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PROPOSED BRAVO INTEGRATION PROJECT SOCIAL IMPACT ASSESSMENT FOR BRAVO 3 (PHASE 3)

Prepared by:

Metro Concepts (Pty) Ltd

PO Box 0069, Glen Erasmia 1638
Tel: 082 822 5091
Email: narda@metroconcepts.co.za

EXPERIENCE RECORD

This report was compiled by **Mrs *Narda Botha*** of ***Metro Concepts (Pty) Ltd***. Mrs Botha holds a B Art et Scien *(Town and Regional Planning)* degree from the North West University in Potchefstroom and has approximately 20 years' experience in this field, which includes the collection and analysis of socio-economic data, land use interpretation, control and future development proposal.

Socio economic research were included in the following projects:

- Social Impact Assessment for Moretele, 132kV transmission lines and substations.
- Socio-economic profile for the Comprehensive Urban Plan (CUP) for Kimberley in co-operation with the Swedish Government.
- Compiled the urban structure plan for Frankfort (Free State Provincial Government)
- Compiled the urban structure plan for Winburg (Free State Provincial Government)
- Compiled the urban structure plan for Oranjeville (Free State Provincial Government)
- Involved with the compiling of structure plans for towns in the Free State as well as for the "Restricted Development Areas" surrounding the Vaaldam.
- Compiled a town planning scheme for Vredefort and Mokwalo (Free State Provincial Government)
- Compiled a town planning scheme for (Free State Provincial Government)
- Ad-hoc research projects e.g. "Upgrading of Central Business Districts" and "Guidelines for the evaluating of applications on the banks of the Vaal River, Vaaldam and the Barrage Area inside the Vaal River Complex guide plan area" (Free State Provincial Government)

Indemnity

This report is based on the available literature, reports, databases, maps and project information supplied by Envirolution. The findings, results, observations, conclusions and recommendations given in this report are based on the author's best professional knowledge as well as information available at the time of the study. Therefore the author reserves the right to modify aspects of the report, including the recommendations, if and when new information may become available from ongoing research or further work in this field, or pertaining to this investigation.

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EXECUTIVE SUMMARY

The growing demand for electricity is placing increasing pressure on Eskom's existing power generation and transmission capacity. Eskom (SOC) is committed to implementing a Sustainable Energy Strategy that complements the policies and strategies of National Government. Eskom aims to improve the reliability of electricity supply to the country, and in particular to provide for the growth in electricity demand in the Gauteng and Mpumalanga provinces. For this reason, Eskom obtained environmental authorisation to construct the new 400 kV Kusile (previously known as Bravo) coal-fired Power Station between Bronkhorstspruit and Witbank in 2007. Construction of the Kusile power station has already commenced. Due to this construction, the new Kusile Power Station needs to be integrated with the existing Eskom electricity infrastructure.

In this regard Eskom also obtained environmental authorization on 09 October 2009 from the Department of Environmental Affairs (DEA) for the construction of Bravo 3 (Phase 3) which entails the construction and operation of a new 400kV transmission power line from the Kusile Power Station to the existing Lulumisa substation in Kayalami (near Diepsloot) in Gauteng. This transmission power line will be approximately 120km in length. (DEA Reference No. 12/12/20/1097). This line exits the Kusile power station in Victor Khanye Local Municipality to the west. It follows an existing transmission power line for approximately 3.5km where after it turns northwards and follows another existing transmission power line for approximately 6.2km. The corridor then turns westwards and again follows an existing transmission power line up to the Apollo converter station.

From the Apollo converter station, the proposed transmission power line continues in a westerly direction along an existing transmission power line. It crosses the R21, the M57, the M18, the R101, the N1, and the R55. West of the R55 the corridor traverse Olievenhoutbosch within an existing servitude. It enters the Minerva substation from the east. It exits the Minerva substation to the north and continues along an existing transmission power line. It then crosses the R28, the M34 and the R511. Approximately 4.3km west of the R511 the corridor turns southwards and crosses the R28 again. It then passes west of Diepsloot and enters the Lulumisa substation from the north. Please refer to the locality map (Figure 1) for further details.

Following approval by DEA in 2009, it has been identified that certain tower footings associated with the power lines may impact on watercourse crossings and drainage lines. Thus requiring Environmental Authorisation in terms of the National Environmental Management Act (NEMA) (Act 107 of 1998). Activities identified in Listing Notice 1 of General Notice Regulations (GN R.) 983 and Listing Notice 3 of GN R. 985 are triggered by the proposed project and thus a Basic Assessment (BA) process is being undertaken. Specialist Ecological (Flora and Fauna), Avifauna, Wetland, Social and Heritage Assessments were undertaken during the Basic Assessment.

The proposed transmission power line corridor starts out in the Victor Khanye Local Municipality (which forms part of the Nkangala District Municipality), traverse the City of Tshwane Metropolitan Municipality (COT), a very small portion of the Ekurhuleni Metropolitan Municipality (EMM) before it terminates in the City of Johannesburg Metropolitan Municipality (COJ). Victor Khenye Local Municipality is located in Mpumalanga Province, while the three Metropolitan Municipalities (the City of Tshwane, Ekurhuleni and the City of Johannesburg) are located in Gauteng Province.

This particular SIA took into account the significance, spatial, duration, degree of probability and degree of certainty that a potential impact might have on the social environment. Impacts can either be negative, neutral or positive. The impacts are also categorised according to the various project stages, i.e. construction, and operation and maintenance. Mitigation measures have also been identified with the aim to reduce the potential negative impacts and to enhance the potential positive impacts.

The impact of the proposed Bravo 3 (Phase 3) project have a number of negative impacts in the geographic, demographic and socio-cultural processes. However all of these impacts can be mitigated successfully if effectively managed. These impacts and their associated mitigation measures are summarised in the table below:

Impact	Mitigation Measures
On mining activities	• The location of the Transmission power line should be determined in consultation with mining companies. • It is preferable to avoid mining operations at these plants altogether.
Possible risks associated with the presence of transmission power lines	• Scientific studies regarding this possible impact should be studied and the results must be communicated to community.
On watercourses	• Construction camps to be located not closer than 50m from the edge of riparian habitat / wetland buffer zone. • As far as possible, use existing bridge crossings as access roads. • Storm-water containing sediment can be discharged to grassland buffers to ensure sediments fall out prior to water entering surface water bodies. Care must be taken that storm-water containing hydrocarbons and other pollution sources are not discharged. • Implement suitable storm-water measures during construction to manage ingress of runoff into watercourses. • Ensure proper storage of material (including fuel, paint) that could cause water pollution. • Ensure proper storage and careful handling of hazardous substances with spill prevention materials at hand. • Ensure proper waste management and housekeeping. • Demarcated areas where waste can be safely contained and stored on a temporary basis during the construction phase should be provided. • When adequate volumes of waste (not more than 1 month) have accumulated, all waste is to be removed from site and disposed of at a licensed facility. • Waste is not to be buried on site.
Economic impacts including: • Compensation for servitude • Direct formal and/or informal employment opportunities for local individuals, and • Indirect formal and /or informal business opportunities to local individuals. • Electricity supply and economic growth.	**Compensation:** • Appoint a land valuator with experience be experience. • The process should be conducted with the necessary respect, and the negotiator should be transparent about the process and expectations (do not engage in "empty promises"). • The negotiation should be done for the whole servitude and not part of the servitude. • Contracts should be reviewed by an independent body. • Land owners should be made aware that a pre- and post-evaluation of their land value is possible. • In the case of tribal authorities, Eskom should consider establishing a trust fund in consultation with the tribal authority

	(as a form of compensation) for the community that is jointly administrated by Eskom and the tribal authority. Community development projects can then be funded from the trust fund, which would aid sustainable development in the area. **Employment:** • Unskilled job opportunities should be afforded to the inhabitants of the communities closest to the proposed construction site. Means to achieve this are suggested below: • Identify types and levels of employment that the development can offer. • Local individuals should be employed for work components that do not require a substantial amount of skill, e.g. foundation excavation, vegetation clearance, erection of gates, cleaning services, and security guards • Appoint a local labour broker. The process of procurement should be monitored by Eskom to ensure that the process was transparent and equal opportunities were afforded. • Refer contractors to jobseeker's databases kept by local community structures when sourcing local labour. • Individuals with the potential to develop their skills should be afforded training opportunities. • Identify targets for BEE and local employment. • Reserve agreed percentage of higher level positions for local employment. • Location of appropriate transport providers who would be available to assist contractors in transporting worker to and from these sites. • Younger people tend to have higher levels of education and may stand in line for higher levels of employment. Opportunities for the employment of younger people should be maximised. • Individuals with the potential to develop their skills should be afforded training opportunities. • Equal opportunities for employment should be created to ensure that the local female population also has access to these opportunities. • Through consultation with relevant key stakeholders, identify the segment that might benefit from informal indirect opportunities, and promote skills development and subsidisation initiatives that are sustainable. • Encourage, in consultation with key stakeholders, construction workers to use local services. • Mechanisms should be developed to provide alternative solutions for creating job security upon completion of the project. • Payment should comply with applicable Labour Law legislation in terms of minimum wages. • Where local labourers are employed on a more permanent basis, these labourers should be registered with the Unemployment Insurance Fund (UIF), Pay as You Earn or any other official bodies as required by law. This would enable the workers to claim UIF as a means of continuous financial support when the workers' positions during construction itself have become redundant or once the construction phase comes to an end. **Property Values:**

	• Implementation of visual mitigation measures as proposed in the Visual Impact Assessment. **Business:** Make use of local suppliers of goods and services where possible. Means to achieve this are suggested below: • Engage with local businesses to assist with meeting requirements for tender processes and documentation. • Identify targets for BEE and local procurement • Communicate supply chain opportunities through the project's website and communication materials. • Communicate supply chain opportunities through local business networks. • Expedite process of registering local service providers on Eskom's procurement database. • Engage with local stakeholders to establish a local business forum to increase access to opportunities. • Provide information regarding the types of business opportunities and economic and economic spin-offs that may arise from the proposed development. • Participatory workshops in which interested members of local communities can be guided with regards to types of business opportunities that could arise. • Provide the local business network in advance of construction with a list of required goods and services as well as procurement tendering requirements. • Investigate ways of enabling potential sub-contractors from low-income areas to tender. • Set up linkages for small business loans, as well as small business skills training. **Employment:** • Individuals with the potential to develop their skills should be afforded training opportunities. Eskom should be involved in this process. • Make use of local labour on unskilled maintenance components, such as servitude maintenance. • Where local labourers are employed on a more permanent basis, cognisance should be taken of the Labour Law in terms of registering the worker with the Unemployment Insurance Fund (UIF), Pay as you earn (PAYE), workman's compensation and all other official bodies as required by law. This would enable the worker to claim UIF as a means of continuous financial support when the worker's position on the construction team has either become redundant or once the construction phase comes to an end. **Electricity supply and economic growth:** None
On family structures and social networks associated with the presence of construction workers.	• Raise awareness amongst construction workers about local traditions and practices. • Inform local businesses about the expected influx of construction workers so that they can plan for the extra demand. • Before construction commences, representatives from the local municipality and community-based organisations, as well as neighbouring and/or affected residents should be informed of

	the details of the construction company (contractor), size of the workforce and construction schedules. • Ensure that the local communities communicate their expectations of construction workers' behaviour. • Conditions stipulated by property owners in terms of the construction activities should be implemented and monitored. • Maximise local employment to minimise the need for housing of temporary workers which could lead to social problems of integration with the local community. • All construction activities should be restricted to working areas. • Construction workers should wear name tags and clothing to ensure that they can be readily identified as belonging to the construction workforce. This should be applicable to all construction workers, including those locally recruited. • What workers bring on site should be monitored. The provision of catering on-site will reduce the chances that substances such as alcohol are brought on-site or used during working hours, reducing the likelihood of alcohol related conflict and disturbances. • Workers should receive fines if they do not adhere to the conditions, rules and regulations. • Workers should be made aware of property owners' concerns regarding construction work on their properties so that they are familiar with the sensitive issues. • A specific contact person should be identified to allow community members and property owners to easily direct their queries and concerns and obtain general information regarding the construction process. • Eskom personnel should preferably not access private properties without prior notification of the property owners. • Eskom maintenance personnel should be in possession of the required identification documents and clothing when undertaking maintenance work. • Vehicles used should be clearly marked. • Eskom personnel should behave properly at all times.
Possible influx of unemployed job seekers and temporary workers.	• Maximise local employment according to strategies outlined previously. • The number of job opportunities available as part of the proposed project and the recruitment process should be clearly communicated. • The communication strategy should ensure that unrealistic employment expectations are not created. • Access to the construction site should be controlled. • Have clear rules and regulations for access to the construction camp to control loitering. • The use of local labour should be maximised through contractual conditions set for the sub-contractors. • Construction workers should be clearly identifiable by wearing proper construction uniforms displaying the logo of the construction company. • Construction workers must also be provided with identification tags.
Relocation of existing and new households and/or population segments.	• Avoid the resettlement and/or displacement of households as far as possible. • If resettlement is unavoidable, residents should be sufficiently compensated and assisted with the relocation process. • A form of compensation should also be granted to individuals who are residing in informal settlements within the servitude.

	• A formal grievance procedure should be implemented and communicated to landowners to ensure a fair and transparent process. • Eskom (or its appointed contractor) should monitor areas where people gather in the field on a regular basis as this is normally the first indication that settlement might take place in the area. These people should be removed in co-operation with the local SAPS to prevent the formation and/or expansion of informal settlements in such an area, especially if it encroaches upon the servitude. • The servitude should be inspected on a regular basis to determine whether any settlement has taken place, either within the servitude, or encroaching upon the servitude. • Households that encroach upon or settle within the servitude have to be relocated as soon as possible. • Eskom or its appointed contractors should assist these households with the relocation process. • Educate surrounding communities about the dangers of living in the servitude. • A form of signage on the towers should also indicate that it is dangerous. • In some way, a barrier (psychological and/or physical) should indicate that no structures should be built in the servitude. • One way of achieving such a barrier is to educate community leaders on the health and safety aspects of the servitude, who then in turn can ensure that settlement does not take place within the servitude.
On farming activities	• The footprint associated with the construction related activities (access roads, construction platforms, workshop etc.) should be minimised. • Initial servitude clearing on the farmland should take place after the harvesting season, as far as possible. Landowners should be compensated for the loss of cultivated land. • Compensation for the temporary loss of cultivated land should be included in the negotiation process with the landowner. • Mitigation measures should be implemented to avoid any negative impact on animals (e.g. fencing off the construction area). • Eskom or its appointed contractor(s) should assist with the temporary relocation of livestock during construction. • An Environmental Control Officer (ECO) should be appointed to monitor the establishment phase of the construction phase. • All areas disturbed by construction related activities, such as access roads on the site, construction platforms, workshop area etc. should be rehabilitated at the end of the construction phase. • Eskom should discuss the construction schedule and activities with the affected farmers to enable them to plan their farming activities and animal movement accordingly. • The location of the construction camps where workers would be housed should be carefully considered to limit any possible negative social impacts. • The construction camp should be located near support services, and ideally not in the vicinity of residential dwellings. • Eskom must liaise with the farmers' associations and a protocol for gaining access to farms should be established and distributed to all parties involved. The impact of careless conduct on the side of contractors must be acknowledged and

	the contractors should receive an induction in terms of the relevant code of conduct to which they should adhere. • Access to the construction site should be controlled. • Have clear rules and regulations for access to the construction camp to control loitering. • Construction workers should be clearly identifiable by wearing proper construction uniforms displaying the logo of the construction company. • Construction workers must also be provided with identification tags.
Possible disputes between workers, contractors and labour-brokers.	• Establish a community stakeholders' forum where labour related issues can be addressed in consultation with local community representatives on a regular basis, to improve relationships and build trust. • Make use of local labour brokers. • Ensure utmost sensitivity in the treatment of workers on-site, particularly regarding potential racial issues that may be implicated. This also applies to the manner on which labour disputes when they occur, are handled by contractors and, when necessary, Eskom Project Managers.
On community and workers' health, including effects of dust, noise, sexually Transmitted Infections (STIs) and other infectious diseases.	• The impact of dust can be limited through taking proper dust abatement measures like watering of roads and control of traffic speed limit. The contractors will be required to incorporate such issue in to the management plan and submit with their contract proposals. • Noise pollution beyond the stated limits, can be minimized by the provision and use of proper hearing equipment for construction workers and working time should be limited in order not to affect the local communities in the vicinities. • An aggressive STI and HIV/AIDS awareness campaign should be launched, which is not only directed at the construction workers, but also at the community as a whole. • Condoms should be distributed by placing them at centrally located points and by ensuring that construction workers and community members area aware of the availability and locality of condoms. • Access to the construction site should be controlled to prevent sex workers from either visiting and/or loitering at the site. • Local women should be empowered. This could be achieved by employing them to work on the project, which in turn would decrease their (financial) vulnerability. • Regular leave should be given to contractors. • Provide entertainment to workers. • The construction work camps shall be maintained in a clean and healthy condition as prescribed by international standards.
Impact of the increase in traffic, including construction vehicles – access routes, dust, noise.	• Construction activities should be planned to minimise added disruption of traffic, especially during peak hours. • The closing of gates, especially in livestock farming areas must be reiterated. • Land owners should be informed in advance of any planned maintenance activities.
Possible security and safety risks.	• Construction workers should be clearly identifiable. Overalls should have the logo of the construction company on it and construction workers should wear identification cards. • Construction sites should be fenced and access should be controlled. • Loitering of outsiders at the either the construction site or at the construction village should not be allowed. Loiterers at the site

	should be removed in cooperation with the local branch of the South African Police Service (SAPS). • Contractors should regularly provide adequate safety equipment and orientation to his employees. • Project related vehicles will be required to abide by good driving conducts, obey speed limits and follow the rules of safe driving.
Visual impact and impact on sense of place.	• Develop and implement a Community Engagement and Interaction policy to create protocols and positive interactions with the local community in particular neighbouring landowners. • New infrastructure should be located in close proximity to existing infrastructure of a similar nature, as far as possible. • Rehabilitation of land to its previous condition should take place as soon as a pipeline is removed from a property. • Inform neighbouring property owners when construction will take place, including information on the nature and timeframe of the construction activities.
Impact of no-development option	N/A

ACRONYMS

AIDS Acquired Immune Deficiency Syndrome
CBD Central Business District
COJ City of Johannesburg
COT City of Tshwane
CS Community Survey
DEAT Department of Environmental Affairs and Tourism
DWS Department of Water and Sanitation – DWS
EAP Environmental Assessment Planner
EIA Environmental Impact Assessment
EMF Electro Magnetic Fields
EMM Ekurhuleni Metropolitan Municipality
EMP Environmental Management Plan
ESTA Extension of Security of Tenure Act
GDP Gross Domestic Product
GDS Growth and Development Strategy
GPS Global Positioning System
GVA Gross Value Add
HIV Human Immune-deficiency virus
IDP Integrated Development Plan
MLL Minimum Living Levels
MP Mpumalanga Province
NDM Nkangala District Municipality
NEMA National Environmental Management Act
OHSA Occupational Health and Safety Act
PPP Public Participation Process
RDP Reconstruction & Development Programme
RoD Record of Decision
SAPS South African Police Service
SDF Spatial Development Framework
SIA Social Impact Assessment
SIC Standard Industrial Classification Sector
STI Sexually Transmitted Infections
VKLM Victor Khanye Local Municipality
WHO World Health Organisation

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1. INTRODUCTION AND PROJECT BACKGROUND

Eskom Holdings is a South African and vertically integrated utility that generates, transmits and distributes electricity. It supplies approximately 95% of the country's

electricity and 60% of the total electricity consumed on the African continent. An electric power system is a complex assemblage of equipment and circuits for generating, transmitting, transforming and distributing electrical energy.

