FINAL SOCIAL IMPACT ASSESSMENT REPORT

THE PROPOSED ESKOM RUSTENBURG STRENGTHENING PROJECT

Prepared for:

Dynamic Intergrated Geohydro Environmental Services (DIGES)
6th Road, Constantia Park, Building 2 Upstairs, Midrand, Gauteng
Province Tel. No.: +27 11 312 2878
Fax No.: +27 11 312 7824 | 546 1

Prepared by:

Strategic Environmental Focus (Pty) Ltd
CSIR Campus
Building 4, 2nd Floor
Meiring Naude Street
Brummeria, Pretoria
Tel. No.: +27 12 349 1307
Fax No.: +27 12 349 1229
Website: www.sefsa.co.za
E-mail: sef@sefsa.co.za

October 2014

SEF Ref: 505556

CONTENTS PAGE

LIST OF FIGURES

LIST OF PHOTOGRAPHS

LIST OF TABLES

1 INTRODUCTION

SEF has been appointed as independent Environmental Assessment Practitioner (EAP) by Dynamic Intergrated Geohydro Environmental Services (DIGES) to assist in the process of an Environmental Authorisation, in terms of the Environmental Impact Assessment (EIA) Regulations promulgated in terms of Chapter 5 of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998). This SIA forms part of the EIA process for the development of electrical infrastructure.

Eskom intends to construct and maintain a new substation, Marang B 400/132kV and a power line (±2km, 400 kVloop-in-loop-out) from the existing Bighorn-Marang or Medupi-Marang or Midas-Marang 400kV power lines.

The proposed project will be in close proximity to the existing 400/88kV Marang Main Transmission substation on Farm Klipgat 281 JQ and Portion 2 of the Farm Elandsheuvel 282 JQ, located approximately 14 km North East of Rustenburg (Figure 1-1).

Marang 400/88kV substation is one of the four Main Transmission Substations (MTS), which are currently supplying Rustenburg's platinum mining, smelting operations and commercial operations with electricity. The substation is supplied via the 3x 400kV power lines, i.e., Matimba-Marang, Bighorn-Marang and Midas-Marang. It comprises of 4 x 315 MVA, 400/88kV transformers and has a capacity of 945 MVA. The recorded peak load was 776MVA in years 2010/11 and 694MVA in years 2011/12. As a result, the Marang 400/88kV will exceed the 400/88kV firm capacity limit by 2015/16. To address these transformation capacity constraints and to align with the 20 year load forecast, Eskom will require a new substation site since the existing substation has space limitations for an extension.

The proposed project entails the construction and maintenance of the following:

- A new 3x 500MVA 400/132kV Main Transmission Substation (MTS), Marang B on approximately ±30 hectares; and
- A Power Line (±2km 400kV loop-in-loop-out) from the existing Bighorn-Marang/Medupi-Marang 400 kV power lines.

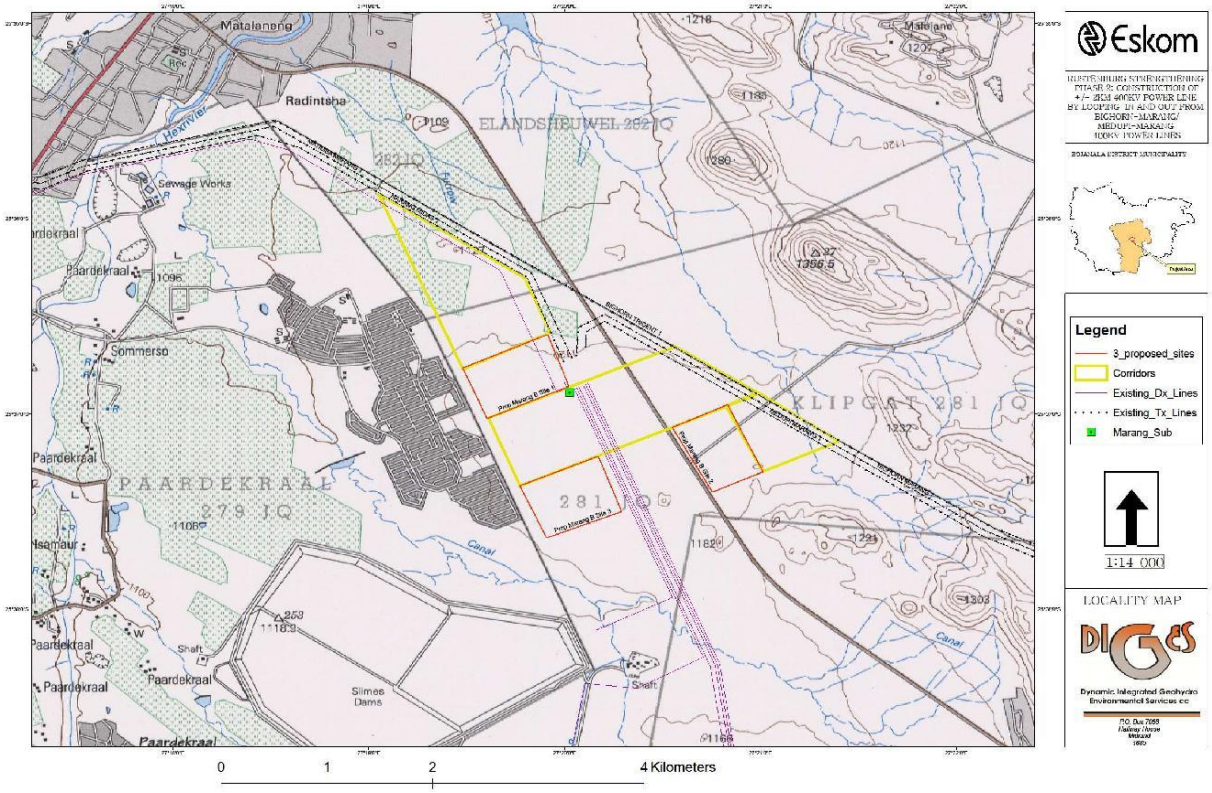


Figure 1-1 Project location

2 SCOPE OF WORK

2.1 Study objective

As communities continue to grow, local officials and community members are constantly challenged by the need to balance fiscal, social, economic, and environmental goals. One aspect of this challenge is deciding how much and what types of new development the community can accommodate without compromising the day-to-day quality of life for local residents. SIA is designed to assist in making decisions that promote long-term sustainability, including economic prosperity, a healthy community, and social well-being.

Assessing social impacts requires both quantitative and qualitative measurements of the impact of a proposed development. For example, a proposed development may increase employment in the community and create demand for more affordable housing; both effects are easily quantifiable. Also of importance, however, are the perceptions of community members about whether the proposed development is consistent with a commitment to preserving the character of the community. Assessing community perceptions about development requires the use of methods capable of revealing often complex and unpredictable community values.

The aim of this SIA is to investigate and describe the social environment surrounding the proposed development, to assess the anticipated social impacts of the proposed infrastructure and to identify appropriate mitigation measures to mitigate adverse impacts and enhance positive impacts.

The SIA is meant to assist the decision-making authorities in their decision-making on whether the development will be socially, environmentally and economically sustainable.

The objectives of this SIA are to:

- Define and describe the receiving environment (footprint, local and regional) from an social perspective, and identify, analyse and in detail assess the opportunities and constraints arising from or potentially limiting the proposed infrastructure ;
- Investigate the potential social benefits of the proposed infrastructure in order to ensure maximum benefit to the local community and associated structures;
- Assess the development impact of the proposed infrastructure on the economy of the local area (from a social point of view), which will form an important component for establishing the overall feasibility of the project; and
- Identify relevant legislation, standards and policies.

2.2 Legislative and regulatory review

SEF has been appointed as independent Environmental Assessment Practitioner (EAP) by Dynamic Intergrated Geohydro Environmental Services (DIGES) to assist in the process of an Environmental Authorisation, in terms of the Environmental Impact Assessment (EIA) Regulations promulgated in terms of Chapter 5 of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998). This SIA forms part of the EIA process for the development of electrical infrastructure.

According to the EIA Regulations, an EAP or person compiling a specialist report or undertaking a specialised process, appointed in terms of regulation 16(1) must be independent and should have expertise in the process required for conducting environmental impact assessments, including knowledge of the Act, the above-mentioned Regulations and any guidelines that have relevance to the proposed activity.

GN No & Activity Number		Activity Description
GN No. 545 of 18 June 2010	8	The construction of infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.
	15	Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more.
GN No. 546 of 18 June2010	4 (c)(i) ee	The construction of a road wider than 4 metres with a reserve less than 13.5metres in North West in critical biodiversity areas (Terrestrial Type 1 and 2 and Aquatic Type 1) as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.

Below is a brief description of the legislative and regulatory requirements that were taken into consideration while compiling this report.

International Best Practise Guidelines

The **Rio Declaration on Environment and Development** aims to create and enforce a broad set of principles that encompass the protection of the environment, and respect global citizens and their rights to sustainable development. It aims to have development standards focuses on people, challenges unsustainable consumption and promotes the knowledge of often marginalised groups.

Principle 8: To achieve sustainable development and a higher quality of life for all people, States should reduce and eliminate unsustainable patterns of production and consumption and promote appropriate demographic policies.

Principle 10: Environmental issues are best handled with the participation of all concerned citizens, at the relevant level. States shall facilitate and encourage public awareness and participation by making information widely available.

Principle 20: Women have a vital role in environmental management and development. Their full participation is therefore essential to achieve sustainable development

Principle 21: The creativity, ideals and courage of the youth of the world should be mobilized to forge a global partnership in order to achieve sustainable development and ensure a better future for all.

There is also a broad international best practice which has been established. This informs the thinking behind the SIA. This is vital to ensure that the SIA is comprehensive, broad and integrates a multitude of important social and environmental discourses.

Agenda 21 further elaborates on sustainable development and calls for the 'active participation in decision-making of those affected groups that have often been excluded" (Agenda 21, 1992). The issue of sustainable development is expanded in the **Millennium Development Goals** (MDG), which are eight development objectives that were adopted by the international community in 2000. The seventh MDG aims to 'Ensure Environmental Sustainability'. In this way, the environment must be protected and the adverse effects of climate change guarded against. The **Johannesburg Plan of Implementation** (JPI) is a detailed report of 11 chapters, in which each focuses on a theme of sustainable development and links to the MDG's and the Rio Declaration. The JPI thus promotes active citizenry, protecting the environment, issues such as health, poverty reduction and unsustainable patterns of consumption and production.

Constitutional Provision

The Constitution deals with the environment in Section 24 and proclaims the right of everyone—

(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; and

(iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

Sustainable development

Section 24 of the Constitution explicitly states that justifiable “economic and social development” must be recognised and promoted. Economic and social development is essential to the well-being of human beings. In a June 2007 judgement, the Constitutional Court has recognised that socio-economic rights that are set out in the Constitution are indeed vital to the enjoyment of other human rights guaranteed in the Constitution. But development cannot subsist upon a deteriorating environmental base. Unlimited development is detrimental to the environment and the destruction of the environment is detrimental to development. Promotion of development requires the protection of the environment. Yet the environment cannot be protected if development does not pay attention to the costs of environmental destruction. The environment and development are thus inexorably linked. And as has been observed—

“[E]nvironmental stresses and patterns of economic development are linked one to another. Thus agricultural policies may lie at the root of land, water, and forest degradation. Energy policies are associated with the global greenhouse effect, with acidification, and with deforestation for fuelwood in many developing nations. These stresses all threaten economic development. Thus economics and ecology must be completely integrated in decision making and lawmaking processes not just to protect the environment, but also to protect and promote development. Economy is not just about the production of wealth, and ecology is not just about the protection of nature; they are both equally relevant for improving the lot of humankind” (Brundtland Report, 2007).

The concept of sustainable development

It was the report of the World Commission on Environment and Development (the Brundtland Report) which “coined” the term “sustainable develo pment” (Sands, 2003). The Brundtland Report defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. It described sustainable development as—

“[i]n essence…a process of change in which the expl oitation of resources, the direction of investments, the orientation of technological development; and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations”.

This report argued for a merger of environmental and economic considerations in decision-making and urged the proposition that “the goals of economic and social development must be defined in terms of sustainability”. It called for a new approach to development - “a type of development that integrates production with resource conservation and enhancement, and that links both to the provision for all of an adequate livelihood base and equitable access to

resources." The concept of sustainable development, according to the report, "provides a framework for the integration of environment[al] policies and development strategies".

The 1992 Rio Conference made the concept of sustainable development a central feature of its Declaration. The Rio Declaration developed general principles on sustainable development and provided a framework for the development of the law of sustainable development. In this sense, the Rio Declaration provides a benchmark for measuring future developments and a basis for defining sustainable development.

At the heart of the Rio Declaration are Principles 3 and 4. Principle 3 provides that "[t]he right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations." Principle 4 provides that "[i]n order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it". The idea that development and environmental protection must be reconciled is central to the concept of sustainable development. At the core of this Principle is the principle of integration of environmental protection and socio-economic development.

Sustainable development does not require the cessation of socio-economic development but seeks to regulate the manner in which it takes place. It recognises that socio-economic development invariably brings risk of environmental damage as it puts pressure on environmental resources. It envisages that decision-makers, guided by the concept of sustainable development, will ensure that socio-economic developments remain firmly attached to their ecological roots and that these roots are protected and nurtured so that they may support future socio-economic developments.

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

NEMA embraces the concept of sustainable development. Sustainable development is defined to mean "the integration of social, economic and environmental factors into planning, implementation and decision-making for the benefit of present and future generations". This broad definition of sustainable development incorporates two of the internationally recognised elements of the concept of sustainable development, namely, the principle of integration of environmental protection and socio-economic development, and the principle of inter-generational and intra-generational equity.

One of the key principles of NEMA requires people and their needs to be placed at the forefront of environmental management − batho pele. It requir es all developments to be socially, economically and environmentally sustainable. It requires that the social, economic and

environmental impact of a proposed development be “considered, assessed and evaluated” and that any decision made “must be appropriate in the light of such consideration and assessment”. This is underscored by the requirement that decisions must take into account the interests, needs and values of all interested and affected persons. NEMA therefore requires the integration of environmental protection and economic and social development. It requires that the interests of the environment be balanced with socio-economic interests.

In terms of the EIA Regulations promulgated in terms of Chapter 5 of NEMA, an EIA is required for the proposed project. The EIA Regulations of 2010 (GNR No R. 543, R. 544, R. 545 and R. 546) requires that a list of “listed activities” be assessed.

Before the project can commence, an authorization is needed from the Department of Environment Affairs, in compliance with the Environmental Impact Assessment Regulations of 2010. The development is listed in terms of Government Notice R545 and R546 under Chapter 5 of the National Environment Management Act (Act No. 107 of 1998), and therefore requires that an Environmental Impact Assessment be undertaken. The project will trigger listed activities No. 8 and 15 of Government Notice R545 and activity 4c i(ee) of Government R546 which state that:

GN R.545 Activity 8: The construction of infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex;

GN R545 Activity 15: Physical alteration of undeveloped, vacant or derelict land or residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more; and

GN R546 Activity 4c i (ee): The construction of a road wider than 4 metres with a reserve less than 13.5metres in North West in critical biodiversity areas (Terrestrial Type 1 and 2 and Aquatic Type 1) as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans

Please refer to the Scoping Report / EIA Report for more information.

Other Legal Requirements

In addition to the above, the following key legislation and guidelines are also relevant to the process:

- Environment Conservation Act (ECA) (Act 73 of 1989);
- Environment Conservation Amendment Act (Act 50 of 2003);
- National Building Regulations and Standards Act No. 103 of 1997;
- National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004);
- National Heritage Resources Act, 1999 (Act No. 25 of 1999);
- National Water Act (Act 36 of 1998 as amended);
- National Environmental Management: Air Quality Act (Act 39 of 2004);
- Nature Conservation Ordinance 12 of 1983;
- Occupational Health and Safety (OHS) Act (Act 85 of 1993);
- Department of Environment and Tourism (DEAT[1]) Guideline 3: General Guideline to the EIA Regulations (2006);
- DEAT Guideline 4: Public Participation (2009); and
- DEAT Guideline 5: Assessment of Alternatives and Impacts (2009).

2.3 Terms of reference of the Social Impact Assessment

This SIA is meant to assist the decision-making authorities to decide whether the development will be socially, environmentally and economically sustainable.

The analysis includes a baseline study describing the social characteristics of the affected population, as well as the cultural and socio-political dynamics in the broader project area. In addition, the assessment identifies relevant social aspects and predicts the anticipated impacts associated with the proposed project. The assessment of positive and negative social impacts includes the identification of viable mitigation measures and project related benefits.

2.4 Assumptions and limitations

It is essential that the SIA are based on current and accurate project information. Similarly, the geographic extent of the SIA is influenced by project design and overall planning processes. The SIA report is based on current information received while compiling the SIA and the report therefore takes into consideration project information relating to planning and design, implementation and infrastructure placement available to SEF during the compilation of this report.

[1] Now the Department of Environmental Affairs (DEA)

The following assumptions are therefore made:

- The construction impacts are provided for the length of the construction period;
- The impacts during the operational phase provide an indication of the impact during steady state operations; and
- It is assumed that local employment will be a priority for all operations.

Since the SIA methodology relies on the introduction of the project to stakeholders through the NEMA EIA public participation process, fieldwork was only undertaken after the draft Scoping Report was made available to the public. Once the project had been widely announced to all stakeholders, interactive meetings and interviews was held with key stakeholders to inform the SIA. The findings of this final report therefore includes these interactions, but cannot be seen as final before the final comments on the draft EIA has been received and addressed.

The information contained in this report has been compiled with the utmost care and accuracy within the parameters specified in this document. Any decision based on the contents of this report is, however, the sole responsibility of the decision maker.

