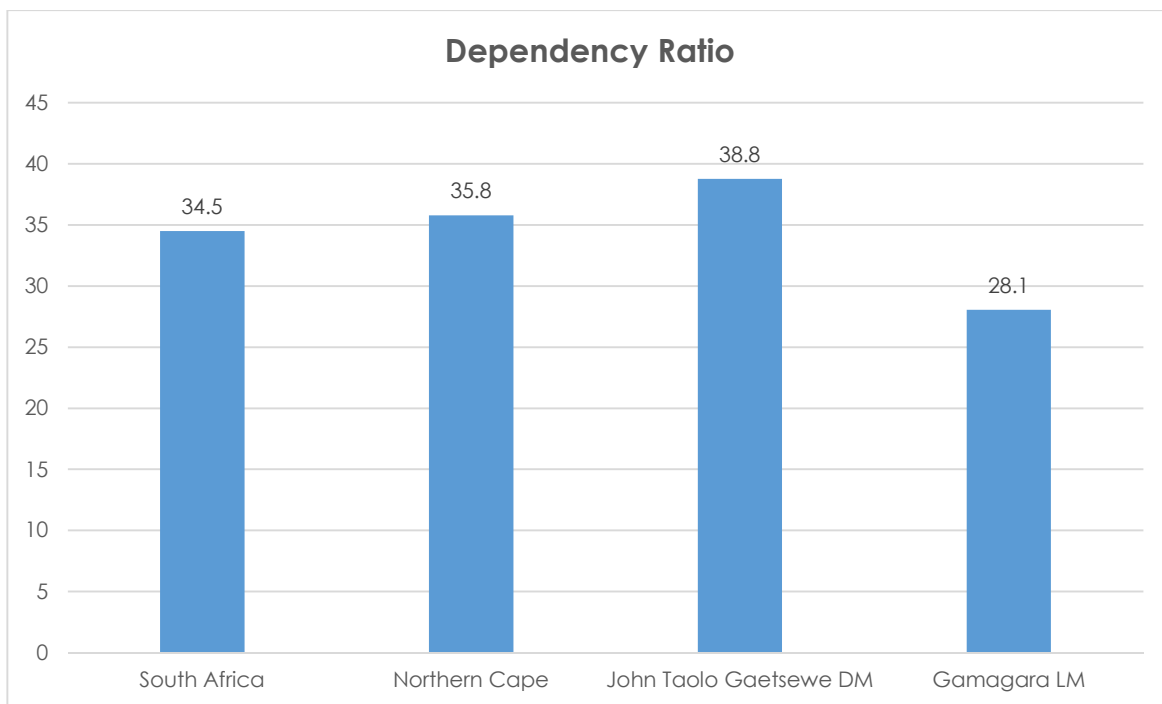


Figure 4.6: Dependency ratio of South Africa, Northern Cape, John Taolo Gaetsewe DM, and Gamagara LM (Source: Census 2011).

4.6.6. Education Levels

Education plays a pivotal role in community development. The level of education influences growth and economic productivity of a region. 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. While low levels of education typically lead to a low 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, Northern Cape, John Taolo Gaetsewe DM, and Gamagara LM.

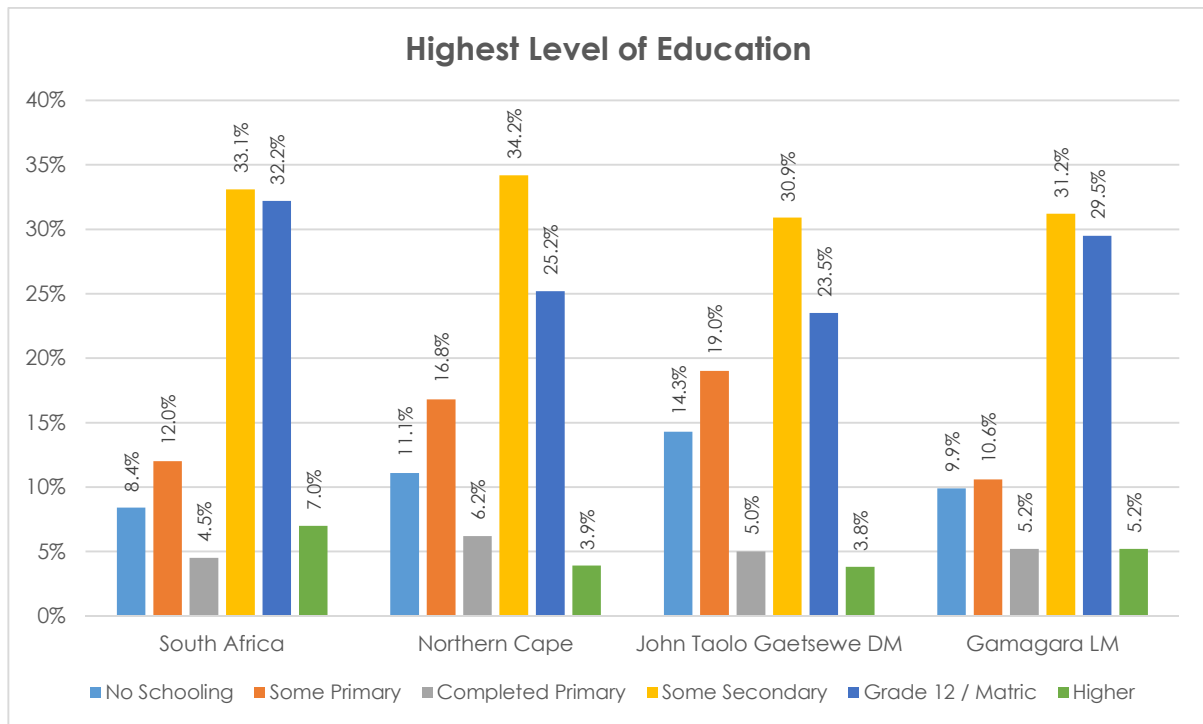


Figure 4.7: Highest Level of Education in South Africa, Northern Cape, John Taolo Gaetsewe DM, and Gamagara LM (Source: Census 2011).

Approximately 9.9% of the Gamagara LM population aged 20 years and older have received no form of schooling. This figure is lower than the DM (14.3%), and Provincial (11.1%) averages, but higher than the National (8.4%) average. The majority of 31.2% of the LM population have received some secondary education, followed by 29.5% which have completed Matric (which correlates with the DM, Provincial, and National trends). Approximately 5.2% of the LM population have received some form of higher / tertiary education.

Due to the fact that a smaller than average proportion of the Gamagara LM population have received no form of schooling (9.9%), and due to the fact that over a third (34.7%) of the LM population which have received some form of schooling have completed Matric, or higher, it can be expected that a considerable proportion of the population will either be skilled, or have a low-skill level, and would therefore be suitable for employment across a range of non-skilled, low-skill or skilled sectors. The need for skills development opportunities in order to improve the skills, and income levels of the area, would therefore need to be assessed in detail as part of the socio-economic development and upliftment initiatives of the project should it come to fruition.

4.6.7. 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.

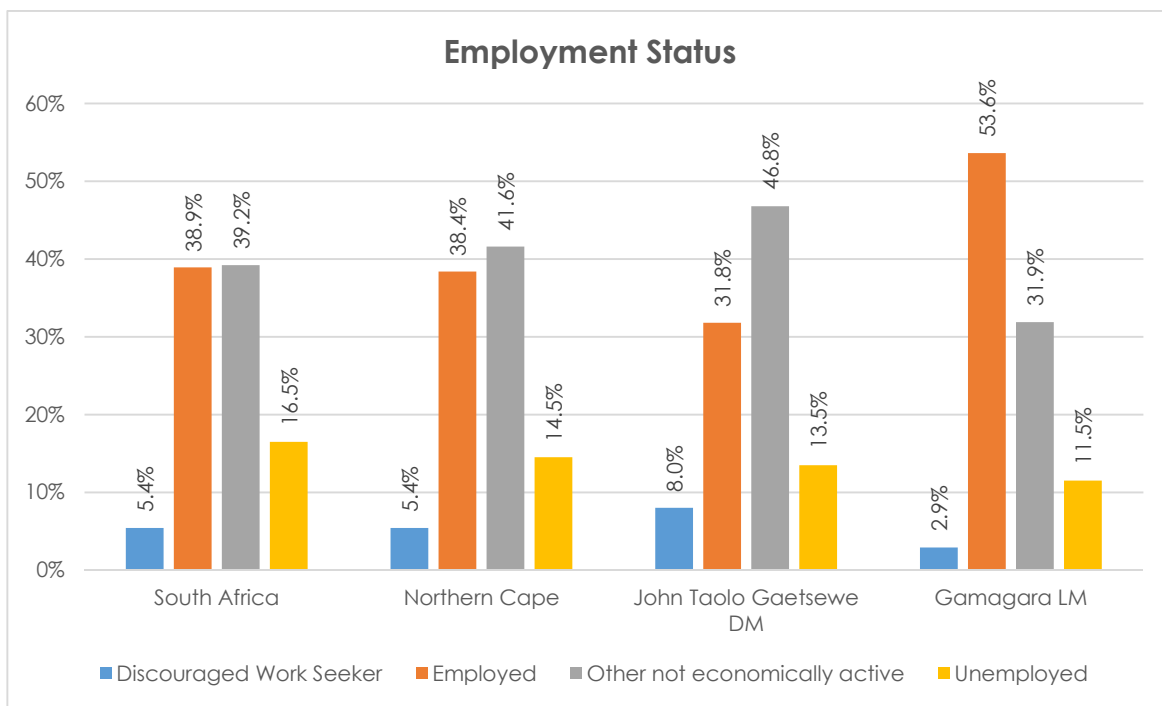


Figure 4.8: Employment Status in South Africa, Northern Cape, John Taolo Gaetsewe DM, and Gamagara LM (Source: Census 2011).