To better understand the social impacts both at regional and local level, it is necessary to briefly explain the nature of the project and related activities. Eskom relies on coal-fired power stations to produce approximately 90% of its electricity. Coal is used to heat water and convert it into steam at high temperatures and pressures. Hot steam at temperatures of between 500°C and 535°C is released and turns a large turbine connected to a rotating magnet to convert energy in the fuel into high voltage electric power.

In order for the electricity to be transmitted safely and efficiently, it must be at a high voltage (typically 400kV) and a low current. The transmission system carries the electric power in large amounts from generating stations to consumption areas. Electricity delivered by transmission circuits is then stepped down in facilities called substations to voltages more suitable for use in industrial and residential areas.

Among other things, substations are used to transform power from one voltage level to another; interconnect alternative sources of power; connect generators, transmission or distribution lines and loads to each other as well as provide switching for alternate connections and isolation of failed or overloaded lines and equipment. This transmission is also used to interconnect adjacent power systems for mutual assistance in case of emergency. The electricity is transformed down to 11 000 volts for local distribution and then further reduced according to the need - for example, 220 volts for domestic use. The electricity entering consumers' premises and homes has had a complex journey - from the initial high voltage transmission grid to a lower voltage distribution network. It has travelled over ground and (probably) underground for many kilometres and been transformed many times on the way.

The growing demand for electricity is placing increasing pressure on Eskom's existing power generation and transmission capacity. Eskom (SOC) is committed to implementing a Sustainable Energy Strategy that complements the policies and strategies of National Government. Eskom aims to improve the reliability of electricity supply to the country, and in particular to provide for the growth in electricity demand in the Gauteng and Mpumalanga provinces. For this reason, Eskom obtained environmental authorisation to construct the new 400 kV Kusile (previously known as Bravo) coal-fired Power Station between Bronkhorstspruit and Witbank (Emahlahleni) in 2007. Construction of the Kusile power station has already commenced and will comprise six units, each rated at an 800 MW installed capacity for a total capacity of 4 800 MW. Once completed, Kusile will be the fourth-largest coal-fired power station in the world.

Due to this construction, the new Kusile (Bravo) Power Station needs to be integrated with the existing Eskom electricity infrastructure.

The Bravo (Kusile) Integration Project spans the provinces of Gauteng and Mpumalanga and will be handled as five individual Environmental Impact Assessments (EIA), namely:

a) **Bravo 1 (DEAT Ref. No: 12/12/20/1093**): **Sol – Camden By-Pass Power Line (Phase 1)**

The intention of Bravo 1 is to build two 400 kV bypass lines for Zeus substation. The two 400 kV lines from Sol Substation and the two 400 kV power lines from Camden power station will be disconnected from Zeus substation and joined to each other to form two Camden - Sol 400 kV power lines. The location of the two by-pass lines is planned to be within approximately 10 km radius of the Zeus substation. The project is located within the Govan Mbeki District Municipality.

The construction and operation of two (2) 400kV bypass transmission power lines, both approximately 10km in length, as follows:

- One (1) 400kV bypass transmission line between the Sol substation in Kriel and the Zeus substation in Secunda, and
- One (1) 400kV bypass transmission line between the Sol substation in Kriel and the Camden substation in Ermelo.

b) **Bravo 2 (DEAT Ref. No: 12/12/20/1094**): **Apollo and Kendal loop in and loop out lines (Phase 2)**

Eskom propose to construct four new 400 kV overhead power lines, located within the Emalahleni Local Municipality in Mpumalanga, to loop in and out of Kusile (previously known as Bravo) Power Station. The existing Kendal-Apollo line will be looped in and out of Kusile to form the Kusile-Apollo and Kusile-Kendal lines. In addition, the existing Duvha-Minerva 400 kV overhead power line will be looped in and out of Kusile Power Station, to form the Kusile-Duvha and Kusile-Minerva lines.

The construction and operation of two (2) 400kV loop-in lines into the new Kusile Power Station, both approximately 10km in length, as follows:

- One (1) 400kV loop-in line from the Kendal (Ogies) to Apollo (Centurion) transmission line; and
- One (1) 400kV loop-in line from the Duvha (Middelburg) to Minerva (Johannesburg) transmission line.

c) **Bravo 3 (DEAT Ref. No. 12/12/20/1097**): **Construction of a 400kV power line from Kusile Power Station to Lulamisa (Phase 3)**

In order for the Kusile power station to be integrated within the existing Eskom infrastructure, Eskom proposes to construct a new 400kV power line from the new Kusile Power Station to the existing Lulamisa substation in Kyalami, near Diepsloot. This line will be approximately 120 km in length and will run through the Bronberg area. The construction of this proposed 400 kV power line is aimed to ensure sufficient electricity supply to the Diepsloot and Johannesburg North areas, where currently frequent electricity shortages are experienced. The corridor covers an area from Victor Khanye in the east, to Diepsloot in the west.

d) **Bravo 4 (DEAT Ref. No: 12/12/20/1095**): - **Two new 90 km Kendal –Zeus 400 kV Power Lines (Phase 4)**

Eskom propose to construct two new 400 kV power lines, one from Kusile to Zeus and the other one from the Kendal Power Station (near Ogies) to the Zeus substation (near Secunda), Mpumalanga. These lines will run parallel to each other and will be approximately 95 km in length. These corridors merge into two corridors approximately 30 km from the Zeus substation.

e) **Bravo 5 (DEAT Ref. No: 12/12/20/1096):** - **New 10km Kusile (Bravo)-Vulcan Power Line (Phase 5)**

Eskom proposes to construct a 400 kV overhead power line, by-passing the existing Duvha Power Station, to form a new Kusile-Vulcan line near Emahlahleni, Mpumalanga. This by-pass line is planned to be approximately 10 km in length. The area to be investigated for this by-pass line is a 10 km radius surrounding the existing Duvha Power Station.

This report only focusses on **Bravo 3 (DEAT Ref. No: 12/12/20/1097**). Separate Social Impact Assessment (SIA) Reports have been compiled for Bravo 4 and Bravo 5.

Eskom obtained environmental authorization on 09 October 2009 from the Department of Environmental Affairs (DEA) for the construction of Bravo 3 which entails the construction and operation of a new 400kV transmission power line from the Kusile (Bravo) Power Station to the Lulumisa substation in Kayalami (near Diepsloot) in Gauteng. This transmission power line will be approximately 120km in length. (DEA Reference No. 12/12/20/1097). This line exits the Kusile power station in Victor Khanye Local Municipality to the west.

Eskom has appointed Envirolution Consulting as independent environmental consultants, to undertake the Basic Assessment and Environmental Management Programme (EMPr) process. The main objective of the Basic Assessment and EMPr is to identify and assess potential environmental impacts associated with the proposed project, and to compile appropriate mitigation measures.

A number of specialist assessments will be undertaken as part of the EIA and EMP. The updating of existing Social Impact Assessment (SIA) reports are included in these specialist studies. Metro Concepts (Pty) Ltd, was appointed by Envirolution Consulting (Pty) Ltd to update the existing Social impact Assessments (SIA's), compiled by Ms Nonka Byker, MasterQ Research for Bravo 3.

A Water use Licence Application will be undertaken as a separate application and will be submitted to the Department of Water and Sanitation.

2. OVERVIEW OF THE SOCIAL IMPACT ASSESSMENT (SIA) PROCESS

2.1 DEFINITION OF SOCIAL IMPACTS AND SOCIAL IMPACT ASSESSMENT (SIA)

Social impacts can be defined as "*The consequences to human populations of any public or private actions that alter the ways in which people live, work, play, relate to one another, organise to meet their needs and generally live and cope as members of a society. These impacts are felt at various levels, including individual level, family or household level, community, organisation or society level, Some social impacts are felt by the body as a physical reality, while other social impacts are perceptual or emotional*." (Vanclay, 2002).

A Social Impact Assessment therefore attempts to predict the probable impact of a development (before the development actually takes place) on people's way of life (how they live, work, play and interact with one another on a daily basis), their culture (their shared beliefs, customs and values) and their community (its cohesion, stability, character, services and facilities), by:

- Appraising the social impacts resulting from the proposed project;
- Relating the assessed social impacts of the project to future changes in the socio-economic environments that are not associated with it. This would serve to place the impacts of the project into context;
- Using the measurements (rating) to determine whether the impacts would be negative, neutral or positive;
- Determining the significance of the impacts; and
- Proposing mitigation measurements.

An SIA is thus concerned with the human dimensions of the environment, as it aims to balance social, economic and environmental objectives and seeks to predict, anticipate and understand the potential impacts of development.

2.2 PURPOSE OF THE SOCIAL IMPACT ASSESSMENT

The purpose of the Basic Social Impact Assessment is to identify, describe and analyse the anticipated positive and negative impacts (during construction and operational phases) that the proposed 400kV overhead transmission power lines and supporting towers could have on the socio-economic environment and notably the individuals and communities in the surrounding area.

The Basic Assessment Report must include:

- An understanding of the proposed project, including the route corridors, and the nature and timeframe of proposed activities.

- Gaining information on the baseline geographical and social-economic profile characterising the study area in terms of the following change processes:
  - Geographical processes: land use patterns;
  - Demographic processes: the number and composition of people;
  - Economic processes: the way in which people make a living and the economic activities in society;

- Socio-cultural processes: the way in which humans behave, interact and relate to each other and their environment and the belief and value systems which guide these interactions;

- A description and evaluation of the socio-economic issues and potential impacts (including direct, indirect, cumulative impacts and residual risks) that have been identified.

- An evaluation of the direct, indirect, cumulative impacts and residual risks of the identified issues within the Basic Assessment Report in terms of the following criteria:

  - the nature, which shall include a description of what causes the effect, what will be affected and how it will be affected;

  - A statement regarding the potential significance of the identified issues based on the evaluation of the issues/impacts.

- Any aspects which are conditional to the findings of the assessment which are to be included as conditions of the Environmental Authorisation.

- Any gaps in knowledge at this point of the study.

- A reasoned opinion as to whether the proposed project should be authorised.

2.3 METHOLOGY OF THE SOCIAL IMPACT ASSESSMENT

To ensure that the objectives of the study are answered, data had to be collected. Data mostly centred on a desktop study, in which the following documents were scrutinised:

- Determination of the scope of assessment, based on information received from Envirolution Consulting,
- As source document, the draft Social Impact Assessment Report for Bravo 3, as part of the Environmental Impact Assessment Process, prepared by Ms Nonka Byker, MasterQ Research November 2008.
- Review of literature and desktop studies, confirming the social setting and characteristics of the study area.
- Data, including census data, project maps and planning documents (2011 Census Survey and documents from Mpumalanga Province, Nkangala District Municipality and Victor Khanye Local Municipality);
- Data, including census data, project maps and planning documents (2011 Census Survey and documents from Gauteng Province, City of Tshwane, Ekurhuleni and City of Johannesburg Metropolitan Municipalities);

- Review of relevant planning and policy frameworks for the areas; and
- Review of information from similar projects;

The assessment of direct, indirect and cumulative impacts as well as other issues in terms of the following criteria:

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

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

S = (E+D+M)P
S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

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

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

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

The summarizing of assessment impacts in a prescribed table format including the rating values as per above criteria.

Measures for inclusion in the draft Environmental Management Programme.

2.4 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations are relevant to this study:

- The 1996, 2001 and 2011 Census data were used for the purpose of this study. Although the data are not generally perceived as being entirely precise, it does give a broad reflection of the social environment.
- The social environment cannot be fragmented and will be discussed broadly. Given the scope of the project and approximate location of the route, detailed studies could not be done on every farm, town and/or settlement potentially affected.
- The general social impacts, which will be experienced by the communities affected by the line, will be largely similar. If the finding is otherwise, this is pointed out.
- It is not the purpose of this SIA report to quantify the resettlement impacts of each alternative. This will take place during the resettlement action plan stage of this development process.

2.5 APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

The following legislation and regulatory documents are relevant to the SIA:

- Constitution of the Republic of South Africa (Act No. 108 of 1996);
- The Occupational Health and Safety Act (Act No. 85 of 1993);
- Extension of Security of Tenure Act (Act 62 of 1997) (ESTA);
- National Environmental Management Act (NEMA), No. 107 of 1998, as amended and Environment Conservation Act, No. 73 of 1989, as amended;
- The Environmental Impact Regulations of 4 December 2014;
- National Water Act, 1998 (Act No. 36 of 1998)
- Relevant Labour Relations Legislation

Table 1 gives a summary of the content of the above mentioned legislation and regulatory documents relevant to this Social Impact Assessment.

Table 1: Summary of applicable legislation and regulatory documents

Legislation/Policy	Purpose/Statement/Objectives	Measures/Strategies to be implemented

Constitution of the Republic of South Africa (Act No. 108 of 1996)	Everyone has the right to an environment that is not harmful to his or her health or well-being; and To have the environment protected for the benefit of present and future generations.	Prevent pollution and ecological degradation Promote conservation, and Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.
National Environmental Management Act (NEMA), No. 107 of 1998, as amended	A full EIA is required for all projects likely to have significant impacts on the environment because of the nature or extent of the activity, for instance if the effect of the activity is unpredictable, or there is a high risk of environmental degradation.	
EIA Regulations 2006 (repealed in 2010 and 2014	The purpose of this Notice is to identify activities that would require environmental authorisations prior to commencement of that activity and to identify competent authorities in terms of sections 24(2) and 24D of the Act.	**Proposed Activity: GNR 983: 2014 (Listing Notice 1) Activity 12:** The development of – - buildings exceeding 100 square metres in size; Where such development occurs – (a) within a watercourse; or (c) within 32 metres of a watercourse, measured from the edge of a watercourse. **GNR 983: 2014 (Listing Notice 1) Activity 19:** The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells grit, pebbles or rock of more than 5 cubic metres from– (i) a watercourse. **GNR 985: 2014 (Listing Notice 3) Activity 14:** The development of – (xii) infrastructure or structures with a physical footprint of 10 square metres or more; Where such development occurs - (a) within a watercourse; (b) in Mpumalanga; (ii) if outside urban areas, in (dd) sensitive areas identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent Authority.

Extension of Security of Tenure Act (Act 62 of 1997) (ESTA)	This act provides for measures to facilitate the long-term security of land tenure, and also regulates the conditions of residence on certain land, the circumstances under which a person's right to reside on a particular piece of land may be terminated, and to provide for regulatory matters where persons have been evicted from a particular piece of land or land portion.	**Chapter 4** of this act relates to the measures that have to be implemented when right of tenure is terminated on any lawful ground (e.g. in the case of relocation), provided that such a termination is just and has regarded the following factors: • The fairness of the agreement on which the owner relies; • The conduct of the parties giving rise to the termination; • The interests of the parties involved in relation to the comparative hardship of the owner and/or occupier of the land; • The existence of a reasonable expectation for the renewal of an agreement; and • The fairness of the procedure leading to termination, including whether or not the owner/occupier had been granted a reasonable opportunity to make representations before termination became effective. Section 14 under Chapter 4 outlines the procedures for the restoration of residence, the use of land, and compensation for damages. A person who was the rightful owner of the land may institute proceedings in a court of law, where after the court may make the following orders: • The restoration of residence and land use; • The repair, reconstruction or replacement of any building, structure or any other installations that the owner/occupier have enjoyed on his land prior to the removal and/or eviction; • The restoration of any services that the owner/occupier has a right to; • The payment of compensation; • The payment of damages, including but not limited to, damages inflicted by the removal process; or • Any other compensation the court may see fit.
National Water Act, 1998 (Act No. 36 of 1998)	The purpose of this Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways. .	Factors to be taken into account in terms of this act include: • meeting the basic human needs of present and future generations; • promoting equitable access to water; • redressing the results of past racial and gender discrimination; • promoting the efficient, sustainable and beneficial use of water in the public interest; • facilitating social and economic development; providing for growing demand for water use; • protecting aquatic and associated ecosystems and their biological diversity; • reducing and preventing pollution and degradation of water resources; • meeting international obligations; • promoting dam safety; • managing floods and droughts, and for achieving this purpose, to establish suitable institutions and to ensure that they have appropriate community, racial and gender representation

3. DESCRIPTION OF PROPOSED PROJECT

This section aims to describe the nature of the potential development. Understanding the nature and phases of the development is important, as certain impacts are likely to occur at different stages of the development.