2.5 Project activities and phases

2.5.1 Pre-construction and construction phase

The construction phase of the project is expected to take up to 24 months with a project lifespan of 40 years or more. Approximately 102 individuals will be employed on site. The main works for the construction of the 400kV power lines and substation include the following:

Prior to construction of the overhead line a precise ground survey is carried out to determine the ground profile along the centre of the line route and for 27.5m on either side where the ground profile slopes across the line route. This is to ensure that the location selected for poles and stays and their relationship with each other comply with the technical limits laid down for maximum span lengths, maximum sums of adjacent spans and safe clearance to live conductors in the final siting of pole. Further consideration is given to detailed environmental effects. Where the route of the line passes over or in close proximity to trees that could infringe safe clearances to 'live' conductors, the trees must be felled or pruned prior to the construction of the line.

Geotechnical investigations will be carried out at tower positions to determine the type of foundation. The holes will be filled in after soil sampling is completed.

A survey crew will peg the substation location and the power line corridor. The Right Of Way must be cleared to allow for construction and operation activities of substation and power line. The land-owner and the local community will be notified prior to construction clearing.

Where there is no existing Services Access available or where ground conditions prevent normal Services Access, temporary Services Access routes may have to be constructed. If temporary Services Access roads need to be installed then either a trackway system or temporary stoned Services Access roads are technically acceptable.

Overhead power line construction follows a standard sequence of activities mentioned below:

- The Right Of Way corridor may be used as an area for temporary storage and handling for equipment and materials related to construction. Steel components of structures may be delivered and placed on the ground near foundation sites.
- A work crew will excavate the foundations for the towers. The foundation is influenced by the terrain encountered as well as the underlying geotechnical condition. The actual size and type of foundation to be installed will depend on the soil bearing capacity and can be excavated manually or by using machines. The foundations will be back filled, stabilized through compaction and capped with concrete.
- Once foundations are in place, the following work will be carried out:
    - Erection of the structures within the Right Of Way;
    - The steel components of the tower will be assembled using a crane and then lifted onto the foundations;
    - Insulators and attachment hardware will be installed and stringing sheaves attached to the insulators; and
    - The conductors will be strung by attaching the conductor to a steel line and pulled through each structure's stringing sheaves under tension to keep the conductors well off the ground.
- According to Parsons Brinckerhoff, the construction of a substation typically consists of, but is not limited to the following sequence of activities:
    - Cut and fill grading;
    - Placement and compaction of structure fill to serve as a foundation for equipment;
    - Grading to maintain drainage patterns;
    - Oil spill containment facilities;
    - Crushed rock surfaced yard, parking areas and roads;
    - Fencing and gating;
    - Landscaping with native plants where applicable; o
    Installation of equipment and structure foundations; o
    Installation of structures and equipment;

- Installation of bussing materials;
- Installation of control shelter; and
- Installation of control and relaying equipment and wiring.

2.5.2 Operation and maintenance

During the operation phase, ESKOM shall perform the following activities;

- Vegetation maintenance within the ROW and access roads. This will ensure that vegetation does not interfere with human safety, transmission line conductors, towers and impede access to the transmission line for maintenance crews. Vegetation clearance shall be performed using a variety of methods such as manual, mechanical and herbicidal applications;
- Access road maintenance to ensure that the roads are in good condition for all weather access by maintenance crews; and
- Transmission line maintenance which will include routine checks and system upgrade and repairs.

2.5.3 Decommissioning

During the decommissioning phase, the line will be removed in a reversed sequence as the construction phase and rehabilitation of the lines. The process of dismantling and removal of the line includes:

- Lowering the overhead conductors and earth wires to the ground and removing them from the site and selling them as scrap;
- Removing insulators and line hardware from structures at the site and disposing them at a registered local authority waste facility;
- Dismantling the towers and cutting them into pieces small enough to be handled and transported from the site;
- Demolition of foundations and disposing the concrete at a registered landfill site; and
- Backfiling and compaction of the excavation with suitable material.

2.6 Project alternatives

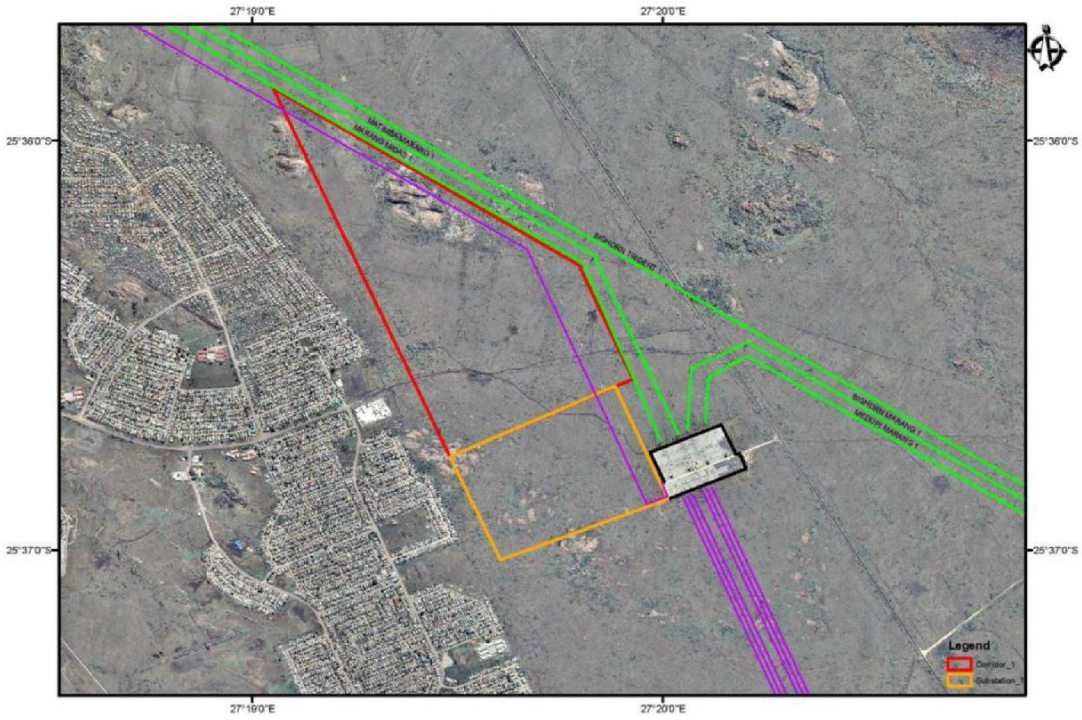
To give effect to the principles of NEMA and Integrated Environmental Management (IEM), an EIA should assess a number of reasonable and feasible alternatives that may achieve the same end result as that of the preferred project alternative. The following alternatives have been identified during the scoping phase of the project and were further investigated as part of this EIA:

Corridor/Location Evaluation

The proposed activity has three alternative substation sites and corridors for the Marang B Transmission substation and 400kV loop in loop out power lines. A preferred corridor and substation site will be selected that is preferable in terms of minimum environmental damage, accessibility during maintenance, and the interested and affected parties concerns.

Three substation sites and corridor alternatives will be assessed. Information is presented as per the Environmental Scoping Report.

Substation Site and Corridor Alternative 1: The proposed substation site is approximately 39 hectares whilst the corridor has a width ranging from approximately 55-812m and length of 1800m respectively. The area is located to the North West of the existing Marang Transmission Substation and East of Boitekong Township. The area is accessed via D522 tarred road and is also characterized by access tracks and existing 88kV power lines traversing across the substation and corridor site. The natural vegetation is severely modified due to activities related to agriculture, mining and urbanization. It is dominated by acacia shrubs and few large trees. Koppies are located in the northern side of the corridor and there are areas used as dumping grounds by the Boitekong community.

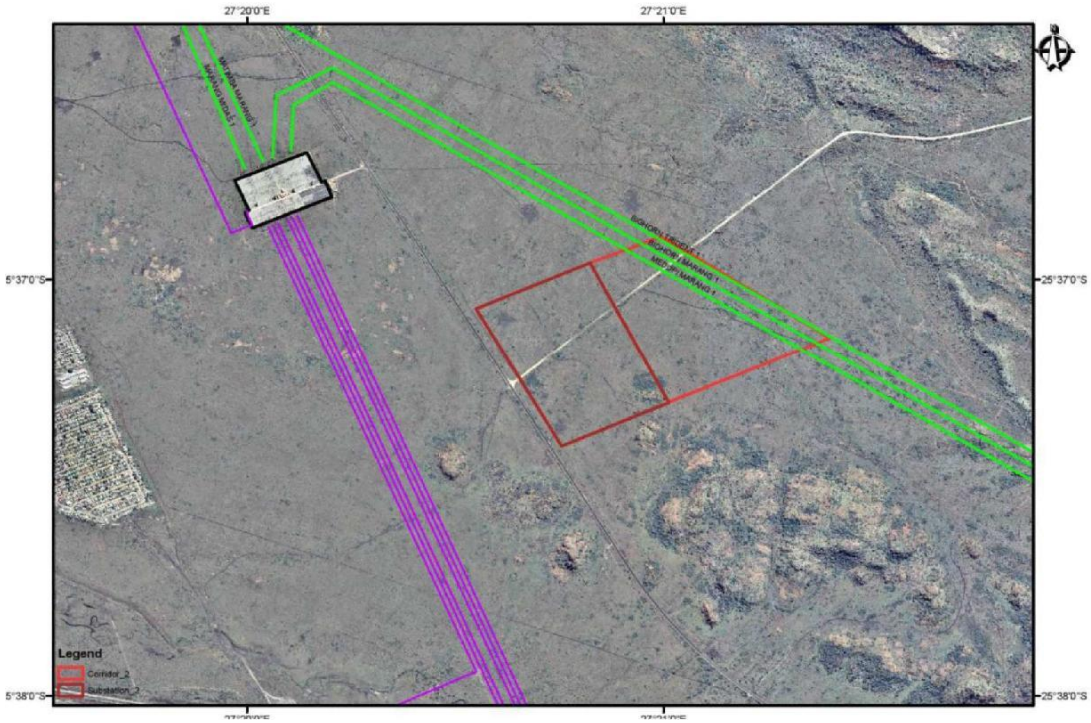


Source: DIGES Draft Scoping Report, March 2014

Figure 2-1 Alternative 1 substation site and corridor

Substation Site and Corridor Alternative 2: The proposed substation site is approximately 34 hectares whilst the corridor has a width of approximately 705m and length ranging from

268m to 698m respectively. The proposed area is located south east of the existing Marang Transmission Substation east of the D522 road and a gravel road to mines in the area cuts through the substation site. A small koppie is located in the south eastern border of the substation and substation and corridor area is in close proximity to koppies in the south. The vegetation is also modified due to past agricultural activities. A non-perennial stream that feeds into the Bospoort Dam located approximately 5km North West of the site cuts in the south eastern border of the corridor. Few rocky outcrops were observed within the substation and corridor sites.



Source: DIGES Draft Scoping Report, March 2014

Figure 2-2 Alternative 2 substation site and corridor

Substation Site and Corridor Alternative 3: The proposed substation site is approximately 38 hectares whilst the corridor has a width and length of approximately 706m and 2 237m respectively. The proposed area is located to the south of the existing Marang Transmission Substation and south east of Boitekong Township. Corridor 3 will start from the existing 400kV power lines located to the east to south east of the existing Marang Transmission Substation. The corridor will cross D522 running parallel to Marang Transmission Substation and substation Alternative 1 and 3. The area is also characterized by access tracks and existing 88kV power lines traversing across corridor site. The natural vegetation is severely modified due to activities related to agriculture, mining and urbanization. A small koppie is located to the east of the substation site and within the substation and corridor site there are a few small rocky outcrops.

Source: DIGES Draft Scoping Report, March 2014

Figure 2-3 Alternative 3 substation site and corridor

Activity Alternatives

To address the load constraints within the Rustenburg network, Eskom evaluated the technical and economic feasibility of four options. The option that was preferred was to construct a new Marang B Transmission substation which will de-load the existing Marang substation as well as create spare capacity for industry's future load growth. Hence the application for the proposed works.

Access Routes

Permanent access roads are required from the new Marang B Transmission substation to the tarred road, D522. Access to the power line routes will be from the existing tracks and the existing 400kV servitude. Where no access exists near to the power line routes, access tracks will be created which will suite the nature of the terrain.

Design Alternatives

Transmission towers are utilized to suspend high voltage overhead power lines and each transmission tower must be constructed to support the level imposed on it by conductors. Although the power line towers that will be utilized for this project have not been decided, three tower structures below are generally used for 400kV power lines.

- ***Cross Rope Suspension Tower***

The towers are supported by stays or guys in order to stabilize the towers. This tower is easy to assemble and the structure and requires less galvanized steel than the guyed V tower making it lighter. Forces from the earthwires, tower guys, and conductors are transferred only to the two mast peaks, thus eliminating direct bending moments in the structure and resulting in cost savings in the order of 50% per tower. The tower has an average height of 36m and requires servitude of 55m (Figure 2-4).

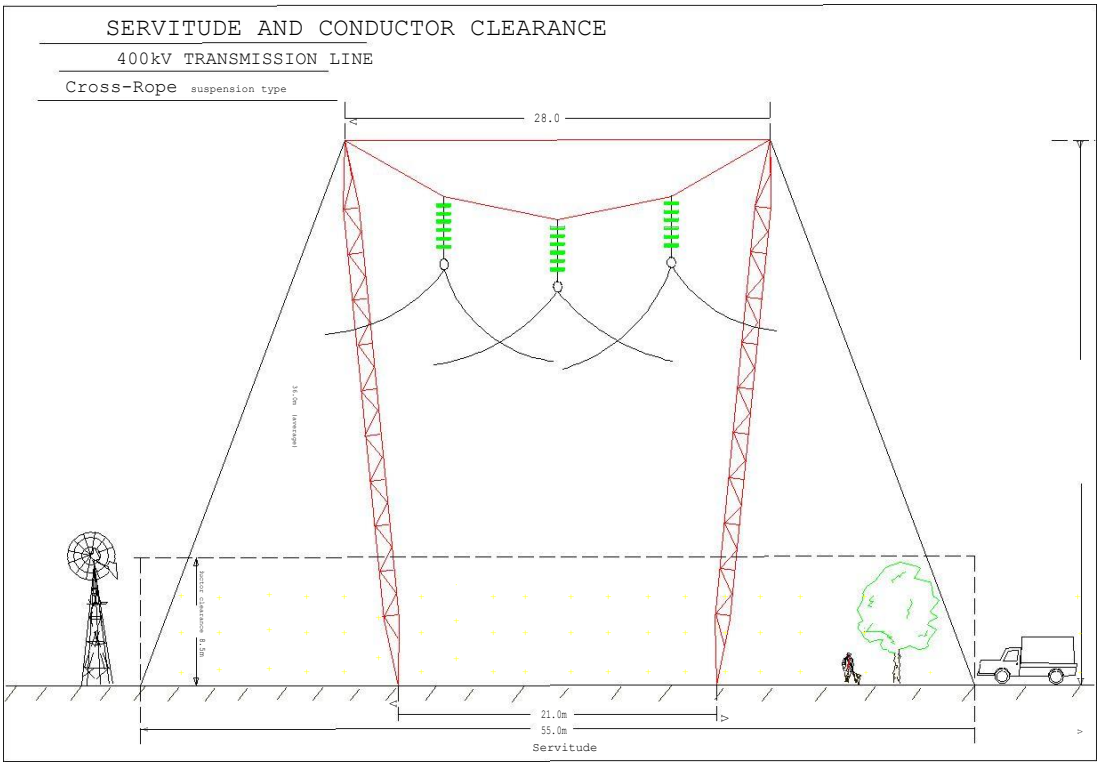


Figure 2-4 Cross-rope Suspension Tower

- ***Guyed Suspension Tower***

The tower has one large foundation and four guys therefore four smaller foundations. They provide the best protection from lightning impulses due to ground wire and cross arm configuration. Tower cross bar helps with the live maintenance. The towers have an average height of 33m (Figure 2-5).

- ***Self-Supporting Tower***

This is a typical Eskom designed self-supporting tower and utilizes a V assembly to allow for compaction of the phases. The structure was optimized to carry 190KN glass insulators which support quad zebra conductors. Commonly used before the cheaper guyed and cross rope structures were designed (Figure 2-6).