Of the Gamagara LM's labour force (i.e. individuals ages between 15 and 64 years of age) approximately 31.9% 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 of significance as it demonstrates a population's willingness and desire to find employment. The economically inactive proportion of the Gamagara LM's labour force is significantly lower than the DM (46.8%), Provincial (41.6%), and National averages (39.2%). This high proportion of the economically inactive population implies that irrespective of the size of the LM and DM labour forces, 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 John Taolo Gaetsewe DM and Gamagara LM). This also implies that there may be limited human capital available within the John Taolo Gaetsewe DM and Gamagara LM, without the provision of training and development of young and economically active people in occupations in the relevant fields needed.

Approximately 11.5% of the Gamagara LM's labour force is unemployed. This means that 11.5% of the economically active population within the LM are currently unemployed, but are willing and able to work, and are actively seeking employment. The unemployment rate for the LM is lower than the DM (13.5%), Provincial (14.5%), and National averages (16.5%). In addition, the employed proportion of the population within the LM (53.6%) is considerably higher than the DM (31.8%), Provincial (38.4%), and National averages (38.9%).

According to the Gamagara LM IDP 2017 – 2022, the employment rate will only grow once the skills level within the LM improves. Currently the mines require a minimum of Grade 10 to be employed. Such a scenario has created a barrier to the employment of those individuals that do not have a Grade 10 to be absorbed in the labour market, which increases the unemployment and dependency rate in the LM, and as a result the payment of services will also ultimately suffer.

In order to fully understand the employment levels within an area it is also important to gain an understanding of the type of employment. 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.

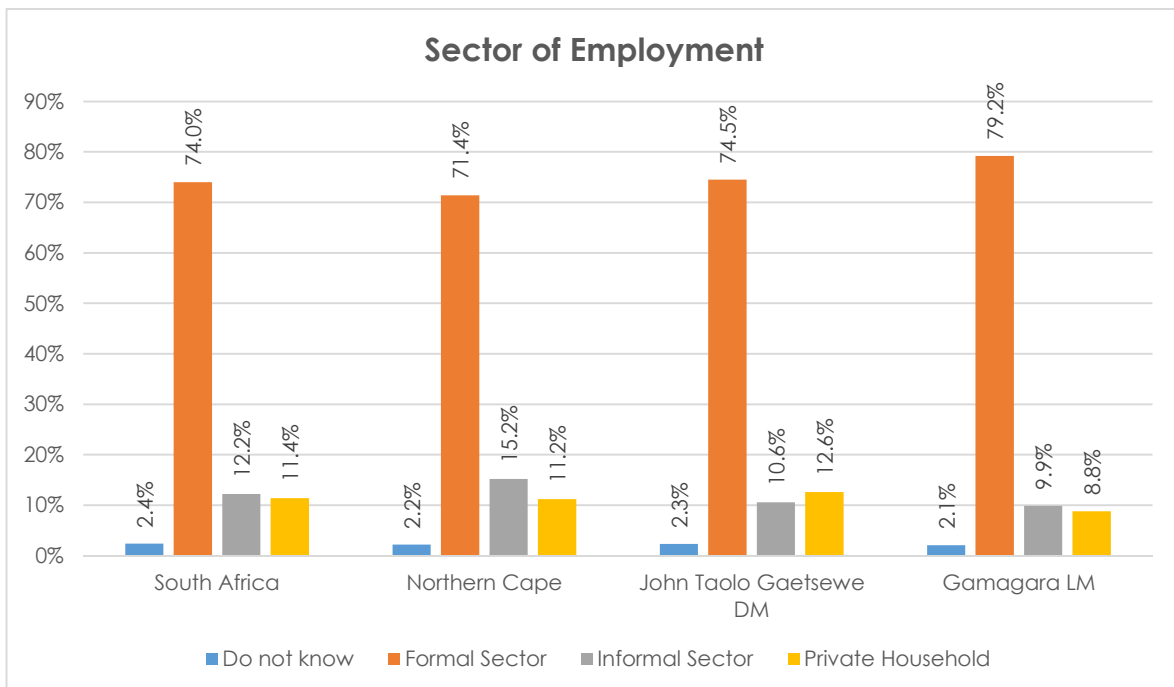


Figure 4.9: Sector of employment in South Africa, Northern Cape, John Taolo Gaetsewe DM, and Gamagara LM (Source: Census 2011).

Of the employed population of the Gamagara LM approximately 79.2% are employed within the formal sector, followed by 9.9% of the employed population employed in the informal sector, and 8.8% employed in private households. These figures correlate closely with the John Taolo Gaetsewe DM, Northern Cape Province, and South Africa as a whole.

The creation of employment opportunities within the formal sector as a result of the development of Mogara Solar 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.

4.6.8. Annual Household Income levels

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

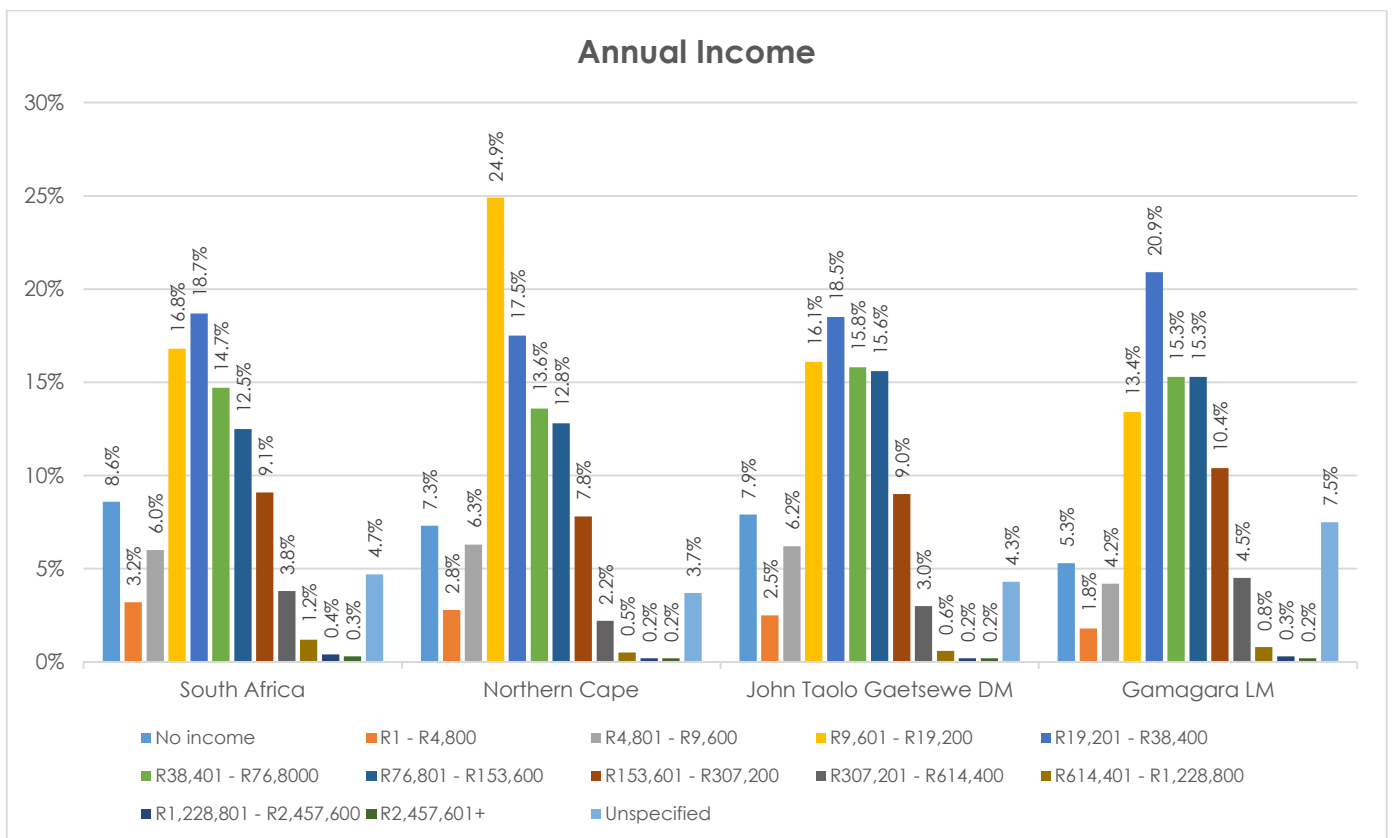


Figure 4.10: Average Annual Income in South Africa, Northern Cape, John Taolo Gaetsewe DM, and Gamagara LM (Source: Census 2011).