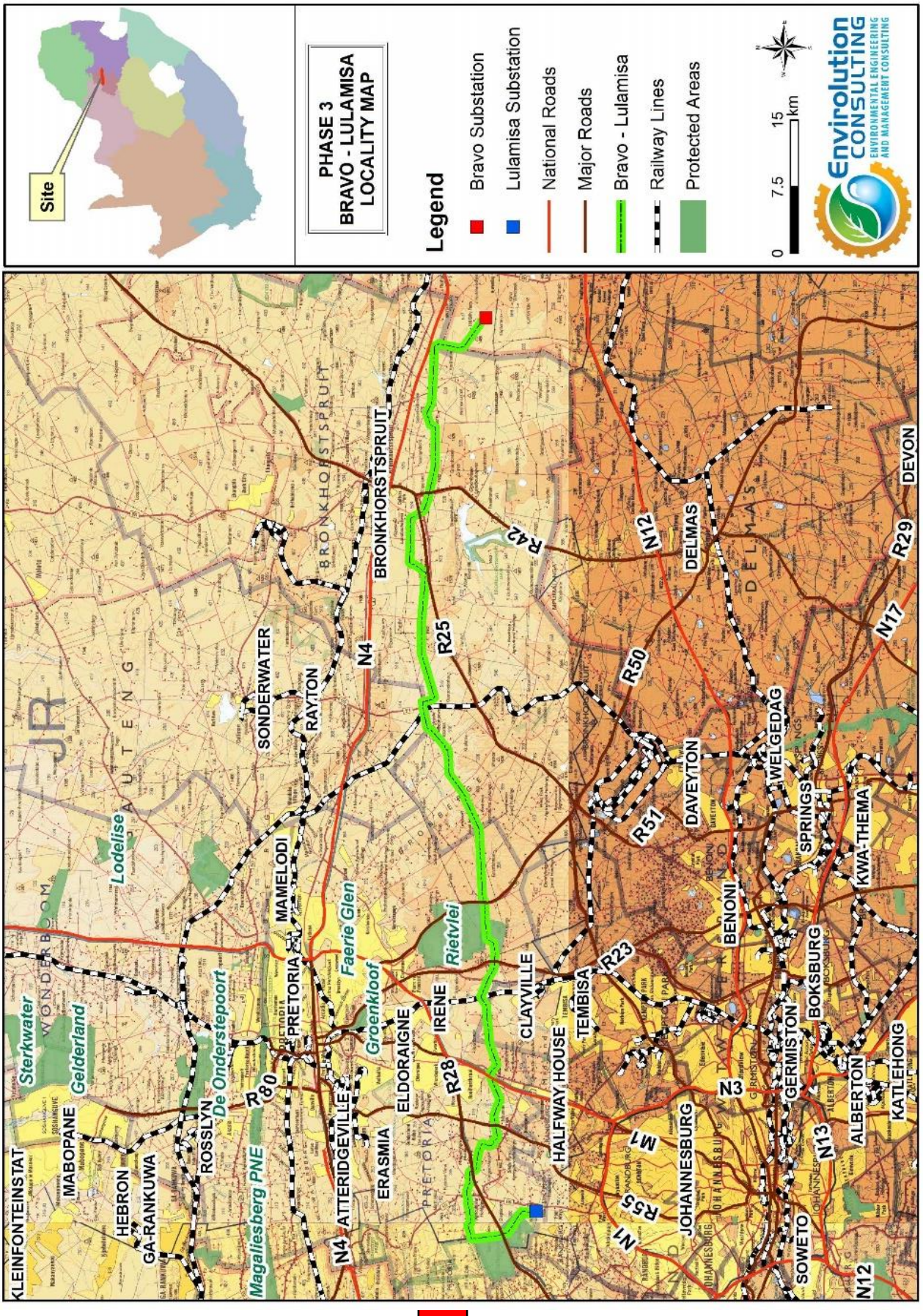
3.1 THE PROJECT

This proposed transmission line exits the Kusile power station in Victor Khanye Local Municipality to the west. It follows an existing transmission power line for approximately 3.5km where-after it turns northwards and follows another existing transmission power line for approximately 6.2km. The corridor then turns westwards and again follows an existing transmission power line up to the Apollo converter station.

From the Apollo converter station, the proposed transmission power line continues in a westerly direction along an existing transmission power line. It crosses the R21, the M57, the M18, the R101, the N1, and the R55. West of the R55 the corridor traverse Olievenhoutbosch within an existing servitude. It enters the Minerva substation from the east. It exits the Minerva substation to the north and continues along an existing transmission power line. It then crosses the R28, the M34 and the R511. Approximately 4.3km west of the R511 the corridor turns southwards and crosses the R28 again. It then passes west of Diepsloot and enters the Lulumisa substation from the north.

An indication of the position of the power line is provided in Figure 1 below. The purpose of the construction of the proposed line is aimed to ensure sufficient electricity supply to Diepsloot and Johannesburg North areas.

Figure 1: Phase 3 Construction of a 400kV power line from Kusile (Bravo) Power Station to Lulamisa - Locality Map



3.2 DESCRIPTION OF PROJECT ACTIVITIES

3.2.1 Servitude

The proposed 400kV transmission power lines will require a servitude of 55m in width, i.e. 27.5m both sides of the centre line. No structures are allowed within the servitude.

For forestry, the required servitude is 76 m wide, i.e. 38m each side of the centre line, due to fire risk and tree-felling. The servitude is required for the safe operation (as required in terms of the Occupational Health and Safety Act regulations) of the power line and reliability (quality of supply) of electricity supply to consumers.

A servitude does not mean that the holder of the servitude, i.e. Eskom, is the owner of the land, but merely that Eskom has the right of way to convey electricity across the land, subject to conditions agreed between Eskom and affected landowners. A servitude provides Eskom certain defined rights for the use of the specific area of land:

- Access to erect a transmission line along a specific agreed route;
- Reasonable access to operate and maintain the line inside the servitude area;
- The removal of trees and vegetation that will interfere with the operation of the power line.

The registration of servitudes can be a lengthy process, as it requires contractual negotiations with each affected landowner. Once this is complete, an application for registration of the servitude is lodged with the Provincial Deeds Office against the property deed. The actual location of the towers on which the conductors will be strung is determined by a number of different factors, including:

- The outcome of Eskom negotiations with landowners, including landowner preferences;
- Environmental features and technical requirements.

3.2.2 Towers

As part of the new 400kV power line there is a footing that is proposed after every 400m. Tower positions have not been confirmed yet as negotiations with landowners are currently going on. The following types of towers may be used on this project:

- Cross rope suspension tower
- Compact cross rope suspension tower
- Guyed-V suspension tower;
- Self-supporting suspension tower; and
- Self-supporting strain tower.

Different towers may be used along different sections of the routes to comply with the local conditions including, the terrain, ground clearance requirements, topology and geology. It is assumed that each tower would be erected on concrete footings with dimensions of 2 x 2 x 2 m (area = 4 m^2 and volume = 8 m^3) for each concrete footing. The number of foundations will be dependent on the type of tower chosen. The installation of the foundations will take place under supervised conditions. All towers will be assembled simultaneously in stages, that is, bottom structures will be assembled for all towers in the first phase (phase 1), middle structures for all towers will be assembled simultaneously in the second phase (phase 2) and so on.

3.2.3 Access Roads

The project will also entail the construction of associated infrastructure such as access roads and a centre line track within the servitude. Existing roads will be utilised as far as possible during construction and operation. Access roads will be established in areas where access is presently unavailable and are required to move construction equipment and personnel to and from the construction sites (tower positions). The centre line track is required for conductor stringing and on-going line inspections and maintenance activities.

Furthermore, access roads will be aligned and constructed within the provisions and to the specifications of private landowners. This is considered important for two primary reasons:

- Access roads should fulfil multi-purpose functions serving the needs of Eskom and the landowners.
- Landowners are acutely aware of sensitivities on their land and will be in an excellent position to inform Eskom of optimum alignments.

No roads that trigger NEMA Regulations Listed Activities will be required. The specifications for the access road will be contained within the Environmental Management Plan (EMP) that will be prepared for construction and which will become legally binding on Eskom and contractually binding on the Eskom-appointed contractors (with special care being taken with river/stream crossings, where potential environmental impacts are greatest, with due consideration for water use licences that must be obtained from the Department of Water and Sanitation - DWS).

3.2.4 Minimum Clearing Distances

For safety reasons (as set out in regulations of the Occupational Health and Safety Act), the transmission line requires minimum clearance distances. These are summarized as follows:

- The minimum vertical clearance distance between the ground and 6 power line conductors is 8.1m;
- The maximum crop height permitted within the servitude is 4.3m;
- The minimum vertical clearance to any fixed structure that does not form part of the power line is 5.6m;

- The minimum distance of a 400 kV power line from a proclaimed public road is 95m from the centre line of the road.
- The minimum safe distance required from the centre of the power line to the edge of a domestic house is 40 – 50m.
- Farming activity, except for sugarcane and commercial forestry, can be practiced under the conductors, provided that there is adherence to safe working clearances, crop height restrictions and building restrictions.

3.2.5 Establishment of Construction Camps

The establishment of construction camps will be done in accordance to the stipulations of the final Environmental Management Plan and negotiations with the affected landowners. The construction contractor would need to set up at least one site camp but this does not necessarily need to be near the power line route. The contractor may however prefer to use a fully serviced site at another location. The contractor will be encouraged to utilise already disturbed areas for construction camp purposes, in order to minimise cumulative impacts. It is likely that a number of construction camps would need to be established for the construction period

3.2.6 Water

Water will be required for potable use and in the construction of the foundations for the towers. The water will be sourced from municipality points at locations closest to the area of construction.

3.2.7 Sewerage

A negligible sewage flow is anticipated for the duration of the construction period. The Contractor is to provide portable toilet facilities for the use of his workforce at all work sites, and the contactor will ensure regular treatment of these facilities. The toilets will be serviced regularly, as specified by the final site specific EMPr.

3.2.8 Solid Waste Disposal

Eskom has a strong commitment to waste minimisation and recycling. All solid waste will be collected at a central location at each construction site, and will be disposed at the registered waste site or stored temporarily until removal for recycling or disposal at an appropriately permitted landfill site in the vicinity of the construction site.

3.2.9 Foundations

The excavations shall be kept covered or barricaded in a manner accepted by the Supervisor to prevent injury to people or livestock. Failure to maintain proper protection of excavations may result in the suspension of excavation work until proper protection has been restored.

3.2.10 Concrete Batching

Concrete batching will be required for the foundations of the tower footing. The following guidelines are contained in the Eskom specification for the Transmission Line Towers and Line Construction:

- The Contractor shall be responsible for negotiating the site of his batching plant (if required) and the conditions under it may be established, with the landowner. The Contractor shall be responsible for the proper management of the batching plant.
- Upon completion of works, the ground of the batching plant area shall be rehabilitated and the site cleaned and left as it was found and to the satisfaction of the Supervisor and landowner.
- The use of local water for concrete must first be negotiated with the landowner and the appropriate authorities. Such water is to be analysed and accepted by the Project Manager before use.

3.2.11 Stringing

Once towers have been erected, cables will be strung between the towers. Stringing will be undertaken in accordance with Eskom's stringing procedure**.**

3.2.12 Bird Flight Diverters

Bird flight deflectors will be fitted on the structures during the construction phase.

3.2.13 Electricity

Diesel generators will be utilised for the provision of electricity where electricity connection is not readily available during construction.

3.2.14 Anti-Climbing Devices

Anti-climbing devices shall be designed for each tower. These are to be attached at a height of approximately 3m, but not less than 2,5m above ground level.

3.3 DESCRIPTION OF CONSTRUCTION PROCESS

It is estimated that the construction period for this project will be 18-24 months.

Generally, the construction of the power line is expected to consist of the following sequential phases, all of which has been approved under the existing authorisation for the power line (EIA DEA Reference No. 12/12/20/1097):

Pre-construction phase:

Step 1: Feasibility and identification of line alternatives.

Step 2: Basic Assessment input and environmental permitting.
Step 3: Negotiation of final route with affected landowners.
Step 4: Survey of the proposed route.
Step 5: Selection of structures suited to the terrain and ground conditions.
Step 6: Final design of the distribution line and placement of towers.
Step 7: Issuing of tenders and eventually appointment of contractors for the project

Construction phase:

Step 8: Vegetation clearance and construction of access roads (if required).
Step 9: Pegging of structures.
Step 10: Construction of foundations.
Step 11: Assembly and erection of structures.
Step 12: Stringing of conductors.
Step 13: Rehabilitation of disturbed areas and protection of erosion sensitive areas.
Step 14: Testing and commissioning.

Operations and Maintenance Phase:

Vegetation will be maintained by Eskom in the operational phase of the project.

Construction teams:

During construction, teams are responsible for the excavation of foundations, concrete works, erection of steel structures, stringing of transmission cables, and site rehabilitation respectively. All these activities, including vehicular access and the pylon anchors, are required to take place within the negotiated servitude.

Construction activities will not be continuous for long but intermittent over periods of time. Therefore, it is anticipated that any impacts associated with construction workers are likely to be of medium intensity as a result of the low numbers of people employed intermittently over a large area.

Some of the initial activities only involve a limited number of specialised people that moves through the servitude. It is only when bush clearance starts that larger numbers of construction workers come onto site. The following teams are generally active on site:

- Bush clearance team:

  This team could also be involved in erecting gates. The potential for recruiting local labour for these teams is extensive.

- Foundations team:

  More than one team could be used to accelerate construction. Although there is an opportunity for local labour to be recruited in this team, it is limited to unskilled activities.

- Assembly team:

  More than one team could be used to accelerate construction. Limited potential for recruitment of local labour exists as this task largely requires skilled labour.

- Erection team:

  No potential for recruitment of local labour as highly skilled teams are required for this task.

- Stringing team:

  Limited potential for recruiting local labour as this task largely requires skilled labour.

- Rehabilitation team:

  These teams could be involved in different activities. Limited potential for recruiting local labour as this task largely requires skilled labour.

- Ongoing Maintenance:

  During the life span of the Sub-transmission line i.e. approximately 25 years, ongoing maintenance is required to be performed from time to time. This maintenance work is undertaken by contractors employed by Eskom, and in compliance with the Environmental Management Programme (EMPr).

Although the number of staff employed (skilled and unskilled) depends on the contractor, teams are generally made up according to the following table. Unskilled labour is usually trained by the contractors and is usually sourced from local communities.

Table 2: The likely staffing structure for the construction of the proposed works

OPERATION	SKILLED	UNSKILLED
Bush clearing	20%	80%
Gate installation	20%	80%
Excavations	80%	20%
Stay installation	80%	20%
Tower installation	50%	50%
Stringing	80%	20%
Excavation	50%	80%
Steel erection	50%	50%
Electrical work	90%	10%

3.4 PROJECT LOCATION

This project is situated in the Mpumalanga and Gauteng Provinces and falls under the jurisdiction of the following municipalities:

- The Victor Khanye Local Municipality in the Nkangala District Municipality (Figure 2),
- The City of Tshwane Metropolitan Municipality (Figure 3),
- Ekurhuleni Metropolitan Municipality (Figure 3), and
- The City of Johannesburg Metropolitan Municipality (Figure 3).

Figure 2: Location of Nkangala District Municipality (left) and Victor Khanye Local Municipality (right)

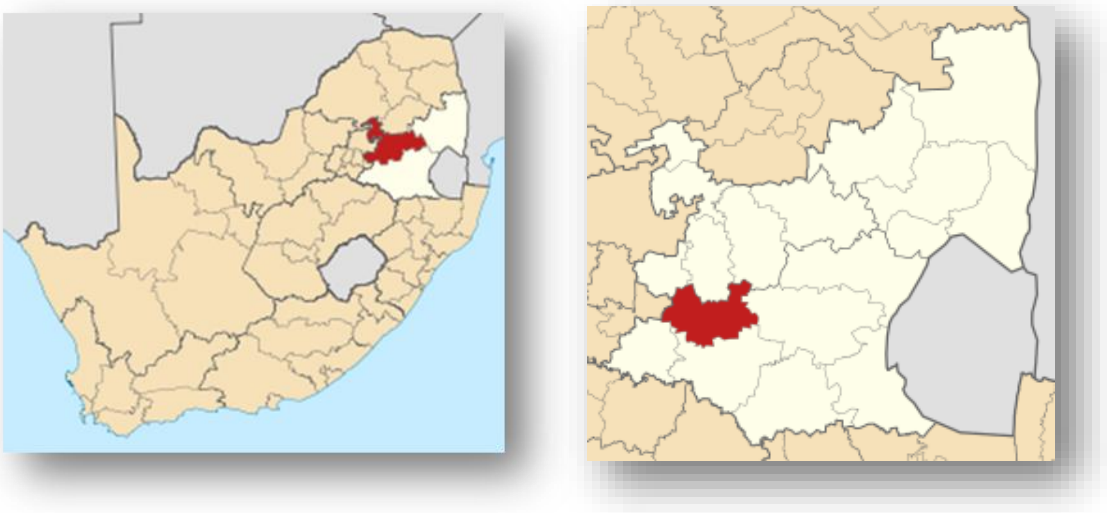


Figure 3: Location of City of Tshwane (left), Ekurhuleni (middle) and City of Johannesburg (right) Metropolitan Municipalities.