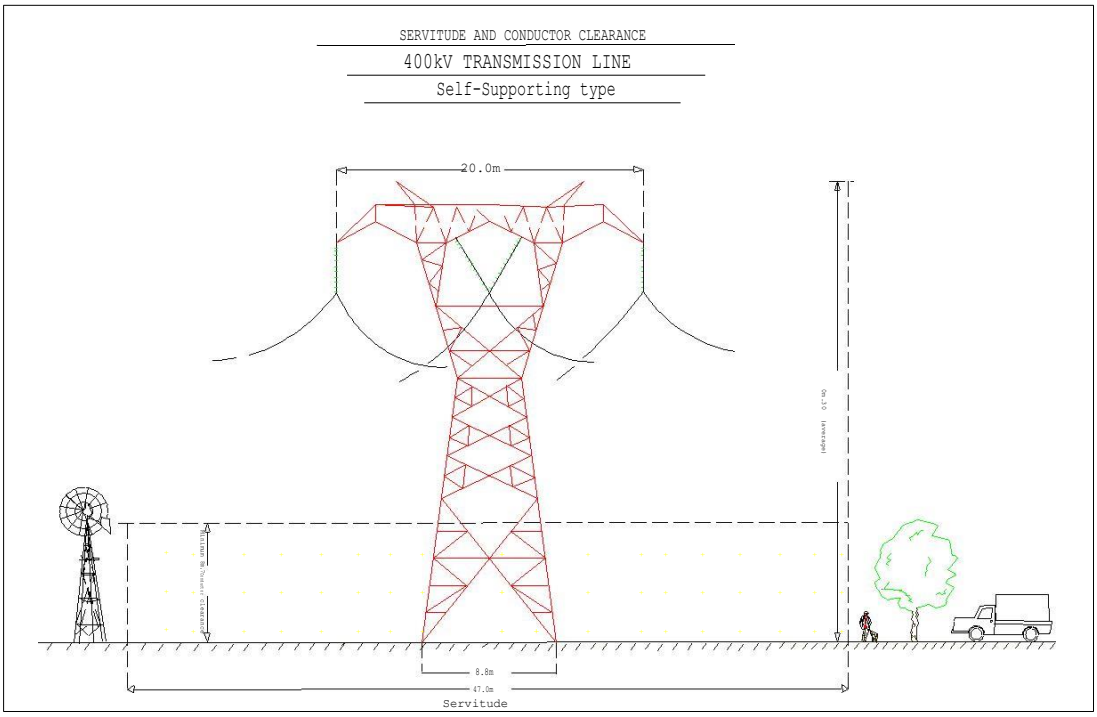


Figure 2-5: Self-supporting Suspension Tower

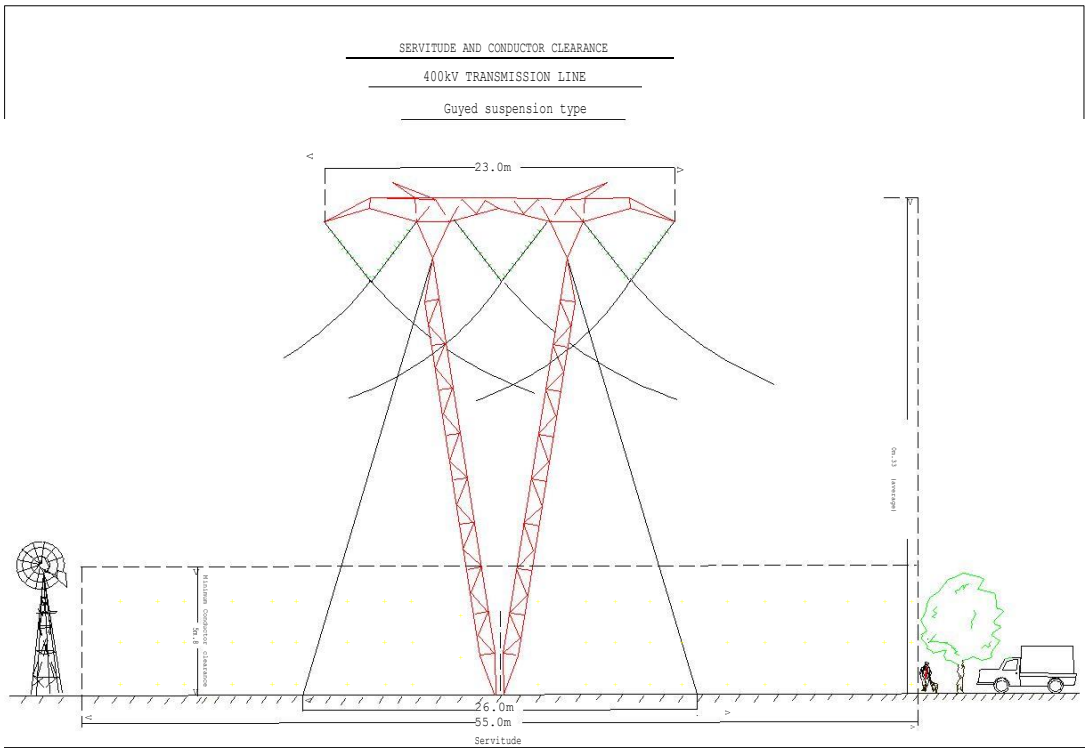


Figure 2 -6: Guyed Suspension Tower

- ***Substation Structure***

Substations are built to ESKOM's specific standards in terms of their structure and layout for operation and maintenance purposes. The proposed Marang B substation is therefore expected to be generic with standard specification facilities.

No-go Alternatives

The 'no-go' alternative assumes that the activity does not go ahead implying that the current state does not change; i.e. power lines and substation will not be constructed. This option would entail not strengthening the existing network in order to test the robustness of the Marang Network.

4 METHODOLOGY

4.1 Introduction to Social Impact Assessment

A SIA examines how a proposed development will change the lives of current and future residents of a community.

Quantitative measurement of such factors is an important component of the SIA. At the same time, the perceptions of community members of how the proposed project will affect their lives are a critical part of the assessment and should contribute to any decision to move ahead with a project.

One of the most important steps in the process is in fact to gain an understanding of community values and concerns. The social impacts of a proposed development on a community may actually begin the day the project is proposed. Changes in social structure and interactions among community members may occur once the new development is proposed to the community. Community members start organising themselves, they start interacting in ways that are different to the norm.

In addition, real, measurable and often significant effects on the human environment can begin to take place as soon as there are changes in social or economic conditions. From the time of the earliest announcement of a pending policy change or development project, attitudes toward the project are formed, interest groups and other coalitions prepare strategies, speculators may lock up potentially important properties, and politicians can manoeuvre for position. These factors were taken into consideration with this specific study.

The International Association for Impact Assessment (IAIA, 2003) states that SIA includes 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 these interventions. Its primary purpose is to bring about a more sustainable and equitable biophysical and human environment. The Inter-organisational Committee on Principles and Guidelines for Social Impact Assessment (2003:231) defines SIA in terms of *"efforts to assess, appraise or estimate, in advance, the social consequences that are likely to follow from proposed actions".*

On the other hand, social change processes are set in motion by project activities or policies. Change has a way of creating other changes. Social change processes can lead to several other, second-order social change processes. Depending on the characteristics of the local

social setting and mitigation processes that are put in place, social change processes can lead to social impacts (Vanclay, 2002:192). Social change processes relevant to the project will be discussed before the potential impacts will be investigated and mitigation measures proposed.

SIA introduces knowledge about the social implications of an activity, into the planning, decision-making and management process associated with the activity. A social impact is something that is experienced or felt and it can be positive or negative. In social sciences, one can distinguish between two types of social impacts:

Subjective social impacts

Impacts that occur "in the imaginations" or emotions of people, such as negative public attitudes, psychological stress or reduced quality of life. This kind of impact is much more difficult to identify and describe, as one cannot readily quantify perceptions or emotions.

Objective social impacts

Impacts that can be quantified and verified by independent observers, such as changes in population size or composition, in employment patterns, in standards of living or in health and safety. This can typically be quantified.

The study makes use of comments obtained as part of the public consultation process as stipulated by NEMA to assess potential social impacts. Comments obtained during the scoping and EIA phase of the assessment will be included in this report as the process unfolds.

Research conducted for the purposes of the report will be mainly of a qualitative nature. The qualitative approach is concerned with understanding social life and the meaning that people attach to everyday life (Fouché and Delport, 2002:79). Using a qualitative approach, social scientists are able to address issues such as human perception and behaviour, regardless of how realistic it may be.

In contrast, the quantitative approach aims to measure the social world objectively, to test hypothesis and to predict and control human behaviour (Hoyle, Harris and Judd, 2002:394).

The assessment of economic impacts typically relies more heavily on quantitative data, however, qualitative data has been used in Section 5 – Baseline Description of the Social Environment, which relies mainly on statistical data.

It is necessary to conduct the SIA in the context of the other impact assessment components (i.e., heritage, environmental, tourism, visual). There is a close relationship between social impacts and other impacts, like the biophysical impacts, of a proposed project (Figure 4-1). For example, changes in the physical environment as a result of the project may directly influence community perceptions about whether to proceed with the project.

Figure 4-1 Holistic approach to Social Impact Assessment

4.2 Approach and methodology

When conducting a SIA, it is crucial to follow a holistic approach that covers a range of essential issues. The methodology that is suggested for this study is indicated in the process diagram and discussed below (Figure 4-2).

The SIA are conducted for the following phases:

Prior to construction

- The period from when the construction of the infrastructure was first mentioned to the public, until the start of the construction phase.

Construction phase

- This phase is expected to commence once the Environmental Authorisation hase been received and is estimated to be completed over a short term.

Operational phase

- The operational phase is expected to commence at the completion of the construction phase and is assumed to be long term.

Decommissioning

- This phase will commence once the infrastructure is no longer in operation.

The social baseline study made use of existing data, further, the information in this report was acquired via comments received during the public participation process, reviewing the previous SIA report for the Central Block application, published reports, including Integrated Development Plans (IDP), statistical data obtained from Statistics South Africa and information obtained from SIA literature (Refer to Section 8 for a list of references).

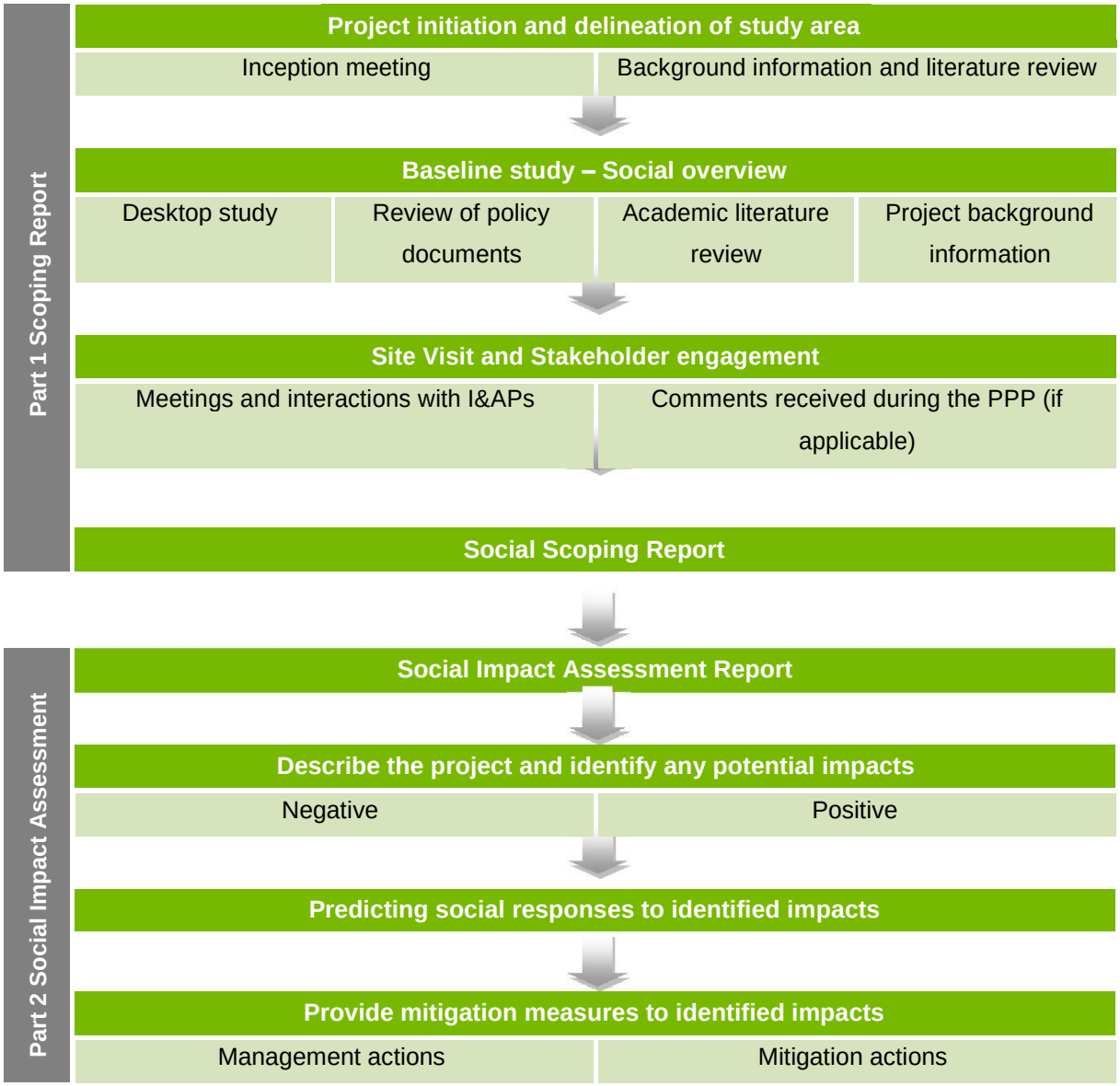


Figure 4-2 Social Impact Assessment Methodology

4.3 Assessment criteria

4.3.1 Assessment weighting

Each aspect within an impact description was assigned a series of quantitative criteria. Such criteria are likely to differ during the different stages of the project's life cycle. In order to establish a defined base upon which it becomes feasible to make an informed decision, it was necessary to weigh and rank all the criteria.

Simply, such a weighting factor is indicative of the importance of the impact in terms of the potential effect that it could have on the surrounding environment. An explanation of the impact assessment criteria follows.

4.3.2 Extent / Scale

The physical and spatial scale of the impact is classified as:

Description	Explanation	Value
None	No noticeable impact is expected.	**0**
Site	The impacted area extends only as far as the activity, such as footprint occurring within the total site area.	**1**
Local	The impact could affect the whole, or a significant portion of the site.	**2**
Regional	The impact could affect the area around the site including neighbouring farms, transport routes and adjoining towns.	**3**
National	The impact could have an effect that expands throughout the country (South Africa).	**4**
International	The impact has international ramifications that go beyond the boundaries of South Africa	**5**

4.3.3 Magnitude

The Magnitude of the impact is considered by examining whether the impact is destructive or benign, whether it destroys the impacted social environment, alters its functioning, or slightly alters it. These are rated as:

Description	Explanation	Value
Minor	The impact is not expected to have a noticeable effect on the social environment.	**2**
Low (L)	The impact alters the affected social environment in such a way that the natural processes or functions are not affected.	**4**
Moderate	The affected social environment is altered, but functions and processes continue, albeit in a modified way.	**6**
High (H)	Function or process of the affected social environment is disturbed to the extent where the function or process temporarily or permanently ceases.	**8**
Very high / don't know	The impact is expected to have a severe effect on the social environment and is seen as a fatal flaw for the process.	**10**

This will be a relative evaluation within the context of all the activities and the other impacts within the framework of the project.

4.3.4 Duration

The lifetime of the impact, which is measured in relation to the lifetime of the proposed development, is indicated as:

Description	Explanation	Value
Immediate	The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than any of the development phases.	**1**
Short term	The impact will be relevant through to the end of the construction phase.	**2**
Medium-term	The impact will last up to the end of the phases, where after it will be entirely negated.	**3**
Long-term	The impact will continue or last for the entire operational lifetime of the development, but will be mitigated by direct human action or by natural processes thereafter.	**4**
Permanent	This is the only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient	**5**

4.3.5 Probability

This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the lifecycle of the activity, and not at any given time. The classes are rated as follows:

Description	Explanation	Value
None	No impacts are expected to occur.	**0**
Improbable	The possibility of the impact occurring is none, due either to the circumstances, design or experience. The chance of this impact occurring is thus zero (0%).	**1**
Low probability	The possibility of the impact occurring is very low, either due to the circumstances, design or experience. The chances of this impact occurring is defined as 25%.	**2**
Medium probability	There is a possibility that the impact will occur to the extent that provisions must therefore be made. The chances of this impact occurring is defined as 50%.	**3**
Highly probable	It is most likely that the impacts will occur at some stage of the Development. Plans must be drawn up before carrying out the activity. The chances of this impact occurring is defined as 75%.	**4**
Definite / don't know	The impact will take place regardless of any prevention plans, and only mitigation actions or contingency plans to contain the effect can be relied upon. The chance of this impact occurring is defined as 100%.	**5**

4.3.6 Mitigation

The impacts that are generated by the development can be minimised if measures are put in place to reduce them. These measures are mitigation measures to ensure that the development takes into consideration the social environment and the impacts that are predicted so that development can co-exist with the social environment as a basis for planning.

Determination of significance
Without mitigation

Significance is determined through a synthesis of impact characteristics as described in the above paragraphs. It provides an indication of the importance of the impact in terms of both tangible and intangible characteristics.

The significance of the impact "without mitigation" is the prime determinant of the nature and degree of mitigation required. Where the impact is positive, significance is noted as "positive" (indicated as +). Significance is rated on the following scale:

Description	Explanation
Low (L)	The impact is not substantial and does not require any mitigation.
Low to medium (LM)	The impact is of little importance, but may require limited mitigation.
Medium (M)	The impact is of importance and is therefore considered to have an impact. Mitigation is required to reduce the negative impacts to acceptable levels.
Medium to high (MH)	The impact is of great importance. Mitigation of the impact is essential.
High (H)	The impact is of major importance, and should mitigation not be applied, it is considered to be a fatal flaw in the project proposal. This could render the entire development option or entire project proposal unacceptable.
International	The impact has international ramifications that go beyond the boundaries of South Africa

Determination of significance

With mitigation

Determination of significance refers to the foreseeable significance of the impact after the successful implementation of the necessary mitigation measures. Significance with mitigation is rated on the following scale:

Description	Explanation
Low (L)	The impact will be mitigated to the point where it is of limited importance.
Low to medium (LM)	The impact is of importance, however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels.
Medium (M)	Notwithstanding the successful implementation of the mitigation measures, to reduce the negative impacts to acceptable levels, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw.
Medium to high (MH)	The impact is of major importance but through the implementation of the correct mitigation measures, the negative impacts will be reduced to acceptable levels.
High (H)	The impact is of major importance. Mitigation of the impact is not possible on a cost-effective basis. The impact continues to be of major importance, and, taken within the overall context of the project, is considered to be a fatal flaw in the project proposal. This could render the entire development option or entire project proposal unacceptable.
Low (L)	The impact will be mitigated to the point where it is of limited importance.

4.3.7 Assessment of significance

Each aspect within an impact description was assigned a series of quantitative values. Such criteria are likely to differ during the different stages of the project's life cycle.

The allocation of a rating is a result of the efficiency and effectiveness, as identified through professional experience and empirical evidence of how effectively the proposed mitigation measures will reduce the significance of the impact.