Poverty levels prevalent within a particular area 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.

Approximately 46% of households within the Gamagara LM fall within the low income (poverty level) bracket, 41% within the medium income bracket, and 13% in the high income bracket. This split differs from that of the Northern Cape, John Taolo Gaetsewe DM and South Africa as a whole, which are all characterised by higher proportions of households falling within the low income bracket, and fewer households within the high income bracket.

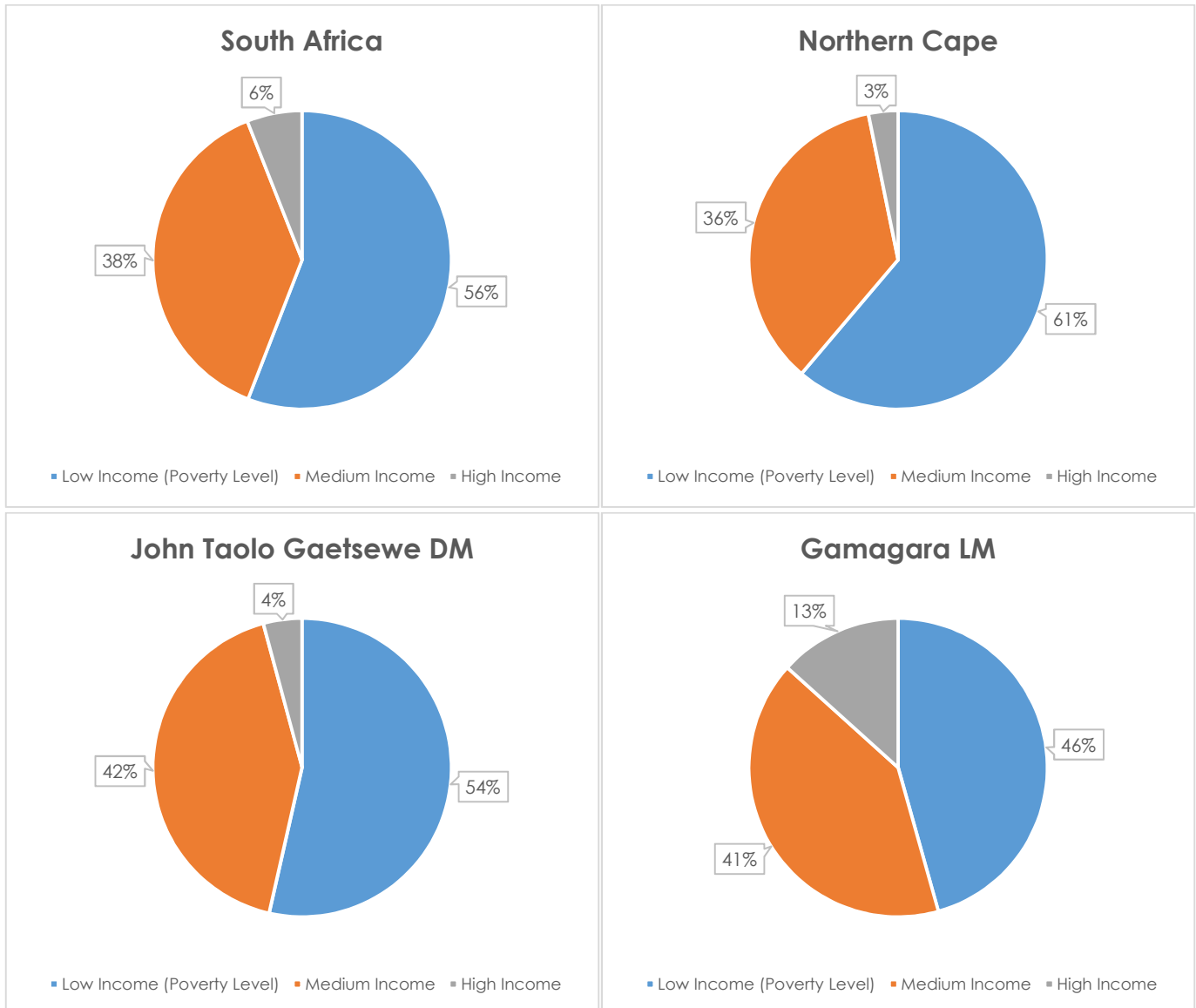


Figure 4.11: Average Income Levels in South Africa, Northern Cape, John Taolo Gaetsewe DM, and Gamagara LM (Source: Census 2011).

4.6.9. Economic Activities

According to the Gamagara LM IDP 2017 – 2022, the LM has become a significant player in the Northern Cape Province, and an important contributor to South Africa's mining sector, and international mining value chain. As a result, the LM has become a centre for the development of infrastructure required to accommodate such development within the mining sector. The Gamagara LM has identified economic push and pull factors, such as education and training, research, entrepreneurship, community image and the arts. Gamagara has planned to develop into a commercial and industrial municipality over and above

the mining economic spin-offs. It has potential to develop into an industrial city by 2030 and a manufacturing city by 2060. The Northern Cape – Saldanha Bay railway line also present the LM with the opportunity to grow economically, while exploiting the benefits and spin-offs that could be derived from the N14 road to Namibia could also contribute to the economic growth of the LM. The main economic sectors within the Gamagara LM include mining, game farming and business services.

4.6.10. Health

South Africa's health sector is most concerned with communicable, non-communicable, pre-natal and maternal, and injury-related conditions. The Northern Cape Department of Health has identified preventative health as a key priority in combating disease through community participation, public advocacy, and health screening in order to prevent morbidity and mortality. The John Taolo Gaetsewe DM lacks appropriate medical care, specifically eye and oral care. There are only 3 public sector dentists and no public sector optometrists within the DM.

4.6.11. Households

As of 2011 there were a total of 11 646 households within the Gamagara LM. This is equivalent to 18.6% of the total number of households within the John Taolo Gaetsewe DM (62 751), 3.7% of the total number of households within Northern Cape Province (313 795), and 0.07% of the total number of households within South Africa (15 065 018). Of the total number of households within the Gamagara LM the majority of 60.7% comprise houses (i.e. house or brick / concrete block structure on a separate stand or yard or on a farm), followed by 12.7% which comprise informal dwellings (i.e. shacks, not in a backyard).

According to the Gamagara LM IDP 2017 – 2022 the growth in mining activities, has resulted in a growth in the need for accommodation in the town of Kathu and adjacent towns. Due to the high demand for accommodation, rental prices have gone up leading to unaffordability and mushrooming of illegal second dwellings (i.e. log homes in Kathu) and backyard shanties in these areas. As a result, there is a need to develop affordable rental houses in Kathu.