3.5 CATCHMENT AREAS AND LAND USES AFFECTED IN THE STUDY AREA

The study area falls within the catchment areas:

The powerline crosses 6 Quaternary Catchments (A21C, A21B, A21A, A23A, B20D and B20F). Several perennial and non-perennial watercourses are crossed by the proposed powerline. The majority of the water drains in two main directions. The central to western parts of the line drain northwest towards the Hartbeespoort Dam and the Crocodile River. This section of the lines falls in the 3rd, Crocodile West, Marico Water Management Area. The remainder drains towards the northeast into the Olifants River and falls within the 4th (Olifants) Water Management Area.

Important rivers crossed by the line, from west to east are:

- Jukskei River;
- Rietvlei River;
- Hennops River;
- Pienaars River;
- Honde River;
- Bronkhortspruit and
- the Wilge River.

A total of 31 watercourses are crossed by the proposed line. The total amount of wetlands can be broken down into:

- 8 floodplain wetlands,
- 20 unchannelled valley bottom wetlands,
- 2 depression wetlands and
- one riparian area which may subsequently be affected by the tower footings.

Each tower footing will be variable and dependant on the area (Wetland, water source type, drainage, soils, etc) in order to minimise potential impacts.

The proposed transmission line corridor does not traverse along any streams, but it does cross several. A large number of the existing power lines in the area are aligned along streams and drainage lines and historically the reasoning behind this was not to interfere with the farming activities. The recent emphasis on environmental impact limitation has however changed this perception.

The proposed transmission corridor crosses the farms as tabled in Table 3 below.

Table 3: Farms affected by the proposed Bravo 3 transmission corridor

Farm Name/ Township	Type	Province
Blue Hills 397-JR	Farm Portion	Gauteng
Boschkop 369-JR	Farm Portion	Gauteng
Diepsloot 388-JR	Farm Portion	Gauteng
Doornkloof 391-JR	Farm Portion	Gauteng
Doornkloof 391-JR	Farm Portion	Gauteng
Doornrandje 386-JR	Farm Portion	Gauteng
Grootfontein 394-JR	Farm Portion	Gauteng
HARTBEESTFONTEIN 537	Farm Portion	Gauteng
Jakhalsfontein 528-JR	Farm Portion	Gauteng
Kleinfontein 368-JR	Farm Portion	Gauteng
Kleinzonderhout 519-JR	Farm Portion	Gauteng
Klipeiland 524-JR	Farm Portion	Gauteng
Klipkop 396-JR	Farm Portion	Gauteng
Knopjeslaagte 385-JR	Farm Portion	Gauteng
Kortfontein 530-JR	Farm Portion	Gauteng
KOSMOSDAL	Erf	Gauteng
Kruispaaie 392-JR	Farm Portion	Gauteng
Nooitgedacht 525-JR	Farm Portion	Gauteng
Olievenhoutbosch 389-JR	Farm Portion	Gauteng
Olifantsfontein 410-JR	Farm Portion	Gauteng
Onverwacht 532-JR	Farm Portion	Gauteng
Puntlyf 520-JR	Farm Portion	Gauteng
Randjesfontein 405-JR	Farm Portion	Gauteng
Rhenosterfontein 514-JR	Farm Portion	Gauteng
Rietfontein 532-JQ	Farm Portion	Gauteng
Rietvlei 518-JR	Farm Portion	Gauteng
Spitskop 533-JR	Farm Portion	Gauteng
Sterkfontein 401-JR	Farm Portion	Gauteng
Tiegerpoort 371-JR	Farm Portion	Gauteng
Vlakfontein 523-JR	Farm Portion	Gauteng
Vlakfontein 569-JR	Farm Portion	Mpamalanga
Vleiland 635-JR	Farm Portion	Gauteng
Witfontein 521-JR	Farm Portion	Gauteng
Witkoppies 393-JR	Farm Portion	Gauteng

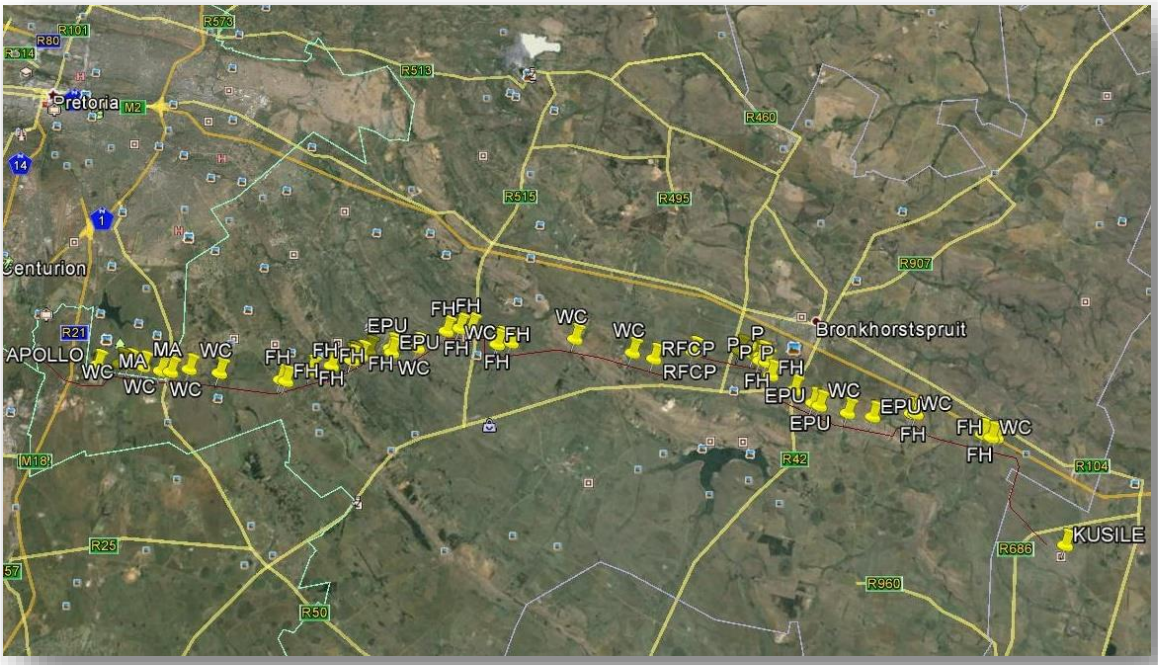
The following table gives a summary of general land uses situated within close proximity to and in the proposed transmission corridor.

Table 4: General land uses near and in proposed transmission corridor (Kusile to Apollo

Proposed corridor between Kusile Power Station and Apollo Converter station		
Land use (name or description) within ±100m of corridor	**Area of jurisdiction**	**Is proposed line in existing servitude?**
Farm portions & grazing House on farm/holdings and farm buildings (FH) Watercourses (WC) Egg production units (EPU) Pivots (P) Rain-fed crop production (RFCP) Mining activities (MA) Grazing Rietvlei Dam Municipal Nature Reserve	Emalahleni CoT	Yes

The location of the land uses mentioned in Table 4 is shown in the image below.

Figure 5: Location of general land uses – Kusile to Apollo



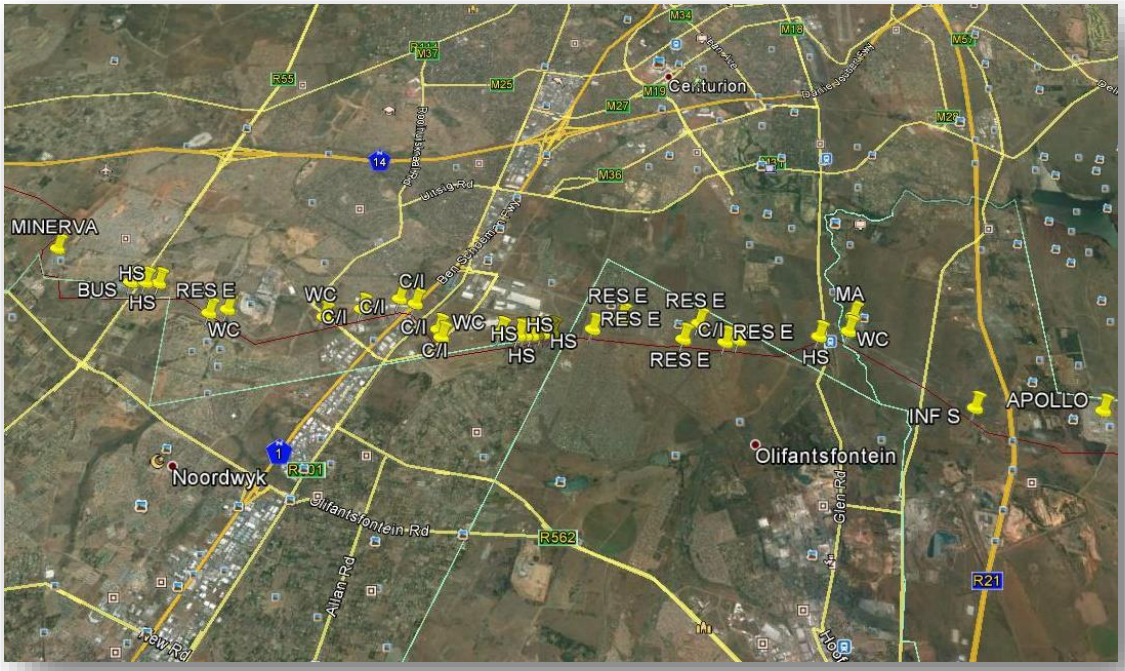
Source: Google Earth

Table 5: General land uses near and in proposed transmission corridor (Apollo to Minerva)

Proposed corridor between Apollo Converter station to Minerva Substation		
Land use (name or description) within ±100m of corridor	**Area of jurisdiction**	**Is proposed line in existing servitude?**
Farm portions & grazing House on farm/holdings and farm buildings (FH) Informal Settlement (IS) Watercourses (WC) Mining Activities (MA) House/Houses (H) Commercial/Industrial (C/I) Residential Estate (RES E) Business (BUS) Grazing/undeveloped	CoT	Yes

The location of the land uses mentioned in Table 4 is shown in the image below.

Figure 6: Location of general land uses – Apollo to Minerva



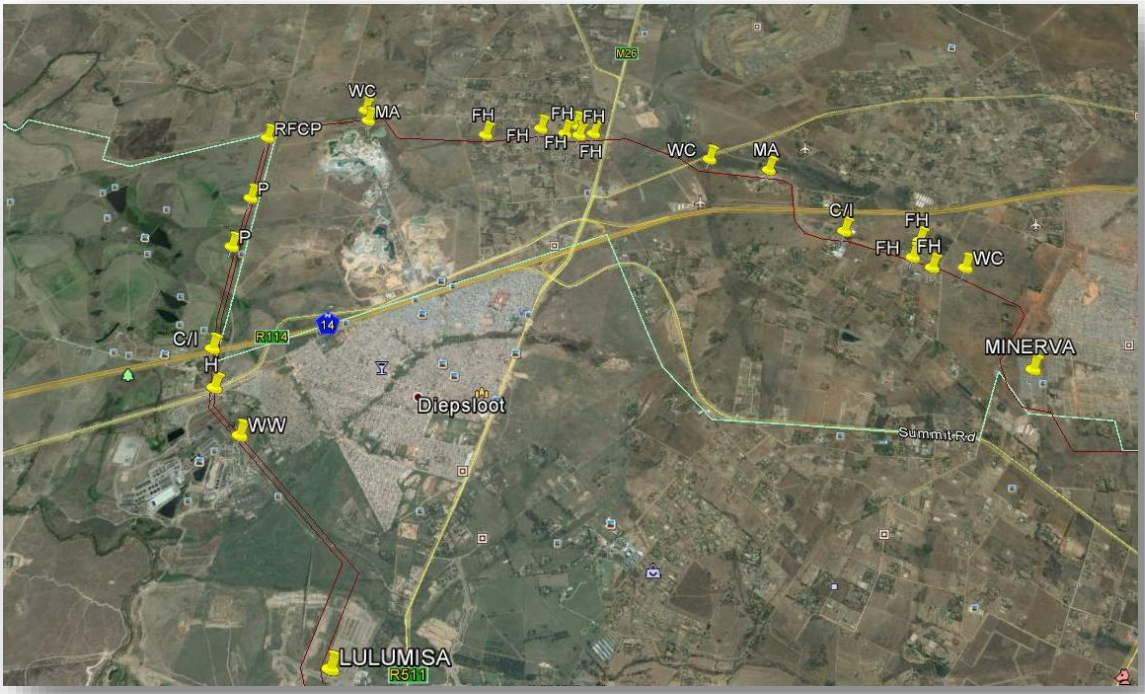
Source: Google Earth

Table 6: General land uses near and in proposed transmission corridor (Minerva to Lulumisa

Proposed corridor between Minerva Substation and Lulumisa Substation		
Land use (name or description) within ±100m of corridor	**Area of jurisdiction**	**Is proposed line in existing servitude?**
Farm portions & grazing House on farm/holdings and farm buildings (FH) Watercourses (WC) Mining Activities (MA) House/Houses (H) Rain-fed crop production (RFCP) Pivots (P) Commercial/Industrial (C/I) Wastewater Treatment works (WW) Residential Estate (RES E) Business (BUS) Grazing/undeveloped	CoJ	Yes

The location of the land uses mentioned in Table 4 is shown in the image below.

Figure 7: Location of general land uses – Minerva to Lulumisa



Source: Google Earth

4 BASELINE DESCRIPTION OF THE GEOGRAPHICAL, SOCIAL AND ECONOMIC PROFILE OF THE STUDY AREA

4.1 MPUMALANGA PROVINCE

From a perspective of the Mpumalanga Province, the energy sector plays a dominant role in the provincial economy, This province is home to 11 of Eskom's 13 coal fired power stations, and Mpumalanga, which accounts for a mere 6,3% of South Africa's gross area, generates a staggering 66% of Eskom's electricity.

Mpumalanga covers a land area of 79487 km^2, which represents approximately 6.3% of the total area of South Africa. The table below shows Mpumalanga recorded a population size of 4 039 939, ranking it sixth as far as population size is concerned.

The province is largely rural in nature, which is evident in the relative low population density of 50.8 persons per km^2, compared to Gauteng with a density of 724,62 persons per km^2.

Table 7: Population size and percentage changes by district and local municipality, censuses of 1996, 2001 and 2011

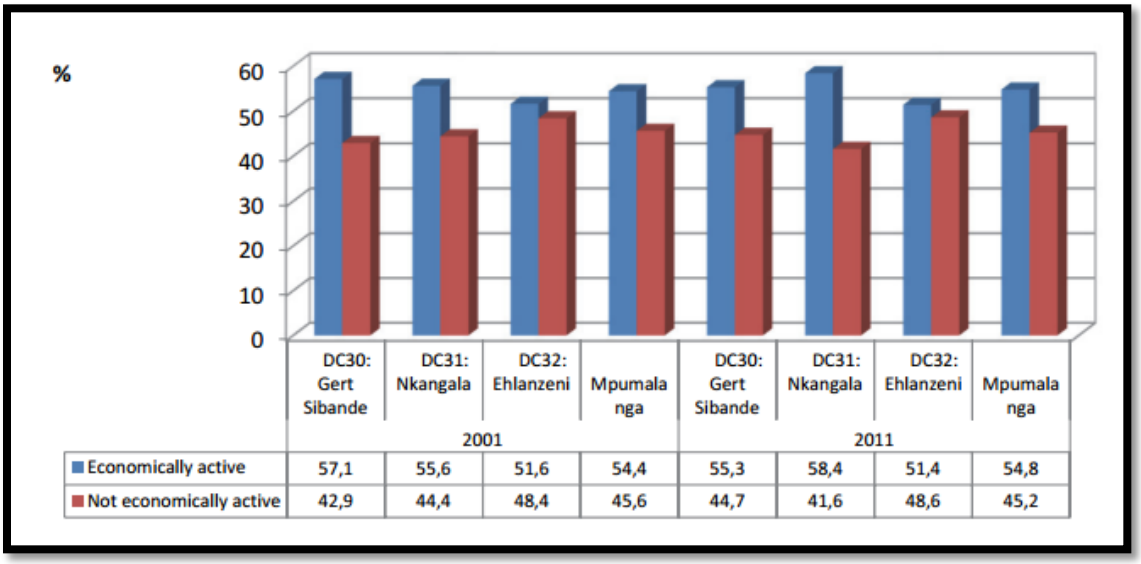
	Population			Percentage change	
Municipality	**Census 1996**	**Census 2001**	**Census 2011**	**1996 & 2001**	**2001 & 2011**
Gert Sibande	**797 400**	**900 007**	**1 043 194**	**12,9**	**15,9**
Albert Luthuli	182 719	187 751	186 010	2,8	-0,9
Msukaligwa	105 368	124 812	149 377	18,5	19,7
Mkhondo	100 388	143 077	171 982	42,5	20,2
Pixley Ka Seme	70 178	80 737	83 235	15,0	3,1
Lekwa	90 080	103 265	115 662	14,6	12,0
Dipaleseng	39 042	38 618	42 390	-1,1	9,8
Govan Mbeki	209 626	221 747	294 538	5,8	32,8
Nkangala	**962 249**	**1 018 422**	**1 308 129**	**5,8**	**28,4**
Victor Khanye	53 208	56 335	75 452	5,9	33,9
Emalahleni	236 040	276 413	395 466	17,1	43,1
Steve Tshwete	135 335	142 772	229 831	5,5	61,0
Emakhazeni	37 004	43 007	47 216	16,2	9,8
Thembisile	241 360	256 583	310 458	6,3	21,0
Dr JS Moroka	259 302	243 313	249 705	-6,2	2,6
Ehlanzeni	**1 364 221**	**1 447 125**	**1 688 615**	**6,1**	**16,7**
Thaba Chweu	65 909	81 681	98 387	23,9	20,5
Mbombela	426 090	476 904	588 794	11,9	23,5
Umjindi	48 547	53 744	69 577	10,7	29,5
Nkomazi	277 864	334 669	390 610	20,4	16,7
Bushbuckridge	545 811	500 128	541 248	-8,4	8,2
Mpumalanga	**3 123 869**	**3 365 554**	**4 039 939**	**7,7**	**20,0**

Table 7 gives the population of Mpumalanga from 1996 to 2011 by district and local municipality within the district. The population of Mpumalanga increased from 3 365 554 in 2001 to 4 039 939 in 2011, yielding a percentage change of 20%. In 2011, the district municipality with the highest population size was Ehlanzeni (1 688 615), while Gert Sibande recorded the lowest population (1 043

194). Mbombela Local Municipality had the highest population (588 000), and Dipaleseng the lowest (42 390). Steve Tshwete had the highest percentage change of 61%, followed by Emalahleni at 43,1%

The figure below shows that the proportion of the economically active population in Mpumalanga has slightly increased from 54,4% in 2001 to 54,8% in 2011, particularly in Nkangala district (an increase from 55,6% to 58,4%). Whereas the Ehlanzeni and Gert Sibande districts witnessed a decrease in the proportion of the economically active population (from 51,6% to 51,4% and from 57,1% to 55,3% respectively).