Thus, the lower the assigned value, the greater the effectiveness of proposed mitigation measures and subsequently, the lower the significance of impacts with mitigation.

The efficiency of the mitigation measure determines the eventual significance of the impact. The level of impact is therefore seen holistically with all considerations taken into account.

Table 4-1 Description of assessment parameters for socio-economic impacts

Scale	Duration	Magnitude	Probability	Significance Rating	Mitigation Efficiency	Significance following mitigation
Site	Immediate	Minor	Improbable	Low	High	Low
Local	Short term	Low	Low probability		Medium High	
Regional	Medium term	Moderate	Medium probability	Medium	Medium	Medium
National	Long term	High	Highly probable		Low to medium	
International	Permanent	Very high	Definite	High	Low	High

5 BASELINE DESCRIPTION OF THE SOCIAL ENVIRONMENT

5.1 Introduction and approach

When conceptualising a proposal to upgrade infrastructure, the anticipated social and environmental impacts are generally broad and not limited to the site only. The proposed project falls within the North West Province, Bojanala Platinum District Municipality (DM), and Rustenburg Local Municipality (LM).

In order to assess the potential impact of the proposed project, it is important to consider the particular Province, DMs, LMs as well as the nearby towns in a holistic way.

The baseline study will therefore include a brief overview of the socio-economic factors in the North West Province and the Bojanala DM with a thorough investigation into the Rustenburg LM.

5.2 Regional context

Much of the North West Province consists of flat areas covered with scattered trees and grassland. The Magaliesberg mountain range in the northeast extends about 130 km from Pretoria to Rustenburg. The Vaal River flows along the southern border of the province. The North West Province borders Botswana on the north, northeast and northwest and shares is domestic borders with the Limpopo-, Gauteng-, Free State- and the Northern Cape Province. (http://en.wikipedia.org).

The North West Province is divided into four municipal districts, which are further subdivided into 20 LMs:

District Municipalities

- Bojanala Platinum DM
- Dr Ruth Segomotsi Mompati DM
- Ngaka Modiri Molema DM
- Dr Kenneth Kaunda DM

The Bojanala Platinum DM has a total land area of 18 332 km^2 or 17% of the North West Province's land area.

The key economic sectors in the district are (http://bojanala.gov.za):

- Mining and quarrying. This industry forms the back bone of the province and the Bojanala Platinum DM's economic output. According to the DM, 94% of the country's

platinum is found in the Rustenburg and Brits areas which are also said to produce more platinum than any other single area in the world;

- Agriculture. This industry account for 19% of the DM's land area and are mainly geared towards commercial dry-land farming, commercially irrigated farming and subsistence dry-land activities. Mixed-crop farming and in the areas of Rustenburg and Brits, maize and sunflower are in abundance in the DM;
- Manufacturing. This sector contributed an estimated R2.5bn to the GVA of the district by 2001 and has grown by about 6.6% between 1996 and 2001; and
- Tourism. An estimated 45% of all tourism establishments in the province are located within the DM and is home to the world-famous Sun City Complex.

The Bojanala Platinum DM has a total of 122 wards and is divided into the following LMs:

Local Municipalities
• Kgetlengrivier • Moretele • Moses Kotane • Madibeng • **Rustenburg**

The Rustenburg LM is a large town situated at the foot of the Magalies mountain range and was proclaimed a township in 1851. Rustenburg is the most populous municipality in the North West Province. Rustenburg means "town of rest" or " resting place" (http://en.wikipedia.org).

The Rustenburg LM consists of the following main towns:

Rustenburg LM
• Bafokeng • Rustenburg • Tlhabane • Hartebeesfontein • Boitekong • Bakwena Ba Magopa • Meriting • Sunrise Park • Bapo Ba Ga Mogale • Monakato • Paardekraal

The site for the proposed new substation and transmission power lines falls within the administration of the Royal Bafokeng Nation's (RBN) South East Region (Source: Royal Bafokeng Nation Population and use of land audit, 2011
Figure 5-1).

Source: Royal Bafokeng Nation Population and use of land audit, 2011

Figure 5-1 Map of the Royal Bafokeng Nation

The following areas has been defined as main receptors due to their proximity to the proposed site for the substation and transmission power lines:

Table 5-1 Sensitive receptors

Receptor	Type of receptor	Distance from site
Boitekong	Residential	1 km
Entabeni		3 km
Mfidikoe		4 km
Chachalaza		4 km
Thekwane		4 km
Kanana		4 km
Boitekong		5 km
Bokamoso		5 km
Meriting		7 km
Tlapa		8 km
Serlaeng		8 km
Waterkloof		9 km
Nkaneng		9 km
Rankelenyane		9 km
Rustenburg		10 km

5.3 Local context

5.3.1 Demographic profile

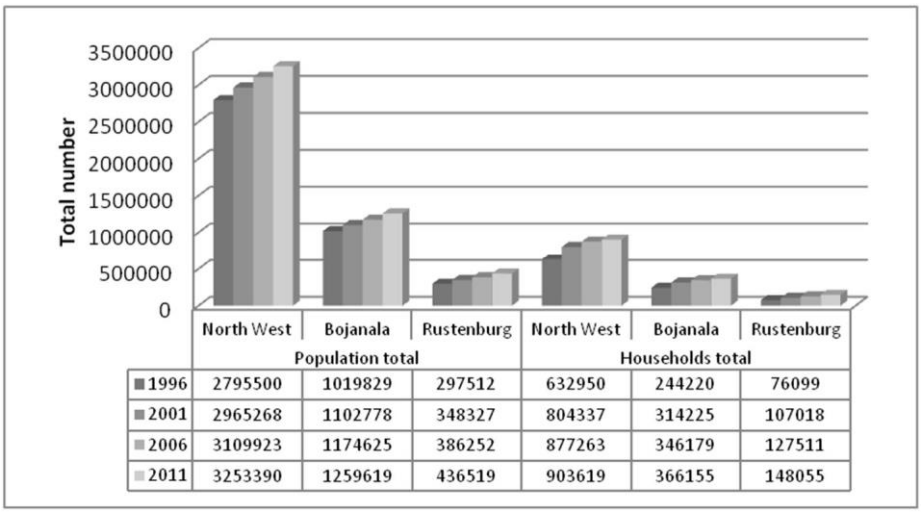
Population and household profile

According to Figure 5-2, the Rustenburg LM saw the highest increase in population size (persons) over the 1996 to 2011 time period, growing by 31.84% since 1996. Households have followed the same trend over the specified time period, growing by 48.60% since 1996. This is markedly higher than the averages for the North West Province (14.07% - population and 29.95% - household) and the Bojanala Platinum DM (19.04% - population and 33.30% - household). This indicates that the Rustenburg area is currently growing, not just in terms of population and household size, but also in terms of the number of jobs that is required by the economy.

According to the RBN's Population and use of land audit (PULA, 2011) the total population for the RBN was approximately 142 000. The South East Region is home to 38% of the non-bafokeng compared to only 8% of Bafokeng in the region. According the PULA, Thekwane had a population of 3 400, Photsaneng a population of 3 600, Mfidikwe a population of 4 400 and Kanana a population of 10 600.

Population group

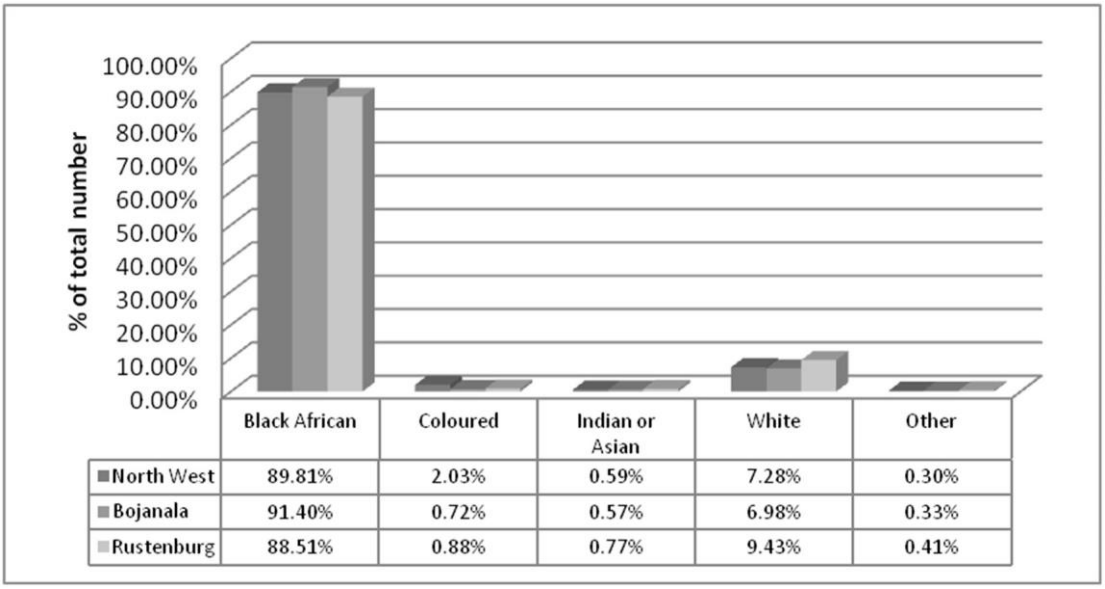
Figure 5-3 indicates that the Rustenburg LM population in 2011 were composed of mostly Black African persons (88.51%) followed by 9.43% White persons. The same trend is noticed in the Bojanala Platinum DM (91.40% and 6.98% respectively) and North West Province (89.81% and 7.28% respectively). Quantec Regional Data (2012), indicates that the Black Population in Rustenburg grew by 33.76% between 1996 and 2011, a faster rate than that of the DM (19.78%) and the Province (15.48%). Even though the overall White Population for the Province decreased by 6.44% over the same period, the White Population grew marginally in both the DM (4.55%) and the LM (9.68%).



	Population total			Households total		
	North West	Bojanala	Rustenburg	North West	Bojanala	Rustenburg
1996	2795500	1019829	297512	632950	244220	76099
2001	2965268	1102778	348327	804337	314225	107018
2006	3109923	1174625	386252	877263	346179	127511
2011	3253390	1259619	436519	903619	366155	148055

Source: Quantec Regional Data, 2012

Figure 5-2 Population and household size (1996 – 20 11)



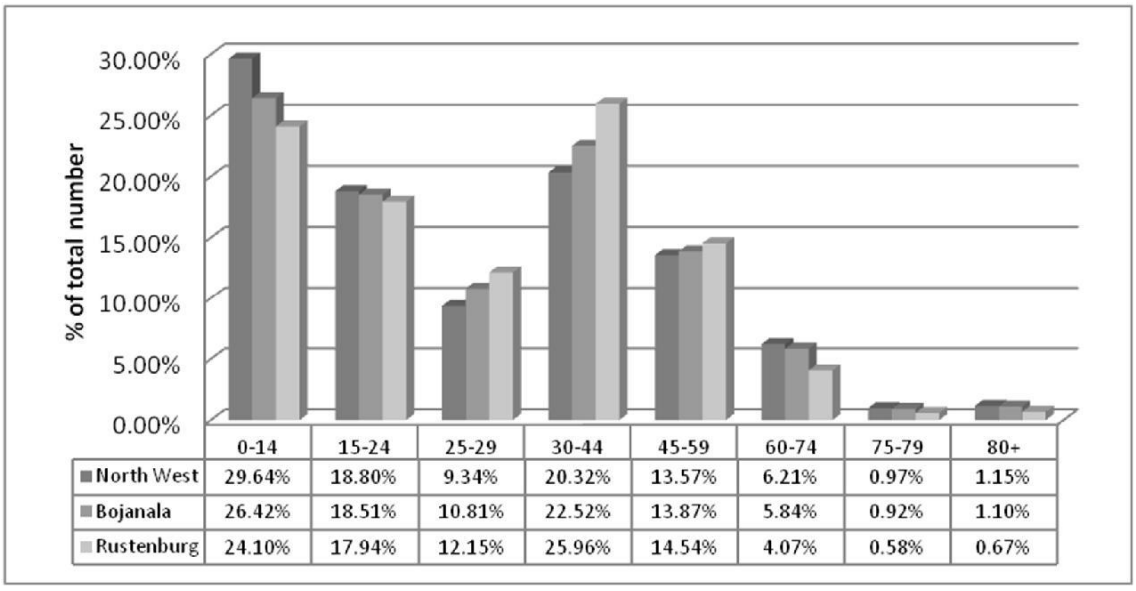
	Black African	Coloured	Indian or Asian	White	Other
North West	89.81%	2.03%	0.59%	7.28%	0.30%
Bojanala	91.40%	0.72%	0.57%	6.98%	0.33%
Rustenburg	88.51%	0.88%	0.77%	9.43%	0.41%

Source: Statistics SA, Census 2011

Figure 5-3 Population group (2011)

Age

It is important to assess the age distribution of persons in order to determine both the current and future needs of an area. Age is an important indicator as it relates to education, skills and dependency. A young population may require an improved educational system, whereas an older society may need an accented focus on healthcare. Statistics SA Census 2011 data indicate that the Rustenburg LM had a child population of 24.10% as compared to the Bojanala Platinum DM (26.42%) and North West Province (29.64%). In contrast, the Rustenburg LM population had a large working age population, (Figure 5-4) with 72.53% of the population forming part of the Economically Active Population (EAP) of the area (15 to 64 years). These persons normally have more work experience and usually fall within the higher skilled and higher salary bracket. The EAP for the DM during 2011 formed 68.28% of the total population. The LM and DM both have larger EAPs than that of the Province (64.72%). When comparing the 2011 data with that of 1996 (Quantec Regional Data, 2012), one will note a 31.84% increase in the total population for Rustenburg. The child population of the LM grew by 18.49% and the working age population grew by 36.01%. It is worth noting that the child population for the DM grew by only 1.53%, whilst the Province's child population grew by a similarly low rate of 2.26%.



	0-14	15-24	25-29	30-44	45-59	60-74	75-79	80+
North West	29.64%	18.80%	9.34%	20.32%	13.57%	6.21%	0.97%	1.15%
Bojanala	26.42%	18.51%	10.81%	22.52%	13.87%	5.84%	0.92%	1.10%
Rustenburg	24.10%	17.94%	12.15%	25.96%	14.54%	4.07%	0.58%	0.67%

Source: Statistics SA, Census 2011

Figure 5-4 Age (2011)

The elderly population (65 and older) is very small (3.37%), which means that less burden is placed on the EAP to support persons that are no longer economically active. Quantec Regional Data (2012) further indicates that the aged population for the LM grew by 39.69% between 1996 and 2011. The aged population for the DM grew by 37.13% and for the Province, 32.66% (Figure 5-5).

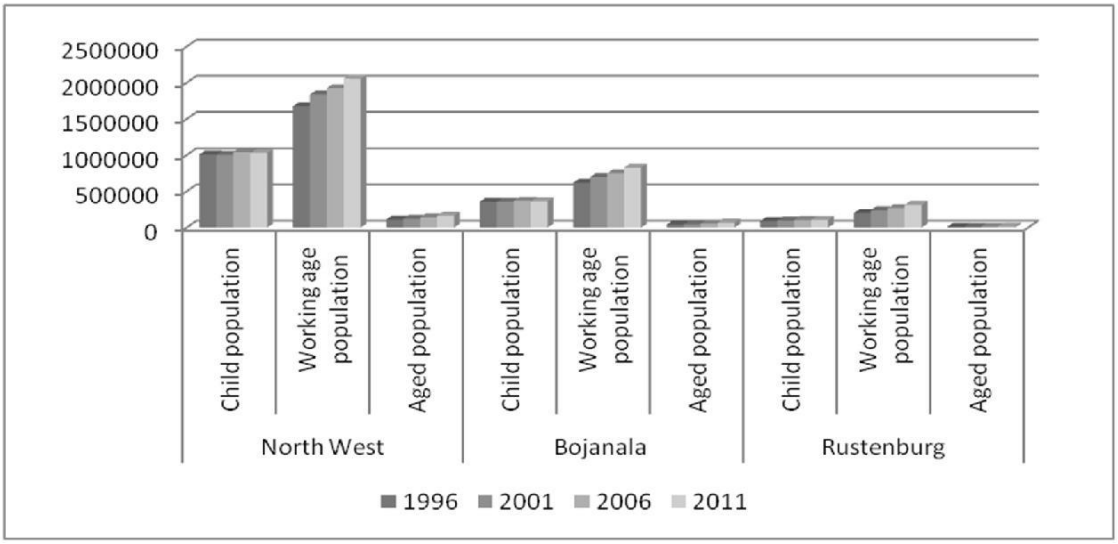
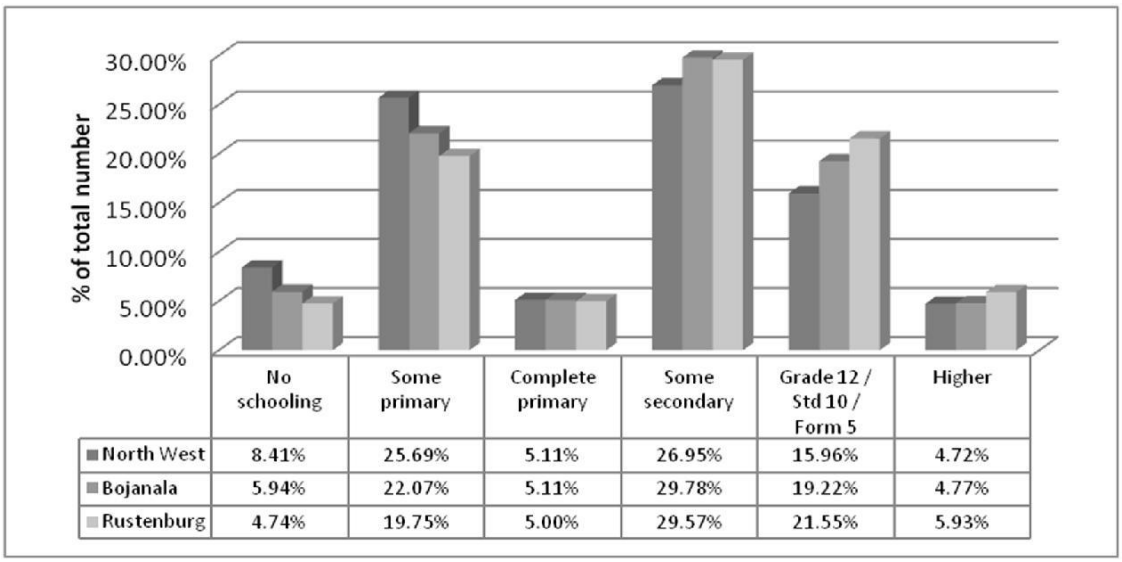


Figure 5-5 Age (1996 – 2011)

Education

The largest percentage (29.57%) of the Rustenburg LM population has obtained some secondary schooling (Figure 5-6). However, 4.74% of the population have not received any form of schooling. Only 4.72% of the population achieved an academic level higher than Grade 12.