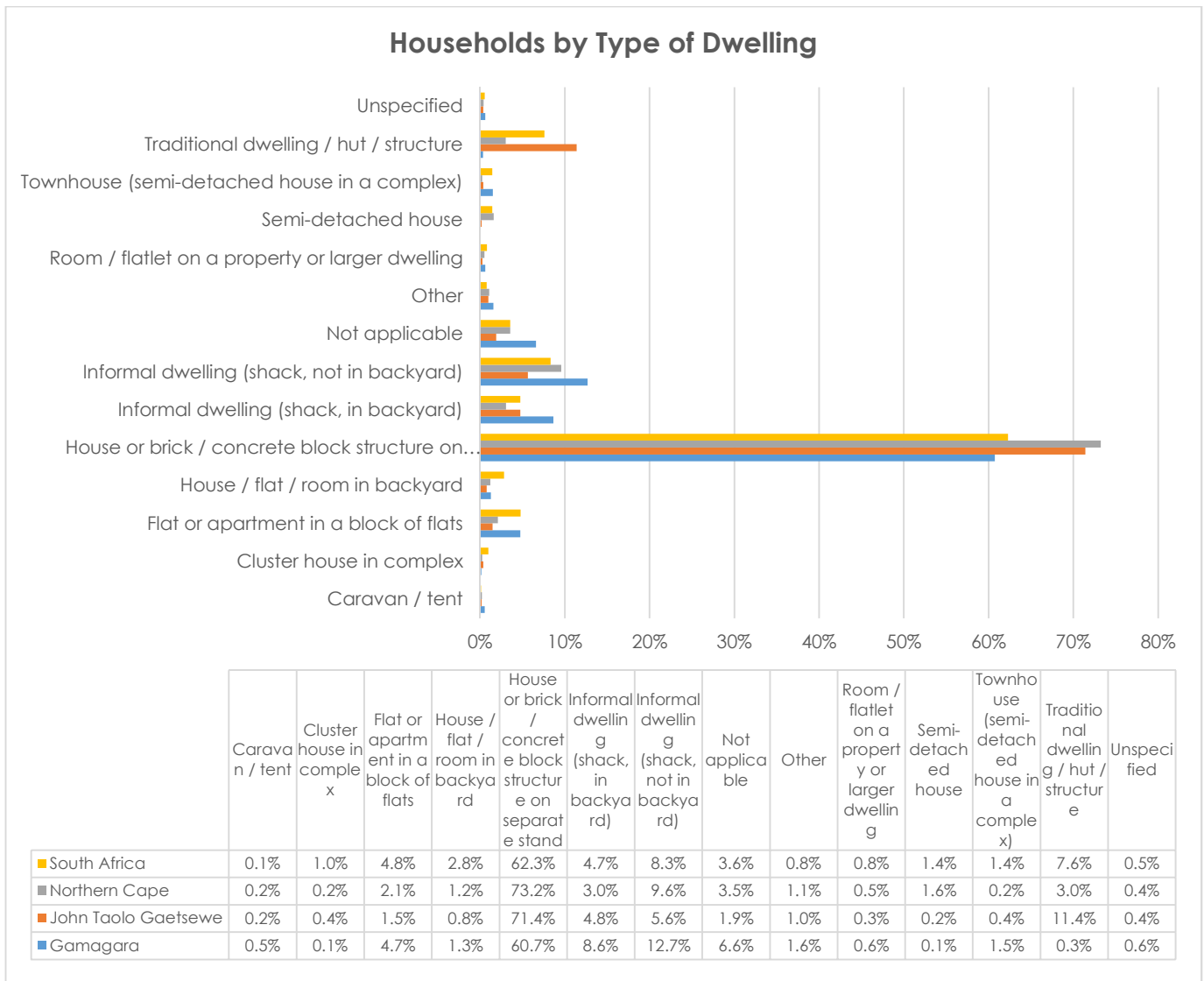


Figure 4.12: Households by Type of Dwelling within South Africa, Northern Cape, John Taolo Gaetsewe DM, and Gamagara LM (Source: Census 2011).

4.6.12. 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.** 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.	Ventilated Improved Pit (VIP) latrine toilet, 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.

Access to basic services is assessed at a household level. An overview of households within the Gamagara LM's access to basic services is described in the following sub-sections.

4.6.12.1. Access to Water

Due to the fact that Gamagara LM is located within an arid area, it has extremely limited water resources. Settlements in the area are therefore heavily dependent on the extraction of groundwater for various uses. Although water resources in the area are supplemented by Sedibeng Water, the exponential growth in the area, especially around Kathu, has necessitated the close monitoring and protection of underground water resources. Sedibeng Water is responsible for providing potable water to the residents of Gamagara LM.

Approximately 92.4% of the households within the Gamagara LM receive their water from a regional / local water scheme (operated by the municipality or other water services provider), which is considered to be above basic level service provision. This figure correlates closely with the John Taolo Gaetsewe DM, Northern Cape Province, and South Africa.

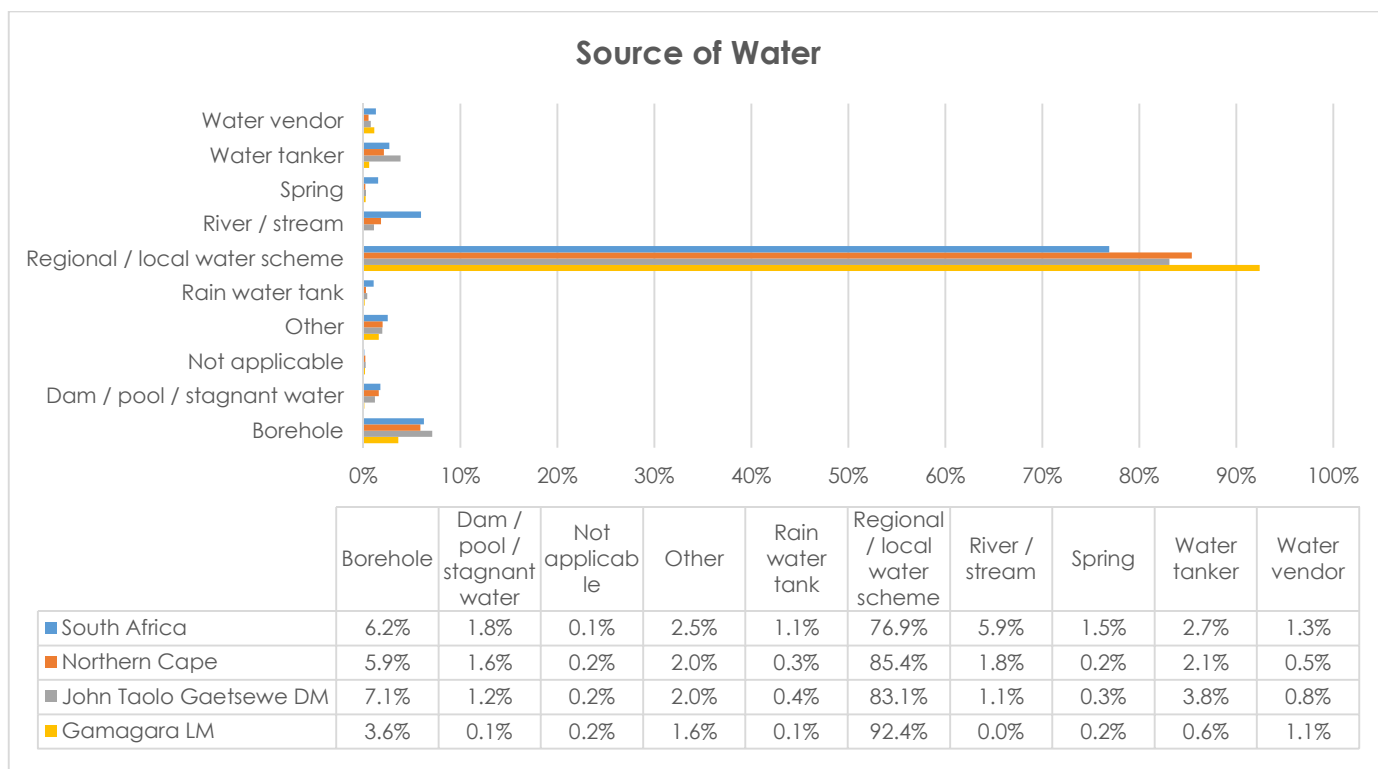


Figure 4.13: Access to water within South Africa, Northern Cape, John Taolo Gaetsewe DM, and Gamagara LM (Source: Census 2011).

4.6.12.2. Access to Sanitation

The majority of households (75.5%) within the Gamagara LM have access to and make use of flush toilets connected to a sewerage system, followed by 10.3% who have access to and make use of flush toilets connected to a septic tank. Households within the Gamagara LM are therefore characterised by a high level of access to sanitation services.