Figure 8: Percentage of economically active and inactive population by district municipality, Census 2001 and Census 2011



As mentioned in paragraph 3.4 a portion of this project, Kusile Power Station, is situated in the Mpumalanga Province and falls under the jurisdiction of the Victor Khanye Local Municipality.

4.1.1 NKANGALA DISTRICT MUNICIPALITY

Nkangala is the economic hub of Mpumalanga and is rich in minerals and natural resources. The Districts' economy is dominated by electricity, manufacturing and mining. These sectors are followed by community services, trade, finance, transport, agriculture and construction.

The district is located to the North-West of the province and is the smallest district in land mass (21%) and has the second largest population concentration (35%) in the province. It covers an area of about 2677.67 km² in extent. The Nkangala District Municipality is made up of six local municipalities, including Victor Khanye.

*4.1.2 **Victor Khanye Local Municipality***

(i) History and Location of Victor Khanye Local Municipality

The Victor Khanye Local Municipality is situated on the western Highveld of Mpumalanga Province, covering a geographic area of approximately 1,567 square kilometres. The prominent towns and settlements in the Municipality include Abor, Argent, Delmas, and Brakfontein. The municipality is strategically located close to the metropolitan areas of Tshwane and Ekurhuleni to the west. The headquarters of the municipality are in Delmas (a French word meaning small farm). Victor Khanye is currently characterized by an increase in mining and related activities in the Leandra area.

The town of Delmas had its origins due to the need to construct a railway line between Apex on the East Rand and Witbank to transport coal. The railway line was opened in 1906 and the town was surveyed in 1907.

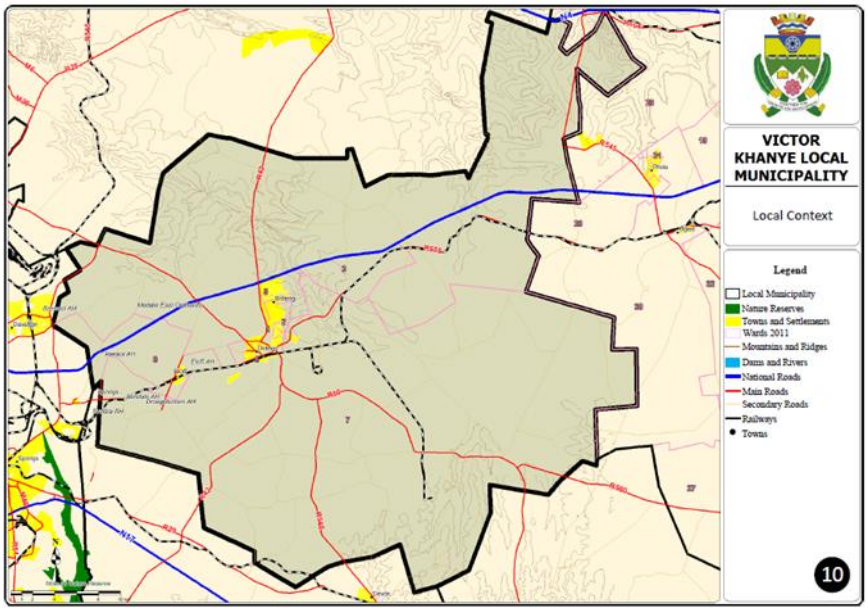
The Delmas [Victor Khanye] district was proclaimed in 1954 and used to be mainly agricultural. As early as 1909 the Delmas Estate and Colliery Co began mining coal in the district.

The most prominent natural feature of the Delmas [Victor Khanye] Local Municipal Area is the Skurweberg Mountain, so named for the ancient sandstone outcroppings that are a rare example of an ancient seabed from the Godwana period. This mountain stretches down the Hell's Kloof Pass into the gorges and canyons cut by the Bankspruit, Elands and Komati Rivers.

The Municipality is very rural in nature and is a major maize producing area. The spatial structure of Victor Khanye is characterised by the following prominent areas:

- Delmas and its extensions: including business and industrial area, and residential area for people in the middle and higher income levels;
- Botleng and its extensions: predominantly a residential area for people in the lower income levels;
- Delpark and its extensions: predominantly a residential area for people in the lower income levels;
- Eloff: predominantly an agricultural holding area; and
- Sundra: predominantly an agricultural holding area.

Figure 9: Map of Victor Khanye Local Municipality



(ii) Broad description of current land uses in Victor Khanye Local Municipality (Geographic profile)

- Transport network

Roads:
The N12 national toll road that links Johannesburg with Nelspruit runs from east to west through the northern part of the Victor Khanye Municipality. It also links the Victor Khanye Local Municipality to Ogies and eMalahleni (Witbank), and to the Maputo Development Corridor towards Maputo (Mozambique).

The major provincial roads in the municipal area are:

- R50 that links Tshwane with Standerton, via Delmas;
- R43 that links with Bronkhorstspruit;
- R555 that links Springs with eMalahleni, via Delmas, and runs parallel to the south of the N12 freeway;
- R548 that links with Balfour; and
- R42 that links Delmas, Bronkhorstspruit and Nigel.

Roads infrastructure in and around the VKLM area was originally designed for low volume traffic. However, the traffic volumes (and especially heavy vehicles) have increased significantly over the past few years due to the rapid growth within the industrial sector, specifically mining activities. As a result, road surfaces in the VKLM are in urgent need of refurbishment and upgrade. It is estimated that 59% of roads in the VKLM are in a state of disrepair (VKLM IDP).

Railway lines:
The major rail infrastructure in the Victor Khanye area includes the following:

- The railway line from Gauteng to Victor Khanye. This main line runs parallel to route R555, and continues eastward, through Nelspruit to the Maputo harbour :
- A southern branch that extends into the south of the Municipality where it terminates;
- From the main line two lines go south through Ermelo to the Richards Bay harbour (one from Victor Khanye and one from Entokozweni); and
- There is also a Railway line going north from Victor Khanye station, running parallel to Road P81-1 through Dullstroom towards Lydenburg.

o Agriculture

The non-urban areas of the Victor Khanye Local Municipality consist mainly of farms and agricultural holdings. The agricultural holdings are mostly found on the periphery of the urban settlements. Many of these holdings are not used for agricultural activities, but for rural residential purposes or for operating service industries.

o Mining

The entire eastern and southern extents of the VKLM is covered by mining license applications, while there are prospecting licence applications on almost the entire remainder of the LM.

The two predominant mining areas are around Delmas in the centre of the municipal area, and also in the far north-eastern corner of the municipal area. Mining activities in the VKLM are concentrated mainly on coal and silica.

o Power stations

Construction of the Kusile power station in the north-eastern parts of the Municipality is far advanced and will add significantly to the amount of electricity generated from the Nkangala District as a whole. No new residential town is planned for this power station as it is expected that the workforce will reside in Delmas Town (VKLM), Phola, Wilge or eMalahleni City (in the neighbouring Emalahleni LM).

o Watercourses

A number of rivers/ spruits traverse the municipal area with the Koffiespruit, Wilge, and Kromdraaispruit being the most prominent. These generally drain in a northerly direction. Regionally, the Municipality falls within the Upper Olifants sub-water management area.

The underground water in the VKLM is under pressure due to municipal use and irrigation purposes.

The Victor Khanye Municipality has numerous natural pans and wetlands and, as a result, is very scenic. The Bronkhorstspruit and various pans in the area exhibit abundant bird life.

- Industrial (Manufacturing)

  Victor Khanye forms an extension of the industrial core of Ekurhuleni Metro (Gauteng) to the west, which, in turn, forms an extension of the Tshwane and Johannesburg Metros.

  Industrial uses are concentrated in the following areas: Botleng Extension 14, Union Forests Plantation, Eloff surrounds, Rietkol Agricultural Holdings, Rietkol 237 – IR, Sundale, portions of Springs A.H. and Sundra A.H.

  A cement grinding plant is being established just to the south of Delmas Town, on the Remainder of Portion 22 of the farm Witfontein 232. It will be the fly ash source for the Kendal Power Station situated some 35km to the west in Emalahleni LM. The milling plant will be accessed directly form route R50.

- Retail and wholesale trade

  As mentioned, the developed urban areas (and business concentrations) in the VKLM are namely Delmas, Botleng and Eloff, of which Delmas functions as the primary node. The urban areas are mainly residential with supportive services such as business, social facilities etc.

- Community facilities

  Most of the facilities are found in urban areas.

- Health

  The public hospital in Delmas Town was recently upgraded and renovated. The renovation projects that were implemented include: an outpatient and casualty unit, a pharmacy, and a maternity and paediatric unit. Planned future upgrades of the hospital will comprise additional wards, living quarters for doctors and nursing staff, extensions to the mortuary and archives, and additional storage.

  There are also three public health clinics in the Municipality: one in the FC Dumat Building in Delmas (includes a dental clinic), one in Botleng Proper and one in Botleng X3.

  Furthermore, three mobile clinics are dispatched into the rural areas of the Municipality to cater for people who have difficulty getting to a clinic.

- Housing

  According to the Mpumalanga Sustainable Human Settlement Master Plan the Victor Khanye Local Municipality had about 15 903 formal houses and 4643 informal houses in 2011. The 4643 informal houses comprised 521 traditional structures, 1150 backyard units, and 2973 structures in informal settlements. It also projected incremental subsidized demand of 1000 units by 2032, and 5993 bonded units by the same time.

  The residential settlements are consolidated in the central western parts of the LM, and informal settlement is primarily consolidated around Delmas Town.

- Spatial development (future land use)

Going forward, a major development is the construction of the Kusile Power Station which will have a significant impact on development in the area and subsequently lead to the future extension of mining activities and related residential demand around the existing urban core areas. As no new residential areas are planned to absorb the anticipated influx of labour for this development, a need for new housing will have to be accommodated in and around the existing urban core areas. The future extension of mining activities in response to the commissioning of the new Kusile Power Station will also have to be accommodated in these developments.

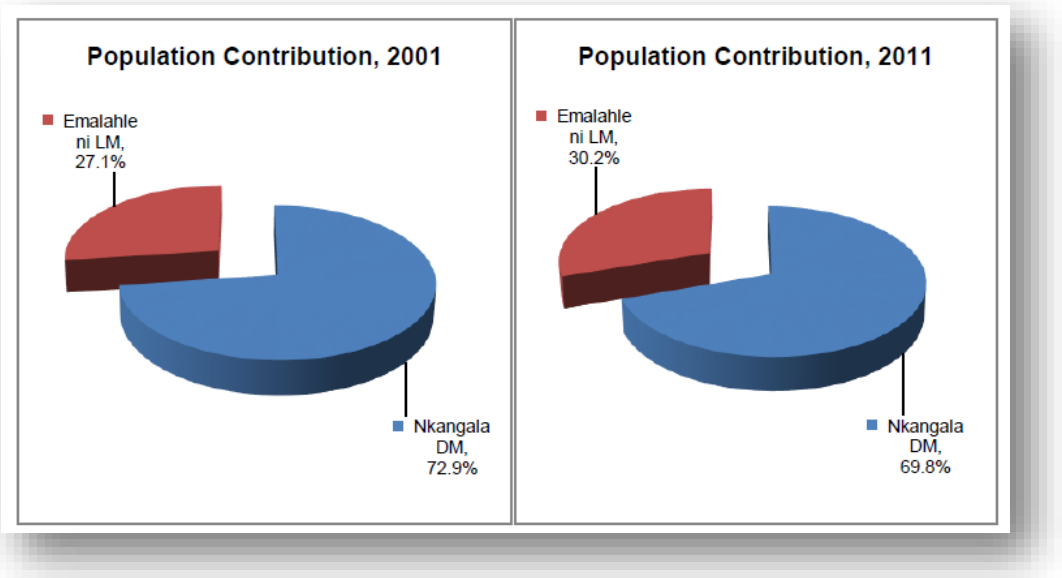
(iii) Demographic analysis/profile

a) Population Size

The following figures indicate the population profile of the Victor Khanye LM and the respective functional areas.

The Victor Khanye LM experienced a slight increase in the total population from 2001 to 2011 as shown in Figure 24. The population percentage increase calculated for the time period 2001 to 2011 is 25.5%, which translates into approximately 19 241 people, from 56 212 in 2001 to 75 453 in 2011. The total population of Victor Khanye contributed a mere 5.5% towards the total Nkangala Population.

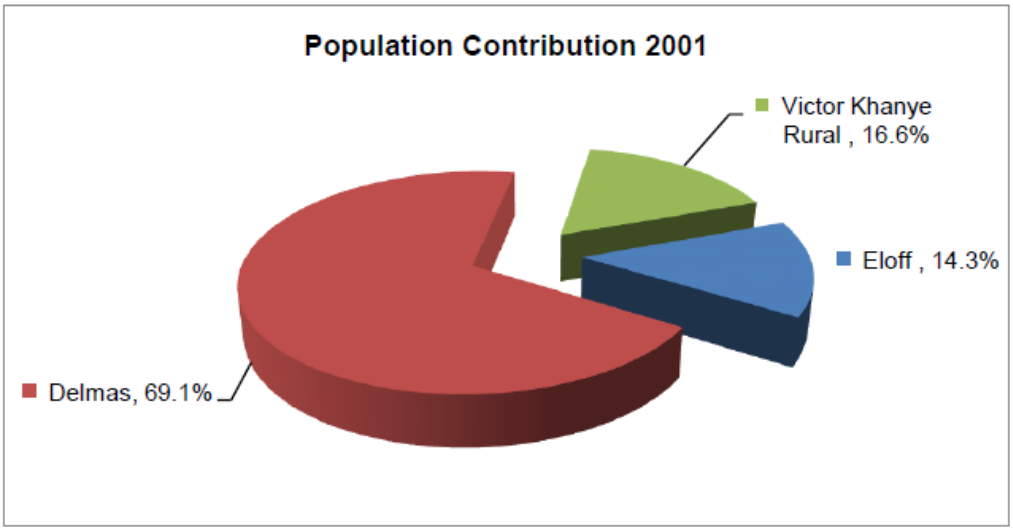
Figure 10: Victor Khanye Local Municipality Population Contribution to Nkgangala District Municipality



From Figure 11 below it is clear that most of the Victor Khanye's population is concentrated within the functional area of Delmas (69.1%), compared to Eloff

(14.3%). The rural area of Victor Khanye accommodates approximately 16.6% of the total population of Victor Khanye.

Figure 11: Victor Khanye Local Municipality Population Contribution



b) Gender Profile

The gender structure of the population is one of the key determinants of population change and dynamics.

The census results reflect a shift in the ratio of males to females with the current balance now marginally in favour of males, representing 51% of the total.

Table 8: Victor Khanye Local Municipality, Gender Profile, 1996, 2001 & 2011

Gender	1996	2001	2011
Male	49.60%	49.24%	51.45%
Female	50.40%	50.76%	48.55%

Source: Victor Khanye LM Draft IDP, 2916/17

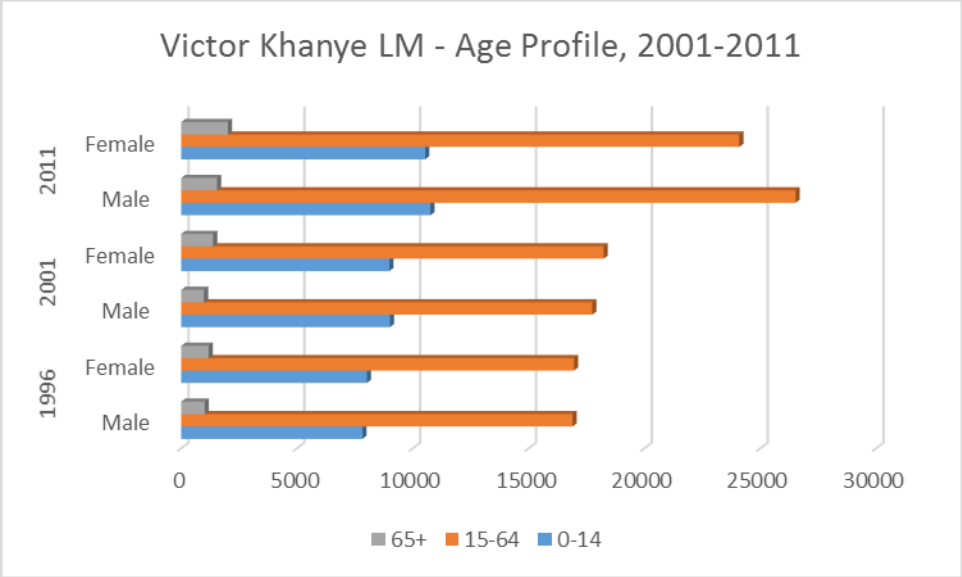
The above table indicates an increase of males and a decrease of females between 2001 and 2011. This is largely due to the nature of industries around the municipal area which tend to be more male oriented.