Data from the Census 2011 indicates that 21.55% of the Rustenburg LM population obtained a Grade 12 qualification, higher than that of the DM (19.22%) and the Province as a whole (15.96%).



	No schooling	Some primary	Complete primary	Some secondary	Grade 12 / Std 10 / Form 5	Higher
North West	8.41%	25.69%	5.11%	26.95%	15.96%	4.72%
Bojanala	5.94%	22.07%	5.11%	29.78%	19.22%	4.77%
Rustenburg	4.74%	19.75%	5.00%	29.57%	21.55%	5.93%

Source: Statistics SA, Census 2011

Figure 5-6 Education level (2011)

5.3.2 Economic profile

This section provides a delineation of the study area and a brief economic status quo pertaining to employment and labour profile.

Employment and labour profile

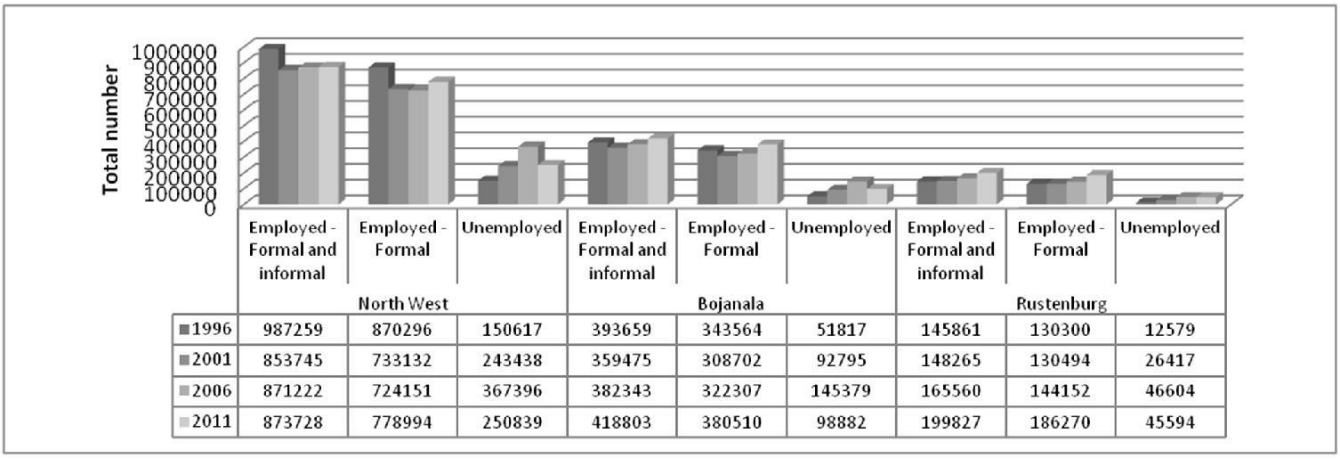
The employment status of the population has a variety of important implications. Economically active and employed persons can contribute to the overall welfare of a specific community by paying their taxes, looking after the youth and aged and by stimulating the economy. However, should a community have a large number of economically inactive and / or unemployed persons, the burden on the EAP of that community are amplified.

Figure 5-7 and Table 5-2 illustrates that the Rustenburg LM unemployment rate increased between 1996 and 2006 but dropping slightly in 2011. This, in addition to the increase in population for the Rustenburg LM indicates that there is a major influx of jobseekers to the area, placing a burden on the municipal infrastructure as well as leading to higher levels of unemployment. In 2011, however, the unemployment rate seemed to decline, during the same time that the population size of the LM increased (refer to Figure 5-2).

Table 5-2 Unemployment rate (1996 – 2011)

Unemployment rate	1996	2001	2006	2011
North West	13.2%	22.2%	29.7%	22.3%
Bojanala Platinum DM	11.6%	20.5%	27.5%	19.1%
Rustenburg LM	7.9%	15.1%	22%	18.6%

Source: Quantec Regional Data, 2012



Source: Quantec Regional Data, 2012

Figure 5-7 Economic status (1996 – 2011)

According to the Bojanala Platinum IDP (2011/2) platinum is the main mineral mined within the DM, however, granite, tin, chrome, lead, slate, diamonds and gold are also mined. Figure 5-8 indicates that the majority of the Rustenburg LM population found employment in mining and quarrying (showing an increase of 56.06% over 15 years).

Tourism forms part of the wholesale and retail trade catering and accommodation industry. The wholesale and retail trade catering and accommodation industry is the second largest within the LM, representing 10.44% of the employment opportunities. The IDP makes mention of the DM's vast cultural, natural (Pilanesberg National Park) and even man-made resources (Sun City resorts). The Nedbank Million Dollar Golf Challenge, and other high profile events (e.g. performances by international celebrities and beauty pageants) also attracts many visitors to the region. Future developments include the proposed development of the Heritage Park which entails the linking of the Madikwe Game Reserve with the Pilanesberg National Park into a large park which would be able to compete with the likes of the Kruger National Park. Other initiatives indicated in the Bojanala IDP include the creation of a conservation corridor stretching from the Borakalalo Nature Reserve in the east through Vaalkopdam, Pilanesberg- up to the Madikwe Game Reserve in the west. The DM intends to address the development and enhancement of the tourism hub in the district as a gateway into the North West Province from Gauteng and Limpopo. Rustenburg's wholesale and retail trade catering and accommodation industry has, however, been declining (27.55%) over the past 15 years. This trend is followed through in the DM with the sector representing 14.31% of the labour force, but declining in growth (30.66%) from 1996.

The agriculture sector has shown a decline across all three regions, with the decline in the LM being 224.93%, the DM being 355.04% and the Province being 321.15% (Quantec Regional Data, 2012). The reasons for the decline in the agricultural sector include amongst others uncertainty due to land reform, high input costs, high risk compared to return, water quality and scarcity, competition for land usage from mining industry and insufficient support (IDP, 2011/2). According to the IDP, the Madibeng LM is the most significant agricultural contributor with much of the produce coming from the Brits and Hartebeespoort area.

The mining and quarrying industry has, in contrast, grown across all three regions, with the DM showing a growth of 61.00% and the Province a growth of 35.37%.

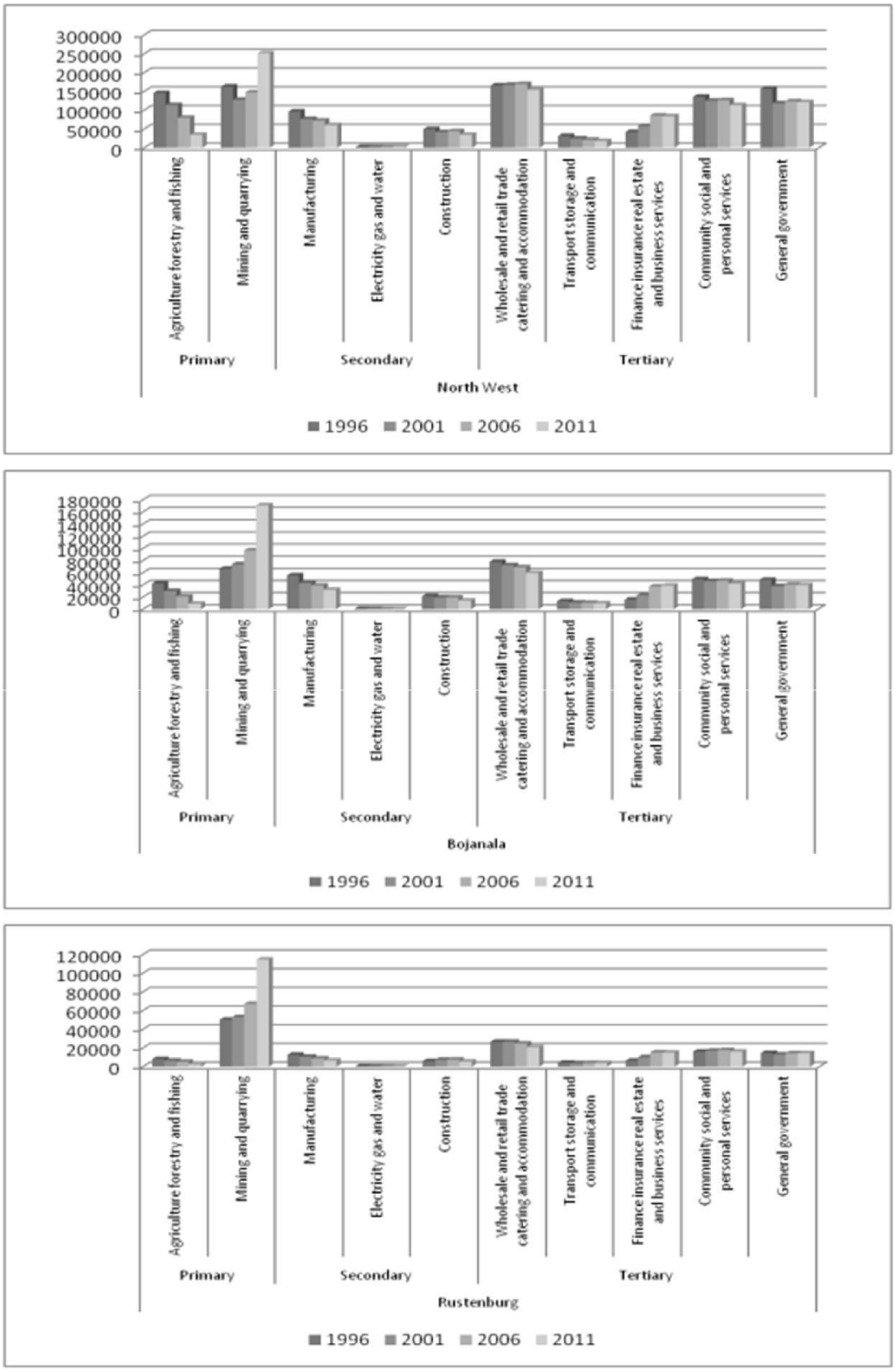
5.3.3 Services and infrastructure profile

Social service delivery centres on the provision of health, education and community development facilities and services. The concept of service delivery also comprises various elements such as affordability, quality, efficiency and access.

This indicator therefore examines the level of service provision in the study area. Services assessed include water, housing and electrification.

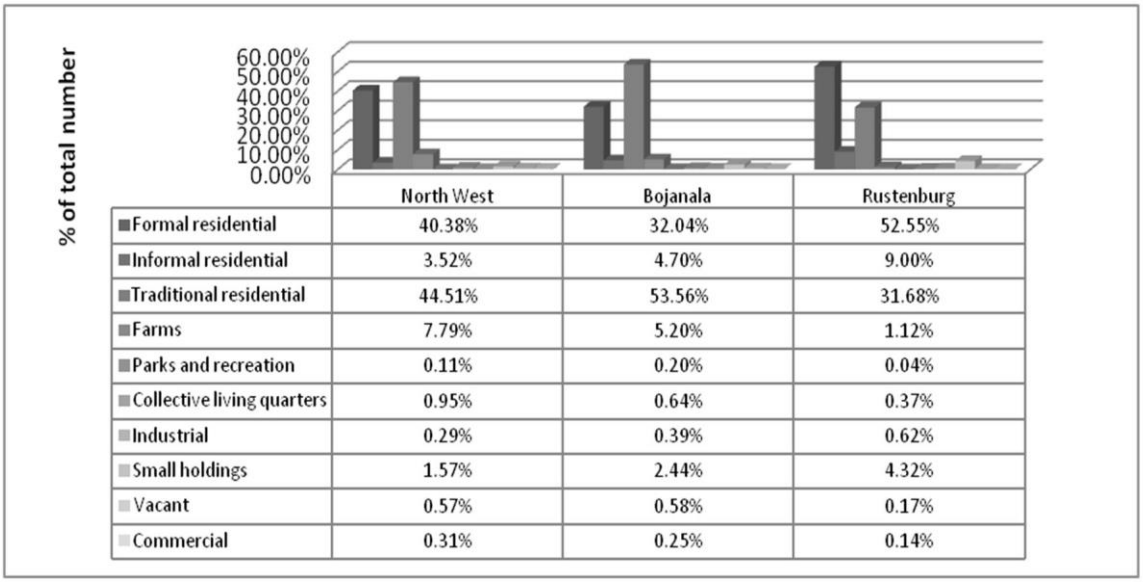
Housing

According to Figure 5-9, the North West Province population reside mainly in “Traditional residential” dwellings (44.51%), with 40.38% residing in “Formal residential” dwellings. The fact that the DM reflects this demographic with 53.56% of dwellings being “Traditional residential” can be attributed to the presence of the Bafokeng people residing in the DM. The demographics are inverted for the LM, with 52.55% of households residing in “Formal residential” dwellings and 31.68% residing in “Traditional residential” dwellings. The LM also has the largest percentage of households (9.00%) residing in “Informal residential” dwellings.



Source: Quantec Regional Data, 2012

Figure 5-8 Industry (1996 / 2011)



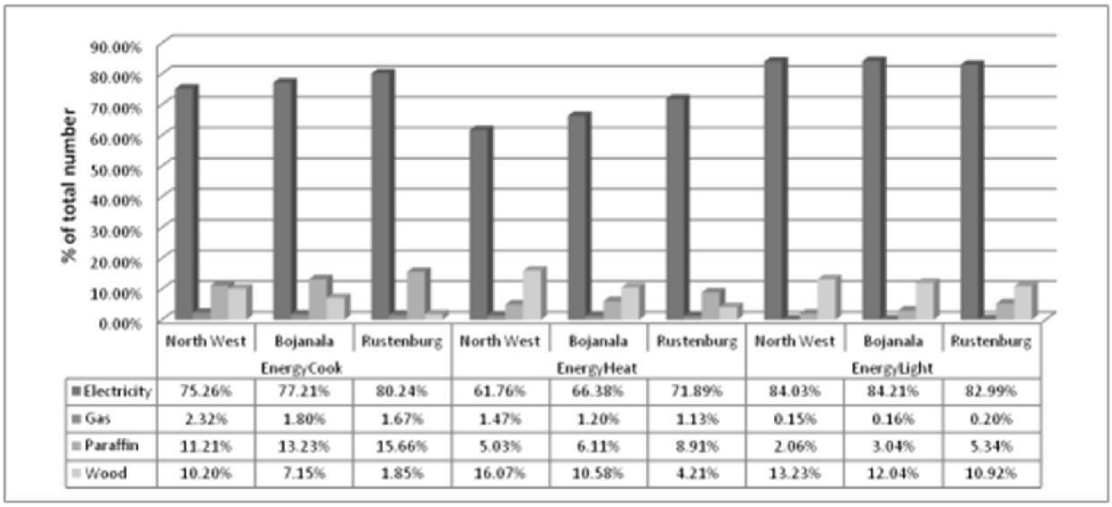
	North West	Bojanala	Rustenburg
Formal residential	40.38%	32.04%	52.55%
Informal residential	3.52%	4.70%	9.00%
Traditional residential	44.51%	53.56%	31.68%
Farms	7.79%	5.20%	1.12%
Parks and recreation	0.11%	0.20%	0.04%
Collective living quarters	0.95%	0.64%	0.37%
Industrial	0.29%	0.39%	0.62%
Small holdings	1.57%	2.44%	4.32%
Vacant	0.57%	0.58%	0.17%
Commercial	0.31%	0.25%	0.14%

Source: Statistics SA, Census 2011

Figure 5-9 Type of dwelling (2011)

Energy use

Figure 5-10 indicates that the majority of households across all regions used electricity for cooking (Province – 75.26%, DM – 77.21%, LM – 80.24%). This trend is repeated, where electricity is predominantly used for lighting and heating in all three regions. This, coupled with the trends shown under the section “Dwelling types” above, indicate that households have transformed into a more formal nature, relying on the municipal and bulk supply of electricity for their daily needs.



	North West	Bojanala	Rustenburg	North West	Bojanala	Rustenburg	North West	Bojanala	Rustenburg
	EnergyCook			EnergyHeat			EnergyLight		
Electricity	75.26%	77.21%	80.24%	61.76%	66.38%	71.89%	84.03%	84.21%	82.99%
Gas	2.32%	1.80%	1.67%	1.47%	1.20%	1.13%	0.15%	0.16%	0.20%
Paraffin	11.21%	13.23%	15.66%	5.03%	6.11%	8.91%	2.06%	3.04%	5.34%
Wood	10.20%	7.15%	1.85%	16.07%	10.58%	4.21%	13.23%	12.04%	10.92%

Source: Statistics SA, Census 2011

Figure 5-10 Type of energy (1996 / 2011)

Table 5-3 illustrates the change in the percentage of households in each region making use of different sources of energy for lighting between 1996 and 2001. The data indicates that the use of electricity has increased across all three regions. The use of alternative sources of energy in the Province and DM has decreased across the board. The use of solar energy and paraffin has, however, increased by 6.42% and 54.35% respectively for the LM.