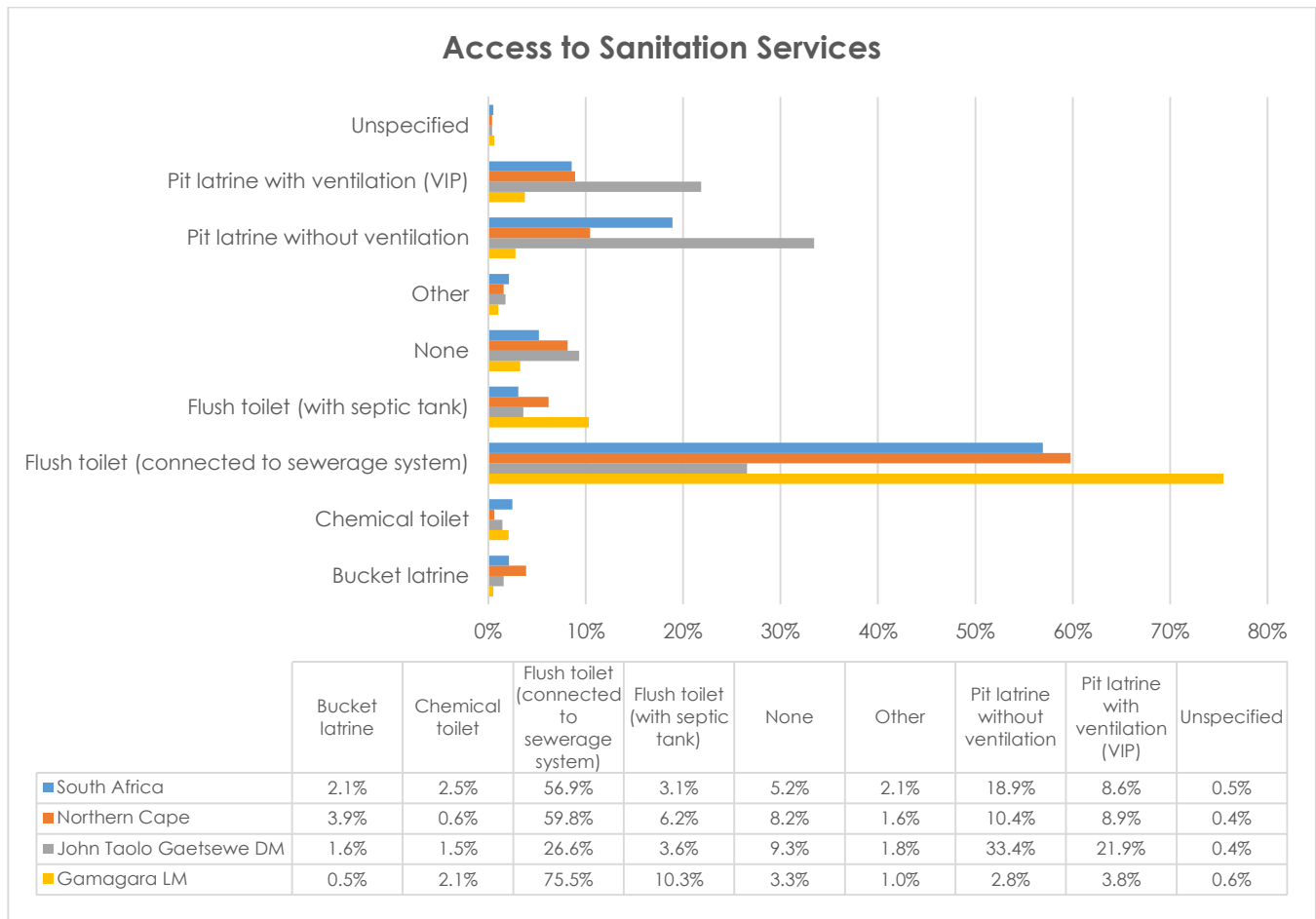


Figure 4.14: Access to sanitation within South Africa, Northern Cape, John Taolo Gaetsewe DM, and Gamagara LM (Source: Census 2011).

4.6.12.3. 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.

The significant majority of households within the Gamagara LM (81.6%) have access to electricity for lighting purposes. Similarly the majority of 76.4% of households within the LM make use of electricity for cooking, and 67.7% for heating purposes.

A significant proportion (39.3%) of households within the LM make use of wood for cooking purposes, and 16.1% make use of candles for their lighting purposes. Households within the Gamagara LM, John Taolo Gaetsewe DM and Northern Cape Province are all characterised by high levels of access to electricity for cooking, heating, and lighting purposes.

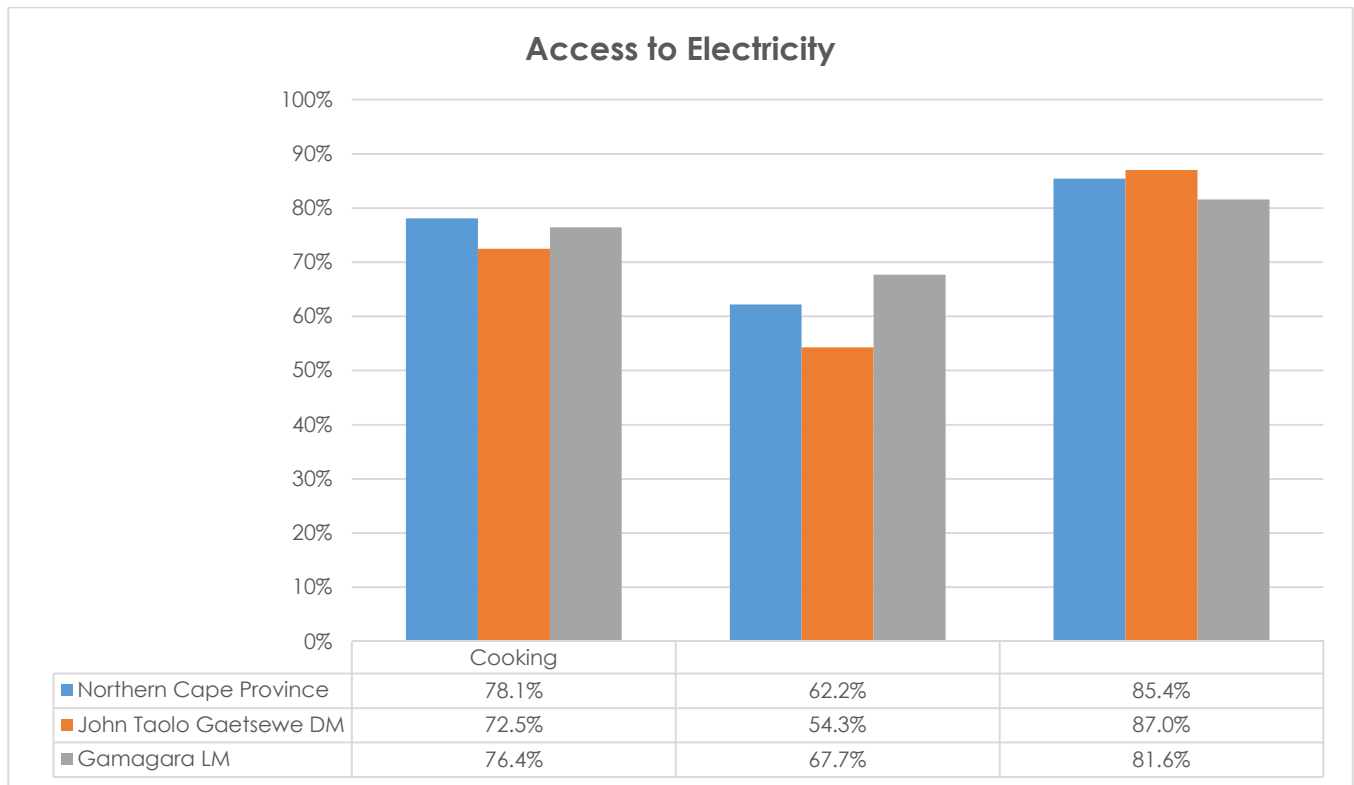


Figure 4.15: Access to Electricity within the Northern Cape, John Taolo Gaetsewe DM, and Gamagara LM (Source: Census 2011).

4.6.12.4. Access to Refuse Removal

Approximately 92.6% of households within the Gamagara LM have their refuse removed by a local authority at least once a week. This figure is significantly higher than the DM (27.1%), Provincial (67.3%), and National (58.0%) averages, indicating high levels of access to refuse removal services within the Gamagara LM.