The increase of males can have an impact on issues of crime, prostitution and drug abuse.

c) Age Profile

Age distribution is an important indicator in terms of the development character and economic active aged segment of an area.

Figure 12: Victor Khanye Local Municipality, Age Profile 2001& 2011



As shown in Figure 12 the Victor Khanye Local Municipality is characterised by a strong economically active population segment, representing more than half (67%) of the total population. The Victor Khanye municipal area has a limited older population segment (aged 65+).

d) Race Profile

A split of the population by race reveals the following classification:

- Approximately 82% Africans
- 16% White
- 1% Coloured
- The balance Asian or others

The most prevalent language spoken is IsiNdebele, spoken by approximately (57%) of the population, followed by IsiZulu (33%) and Afrikaans (2%). The largest variety of spoken languages occurs in the non-urban area. The language preference by Ward is illustrated in the following table.

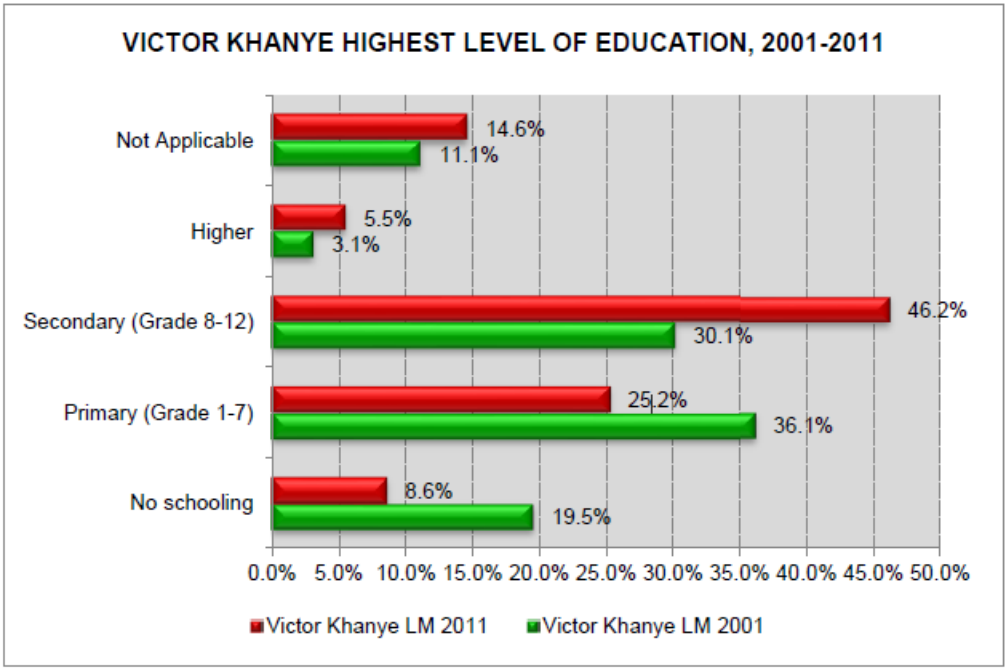
Table 9: Victor Khanye Local Municipality, Language preference by ward

	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 6	Ward 7	Ward 8	Ward 9	Total
Afrikaans	122	138	141	27	82	872	3 268	3 459	3 738	11 847
English	184	184	272	80	149	350	568	472	445	2 704
IsiNdebele	2 158	1 635	3 496	2 096	2 452	1 717	1 910	276	3 232	18 972
IsiXhosa	212	204	570	255	280	215	350	110	285	2 481
IsiZulu	2 894	2 116	7 350	2 444	3 400	2 539	3 162	890	2 112	26 906
Sepedi	244	150	526	251	267	205	383	150	366	2 542
Sesotho	381	274	551	275	313	234	410	148	294	2 880
Setswana	236	241	283	100	101	103	212	91	176	1 543
Sign language	2	7	35	13	20	11	20	16	27	151
SiSwati	72	74	340	158	133	127	283	57	188	1 433
Tshivenda	16	41	65	25	16	28	70	52	117	431
Xitsonga	55	49	259	178	95	80	296	140	270	1 424
Other	29	34	145	120	160	73	276	219	347	1 402
Unspecified	-	-	-	-	-	-	-	-	-	-
Not applicable	-	104	-	-	-	91	114	-	428	737
Grand Total	6 606	5 251	14 033	6 022	7 469	6 644	11 322	6 080	12 024	75 452

e) Educational Profile

The education profile provides an indication of the literacy levels of the Local Municipality. Figures 26 and 27 illustrate the highest level of education for the Victor Khanye LM and the respective functional areas

Figure 13: Victor Khanye Local Municipality, Highest Level of Education, 2001 & 2011



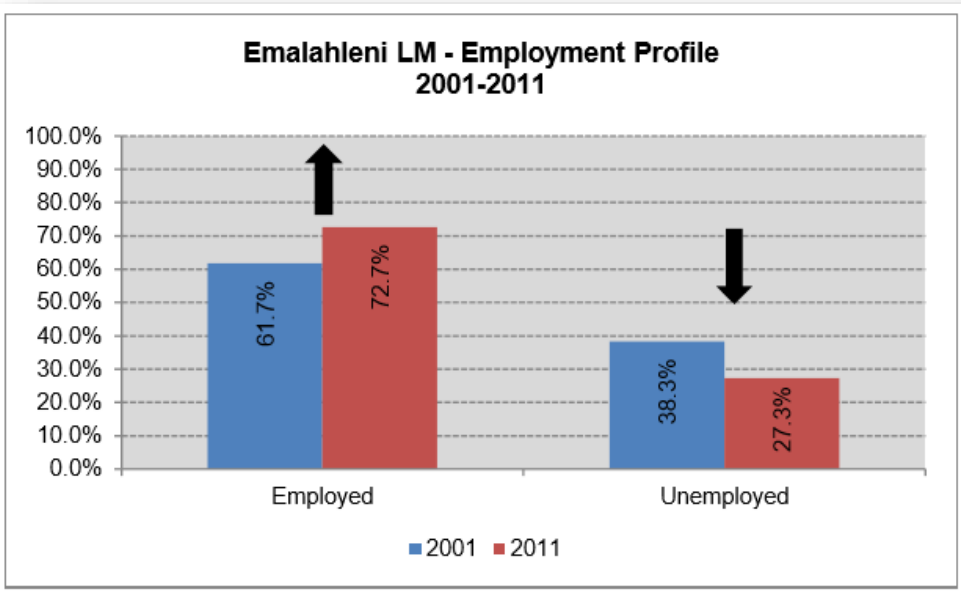
As indicated in Figure 13 (above), Victor Khanye Local Municipality experienced an increase in the highest level of education from 2001 to 2011 in the categories Secondary (Grade 8-12) (from 30.1% in 2001 to 46.2% in 2011)

and Higher (3.1% in 2001 to 5.5% in 2011). For the same time period the following education categories declines; Primary (grade 1-7) (from 35.1% in 2001 to 25.2% in 2011) and no Schooling (from 19.5% in 2001 to 8.6% in 2011).

f) Employment Status

Employment status is a good indication of the economic environment of a Municipality. Figures 14 indicates the employment status of the Victor Khanye LM and respective functional areas.

Figure 14: Victor Khnaye Local Municipality, Employment Status 2001 &2011



The overall employment levels within the Local Municipality are relatively high (71.8%), of which the total employment increase by 14.3% from 57.5% in 2001 to 71.8% in 2011. Similarly, unemployment decreased from 42.5% in 2001 to 28.2% in 2011. This is a good indication of a positive local economy.

It is important to note that Victor Khanye contributes 10% of the daily work force commuting between Mpumalanga and Gauteng. Of the commuting population, 75% work in the neighbouring Ekurhuleni Metro.

Table 10 indicates the 2011 employed segment and the economically active population (EAP) segment.

Table 10: 2011 Employment segment and EAP segment

Area	Employed Segment	EAP Segment
Victor Khanye LM	71.8%	59.7%
Eloff	85.6%	54.2%
Delmas	66.7%	60.9%
Victor Khanye Rural	78.8%	59.2%

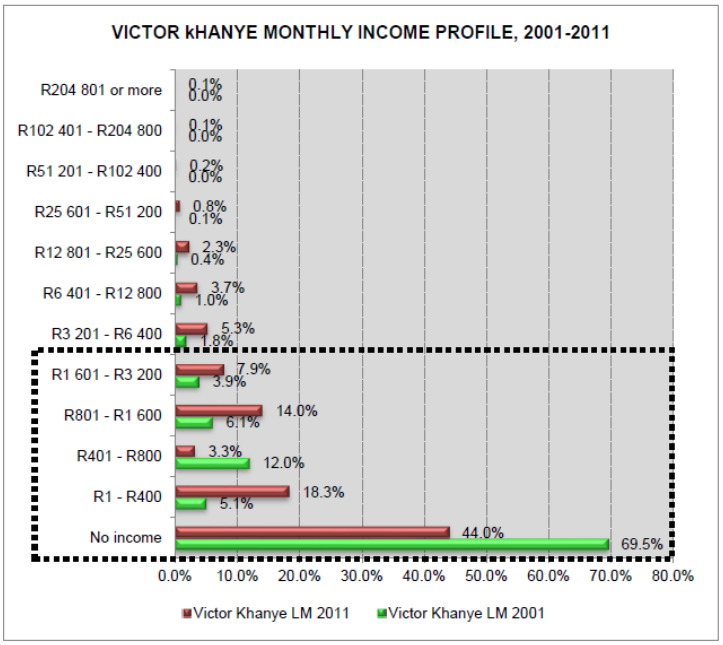
The EAP segment of the Victor Khanye LM is approximately 59.7% of which 71.8% is employed. The Eloff has the lowest EAP segment of approximately 54.2% and the highest employment level (85.6%).

g) Household Income

Figures 15 and 16 indicate the monthly income of households within the Victor Khanye LM and the functional areas.

The monthly income per household increased significantly from 2001 to 2011. The total number of households earning no income decreased by 25.5%; from 69.5% in 2001 to 44.0% in 2011. Households earning a monthly income of R0-400 increased significantly from 5.1% in 2001 to 18.3% in 2011 and households earning R801-R1600 increased from 6.1% in 2001 to 14.0% in 2011.

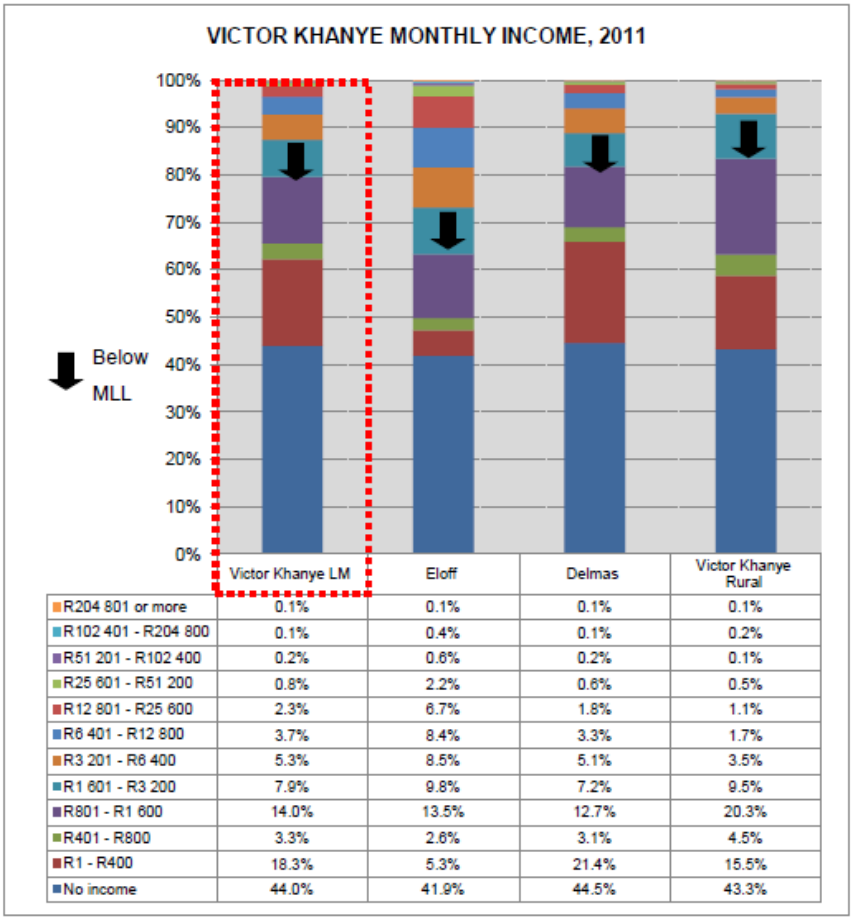
Figure 15: Victor Khanye LM Household Monthly Income Profile 2001-2011



The increase in monthly income is positive, although the overall level of monthly income is still well below the minimum living levels (MLL) estimated at R4 000 to R4 500 per month for 2014 (National Treasury). At minimum, 87.5% of households (for 2011) within Victor Khanye LM earned a monthly income well below the MLL. This indicates high dependency levels of households on government grants and services.

People that live below the poverty line in Victor Khanye are concentrated in the old apartheid proclaimed townships.

Figure 16: Victor Khanye LM Household Monthly Income Distribution 2001-2011



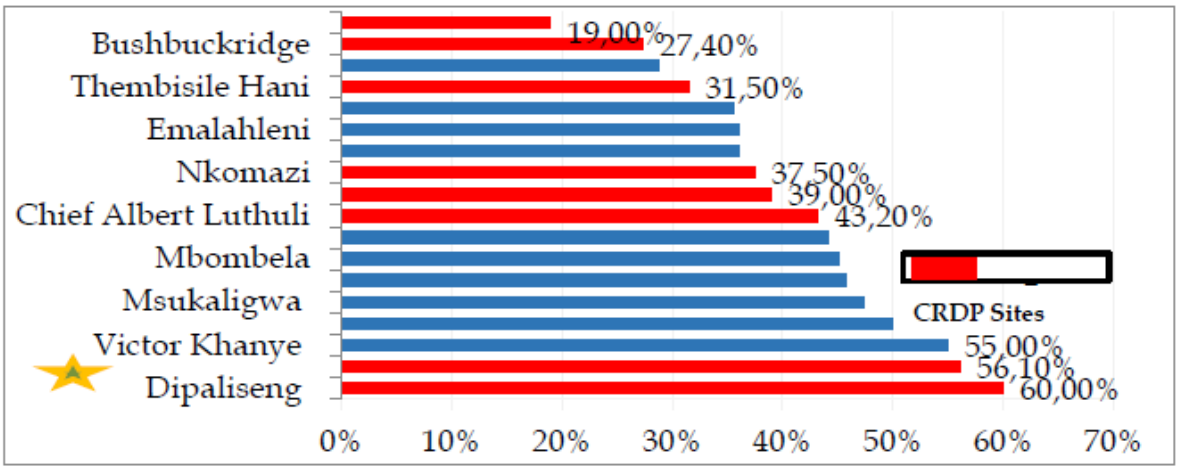
	Victor Khanye LM	Eloff	Delmas	Victor Khanye Rural
R204 801 or more	0.1%	0.1%	0.1%	0.1%
R102 401 - R204 800	0.1%	0.4%	0.1%	0.2%
R51 201 - R102 400	0.2%	0.6%	0.2%	0.1%
R25 601 - R51 200	0.8%	2.2%	0.6%	0.5%
R12 801 - R25 600	2.3%	6.7%	1.8%	1.1%
R6 401 - R12 800	3.7%	8.4%	3.3%	1.7%
R3 201 - R6 400	5.3%	8.5%	5.1%	3.5%
R1 601 - R3 200	7.9%	9.8%	7.2%	9.5%
R801 - R1 600	14.0%	13.5%	12.7%	20.3%
R401 - R800	3.3%	2.6%	3.1%	4.5%
R1 - R400	18.3%	5.3%	21.4%	15.5%
No income	44.0%	41.9%	44.5%	43.3%

The Eloff functional areas have the highest number of households earning an income of between R3201 and R6400 (approximately 8.4% of the total population respectively). Overall the level of income is very low

h) Health Profile

Mpumalanga is one of the three (3) Provinces with the highest infection rates of HIV/AIDS. Latest statistics for the Province reveal that Victor Khanye Local Municipality has an increased infection rate; as measured in pregnant women tested, of 55%, the 3rd highest in the province. With respect to HIV prevalence, excluding pregnant women, the trend reflected a decrease to 23.0%.

Figure 17: Mpumalanga HIV/AIDS prevalence



(iv) Economic Indicators

According to the Victor Khanye IDP (2016/17) the Municipality Gross Domestic Product (GDP) is forecast to grow by 3.4% per annum over up to and including 2016, although this is lower that the District and Province projections. The forecast is very optimistic if we consider that the historic growth rate in the period 1996-2011 remained relatively low at 2.0% per annum.

Agriculture, transport, community services, finance and mining will be the main contributors to the Victor Khanye Local Municipality economic growth in the period up to 2016. The municipality is a major maize producing area. Annual maize production is calculated at between 230 000 and 250 000 metric tons. Mining activities are concentrated on coal and silica. About 3 million metric tons of coal and 2 million metric tons of silica are mined annually in the municipal area.