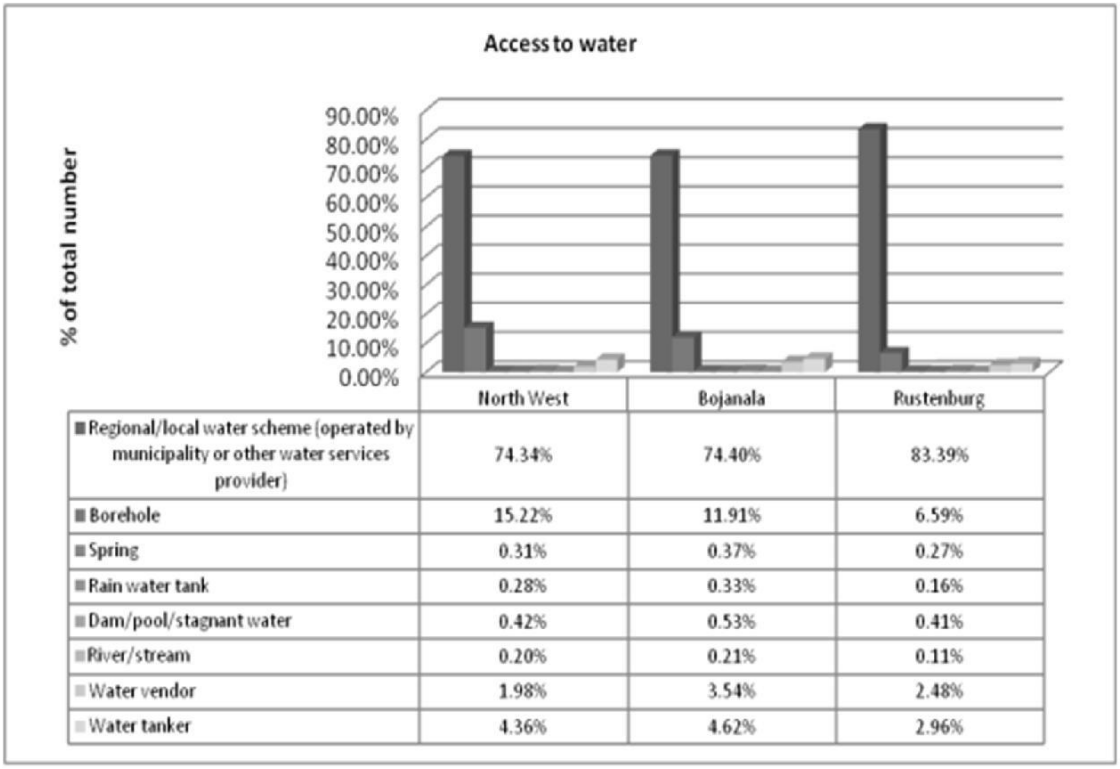
Table 5-3 Change in households' source of energy for lighting (1996 / 2011)

	North West	Bojanala	Rustenburg
Solar/other/unspecified	-84.14%	-52.35%	6.42%
Electricity	62.06%	66.43%	68.05%
Gas	-14.88%	-59.40%	-82.35%
Paraffin	-41.87%	-0.56%	54.35%
Candles	-162.45%	-223.91%	-51.84%

Source: Quantec Regional Data, 2012

Water

According to the 2011 Census data, the majority of households across all regions have access to municipal supplied water infrastructure (Figure 5-11). A small percentage of households still rely on boreholes as source of water, which is attributed to the number of farms and agricultural holdings within the North West Province.



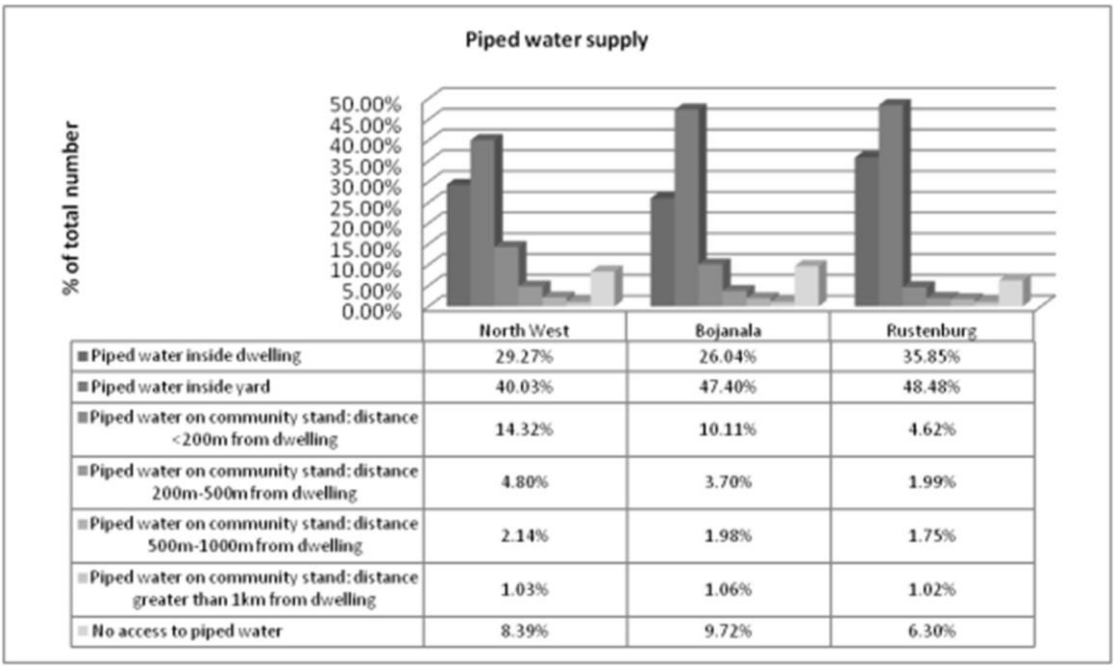
	North West	Bojanala	Rustenburg
Regional/local water scheme (operated by municipality or other water services provider)	74.34%	74.40%	83.39%
Borehole	15.22%	11.91%	6.59%
Spring	0.31%	0.37%	0.27%
Rain water tank	0.28%	0.33%	0.16%
Dam/pool/stagnant water	0.42%	0.53%	0.41%
River/stream	0.20%	0.21%	0.11%
Water vendor	1.98%	3.54%	2.48%
Water tanker	4.36%	4.62%	2.96%

Source: Statistics SA, Census 2011

Figure 5-11 Access to water (2011)

When considering piped water supply, the 2011 Census found that even though a relatively small percentage of households have access to piped water within their dwellings, the majority of households, do however, have access to piped water within their yards. A significant portion of households within the Province (8.39%), DM (9.72%) and LM (6.30%) have no access to piped water (Figure 5-12).

Table 5-4 shows the level of water supply to households has incrementally increased across all three regions. The use of water from a dam, river, stream or spring has reduced significantly, especially within the LM where it has diminished by 195.30%. Households relying on water sourced from a water-carrier/tanker/water vendor have, however, increased in all three regions.



Source: Statistics SA, Census 2011

Figure 5-12 Piped water supply (2011)

Table 5-4 Change in access to water (1996 / 2011)

	North West	Bojanala	Rustenburg
Piped water inside dwelling	34.59%	48.19%	52.24%
Piped water inside yard	43.41%	53.58%	59.62%
Piped water on community stand: <200m from dwelling	24.80%	2.12%	-15.34%
Piped water on community stand: > 200m from dwelling	24.59%	26.45%	49.02%
Borehole/rain-water tank/well	-12.07%	-92.81%	-80.12%
Dam/river/stream/spring	-37.08%	-108.17%	-195.30%
Water-carrier/tanker/Water vendor	45.26%	55.70%	63.16%
Other/Unspecified/Dummy	-109.58%	-101.23%	-0.24%

Source: Quantec Regional Data, 2012

Roads and transport

According to the Bojanala Platinum DM IDP (2011/2), the region's transportation system and infrastructure is of vital importance in the economic development of the district and its neighbouring/surrounding areas. According to the IDP, approximately 2 490 km of the total provincial road network (4 193 km) in the DM are covered with gravel. A total of 151 km (3.6% of the road network in the DM) of the district's roads is described as being in a poor or very poor condition.

According to the IDP, the DM has rail transport, mostly used for freight and to lesser extent long distance passengers.

The Pilansberg airport and Rustenburg airfield provides a low level capacity for air travel within the DM. The Rustenburg area also has a heliport at the Paul Kruger Hospital, and a second is located at the Marikana Platinum Mine.

Some of the key concerns regarding roads and transport in the DM include:

- Conditions of road infrastructure, especially in rural areas and the accessibility and cost of public transport for rural communities;
- Worsening conditions of roads in both rural and urban areas, especially in townships;
- Lack of maintenance for road infrastructure; and
- Concerns about road safety and insufficient law enforcement to ensure safe and reliable transport.

6 SOCIAL CHANGE PROCESSES AND SOCIAL IMPACT CATEGORIES

The purpose of this chapter is to describe anticipated social change processes that the proposed infrastructure upgrade is likely to create. Within each phase of the project certain processes will also occur, although they may not occur in every phase of the project it is important to determine when the impact will occur and the potential impacts it may have on the social change process in that environment. Processes that will be investigated include:

Social Change Processes
• Demographic processes • Economic processes • Geographic processes • Institutional and legal processes • Emancipatory and empowerment processes • Socio-cultural processes

The impacts of the proposed project will be examined and discussed according to the following categories as indicated below:

Project Phase
• Originating prior to the construction phase • Expected to set in during the construction phase • Expected during the operational phase • Expected to occur during the decommissioning phase

It is important to remember that social change can be extremely subtle and the report will aim to describe the anticipated social impacts that the proposed project is likely to effect.

The following social change processes are expected to take place as a result of this project.

Economic processes	Geographic processes	Institutional and Legal processes	Socio-cultural processes
•Waged labour, employment creation and decrease in unemployment	•Conversion and diversification of land use	• Impact equity • Gender relations • Capacity building and skills transfer	• Unacceptable social behaviour • Loss of natural or cultural heritage • Physical quality of environment • Aesthetic quality of environment • Health and social well-being • Safety, hazards, crime

It is necessary to pause here and clarify that the actual impacts experienced at a given project site will depend on a variety of factors that range between the baseline conditions, the public participation process, engagement and capacity building that has taken place, the type of construction methods use, the role of politics, most notably in local municipalities and the other processes of social change either already under way, or which may develop during the life of the project.

6.1 Social Change Process: Economic processes

Economic processes affect economic activity in the region, including the way in which people make a living as well as macroeconomic factors that affect society as a whole. Economic impacts can also be viewed from a social point of view, as employment creation or increased government income, can for example, lead to social development and the reduction of poverty.

6.1.1 Waged labour / Employment creation and decrease in unemployment

Phase at which impact is relevant	Construction Operation Decommissioning
Description of the impact	

Development directly influences changes in employment and income opportunities in communities. Such changes may be more or less temporary (e.g. construction projects, or seasonal employment) or may constitute a permanent change in the employment and income profile of the community should the development project bring long-term job opportunities for community residents.

Relatively high unemployment rates in the economic active population are prevalent (18.6% for the Rustenburg LM). The anticipated employment opportunities from the infrastructure project, and those that will arise from new business sales (i.e. equipment hire, building supplies, etc) will add some benefit, albeit minimal, to the micro economy. The proposed infrastructure project, due to its limited impact, is not expected to solve unemployment in the region, although it will create some economic opportunity if sufficient measures are put in place. A reduction in the unemployment rate will have a direct, although limited, impact on social impacts such as inequality, poverty and crime.

The fact that there will be reasonably few numbers of short to medium term employment opportunities available can, potentially, create tension among community members. Especially in an environment where local mines are in the process of retrenching mine workers. In this event, it is advised that employment opportunities be widely advertised to ensure that the local

community has a fair chance of being employed. The applicant must ensure that potential employment numbers are accurately advertised and that the relevant skills requirements are made very clear and unambiguous. Job adverts should also be posted in the most widely spoken languages in the area to avoid any uncertainties.

In order to ensure that this potential positive impact is maximised to its fullest, it is important to ensure that the created employment opportunities lead to employment of local residents as far as possible. Emerging employment opportunities should be targeted at these local residents as well as people from the surrounding townships. Since there are several communities in close proximity to the proposed site for construction, specific attention should be given to ensure that equal opportunity are given to each community, whether they fall within the RBN or Rustenburg LM administration.

In order to ensure that the resultant positive impact develops into a boost to the economy, it is suggested that, where possible, the applicant advise and assist local business operators (i.e. SMMEs) to provide services to applicant or contractor. The support of local business and the use of their products and services should be promoted as far as possible as this will contribute towards local community economic development. The applicant should work in close conjunction with the RBN and Rustenburg LM administration (Local Economic Development) ensuring that existing SMMEs are used during the construction and operational phase. Where services are currently unavailable, the applicant, in liaison with the RBN and Rustenburg LM administration should promote the development of such SMMEs.

It is advised that at least 45% of goods and services (including labour) be sourced from within 100 kilometre radius of the project. At least 75% of goods and services used must be sourced from within the South Africa.

Significance of the impact	

Table 6-1 Waged labour / Employment creation and decrease in unemployment

Nature	Waged labour	Impact status	P
Impact source(s)	Availability of job opportunities for local residents		
Affected stakeholders	Labour (existing and potential)		
Magnitude	*Magnitude*	**Minor**	**2**
	Duration	**Medium**	**3**
	Scale	**Regional**	**3**
	Probability	**Low**	**2**
Significance Before Mitigation			
Significance Potential		**Low**	**L**
Proposed mitigationmeasures	• It is suggested that non-locals should only be hired when specialist skills, which are not available locally, are required and local business providing such skills cannot be created. The following aspects in this regard should receive priority: ○ Labour based construction methods should be used whenever practically possible; ○ Local residents and communities should be employed, wherever possible; ○ Local construction companies should be used whenever possible, especially for subcontracting work; and ○ Local suppliers should be used as far as possible.		
Significance After Mitigation		Impact status	P
Mitigation efficiency		**Medium**	**M**
Magnitude	*Magnitude*	**Moderate**	**6**
	Duration	**Medium**	**3**
	Scale	**Regional**	**3**
	Probability	**Medium**	**3**
Significance Potential		**Medium**	**M**

6.2 Social Change Process: Geographic processes

Geographic processes are those that affect the land-use patterns of a community.

6.2.1 Conversion and diversification of land use

Phase at which impact is relevant	Construction Operation Rehabilitation
Description of the impact	

Conversion and diversification of land use refers to the change in the way land is used, both in terms of the area of land appropriated for a particular activity, the intensity of the use of the land and whether there are areas of land not used for production, and in terms of the type of land use activities and the pattern or mix of those activities.

The land use patterns of the surrounding area are defined as mining with intermittent residential and business use.

Since the proposed new substation and power lines will require at the minimum 30 ha of land (excluding the servitude for the power line) the land use in these areas will change and the community will no longer have access to the site.

The site falls among three communities that use the land for grazing. The Photsaneng and Thekwane areas use the area for grazing, with the Kwanana area using the area adjacent to the site.

Since the area in questions is already being overgrazed and overstocked, there is potential for conflict among these communities to develop due to scarce resources (i.e. the lack of grazing area). Although attempts have been made to educate the communities about overgrazing and even though requests have been made to sell some of the cattle, the issue has not been resolved.

From the perspective of research participants, agriculture, however, does not form a large part of the communities' source of income (estimated at approximately 5%) and grazing forms an even smaller part of the equation, when also considering crop production (sunflower, maize). It is estimated that mining and mining related industries form at least 70% of the local economy.

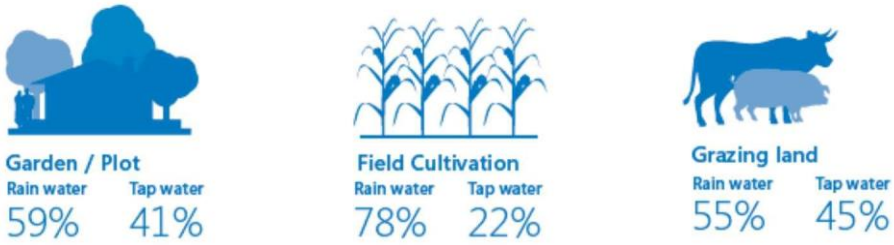
According to the RBN's "Population and use of land audit" 2011, 58% or roughly 61 700 persons indicated that their current occupation was in the mining sector. Roughly 10 600 persons (10%) indicated that they worked within funeral services, 6% or roughly 6 400 persons worked in the construction industry. According to the study, only 9% of participants owned their own business, indicating a low incidence of entrepreneurship within the RBN.

The PULA further indicates that 99.7% of persons surveyed purchased food, as compared to only 0.2% who obtained it through their own production. Of these purchases, 71% was made from a supermarket in Rustenburg or Phokeng, 26% from a trading store and 3% from an informal market at a taxi rank or along the road-side.

The PULA also considered the Household Food Insecurity Access Scale, which found that 50% of the RBN households are food secure, 14% are mildly food secure, 31% are greatly food insecure and 5% are severely stressed. Food security is defined as "all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life" (USAID as used by PULA, 2011).

The PULA also found that at least 6 867 households had access to a garden or small plot of land for food production. An estimate of 3 729 households had access to a field for cultivation

with only 2 909 households having had access to grazing land. A total of 45% of adults indicated that they have a market place to sell produce nearby. According to Source: PULA, 2011 Figure 6-1, the majority of households relied on rain water for their garden, field or grazing land.



Source: PULA, 2011

Figure 6-1 Livestock and crop production

By far the greatest majority of households produced maize (1649), sheep (117) and cattle (117) are the sixth most likely agricultural product produced, followed by chickens (59). The study lastly found that 59% of households didn't consume any of their products, only 30% consumed some of it and the least amount (11%) consumed most of it.