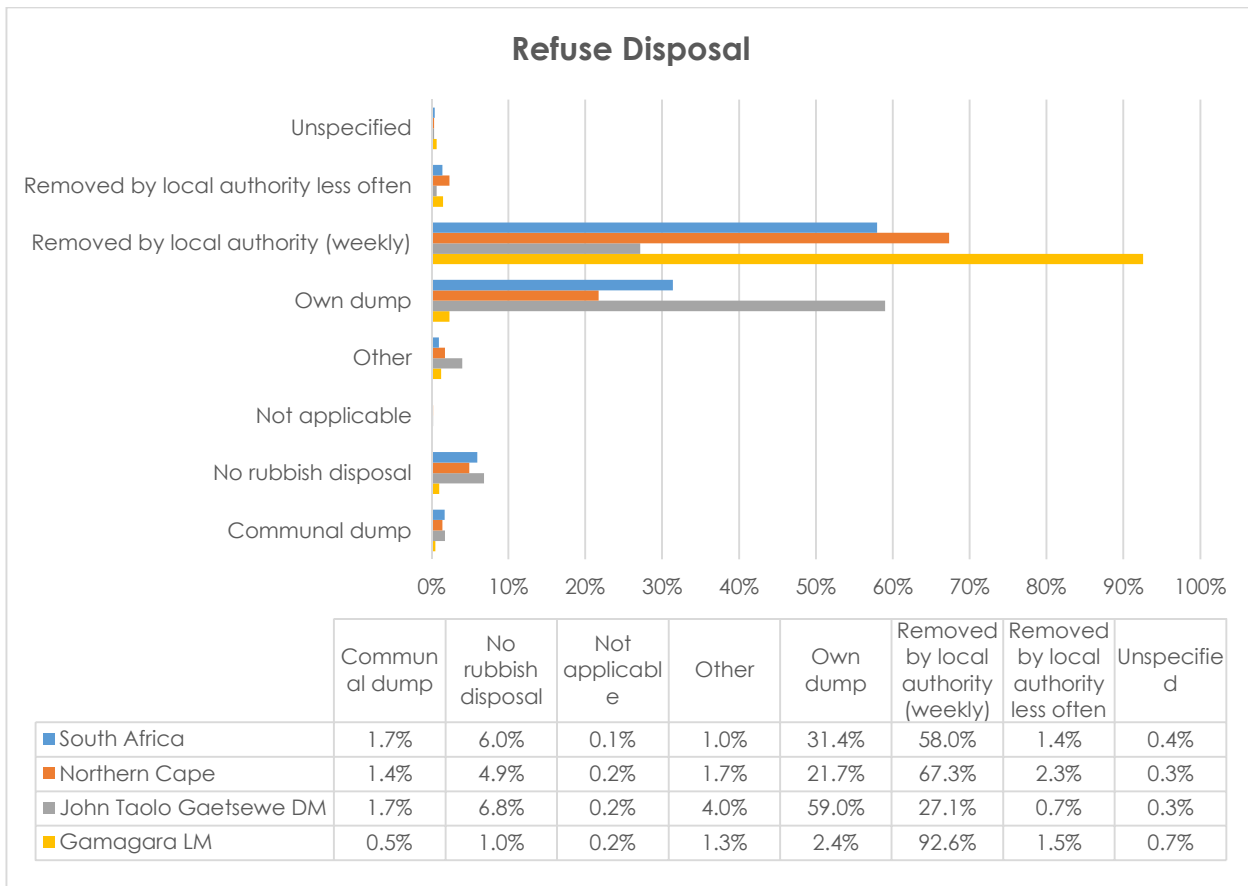


Figure 4.16: Access to Refuse Removal Services within South Africa, Northern Cape, John Taolo Gaetsewe DM, and Gamagara LM (Source: Census 2011).

4.6.13. Baseline summary

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

- » The project is proposed within the Northern Cape Province, which is South Africa’s largest, but least populated Province.
- » The project is proposed within the Gamagara LM of the John Taolo Gaetsewe DM.
- » The Gamagara LM covers an area of land approximately 2 619km² in extent, and comprises five towns, namely: Kathu, Shesheng, Dibeng, Dingleton, and Olifantshoek. The town of Kathu is the largest within the LM and the administrative centre of the LM.
- » Between 2001 and 2011 the Gamagara LM experienced a positive population growth rate of 5.8% per year, almost doubling in size from 23 202 people in 2001 to 41 617 people in 2011.
- » The Gamagara LM is male dominated, with males comprising approximately 54.6% of the LM population.
- » Black Africans comprise the predominant population group within the Gamagara LM, John Taolo Gaetsewe DM, and Northern Cape Province.
- » The Gamagara LM, John Taolo Gaetsewe DM, and Northern Cape Provincial population age structures are youth dominated. A considerable proportion of the respective populations therefore comprise individuals of the economically active population between the ages of 15 – 64.
- » The Gamagara LM has a dependency ratio of 28.1, which is considerably lower than the John Taolo Gaetsewe DM (38.8), Northern Cape Province (35.8), and South Africa (34.5) as a whole.

- » The majority (31.2%) of the Gamagara LM population aged 20 years and older have received some form of secondary schooling, while 29.5% have completed Matric, and 5.2% have received some form of higher education. Such figures imply that the LM population can be expected to have a relatively low-skill level and would either require employment in low-skill sectors, or skills development opportunities in order to improve the skills level of the area.
- » The unemployment rate of the Gamagara LM (11.5%) is lower than that of the John Taolo Gaetsewe DM, Northern Cape and South Africa as a whole. In addition the proportion of economically inactive individuals within the Gamagara LM is lower than in the John Taolo Gaetsewe DM.
- » Household income levels in the LM are higher than the DM, Province and South Africa as a whole, with a lower proportion of low income earners, and higher proportion of high income earners. The area can therefore be expected to have a lower poverty level with associated social consequences such as not being able to pay for basic needs and services, and poor living conditions than that of the DM and Northern Cape Province.
- » The primary economic activities within the Gamagara LM include mining, game farming, and business services.
- » The Gamagara LM and John Taolo Gaetsewe DM are poorly serviced in terms of public sector health facilities. There are only 3 public sector dentists within the John Taolo Gaetsewe DM, and no public sector optometrists.
- » The majority of households within the Gamagara LM comprise formal brick dwellings.
- » The majority of households within the Gamagara LM are well serviced with regards to electricity, water, sanitation, and refuse removal.

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 that were identified during the Scoping process for the detailed design and construction, operation, and decommissioning phases of Mogara Solar.

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 positioning of the PV array and / 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 EIA process occur, 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:** At the peak of construction the project is likely to create a maximum of 300 to 400 employment opportunities. These employment opportunities will be temporary, and will last for a period of approximately 12 to 18 months (i.e. the length of construction). Employment opportunities generated during the construction phase will include low skilled, semi-skilled, and skilled opportunities. Solar PV projects make use of large numbers 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. The majority of the labour force is expected to be sourced from the surrounding towns. No labourers will be accommodated on-site during the construction period.
- » **Establishment of an access road to the site:** Access to the project site will be established for the construction of the facility. Access to the project site is possible through the use of existing unsurfaced farm roads, which can be accessed from the N14 national road. The most appropriate access route will be utilised. 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 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 potential impacts associated with this phase of 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 PV solar 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. For array installations, vertical support posts are driven into the ground. The posts will hold the support structures (tables) on which the PV modules would be mounted. Trenches are dug for the underground AC and DC cabling and the foundations of the inverter enclosures and transformers are prepared if necessary. Underground cables and overhead circuits connect the Power Conversion Stations (PCS) to the on-site AC electrical infrastructure and ultimately the solar facility's on-site substation. The construction of the 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.
- » **Construction of the power line:** A power line is constructed by surveying the power line route, constructing foundations for the towers, installing the towers, stringing the conductors, and finally rehabilitating disturbed areas and protecting erosion sensitive areas.
- » **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 Mogara Solar

6.1.1.1. Direct and indirect employment opportunities and skills development

It is anticipated that at its peak the construction of the proposed project will result in the creation of approximately 300 to 400 employment opportunities. Of those employment opportunities likely to be generated, approximately 60% (i.e. 180 to 240) will accrue to low skilled workers, 25% (i.e. 75 to 100) to semi-skilled workers, and 15% (i.e. 45 to 60) to skilled 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), while the skills developed through experience in the construction of the project will be retained by the community members involved. 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 large numbers 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). While difficult to quantify, indirect employment opportunities are significant in that they provide greater opportunity for women to be included and benefitted, albeit 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.

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.

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 enhancement	With enhancement
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	

Enhancement:

- » 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 Gamagara LM, John Taolo Gaetsewe DM, Northern Cape 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 skills 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 the 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 the construction phase of the proposed project. The economic multiplier effects from the use of local goods and services will include, but is not limited to, the provision of construction materials and equipment, and workforce essentials such as catering services, trade clothing, safety equipment, ablution, accommodation, transportation and other goods. In addition, off-site accommodation may be required in nearby towns such as Kathu for contract workers and certain employees. The increase in demand for goods and services may stimulate local business and local economic development (however locally sourced materials and services may be limited due to availability). There is likely to be a direct increase in industry and indirect increase in secondary businesses.