With respect to Gross Value Added (GVA) - a measure in economic terms of the value of goods and services produced in an area, industry or sector of an economy - the Victor Khanye Local Municipality contribution to the Mpumalanga province is reflected at 2,0% in 2011 at an estimated value of 3,4 billion.

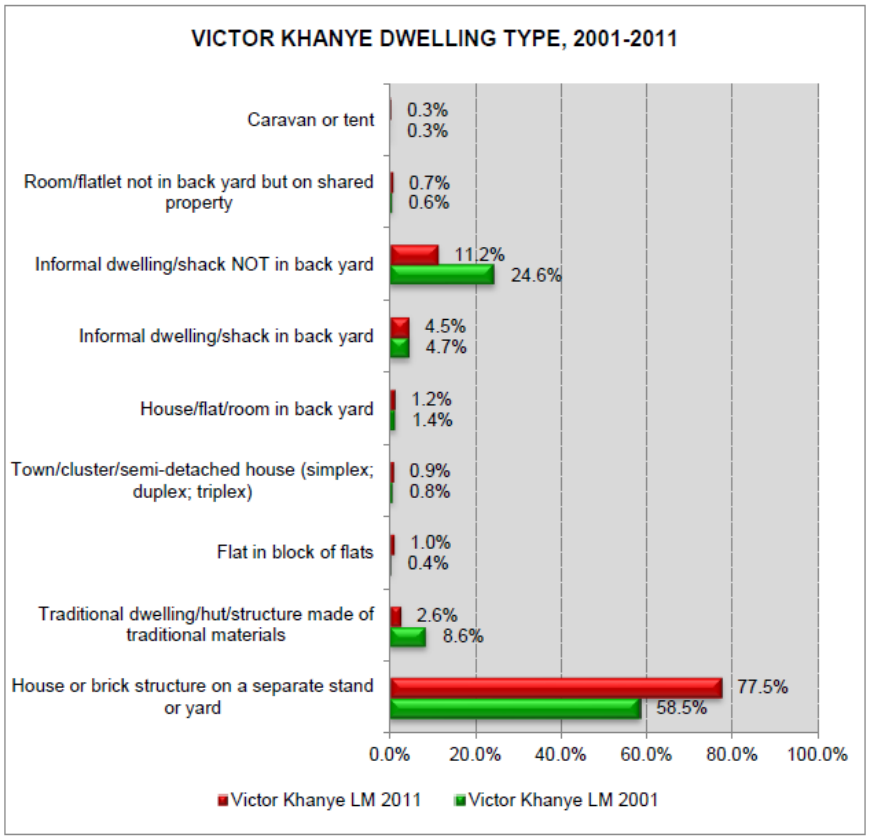
(v) Social Infrastructure Profile

Access to housing and basic infrastructure and services including energy, as well as water provision and sanitation may be considered as a general measure of well-being indicating households' level of living, as well as potential vulnerability status.

a) Housing

Dwelling type is a good indication of the residential character of a municipality. Figure18 indicates the dwelling type distribution within the Victor Khanye LM and the respective functional areas.

Figure 18: Victor Khanye LM Dwelling Type 2001-2011.



The number of households residing in a house or brick structure on a separate stand or yard increased from 58.5% in 2001 to 77.5% in 2011. The number of households residing in an informal dwelling not in a back yard decreased from 24.6% in 2001 to 11.2% in 2011 and households residing in a traditional dwelling / hut / structure made of traditional materials decreased from 8.6% in 2001 to 2.8% in 2011.

b) Household Infrastructure (Energy, Water, Sanitation & Refuse Removal)

Table 11 below shows a slight increase in most levels of services for households in the Victor Khanye municipal area, from 2001 to 2011 and thus also an increase in the general wellbeing of household for the same period.

Table 11: Victor Khanye Local Municipality, Households with services, 2001 – 2011

	Percentage 2001	Percentage 2011
Flushed toilet connected to sewerage	68.1%	83.8%
Weekly refuse removal	63.3%	74.2%
Piped (tap) water inside dwelling	70.8%	83.2%
Electricity for lighting	64.9%	85.1%

4.2 GAUTENG PROVINCE

Gauteng is South Africa's most important political and economic node, the largest urban economy in Africa, and is at the centre of what is probably the only true City Region on the continent.

At 12.2-million people, Gauteng is now South Africa's most populated province. Gauteng is recognised as the "international migrant gateway to South Africa", with international migrants making up an estimated 13% of the population. It is estimated that immigration will add about 0.1% to 0.2% to the annual population growth. In 2007, Gauteng Province hosted 46% of South Africa's population born outside South Africa. This is up from 42% in 2001 and is expected to increase in the years ahead.

The Gauteng City-Region contributes a significant proportion of South Africa's economic output, which includes mining, manufacturing, financial and business services, innovation and trade. In 2008 Gauteng produced 35,5% of the national GDP in current prices. Together, the municipalities in the City-Region contributed 43,8% of South Africa's total economic output in current prices. The region is also the country's centre of trade with Southern Africa and beyond.

In contrast to the economic prowess of the province, Gauteng however also faces a number of challenges related to poverty, unemployment and inequality. South Africa is one of the most unequal societies in the world, and this stark reality is particularly evident in Gauteng cities and towns.

In terms of Statistics South Africa, 2011:

- Gauteng currently has a population of 12.2-million people, which has increased from 9.2-million in 2001 and 7.6-million in 1996. This significant increase in population can to an extent be attributed to labour migration;
- There are 3,909,022 households in Gauteng;

- Gauteng shows a net in migration of 901,600 people from other provinces since 2001;
- 79.8% of people reside in formal dwellings, which is marginally better than 74.4% in 2001. 18.9% of households live in informal settlements, which equals 739,901 households. The remaining households (1.3%) live in traditional dwellings; • 44.3% of households own their dwelling while 37.1% are renting;
- 87.4% of households have access to electricity for lighting purposes, compared to 84.7% for S.A.;
- 89.9% of households have access to refuse removal at least once a week (compared to 63.6% in S.A.);
- 86.5% of households have access to flush or chemical toilets (compared to 62.6% for S.A.);
- 89.4% of households have access to piped water inside a dwelling/yard (73.4% for S.A.);
- 26.3% of the labour force (15-64 years) is unemployed (29.8% for S.A.). This has dropped from 37.2% in 2001; and
- The average annual household income is R156, 000, which is the highest in the country.

4.2.1 City of Tshwane Metropolitan Municipality

(i) History and Background of the City of Tshwane

The City of Tshwane is named after Chief Tshwane. It is the indigenous name of the area that was used by the early inhabitants who lived in the proximity of the Tshwane River, under the chieftainship of Chief Tshwane. According to historical Accounts, Chief Tshwane was the son of Chief Mushi. The latter had moved from the Present day KwaZulu-Natal and settled in Pretoria before the arrival of the Voortrekkers, the Afrikaans-speaking migrants who moved from the Cape.

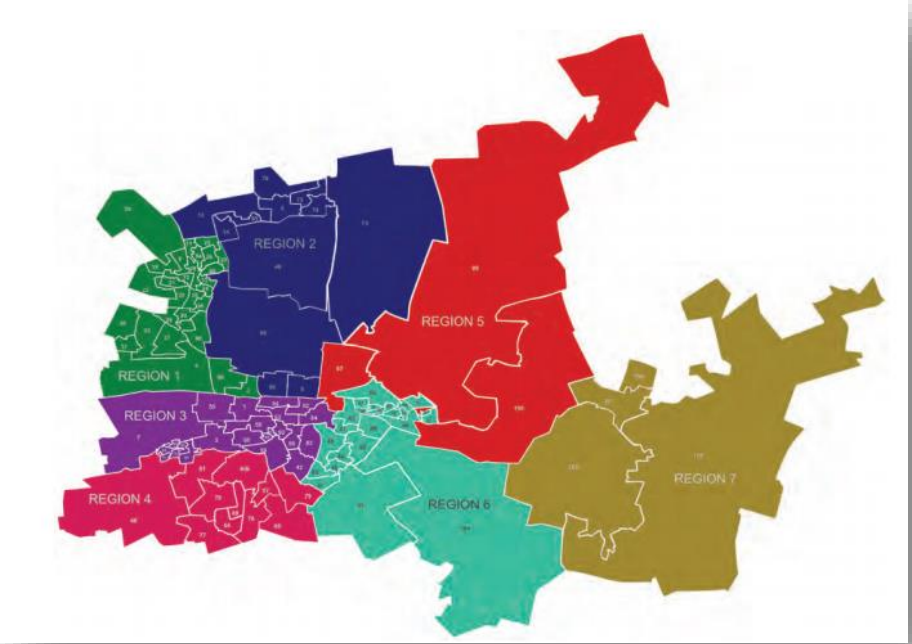
Pretoria (which is now the central business district and surrounding area of the greater Tshwane Metropolitan Municipality) was declared the capital city and seat of Government of the Republic of South Africa during the liberation struggle.

A key milestone in our history was the amalgamation of the municipality with 13 other smaller municipalities on December 5, 2000 to form the new City of Tshwane Metropolitan Municipality. This amalgamation was not simply an exercise in spatial integration; more importantly, it was a deliberate step towards reconciling the residents of this City and developing an integrated economic

base to deepen socioeconomic transformation. The City adopted the slogan "Re a Tshwana" which means, "We are the same," to signify unity.

Given the enormity of the developmental gap that must be addressed and the multiplicity of programmes and projects that must be implemented and to improve service delivery, the City of Tshwane has created 7 administrative Regions (see Figure19).

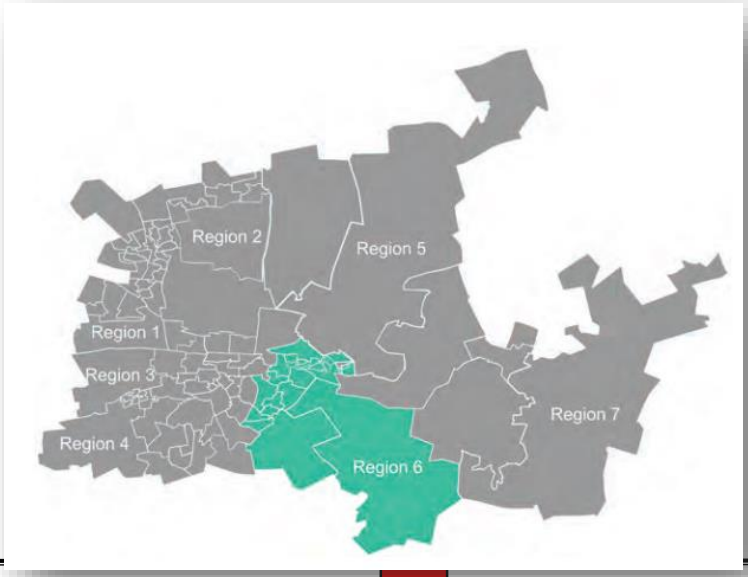
Figure 19: City of Tshwane 7 Administrative Regions, 2011



The corridor proposed for the construction of a 400kV power line from Kusile Power Station to Lulamisa traverse Regions 6 and 7 of this Metropolitan Municipality and for the purpose of this report, a summary of the demographic profile of each of these two regions is included.

(ii) Region 6

Figure 20: City of Tshwane Location of Administrative Region 6



Region 6, bordered by the N1 freeway to the west and Ekhuruleni Local Municipality to the South has 24 wards. It is the Region with the greatest development pressure. Almost all the developable land within the southern section of the Region has been developed and the uncontrolled development in the old Kungwini area places a burden on the existing saturated road infrastructure.

The south-eastern section of this Region has the highest income per capita, but here is also a huge concentration of people in the north-east quadrant with no to low income. The north-eastern section of the Region accommodates mostly low- income communities and industrial land uses.

The middle and south-western section of the Region accommodates medium to high-income areas with large institutional uses. Although population densities in the south-eastern section of the region are relatively low, this part of the Region has the highest percentage of group housing developments compared to any other Region.

Much development has taken place further to the east in the last decade and the road network development has not kept up with land development resulting in severe congestion during the peak hours. There is a lack of north-south link roads in the Region. Sufficient east-west roads exist due to the historic role and function of the CBD. The northern section of the Region is well served by commuter rail with an east-west commuter line and stations from Mamelodi in the east, through Hatfield to Pretoria Station.

Bulk water supply is adequate throughout the region except for the undeveloped parts of Nellmapius and Willow Park/ Willow Brae. The southern portion of the Region is generally well provided with engineering service infrastructure. The challenge in terms of service provision is to phase development in the adjacent old Kungwini area through bulk services.

The Region contains a number of strategic land uses including the CSIR, South African National Intelligence Service, Silverton, Waltloo, Koedoespoort industrial areas and the Menlyn Park Retail Node which has a metropolitan function in terms of facilities. The economic base for Region 6 is balanced between the retail, office sector in the southern and western sections, with commercial, warehousing, wholesale or industrial activities in the north of the Region.

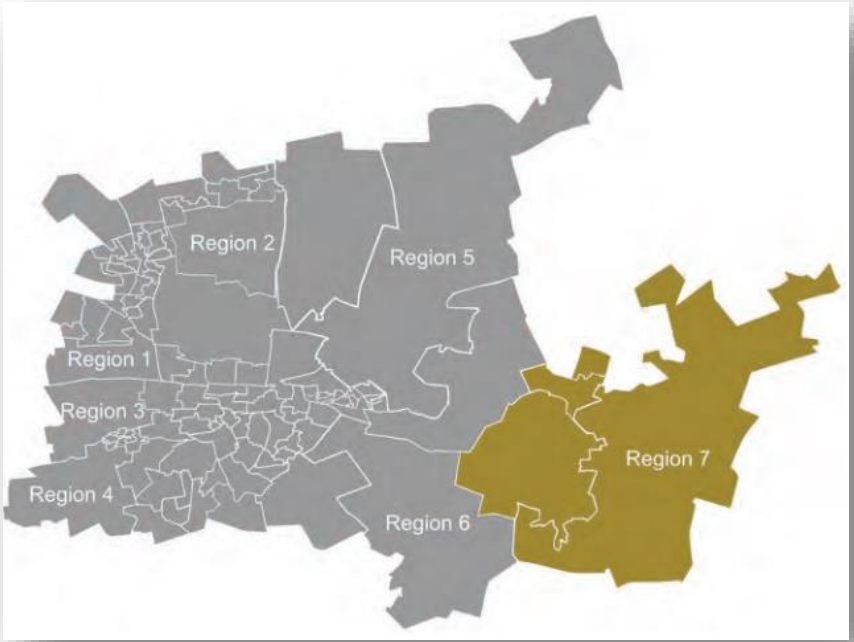
Table 12 summarizes the demographic trends of Region 6.

Table 12: City of Tshwane, Demographic Profile of Region 6

Region 6 Profile	
Population	605 556
Number of households	203 907
Number of formal dwellings	158 216
Average household Size	3.0
Households with access to piped water (tap)	201 350
Households with access to electricity for lighting	167 839
Average annual household income	R194 063
Households with no income	28 736
Persons employed in formal sector	194 428
Persons with no schooling	18 859

(iii) Region 7

Figure21: City of Tshwane Location of Administrative Region 7



Region 7 has the second largest geographical land area and has 4 wards. The area contains some of the best farming land in Gauteng with more than 80% of land arable, but agriculture currently makes an insignificant contribution (less than 5%) to the City's economy. The most significant contributors to the Region's economy are manufacturing, services, financial, and trade. The tourism sector is regarded as small, but a developing sector.

The Region includes a few prominent land uses of strategic significance to the City of Tshwane. These include: Bronkhorstspruit town area, Ekandustria industrial

area, Bronkhorstspruit dam, and high potential agricultural land in the Region. Public transport in rural areas, in particular, non-motorised transport (bicycles and walking), play a special role when short distances are travelled and are also the most popular forms of mobility used by communities. Services are concentrated in the established townships in the urban areas. A significant number of people in the area do not receive piped water, sanitation, and electricity services.

Table 13 summarizes the demographic trends of Region 7.

Table 13: City of Tshwane, Demographic Profile of Region 7

Region 7 Profile	
Population	109 767
Number of households	31 547
Number of formal dwellings	23 896
Average household Size	3.5
Households with access to piped water (tap)	30 455
Households with access to electricity for lighting	27 846
Average annual household income	R83 172
Households with no income	4 298
Persons employed in formal sector	24 528
Persons with no schooling	7 755

(iv) Employment status

Unemployment figures in Tshwane in the past 10 years reveal that unemployment peaked in 2002, reaching 321 478 unemployed people, and eventually dropped down to the lowest figures in 2008. For a number of reasons including the 2008/2009 recession, the number of unemployed people increased from 212 671 in 2008 to 272 450 in 2010, representing a 28.1% increase over that period. However, the City recorded the lowest unemployment rate of 14% in 2010 when compared to other municipalities in the Province.

(v) Health

Health facilities The Tshwane health district is one of three metropolitan areas within Gauteng and is situated within the northernmost part of the province (Tshwane District Health Plan, 2012/13). There are currently 26 community health centres and clinics managed by the City of Tshwane, 35 Provincial clinics, 12 Community Health Centres, 8 satellite clinics and 8 mobiles in the Tshwane district. About 96% of all citizens in Tshwane are within a 5km radius of a clinic. In addition, 24-hour health services are also provided by the district hospitals

(Mamelodi West Hospital, Pretoria West Hospital and the Tshwane District Hospital).

The main challenges the City faces are the impact of migration; high burden of disease within the most at risk population; fragmented health system between the public, private and civil society compounded by poor quality health infrastructure and information systems and health work force shortages; and climate change, for example. The City has seen a downward trend in the number of people living with HIV and it is further expected that by 2016, about 7.5% of its population will be living with HIV

(vi) Social infrastructure

a) Housing

The majority of dwellings by type in the City of Tshwane are formal structures built with brick or concrete material (see Figure 22).