The above give an indication of the reliance on grazing land for survival versus economic benefit. It seems that most of the households produce agricultural products in order to sell it at markets, etc. Households do not produce their own food for survival, but can afford to buy produce at local stores, markets or from persons within the community. Even though there isn't an over reliance on produce for survival, it does form an important economic driver within the communities.

It is therefore determined that the loss of approximately 30 ha of land could have a negative impact on both the current cattle herders as well as the grazing potential of the remaining land, if not properly and proactively managed. The RBN has a big role to play in ensuring that access to the area is managed and that strategies are put in place to managed the land capacity (i.e. grazing on a rotational basis).

Significance of the impact	

Table 6-2 Conversion and diversification of land use

Nature	Conversion and diversification of land use	Impact status	N
Impact source(s)	Loss of access to land due to infrastructure placement		
Affected stakeholders	Local residents, local municipality		
Magnitude	*Magnitude*	**Moderate**	**6**
	Duration	**Long term**	**4**
	Scale	**Site**	**1**
	Probability	**Definite**	**5**
Significance Before Mitigation			
Significance Potential		**High**	**H**
Proposed mitigation measures	• Take into account surrounding land uses and design land use options to support and enhance long-term development options; • The RBN must manage access to land for grazing and implement measures to reduce the number of cattle grazing in the area, or establishing rotational grazing practises; and • Implement mitigation measures suggested by Soil Impact Study.		
	Significance After Mitigation	Impact status	P
Mitigation efficiency		**Medium**	**M**
Magnitude	*Magnitude*	**Moderate**	**6**
	Duration	**Long term**	**4**
	Scale	**Site**	**1**
	Probability	**High**	**4**
Significance Potential		**Medium**	**M**

6.3 Social Change Process: Institutional and legal processes

Institutional and legal processes are those processes that affect the efficiency and effectiveness of various organisations that are responsible for the supply of the goods and services on which people depend. These organisations include government agencies, non-government organisations and the commercial sector.

6.3.1 Impact equity

Phase at which impact is relevant	Prior to construction Construction Operation
Description of the impact	

Impact equity refers to fairness of the distribution of impacts (positive and negative) across the community. People who will benefit from the project must also share in carrying the costs. The project will lead to gain on a regional level, whereas the local communities will not necessarily benefit in terms of financial benefits and employment opportunities.

It is therefore important to recognise that infrastructure developments must be sustainable and recognise people as an element of the environment.

The Rustenburg Local Municipality (Directorate: Planning and Human Settlement) has indicated that there is a need to strengthen the current transmission system for the supply of electricity and to meet the changing customer needs. Therefore, the construction of the proposed infrastructure should have an overall positive impact on the greater community.

Over and above this general positive impact, it is expected that the local community would receive little direct benefits (i.e. only better service delivery in the form of electrification) from the proposed project. Direct benefits that can accrue to the community, such as job creation, local procurement, etc. will mostly be experienced during the construction phase.

During the public consultation phase it has been noted that there are unhappiness in the community with regard to leadership structures and that there internal struggle for leadership. This could also be due to the fact that the National Elections of 7 May 2014 are slowly approaching and political leaders are positioning themselves in the community in order to obtain strategic advantage from it. Therefore, any overtly negative or positive feelings in relation to this project should be closely scrutinised.

It is often difficult to mitigate potential impacts associated with public perceptions of how the project will directly benefit the community. Any direct benefits associated with this project should therefore be highlighted and communicated to the community in an objective manner (i.e. through newspaper articles, written communication to community structures, etc.) without giving attention to internal power struggles or hidden agendas. Processes that will attempt to provide benefit to local community members (i.e. labour recruitment, procurement, etc.) should be fair and transparent and should be managed by the applicant in line with their own policies and procedures.

Significance of the impact	

Table 6-3 Impact Equity

Nature	Distribution of impact	Impact status	N
Impact source(s)	Availability of electricity		
Affected stakeholders	Local residents, mines, local authorities		
Magnitude	*Magnitude*	**Low**	**4**
	Duration	**Medium**	**3**
	Scale	**Regional**	**3**
	Probability	**Low**	**2**
Significance Before Mitigation			
Significance Potential		**Low**	**L**
Proposed mitigation measures	• Negative impacts on the community and affected landowners should be limited as far as possible such as intrusion impacts (dust, noise, and air pollution). Mitigation measures from the EMP should thus be strictly implemented; • Safety and security measures are critical to avoid any increase in criminal activities within the local study area; • Skills training and development should be maximised to benefit as many local employees as possible; • The use of local labour must be maximised as far as possible; and • The applicant's own internal policies and procedures should be used to ensure a fair and transparent recruitment process.		
Significance After Mitigation		Impact status	P
Mitigation efficiency		**Medium**	**M**
Magnitude	*Magnitude*	**Moderate**	**6**
	Duration	**Long**	**4**
	Scale	**Regional**	**3**
	Probability	**Medium**	**3**
Significance Potential		**Medium**	**M**

6.3.2 Gender relations

Phase at which impact is relevant	Prior to construction Construction Operation
Description of the impact	

In most societies certain roles, occupations, responsibilities and qualities are associated with being male or female (i.e. gendered division of labour). While some of these roles have biological origins, many are socially constructed and deeply entrenched by history and tradition. Traditionally, women are represented in the caring professions (i.e. healthcare, education, etc.) and lacks representation in high paying professions, such as engineering, mining, construction and manufacturing.

In the context of sustainable development, gender equity is based on grounds of human rights and since 1994 a number of laws have been passed that is concerned with social

transformation. Amongst these laws are the Employment Equity Act (Act No 55 of 1998), the Preferential Procurement Framework Act (Act No 5 of 2000), and the Broad Based Black Economic Empowerment Act (Act No 53 of 2003).

Significance of the impact	

Table 6-4 Gendered division of labour

Nature	Equal gender relations	Impact status	P
Impact source(s)	Employment Equity requirements		
Affected stakeholders	Labour		
Magnitude	*Magnitude*	**Minor**	**2**
	Duration	**Short**	**2**
	Scale	**Regional**	**3**
	Probability	**Medium**	**2**
Significance Before Mitigation			
Significance Potential		**Low**	**L**
Proposed mitigation measures	• Women must have equal employment opportunities; • Training and skills development should take place for women; • Salaries of women should be equal to that of men when undertaking the same job; • The applicant's own internal policies and procedures should be used to ensure a fair and transparent recruitment process; and • Institute a well-designed gender equality strategy, if not already available.		
Significance After Mitigation		Impact status	P
Mitigation efficiency		**High**	**H**
Magnitude	*Magnitude*	**Moderate**	**6**
	Duration	**Long**	**4**
	Scale	**Regional**	**3**
	Probability	**High**	**4**
Significance Potential		**High**	**H**

6.3.3 Capacity building and skills transfer

Phase at which impact is relevant	Construction Operation
Description of the impact	

Capacity building refers to the conscious increasing of knowledge, networking capability and the skills base amongst local people. It is predicted that the proposed project will add, to a small degree, capacity building in the community, as opportunities do exist to develop the skills of local residents. This type of skills development should, however, encompass more skills than merely the technical skills and should include life skills training and mentorship. In terms of training, it is suggested that all employees be trained in the function of their job and that this training incorporate health, safety, security and environmental aspects. The development and support of SMMEs in the local communities should also be encouraged as far as possible.

Significance of the impact	

Nature	Skills transfer to local employees and capacitating of communities	Impact status	P
Impact source(s)	Construction and operational activities		
Affected stakeholders	Local residents and businesses, local authorities,		
Magnitude	*Magnitude*	**Minor**	**1**
	Duration	**Short**	**2**
	Scale	**Regional**	**3**
	Probability	**Medium**	**2**
Significance Before Mitigation			
Significance Potential		**Low**	**L**
Proposed mitigation measures	• Recruit and train local residents to supply unskilled labour during the construction phase; • Stakeholders should be mutually accountable for increased opportunities regarding skills and competency development (general education and technical training); • Training should be concentrated on skills that can be readily transferred to other employment opportunities in the local area to avoid persons with trained skills leaving the area for work elsewhere; and • Ensure that the employment and training of HDSA and women.		
	Significance After Mitigation	Impact status	P
Mitigation efficiency		**High**	**H**
Magnitude	*Magnitude*	**Moderate**	**3**
	Duration	**Long**	**4**
	Scale	**Regional**	**3**
	Probability	**High**	**4**
Significance Potential		**High**	**H**

6.4 Social Change Process: Socio-cultural processes

Socio-cultural processes are those that affect the culture of a society, that is, all aspects of the way that people live together.

6.4.1 Unacceptable social behaviour

Phase at which impact is relevant	Construction
Description of the impact	

This impact can be defined as types of social behaviour that might be considered deviant or antisocial, such as excessive alcohol consumption, illegal drug use, various types of risk-taking behaviours and vandalism. It is expected that this impact will, to varying degrees, occur during the construction phase of the infrastructure upgrade. There is a risk that the presence of “incoming” workers and or the influx of jobseekers can lead to deviant social behaviour in the communities they occupy. Especially against the background of labour unrests in the area and general retrenchments in the mining industry surrounding the substation.

Projects such as this have to be introduced to the community with caution and thorough public participation will have to be carried out. It is important that the benefits to the community are emphasized during these meetings.

In order to address cumulative impacts, the establishment of construction camps should be avoided. Eskom should instead provide housing subsidies and implement a system for the bussing of employees to and from their residential areas. Transporting of employees may create the opportunity for BEE entrepreneurs to provide shift-time related transport on assigned routes.

It is, furthermore, recommended that the South African Police Department (SAPD), in association with existing Community Based Organisations, Non Government Organisations be used to monitor and assist with the management of the negative social effects of incoming job seekers and strangers.

Significance of the impact

Table 6-5 Unacceptable social behaviour

Nature	Unacceptable social behaviour	Impact status	N
Impact source(s)	Newcomers, construction workers etc.		
Affected stakeholders	Local residents, sub-contractors, local authorities		
Magnitude	*Magnitude*	**Moderate**	**6**
	Duration	**Long term**	**4**
	Scale	**Regional**	**3**
	Probability	**Medium**	**3**
Significance Before Mitigation			
Significance Potential		**Medium**	**M**
Proposed mitigation measures	• Establish a code of conduct for construction workers with strict control measures; • Require construction and operational personnel to wear identification badges to distinguish them from trespassers or unwanted loiterers; • HIV / Aids awareness campaigns within the area should be initiated and supported by Eskom; • Life orientation programmes, explaining the dangers of drug and alcohol abuse should form part of induction for all workers; • Liaise with the SAPD in order to implement effective crime prevention strategies; and • Liaise with existing forums in the community to communicate information to the community and to assist in the monitoring of compliance.		
Significance After Mitigation		Impact status	N
Mitigation efficiency		**Medium**	**M**
Magnitude	*Magnitude*	**Moderate**	**6**
	Duration	**Short**	**2**
	Scale	**Local**	**2**
	Probability	**Low**	**2**
Significance Potential		**Low**	**L**

6.4.2 Loss of natural and cultural heritage

Phase at which impact is relevant	Construction Operation Decommissioning
Description of the impact	

South Africa is a multi-cultural society and urbanisation has resulted in many of the diverse cultures sacrificing their cultural integrity. The National Heritage Resources Act 25 of 1999 and Provisional Declaration of Types of Heritage Objects (General Notice No. 630 of 2000) are concerned with the protection of heritage and promotion of history and culture.

A Heritage Impact Assessment (HIA) has been commissioned, which will address all impacts relating to natural and historical cultural artefacts. The HIA made the following assessment:

Site 1: This proposed area is fairly flat, section of this area is utilised by locals as a dumping place. No sites of heritage significance were identified on the footprint during the survey. As such, this is the most preferred site of the three proposed area for substation.

Site 2: This proposed site is fairly flat and has a small hill on the tip of the south-eastern section. This hill is concentrated by Late Iron Age stone walled sites, some of this walling are still intact. Also noted are terracing which are scattered across the proposed area. These sites most probably date to the Late Iron Age and are protected by the National Heritage Resources Act (No 25 of 1999). If this site is going to be preferred, a permit to demolish would have to be applied with SAHRA, this permit would authorise the destruction of these materials.

Site 3: Like the other sites (2 and 3) access roads and path ways cut across this site. Stone walled sites were noted in this proposed area. These sites date from the Late Iron Age, and are the results of Bantu speaking groups. Thus, these sites and clusters of sites have high significance and are protected by Section 35 of the National Heritage Resources Act (No 25 of 1999). A permit to demolish would have to be applied with SAHRA before this area can be utilised. This permit would authorise the destruction of these remains.

It is strongly recommended that the mitigation measures in the HIA be communicated with affected parties during the consultation process. Hilly areas are known to have items of cultural significance and should be avoided during construction (movement of humans and vehicles). From a social point of view, the following impact ratings are predicted.

Significance of the impact	

Table 6-6 Natural and Cultural Heritage

Nature	Loss of natural and cultural heritage	Impact status	N
Impact source(s)	Construction, site clearance		
Affected stakeholders	Eskom, contractors, local authorities		
Magnitude	*Magnitude*	**High**	**8**
	Duration	**Long term**	**4**
	Scale	**Local**	**2**
	Probability	**Medium**	**3**
Significance Before Mitigation			
Significance Potential		**Medium**	**M**

Proposed mitigation measures	• The recommendations of the HIA should be implemented;
	• The Environmental Control Officer or any person responsible for site management should be aware of the indicators of sub-surface archaeological sites, this may include the following:
	  • Bone concentrations, either animal or human,
	  • Ash deposits (unnaturally grey appearance of soil compared to the surrounding substrate),
	  • Ceramic fragments, including potsherds,
	  • Bone concentrations,
	  • Stone concentrations that appear to be formally arranged (may indicate the presence of an underlying burial),
	  • Fossilised remains of fauna and flora, including trees;
	• Local residents and land owners should be consulted to determine any possible heritage sites not identified by the HIA; and
	• Local residents and land owners should inform mitigation measures when addressing any potential impact on cultural heritage sites or graves.		

	Significance After Mitigation	Impact status	N
Mitigation efficiency		**Low**	**L**
Magnitude	*Magnitude*	**Moderate**	**6**
	Duration	**Short**	**2**
	Scale	**Local**	**2**
	Probability	**Low**	**2**
Significance Potential		**Low**	**L**

6.4.3 Physical quality of the living environment (actual and perceived)

Phase at which impact is relevant	Construction Operation
Description of the impact	

Social impacts experienced in the physical environment relate to exposure to dust, noise, risk, odour, vibration, artificial light etc.

At construction sites, the method and/or processes and actions taken, will have the potential to create pollution/environmental degradation. While these may differ from project to project only experience will enable officials to easily identify these. Some factors may not be readily measurable and may not be visible at all. Still, all construction related projects have at least some negative impacts on the environment. These include:

Noise: Regardless of where the noise originates from, noise pollution becomes more acute and more important depending on the proximity of neighbouring communities. The impacts of noise levels can be both physical and physiological at the high end of the spectrum but more commonly impact on communication or create psychological effects at the lower end of the spectrum.

The negative community response even to relatively low noise levels is one of the most common environmental considerations. The repetitive operation of machinery also creates a range of noise levels. Although of low intensity, these have an impact due to long periods of operation. Environmental legislation requires these operations to be effectively screened to reduce or deflect noise. Vehicle engine or loading noise and even reverse warning alarms on trucks and loaders can impact communities near a site. Machinery such as compressors, generators, metal workshop tools such as angle grinders, pneumatic drills and jackhammers create high noise levels that are difficult to screen.

In terms of noise impact, the National Noise Regulations define an increase of 7dB above the ambient noise levels as disturbing. It is therefore advised that noise levels be kept within 7dB of the baseline data. Noise reduction is essential and the applicant must endeavour to limit unnecessary noise, especially loud talking, shouting, whistling, radios, sirens, etc.

Dust: Almost all construction sites have the capacity to produce dust into the atmosphere. This dust could increase as a result of failure to control its natural proliferation, or from increased physical activity, like the transportation of goods and equipment. Dust is one of the most visible, invasive, irritating and potentially harmful forms of pollution. Dust in surface environments represents a health risk with respect to dust-borne diseases, respiratory diseases silicosis and asbestosis, and has a high nuisance impact, lowering the quality of life in surrounding communities. Dust retards vegetation growth and reduces the palatability to animals.

In addition, the Air Quality Specialist report by Rayten Engineering Solutions (2014) indicated that agriculture and mining may contribute to ambient air quality. Major mining operations within the Rustenburg Local Municipality include Anglo Platinum, Impala Platinum, Lonmin Platinum, Xstrata, Omnia Phosphates and Samancor Chrome Mine. Anglo Platinum is located to the immediate south of the proposed project site. Dust emissions from the neighbouring mining operations will contribute to ambient particulate concentrations, particularly during windy conditions.

The report further indicated that “heavy construction is a source of dust emissions that can have a substantial temporary impact on the local air quality situation. Emissions during construction are associated with land clearing, drilling and blasting, ground excavation and cut and fill

operations. Dust emissions often vary substantially on a daily basis, depending on the level of activity, the specific operations and the prevailing meteorological conditions. A large portion of the emissions results from equipment traffic over temporary roads at the construction site".

The proposed project will be constructed over a period of 24 months. During the construction phase of the proposed project, it is expected that fugitive dust emissions will result from the construction of new infrastructure associated with the proposed project. Vehicle activities associated with the transport of equipment to and from the site, and on-site construction equipment traffic will also contribute to elevated fugitive dust levels (Air Quality Report, 2014).

Aesthetic: Construction sites have the potential to momentarily or permanently scar the landscape, either by limited physical impacts or, from a larger perspective, by breaking the skyline and the natural contours or flow of the surrounding landscape.

Water – The objective of the United Nations Millennium Development Goals on water is a 50% reduction in the number of people without sustainable access to safe drinking water, by 2015. The applicant should, as far as possible, explore opportunities to minimise water usage, maximise water reuse and recycling.