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 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 enhancement	With enhancement
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	
Enhancement:		
<ul style="list-style-type: none"> » 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:		
<ul style="list-style-type: none"> » Opportunity for local capital expenditure which has the potential to benefit the local service sector. 		
Residual impacts:		
<ul style="list-style-type: none"> » Improved local service sector which will result in a 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 to 400 opportunities at the peak of construction comprising 180 to 240 opportunities for low skilled workers, 75 to 100 opportunities for semi-skilled workers, and 45 to 60 opportunities for skilled workers), 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 Kathu (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

	Without mitigation	With mitigation
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.		
Extent	Local (1)	Local (1)
Duration	Short-term (2)	Short-term (2)
Magnitude	Moderate (6)	Low (4)
Probability	Improbable (2)	Improbable (2)
Significance	Low (18)	Low (14)
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 locals first procurement policy.
- » Provide transportation for workers (from Kathu 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 loiterers from the construction site.

Cumulative impacts:

- » Additional pressure on natural resources, services, infrastructure and social dynamics in the area due to an increase 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. All landowners have raised concerns regarding security in the area and have reiterated that crime in the area should not increase as a result of the project. A concern was raised regarding the location of the access to the site and the potential to open up the area as a thoroughfare.

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 within daylight hours during the construction phase, and / or as any deviation that is approved by the relevant authorities.		
» Provide transportation for workers 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 to ensure appropriate security procedures and measures are implemented.
- » Access in and out of the construction site 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 EPC Contractor should implement a stakeholder management plan to address neighbouring farmer concerns regarding safety and security.
- » The project proposed must prepare and implement a FMP; this must be done in conjunction with surrounding landowners.
- » The EPC Contractor must prepare a Method Statement which deals with fire prevention and management.

Cumulative impacts:

- » Possible increase in crime levels (with influx of people) with subsequent possible economic losses.
- » Increased risk of veld fires if vegetation clearing is not appropriately implemented, monitored and maintained.

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 N14 national road provides the primary access to the area, while the project site itself is accessed through the use of existing unsurfaced farm roads, which can be accessed from the N14 national road. The N14 connects the town of Kathu in the north, to the towns of Upington in the west, and Postmasburg in the south (via the R325). Traffic utilising the road is mainly mining related, but could also include tourist traffic. Local farmers and residents utilise gravel access roads to access their farms.

Increased traffic due to construction vehicles could cause disruptions to road users, the local community and increase safety hazards, especially on the main road that will be utilised - the N14. The use of local roads and transport systems may cause road deterioration and congestion. An increase of traffic from the rise in construction vehicles is a safety concern for other road users and local communities in the area. Impacts 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.

There are a few and sparsely populated homesteads or residents living in the nearby area, which will be impacted by the project. In terms of national roads involved, the expectation is that the proponent should consult with the relevant roads agency to ensure that they do not contribute to the deterioration of roads without taking some responsibility for repairing the impact that their construction vehicles may have on the road during construction phase.

The key sensitive social receptors are as follows:

- » Farm Legoko 2/460: The landowner resides on the farm. No grazing activities take place on this farm.

- » Farm Legoko 1/460: The landowner and a few farm workers reside on the farm. The farm is utilised for livestock and game farming activities.
- » Farm Legoko RE/460: The adjacent landowner and a few farm workers reside on the farm. The farm is utilised for livestock and game farming activities.
- » Farm Bestwood 1/459: Landowners reside on farm. The farm is utilised for livestock and game farming activities.

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:

- » All vehicles must be road worthy and drivers must be qualified, obey traffic rules, follow speed limits and be made aware of the potential road safety issues.
- » Heavy vehicles should be inspected regularly to ensure their road worthiness.
- » Provision of adequate and strategically placed traffic warning signs and control measures along the R505 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 EPC 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.
- » 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 & 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 N14, 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	High (8)	Moderate (6)
Probability	Highly probable (4)	Probable (3)
Significance	Medium (44)	Low (27)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> » 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. » 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:		
<ul style="list-style-type: none"> » 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 the area will heighten the nuisance impacts, such as noise, dust and wear and tear on roads. 		
Residual impacts:		
<ul style="list-style-type: none"> » Only damage to roads that is not fixed could affect road users. 		

6.1.1.7. Visual 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 area’s “sense of place”. 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.

Given the nature of the surrounding area within which the project is proposed, the number of PV projects already authorised in the area, and the limited visual impact the project is anticipated to have (i.e. most significantly within 2km of the site) it can be anticipated that the visual and sense of place impacts associated with the construction of the facility will 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 area's "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:		
<ul style="list-style-type: none"> » 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:		
<ul style="list-style-type: none"> » Other construction activities in the area will heighten the intrusion impacts, such as noise, dust and aesthetic pollution and further negatively impact the area's 'sense of place'. 		
Residual impacts:		
<ul style="list-style-type: none"> » None anticipated. 		

6.2. Operation Phase

Mogara Solar 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 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 Mogara Solar

6.2.1.1. Direct and indirect employment opportunities and skills development

It is anticipated that the operation of the project is likely to create a maximum of approximately 60 employment opportunities, comprising approximately 42 low-skilled, approximately 15 semi-skilled, and approximately 3 skilled opportunities. Employment opportunities include safety and security staff, operation and monitoring, and maintenance crew. Maintenance activities will be carried out throughout the lifespan of the project, and will include washing of solar panels, vegetation control, and general maintenance around the solar energy facility. 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 mitigated?	Yes	
Mitigation:		
» 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 programs 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	
Mitigation:		
» 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)	High (8)
Probability	Highly probable (4)	Highly probable (4)
Significance	Medium (56)	High (64)
Status (positive or negative)	Positive	Positive
Reversibility	N/A	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> » 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:		
<ul style="list-style-type: none"> » Significant LED and social upliftment of the local communities as a result of other IPP projects within the area. 		
Residual impacts:		
<ul style="list-style-type: none"> » Social upliftment of the local communities through the development and operation of the project. 		

6.2.1.4. Visual 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 Mogara Solar. The area surrounding the project site is characterised by existing mining activities and electricity infrastructure (including substations, power lines and authorised solar facilities). Considering this, it can be anticipated that the visual and sense of place impacts associated with the operation of the facility will be of low significance.

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 Mogara Solar.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Minor (2)
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:		
» Implement mitigation measures identified in the VIA report prepared for the project.		
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 Mogara Solar will remain if the facility is not decommissioned and dismantled after the end of its operational life.		

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 have negative implications in terms of food production and security, and could also threaten jobs of workers employed in the agricultural activities.

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 (6)	Low (4)
Probability	Not probable (2)	Improbable (1)
Significance	Low (22)	Low (9)
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.”

Mogara Solar is proposed within proximity to a number of other solar energy facilities (refer to **Table 6.13** and **Figure 6.1** for an overview of solar PV facilities within a 30km radius of the project site).

Table 6.13: Other solar energy projects / developments approved within proximity of Mogara Solar

Project Name	Location	Approximate distance from the PV Facility development site	Project Status
Solar farm for Bestwood, Kgalagadi District Municipality, Northern Cape	Remaining extent of Farm Bestwood 459-RD	7km to the north	Received Environmental Authorisation (EA)
PV Solar facility on Farm Bestwood 1/459	Portion 1 Farm Bestwood 459	Adjacent farm to the north	Received EA
AEP Kathu Solar facility	RE of Farm Legoko 460	Adjacent farm to the east	Received EA
AEP Mogobe Solar PV Energy Facility	Portion 1 of Farm Legoko 460	Adjacent farm to the south	Received EA
AEP Legoko Solar Facility	Portion 2 of the Farm 460 Legoko	Same farm; to the north	Received EA
100MW Kalahari Solar Power Project (CSP)	Portion 0 of farm Kathu 466	17.5km to the north west	Preferred Bidder (PB) Round 3.5: construction commenced in May 2016
75MW San Solar Energy Facility and Associated Infrastructure	Remaining extent of Farm Wincanton 472	26km to the north west	Received EA
75MW Sishen Solar Farm	Portion 6 of Wincanton 472	26.5km to north west	Preferred Bidder (PB) Round 2: in operation

Project Name	Location	Approximate distance from the PV Facility development site	Project Status
75MW Kathu Solar Energy Facility	Portion 4 of the Farm Wincanton 472	26.5km to north west	Preferred Bidder (PB) Round 1: in operation
115 MW Boitshoko Solar Power Plant	Remaining Extent of Portion 1 of The Farm Lime Bank no. 471	18.5km to the north-west	Received EA

In addition to the solar energy developments listed in **Table 6.13**, an additional new 100MW PV solar energy facility is proposed for development on the same project site, namely:

- » Gaetsewe Solar, a 75MW PV solar energy facility and associated infrastructure, proposed for development on Portion 02 of the Farm Legoko No. 460, located adjacent to and immediately north of the project site.

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 area's sense of place.