Waste – All construction sites produce waste products. The ratio of waste produced and the potential for production of saleable waste from the products depends on the commodity and demand. The illegal disposal of waste, can lead to the spread of vermin and disease.

Light –Light pollution is defined as: "Any adverse effect of artificial lighting including sky glow, glare, light trespass, light clutter, decreased visibility at night, and energy waste" (www.darksky.org). Lighting structures will have little to no visual impact during daylight hours but will contribute to the ambient light levels and light pollution at night. In order to prevent light pollution, these structures must not be used excessively but must only create sufficient light to enable safe navigation at night. If possible, the design of the lighting structures used must include shields which will ensure that any light produced is focused down onto the road surface thereby preventing sky glow and glare and greatly reducing their visibility from within the visual envelope at night. This will also make the light significantly more energy efficient.

The environment in which the infrastructure upgrade will take place has already been impacted by other industrial and mining activities. Even though it is expected that the environment will suffer a minimal level of environmental degradation, it is not anticipated that the construction activities will have a detrimental impact on the community. It is therefore suggested that all the mitigation measures stipulated by the EMP be implemented and monitored on a regular basis.

Significance of the impact

Nature	Quality of the physical environment (actual and perceived)	Impact status	N
Impact source(s)	Noise, dust, water and nuisance impacts		
Affected stakeholders	Local residents, construction workers, local authorities		
Magnitude	*Magnitude*	**High**	**4**
	Duration	**Long term**	**4**
	Scale	**Regional**	**3**
	Probability	**High**	**4**
Significance Before Mitigation			
Significance Potential			**M**

Proposed Mitigation Measures

- Existing community forums must serve as liaison between the affected stakeholders and Eskom and can discuss traffic, dust, noise and construction related concerns with them;
- Prevent dust blowing off transported materials by washing vehicles, wheels and covering loads;
- Mitigation measures such as wet suppression should be employed to reduce particulate emissions during the construction phase, particularly during construction at Sites A and C, due to their close proximity to Boitekong;
- Prepare a dust management plan in liaison with air quality and soil specialist;
- Fugitive dust emissions during the construction phase should be minimised with wet suppression, wind speed reduction methods or chemical suppression as advised by the air quality specialist;
- Prepare a noise reduction plan to cover all significant impacts at source and implement noise reduction and screening to limit exposure.
- The maximum acceptable night time noise levels should not be exceeded;
- Upgrade the roads feeding to the site;
- Traffic calming measures should be put in place to minimise traffic noise;
- Adequate monitoring of the biophysical impacts should occur in order to address any unnecessary inconveniences to stakeholders;
- The following mitigation measures should be implemented to limit visual impacts:
  - Make use of existing access roads where possible;
  - Where new access roads are required, the disturbance area should be kept as small as possible. A two-track dirt road will be the most preferred option;
  - Locate access routes so as to limit modification to the topography and to avoid the removal of established vegetation;
  - Avoid crossing over or through ridges, rivers, pans or any natural features that have visual value;
  - Maintain no or minimum cleared road verges;
  - Access routes should be located on the perimeter of disturbed areas such as cultivated/fallow lands as not to fragment intact vegetated areas;
  - If it is necessary to clear vegetation for a road, avoid doing so in a continuous straight line. Alternatively, curve the road in order to reduce the visible extent of the cleared corridor;
  - Keep the construction sites and camps neat, clean and organised in order to portray a tidy appearance;
  - Screen the construction camp and lay-down yards by enclosing the entire area with a dark green or black shade cloth of no less than 2 m height;
- Eskom must develop a community liaison protocol for dealing with community complaints in a way that is sensitive to their traditional and cultural practises;
- Recommendations made in the EMPr should be adhered to.

	Significance After Mitigation	Impact status	N
Mitigation efficiency		**Low**	**L**
Magnitude	*Magnitude*	**Moderate**	**6**
	Duration	**Long term**	**4**
	Scale	**Regional**	**3**
	Probability	**Medium**	**3**
Significance Potential		**Medium**	**M**

6.4.4 Aesthetic quality of the living environment and sense of place

Phase at which impact is relevant	Construction Operation
Description of the impact	

The visual impact of a project is influenced by the terrain, relief of surrounding areas as well as by the population density, transport routes or other development nodes, which will all impact on its visual absorption capacity. It is possible that a project could impact on the "Sense of Place", that quality that makes the place unique or distinct with a character of its own. Visual quality or aesthetic appeal might also be affected if the degree of visual diversity or complexity, discernible textures or patterns or striking features and the landscape character are impacted.

To determine the quality of the visual resource, a Visual Impact Assessment (VIA) has been commissioned. The VIA will identify impacts associated with the project and provide mitigation measures for addressing these impacts. From a social point of view, the following preliminary impact ratings are predicted.

Significance of the impact

Nature	Degradation of physical environment	Impact status	N
Impact source(s)	Project infrastructure during construction		
Affected stakeholders	Visual receptors		
Magnitude	*Magnitude*	**High**	**4**
	Duration	**Medium**	**3**
	Scale	**Local**	**2**
	Probability	**High**	**4**
Significance Before Mitigation			
Significance Potential			M
Proposed mitigation measures	• Utilise the existing screening capacity of the site and improve it by enclosing the construction site and stockyards with a dark green or khaki brown shade cloth of at least 20% density and at least 3 metres high, as an additional screen; • Retain the existing vegetation cover of the site through selective clearing, where practical; • Remove rubble and other construction rubbish off site as soon as possible or place it in containers in order to keep the construction site free from additional unsightly elements; • Keep the construction sites and camps neat, clean and organised in order to portray a tidy appearance; • Treat all steelwork with a matt paint to limit reflection; • Be sensitive towards the use of glass or materials with a high reflectivity to avoid glare from the shiny surfaces and to avoid visual discomfort for viewers during the day; and • Repair damage and do not allow the facility to fall into disrepair.		
	Significance After Mitigation	Impact status	N
Mitigation efficiency		**Low**	**L**
Magnitude	*Magnitude*	**Low**	**4**
	Duration	**Long**	**4**
	Scale	**Local**	**2**
	Probability	**High**	**4**
Significance Potential		**Medium**	**M**

6.4.5 Health and Social Well-being

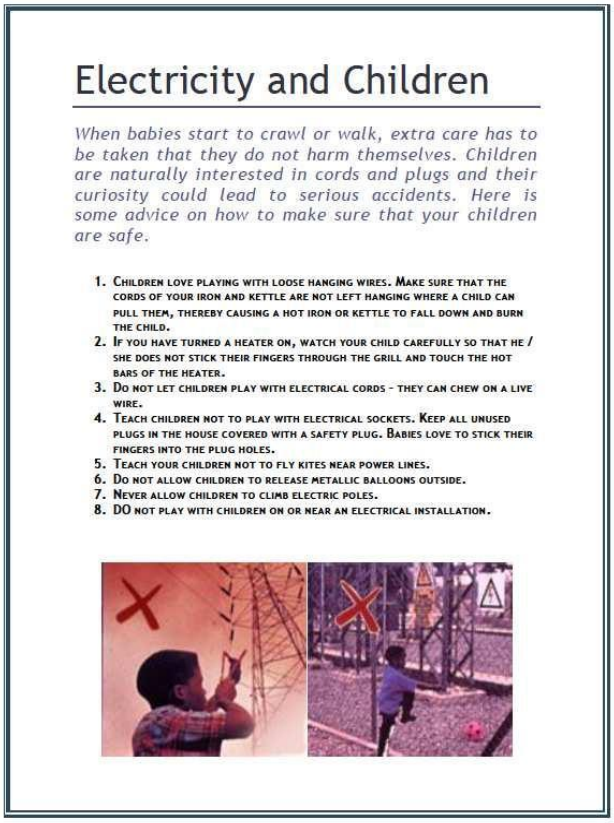
Health aspects are included from a social perspective and will be expressed in non-medical terminology.

The Occupational Health and Safety (OHS) Act (Act 85 of 1993) provides for the protection of the health and safety of employees and other persons at a workplace. The prevention and management of construction related incidents are addressed by the OHS Act. The applicant should strive to abide by the abovementioned OHS Act, in addition to international best practice guidelines.

Construction related public health impacts due to possible air/dust pollution, noise pollution and light pollution should also be considered. It is expected that vehicle traffic on the road leading to the substation may cause dust and noise in addition to the baseline conditions. Proper consultation with households in close proximity to the site will be essential both prior to and during the construction phase.

Photo 6.1 indicates the health and safety warnings displayed on the perimeter fence of an Eskom substation. These warnings are key to ensuring the safety of community members and employees at the substation. As part of the mitigation measures, it is suggested that educational posters and flyers be distributed at local schools, educational establishments and clinics, warning community members of the general risks and dangers of electricity (see Photo 6.2 for an example). General construction risks can also be included in the educational material.

Photo 6.1 Health and Safety Warnings displayed on the perimeter of a substation



Electricity and Children

When babies start to crawl or walk, extra care has to be taken that they do not harm themselves. Children are naturally interested in cords and plugs and their curiosity could lead to serious accidents. Here is some advice on how to make sure that your children are safe.

1. Children love playing with loose hanging wires. Make sure that the cords of your iron and kettle are not left hanging where a child can pull them, thereby causing a hot iron or kettle to fall down and burn the child.
2. If you have turned a heater on, watch your child carefully so that he / she does not stick their fingers through the grill and touch the hot bars of the heater.
3. Do not let children play with electrical cords - they can chew on a live wire.
4. Teach children not to play with electrical sockets. Keep all unused plugs in the house covered with a safety plug. Babies love to stick their fingers into the plug holes.
5. Teach your children not to fly kites near power lines.
6. Do not allow children to release metallic balloons outside.
7. Never allow children to climb electric poles.
8. DO not play with children on or near an electrical installation.

Source: Adapted from www.eskom.co.za

Photo 6.2 Example of educational flyer

Significance of the impact	

Table 6-7 Health and social well-being

Nature	Environmental impacts (water, dust, noise, etc)	Impact status	N
Impact source(s)	Construction		
Affected stakeholders	Construction workers, affected communities		
Magnitude	*Magnitude*	**High**	**8**
	Duration	**Long**	**4**
	Scale	**Local**	**2**
	Probability	**Highly**	**4**
Significance Before Mitigation			
Significance Potential			**M**
Proposed Mitigation Measures	• In order to reduce the impact on the local community it is important to maximise the use of local labour as far as possible; • Local labour should be employed as far as possible to avoid additional pressure on the existing services; • Environmental pollution must be limited as far as possible and the requirements of the EMP be implemented to reduce the impact on surrounding communities; • The necessary safety precautions should be taken and first aid supplies should be made available on site; • All employees (including contractors) should undergo health and safety training on a regular basis; • The required safety equipment should be provided to employees and contractors on site and should be in a good working order; • Consult with households living in informal settlements next to the main road leading to the substation, prior to construction, to determine ways to mitigate any negative effect on them; and • Educational posters and flyers should be distributed at local schools, educational establishments and clinics, warning community members of the general risks and dangers of electricity.		
	Significance After Mitigation	Impact status	N
Mitigation efficiency		**Medium**	**M**
Magnitude	*Magnitude*	**Minor**	**2**
	Duration	**Medium**	**3**
	Scale	**Local**	**2**
	Probability	**Low**	**2**
Significance Potential		**Low**	**L**

6.4.6 Personal safety and hazard exposure /crime and violence

Phase at which impact is relevant	Construction Operation Decommissioning
Description of the impact	

The potential impact can be twofold, i.e. personal safety and risk exposure due to the construction site and related infrastructure itself, or due to the influx of strangers entering the local communities.

Furthermore, the influx of potential jobseekers could lead to an increase in the size of the local population, which could have cumulative impacts such as negative social behaviour, petty crime, violence and conflict with local residents.

In order to address some of the risk to community members, the applicant should employ local labour as far as possible. By training local unskilled or semi-skilled labour, rather than migrant labour, the infrastructure upgrade will be able to address most of the security issues. Direct measures to address potential safety issues would, however, also be imperative.

The applicant should ensure that current security features be updated and any new features maintained. The proper fencing of the substation and all construction sites should take place to ensure the safety of community members, children and animals.

In addition, it is anticipated that increased levels of traffic may have a negative impact on the health and safety of animals. The safety of the domestic animals during construction should be taken into consideration and addressed in the EMP. Since the community are dependent on the livestock, either in terms of food or capital security, any negative effect on the animals will translate into a negative impact on the community members. The above impacts can, however, be mitigated to reduce the impact on the communities, and is not seen as a major flaw in the project proposal. Alternative Site 2, which is located accross to the Thekwane road and the road towards Kelgran is not deemed acceptable as it traverses the road and will cause too much disruption and traffic hazards in the area.

The influx of potential job seekers, as well as the increase in movement and activity as a result of construction activities in areas in close proximity to the site could result in an increase of petty criminal activities. This should be closely monitored and addressed where required.

Significance of the impact

Table 6-8 Personal safety and hazard exposure / crime and violence

Nature	Construction related activities and influx of newcomers	Impact status	N
Impact source(s)	Fear of crime and construction / electrical related hazards including traffic		
Affected stakeholders	Local residents, mine labourers, local authorities		
Magnitude	*Magnitude*	**Low**	**4**
	Duration	**Long**	**4**
	Scale	**Local**	**2**
	Probability	**Medium**	**3**
Significance Before Mitigation			
Significance Potential		**Medium**	**M**
Proposed Mitigation Measures	• Strict security measures should be put in place. Security personnel should be on site on a permanent basis; • The construction area should be fenced to avoid unauthorised entry by humans or animals onto the site; • Workers must not be allowed to leave the designated areas without permission; • A Health and Safety Plan should be implemented and it must be ensured that all managers are trained in First Aid and other relevant safety courses; • Implement safety measures to limit fire hazards and implement fire breaks if possible; • Operational safety risks should be addressed as part of the OHS Act; • Appropriate fire-fighting equipment should be on site and construction workers should be appropriately trained for fire-fighting; • Speed limits on the local roads surrounding the site should be enforced; • Speeding of vehicles must be strictly monitored; • Local, unemployed labour should be employed as far as possible; • The site should be clearly marked and “danger” and “no entry” signs should be erected; • Mitigation measures, addressing the safety of grazing animals should be included in the EMP.		
	Significance After Mitigation	Impact status	N
Mitigation efficiency		**Medium**	**M**
Magnitude	*Magnitude*	**Low**	**4**
	Duration	**Medium**	**3**
	Scale	**Site**	**1**
	Probability	**Low**	**2**
Significance Potential		**Low**	**L**

7 CONCLUSIONS AND RECOMMENDATIONS

It is recommended that the mitigation measures suggested in this document, in addition to those highlighted as part of the EMP for the site be implemented and monitored as prescribed in the EMP. Some of the key mitigation measures to be employed include:

Labour and skills development

- Unskilled and unemployed labour should be sourced from the surrounding local communities as far as possible;
- It is suggested that non-locals should only be hired when specialist skills, which are not available locally, are required and local business providing such skills cannot be created;
- Skills development opportunities should be granted to community members and local job seekers, where needed;
- Maximise employment opportunities for the local communities and reduce the influx of a foreign labour force whilst ensuring an effective construction and operational phase;
- Make use of any existing skills databases and include the local councillors and other representative community structures in the process;
- Project contracts between Eskom and the principle contractor should stipulate the use of local labour for unskilled and semi-skilled positions and tasks; and
- Ensure that the Labour Relations Amendment Act, 2002 (Act No. 12 of 2002) as well as the necessary policies and procedures are taken into consideration to ensure the correct procurement procedures.

Local procurement

- Local suppliers should be used as far as possible; and
- Ensure that local businesses, especially those of Historically Disadvantaged Individuals (HDI), women and of Small, Micro and Medium Enterprises (SMMEs) get allocated the maximum appropriate share of project related business opportunities.

Stakeholder Engagement

- Engage with the local community representatives to dispense information relating to the projects, possible employment opportunities and channels of communication (especially in terms of grievances);
- Existing community forums must serve as liaison between the affected stakeholders and the applicant and can discuss traffic, dust, noise and construction related concerns with them;
- Complaints must be attended to by the contractor as soon as possible and to the satisfaction of all parties concerned. A complaint register must be kept up to date and should be produced upon request;

- The applicant should, in liaison with the relevant Roads and Traffic Department and the mines operating in the area, identify problem areas and assist with the regular maintenance of the roads frequently used by construction traffic;
- Consult with households living in informal settlements close to site, prior to construction, to determine ways to mitigate any negative impacts on them;
- Educational posters and flyers should be distributed at local schools, educational establishments and clinics, warning community members of the general risks and dangers of electricity;
- Local residents and land owners should be consulted to determine any possible heritage sites not identified by the HIA; and
- Local residents and land owners should inform mitigation measures when addressing any potential impact on cultural heritage sites or graves.

Based on the impacts identified and the measures that could possibly be implemented to mitigate (or enhance) these impacts, no fatal flaws were identified. It is therefore recommended that the project may proceed.

8 REFERENCES

Vanclay, F. 2003. Conceptual and methodological advances in Social Impact Assessment. n

Vanclay, F. & Becker, H.A. 2003. The International Handbook for Social Impact Assessment. Cheltenham: Edward Elgar Publishing Limited.

Van Vollenhoven,AC. January 2013. A Report on a Cultural Heritage Impact Assessment for the Proposed Eskom Bighorn Substation Expansion Project, Close to Marikana, Northwest Province.

Internet Resources

http://en.wikipedia.org/
http://bojanala.gov.za/index.php/aabout-bpdm
http://en.wikipedia.org/wiki/Rustenburg_Local_Municipality
www.darksky.org http://www.eskom.co.za/c/article/84/safety-around-the-home/

Other

Bojanala Platinum District Integrated Development Plan, 2011/12

Quantec Regional Data, 2012