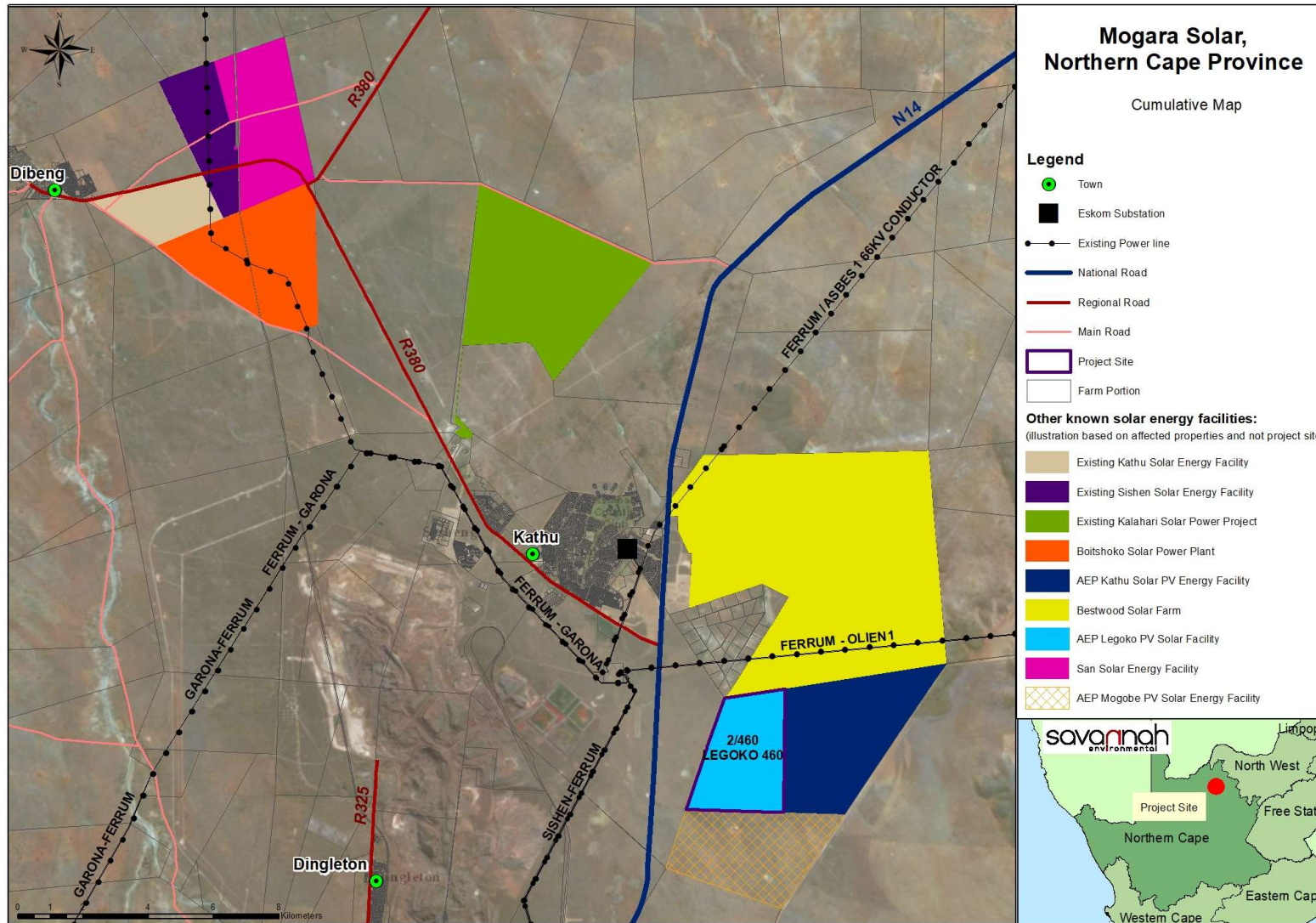


Figure 6.1: Cumulative map showing the location of other solar energy facilities within 30km of the project site.

6.3.1. Cumulative Impacts associated with Mogara Solar

6.3.1.1. Cumulative impact from employment, skills and business opportunities

Mogara Solar 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 Mogara Solar 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.		
	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 (6)
Probability	Highly probable(4)	Highly Probable (4)
Significance	Medium (44)	Medium (52)
Status (positive or negative)	Positive	Positive
Reversibility	N/A	
Irreplaceable loss of resources?	N/A	
Can impacts be mitigated?	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 an area characterised by good levels of solar irradiation suitable for the development of commercial solar 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 higher 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.

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	
Enhancement		
<ul style="list-style-type: none"> » 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. » Form joint ventures with community organisations, through Trusts, which can provide local communities with benefits, such as employment opportunities and services. 		
Residual impacts		
<ul style="list-style-type: none"> » 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 Mogara Solar 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

No alternative sites have been identified for assessment. The final location of the proposed project on the proposed site will be informed by technical considerations and inputs from the relevant specialist studies (including the SIA) being undertaken as part of the EIA process.

6.6. Assessment of Impacts for the No-Go Option

The “no-go” alternative is the option of not constructing Mogara Solar. The implementation of Mogara Solar 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 visual and sense of place impacts.

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 non-polluting, 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 Mogara Solar would not compromise the development of RE facilities in South Africa. However, the socio-economic benefits for local communities associated with this specific project 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 Mogara Solar. 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 (44)	Low (27)
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 (64)
Negative Impacts		
Visual and sense of place impacts	Low (27)	Low (21)
Impacts associated with the loss of agricultural land.	Low (22)	Low (9)

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 (52)
Negative Cumulative Impacts		
Cumulative impact with large-scale in-migration of people	Low (20)	Medium (39)

7.1. Key findings

There are some vulnerable communities within the project area that may be affected by the development of Mogara Solar and its associated infrastructure. 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 project's location within an area which is characterised by high levels of solar irradiation and which is therefore well suited to the development of commercial solar energy facilities.
- » The proposed development also represents an investment in infrastructure for the generation of non-polluting, RE, which, when compared to energy generated as a result of burning polluting fossil fuels, represents a positive social benefit for society as a whole.
- » When considering Mogara Solar, 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.

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.

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**APPENDIX A:
SOCIAL INPUT INTO THE ENVIRONMENTAL MANAGEMENT
PROGRAMME (EMPr)**

1. Construction Phase

OBJECTIVE 1: 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 » Developer's investment plan
Mitigation: Target/Objective	The developer should aim to fill as many of the low-skilled and semi-skilled positions 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 Contractor	Pre-construction & construction phase
Adopt a local employment policy to maximise the opportunities made available to the local labour force	The Proponent & EPC Contractor	Pre-construction & construction phase
In the recruitment selection process, a minimum percentage of women must be employed	EPC Contractor	Pre-construction & construction phase
Set realistic local recruitment targets for the construction phase.	The Proponent & EPC Contractor	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 given the number of positions available. » Training and skills development programme undertaken prior to the commencement of construction phase.
Monitoring	<ul style="list-style-type: none"> » The developer and EPC Contractor must keep a record of local recruitments and information on local labour to be shared with the Environmental Control Officer (ECO) for reporting purposes.

OBJECTIVE 2: 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	<ul style="list-style-type: none"> » Local procurement policy is adopted » Local goods and services are purchased from local suppliers where feasible
Monitoring	<ul style="list-style-type: none"> » The developer must monitor indicators listed above to ensure that they have been met for the construction phase

OBJECTIVE 3: 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 a Community Liaison Officer (CLO)	The Proponent & EPC Contractor	Pre-construction & construction phase

Performance Indicator	<ul style="list-style-type: none"> » CLO is appointed
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 4: 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
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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
Where applicable, any tender documentation which may be prepared for the project 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 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 5: 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
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Mitigation: Action/control	Responsibility	Timeframe
Working hours must be kept during daylight hours as far as possible 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 be 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 display road safety messages and speed limits.	EPC Contractor	Pre-construction phase & Construction phase
Appoint a 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 order for the local community and landowners to express any complaints or grievances with the construction process.	EPC Contractor	Pre-construction phase & Construction phase

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.
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Monitoring	» The developer and EPC Contractor must monitor the indicators listed above to ensure that they have been met for the construction phase
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OBJECTIVE 6: 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 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 » CLO available for community grievances and communication channel
Monitoring	» The EPC Contractor must monitor the indicators to ensure that they have been met for the construction phase

OBJECTIVE 7: 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 a CLO.	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 » CLO 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 8: 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 far as possible 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 personnel 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

2. Operation Phase

OBJECTIVE 1: 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 & Operation and Maintenance (O&M) Contractor	Operation phase
Establish vocational training programs 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