Figure 22: City of Tshwane main dwelling type by Region, 2011.

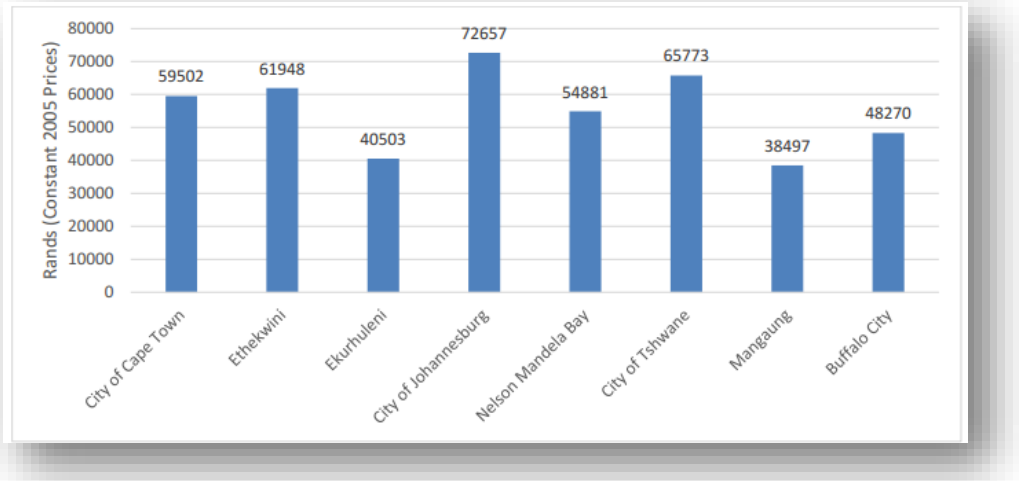
Region	House or brick/concrete block stucture on a separate stand or yard or on a farm	Traditional dwelling or hut or structure made of tradi-tional materials	Flat or apart-ment in a block of flats	Cluster house in complex	Townhouse (semi-detached house in a complex)	Semi-detached house	House/flat/ room in backyard	Informal dwelling (shack; in backyard)	Informal dwel-ling (shack; not in backyard; e.g. in an informal/ squatter settle-ment or on a farm)	Room/flatlet on a property or larger dwel-ling/servants quarters/ granny flat	Caravan/tent
Region 1	171320	538	5268	1093	1795	815	5639	11571	26716	979	80
Region 2	64294	697	1070	1435	4980	515	1353	3645	14627	520	55
Region 3	98195	1031	54165	2242	3579	1604	6183	5705	18519	2762	128
Region 4	68901	419	7116	7846	15595	1102	3983	13001	10431	973	153
Region 5	16819	132	637	135	144	134	819	2556	5695	207	79
Region 6	117248	649	5867	6407	16930	1418	7975	14005	30374	1722	140
Region 7	21392	448	372	94	414	63	585	1363	5808	528	32

While it is encouraging to see that the City has mainly formal structures, the City of Tshwane, however has an unacceptable number of informal dwellings in backyards or informal/squatter settlements. About 51 850 informal dwellings are found in backyards of which the highest numbers are found in Regions 1 (11 571), 4 (13 001) and 7 (14 005). In informal/squatter settlements or on farms, about 112 170 informal dwellings are found across all Regions with the highest in Regions 1 (26 716), 2 (14 627), 3 (18 519), 4 (10 431), and 6 (30 374).

(vii) Economic Indicators

Domestically, the City of Tshwane is one of the eight metropolitan municipalities. It is the second wealthiest municipality in terms of GDP per capita (see figure 23).

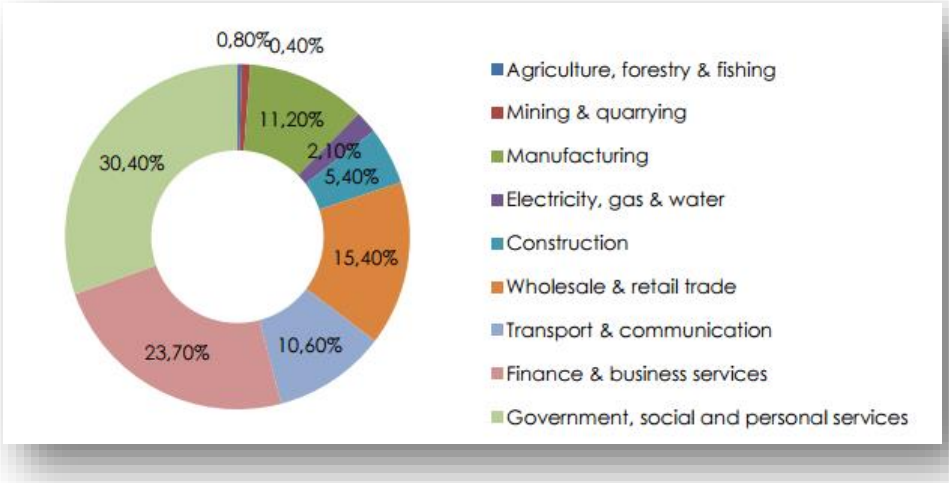
Figure 23: Metropolitan Municipalities GDP per capita 2013



Tshwane's regional output at constant prices was valued around R200 billion in 2013 contributing about 28% of Gauteng's output and about 10% of South Africa's output that year. Tshwane was only outstripped by the City of Johannesburg, which contributed 17% to South Africa's output that same year.

The City's economy is services and finance driven. A breakdown by activity in 2012 reveals that, given the high concentration of government departments in Tshwane, about 30% of the economy was engaged in the government, social and community services sector. This is followed by finance and business services (23,7%). Wholesale and retail trade, as well as manufacturing activity further make important contributions to the City's economic output, accounting for 15, 4% and 11, 2% respectively.

Figure 24: Sector composition of the City of Tshwane economy (%), 2012



(viii) Environmental and Heritage Resources

The City of Tshwane's geographical location and landscape make for a favourable natural environment to support a diversity of trees, plants and small wildlife.

The City of Tshwane is home to the Pretoria National Zoological Gardens; the largest zoo in the country; while the National Botanical Gardens are spread over 76 hectares. Other parks include Burgers Park, Jan Cilliers Park, Springbok Park, and Venning Park/Rose Park.

The City became the only city in the world with a big-five game reserve within city boundaries - the 90 000 hectares Dinokeng Big 5 Game Reserve. It is also home to the first proclaimed game sanctuary in Africa, the 500 ha Groenkloof Nature Reserve that was proclaimed in 1895. The City also boasts one of the world's largest urban nature reserves, the Rietvlei Nature Reserve. This is a unique retreat where many bird and animal species can be viewed on the 3 800 hectares of open grassland. Other nature reserves include Austin Roberts Bird Sanctuary, Bishop Bird Nature Area, Boardwalk Bird Sanctuary, Bronkhorstspruit Nature Reserve, Chamberlain Bird Sanctuary, Colbyn Nature Area, Faerie Glen Nature Reserve, Kallerkop Nature Reserve, Kwaggaspruit Nature Area, Luton Valley Bird Sanctuary, Moreleta Kloof Nature Area, Struben Dam Bird Sanctuary, Wonderboom Nature Reserve and the Pierre van Rynevekd Nature Area.

The Tswaing meteorite crater is Gauteng's best-kept astronomical secret. The Tswaing Meteorite Crater Museum in Soshanguve, 40 km to the north of the city centre, is the only tourism destination of its kind in Africa. The City of Tshwane is steeped in a rich cultural heritage intertwined with the South African history. The City is awash with many fine heritage sites, museums and art galleries. These include the Union Buildings and its spectacular gardens, as well as the Diamond Hill Battlefield, Voortrekker Monument and Freedom Park among others. The City of Tshwane is home of the Nan Hua Buddhist Temple, the largest Buddhist temple in the Southern hemisphere and the only one in Africa. In conclusion, the current spatial structure of Tshwane is such that less affluent areas tend to be found on the peripheral areas of the City. Thus, while City of Tshwane has made strides in improving the quality of lives for the residents, certain communities currently do not enjoy access to a full range of services, social amenities and facilities. The analysis presented in this chapter lays the foundation for the rest of the vision document

4.2.2 City of Johannesburg Metropolitan Municipality (CoJ)

(i) History and Background of the City of Johannesburg

Founded in 1886 with the discovery of gold on the Reef, Johannesburg has grown into a world-class city: the provincial capital of Gauteng and the financial centre of the country. It is home to JSE Limited, the largest stock exchange on the continent and the 16th biggest in the world. Johannesburg generates 16.5 percent of the country's wealth and employs 12 percent of the national workforce.

The current metropolitan area of Johannesburg - formed in 2000 by the merger of five previously independent municipal areas - covers a total of 1 644km², with an average density of 1962 persons per km².

The city's population is also growing, largely as a result of migration from other parts of the country, and the number of households is increasing, placing huge demands on the City's economic and social infrastructure.

It has a financial, municipal, roads and telecommunications infrastructure that matches that of leading world cities, with the City Deep freight terminal - classified as one of the larger inland ports in the world - handling 30 percent of South Africa's exports. There are 7 519km of roads in Johannesburg, of which 6614km are tarred. The city also has two active power stations.

The City has instituted a system of urban management that operates at a regional scale. A map, indicating the seven regions of Johannesburg is included below.

Figure 25: Johannesburg's seven regions

At a regional level, Region D is the most densely populated region in the City with 24.4%, followed by Regions G (16.7%), F (13.4%), A (12.6%), E (11.8%), C (11.6%) and B (9.4%) respectively.

The location of the proposed transmission line is in Region A of Johannesburg. Within the larger Gauteng metropolitan area, Region A is bordered by Mogale City Local Municipality to the west, City of Ekurhuleni to the east and City of Tshwane to the north. Within the City of Johannesburg administrative boundary, Region C and Region E form the southern boundaries of Region A.

(ii) Broad land uses

- **Residential Development**

The region includes formal townships, informal settlements, agricultural holdings and farm portions. The most urbanised areas are around the Fourways, Sunninghill and Midrand areas.

Two prominent marginalized areas, Diepsloot and Greater Ivory Park (including Kaalfontein and Rabie Ridge) form part of Region A, as well as a number of informal settlements such as Kya Sands. The marginalized areas of Diepsloot and Greater Ivory Park require integration into the broader urban network. The most prominent needs arising from these marginalized areas encompass employment opportunities, business sites and local retail, which has resulted in large scale, unregulated informal trade.

Increased densities and pressure for development in many parts of the region are causing infrastructure capacity constraints and a threat to the biodiversity of the environment.

- **Nodal Development**

The Region has a satisfactory hierarchy of nodal developments that include Midrand Metropolitan Node, Fourways Regional Node, Sunninghill Regional Node, Carlswald District Node, San Ridge Square District Node, Cedar Square District Node and several neighbourhood nodes. Region A's speciality nodes such as Kya Sands, Lanseria Airport and Kyalami (from a tourism and industrial function perspective) play a significant role in the growth and sustainability of the region's wealth. These different nodes provide employment opportunities to populace residing within the region. Nodes in the adjacent regions and municipalities, due to their close proximity to and accessibility from Region A, present potential employment opportunities for the region's population and workforce. These nodes include Northgate Regional Node (in Region C), Strijdom Park Industrial Area (in Region B), Woodmead Regional Node (in Region E), Rivonia Regional Node (in Region E), Commercia (in the City of Ekurhuleni) and Centurion (in the City of Tshwane).

The eastern half of the region is characterised by high-tech developments, warehousing, distribution centres and office developments along the N1 strip, which results in a large influx of skilled labour into the region on a daily basis.

- **Road Network**

The north-south linkages such as the N1, R55, R511 and R512 link this Region to a variety of urban opportunities. Malibongwe Drive (R512), William Nicol (R511), Main road (R55), Witkoppen Road (R564), the N14 and N1 are well established and form the basis for strong mobility spines. The general conditions of roads in Greater Ivory Park and Diepsloot are poor. These areas are also experiencing a backlog in terms of the upgrading of gravel roads.

The east-west linkages are less defined in comparison to the north-south linkages. Due to large traffic volumes travelling through the region daily, heavy congestion occurs along the region's major movement routes.

The existing road infrastructure within the region is inadequate to cater for the increased developments at the desired densities and this indicates that developments must be accompanied by road infrastructure upgrades.

(iii) Population analysis/Profile

a) Population size

Table 14 shows the regional total population as a share of CoJ's total population. It is evident from the table that Region D (Soweto) has had the largest population share relative to other regions. However, this share is decreasing year on year and this can be attributed to the historic background of Soweto. It used to provide cheap accommodation for workers during the apartheid era, thus it was flooded by informal settlements, which are now being developed into proper housing. Also, as other people's livelihoods improve they move to more urban suburbs in the other CoJ regions. In 1996, Region A's share of the population was 5.98%, which increased to 14.48% by 2013 (Global Insight, 2013).

Table 14: Regional Total Population as a Share of CoJ Population

Year	CoJ	Region A	Region B	Region C	Region D	Region E	Region F	Region G
1996	2 730 376	5.98%	9.13%	9.99%	36.69%	13.41%	13.41%	13.83%
1997	2 819 188	6.71%	9.15%	10.01%	35.38%	13.53%	13.53%	14.14%
1998	2 908 394	7.41%	9.15%	10.07%	34.16%	13.62%	13.62%	14.41%
1999	2 997 451	8.09%	9.14%	10.18%	33.02%	13.68%	13.68%	14.65%
2000	3 086 621	8.73%	9.11%	10.33%	31.95%	13.72%	13.72%	14.85%
2001	3 181 226	9.35%	9.05%	10.51%	30.99%	13.74%	13.74%	15.00%
2002	3 281 210	9.94%	8.98%	10.73%	30.14%	13.73%	13.73%	15.12%
2003	3 383 160	10.50%	8.89%	10.97%	29.37%	13.69%	13.69%	15.19%
2004	3 482 196	11.02%	8.79%	11.25%	28.69%	13.62%	13.62%	15.22%
2005	3 585 429	11.51%	8.69%	11.58%	28.11%	13.53%	13.53%	15.20%
2006	3 697 378	11.96%	8.58%	11.93%	27.66%	13.40%	13.40%	15.12%
2007	3 814 184	12.32%	8.43%	12.34%	27.50%	13.21%	13.21%	14.91%
2008	3 943 288	12.64%	8.26%	12.77%	27.55%	12.99%	12.99%	14.62%
2009	4 065 609	12.95%	8.12%	13.21%	27.54%	12.77%	12.77%	14.33%
2010	4 206 833	13.33%	8.00%	13.60%	27.33%	12.61%	12.61%	14.14%
2011	4 350 486	13.73%	7.90%	13.96%	26.94%	12.50%	12.50%	14.02%
2012	4 488 843	14.13%	7.83%	14.30%	26.50%	12.42%	12.42%	13.92%
2013	4 622 297	14.48%	7.77%	14.59%	26.11%	12.36%	12.36%	13.84%
2014	4 750 203	14.79%	7.71%	14.86%	25.76%	12.31%	12.31%	13.77%
2015	4 872 881	15.05%	7.66%	15.08%	25.45%	12.27%	12.27%	13.71%
2016	4 989 244	15.27%	7.62%	15.28%	25.18%	12.24%	12.24%	13.67%

b) Gender profile

The gender structure of the population is one of the key determinants of population change and dynamics.

Table 15: City of Johannesburg, Gender Profile, 2001 & 2011

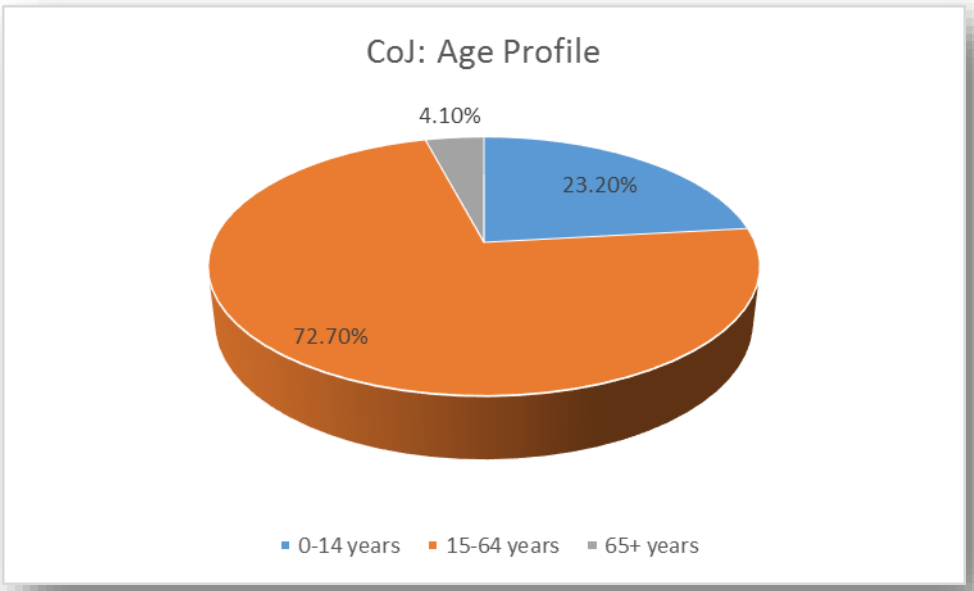
Gender	2011
Males	50,2%
Female	49,8%

Source: Statistics South Africa, 2011

c) Age profile

Age distribution is an important indicator in terms of the development character and economic active aged segment of an area. Figure 26 indicates the age profile of the City of Johannesburg.

Figure 26: City of Johannesburg, Age profile - 2011



As shown in Figure 26 the City of Johannesburg is characterised by a strong economically active population segment, representing almost 73% of the total population. The Johannesburg municipal area has a limited older population segment (aged 65+).

d) Race Profile

Table 16 below shows that the population of the City of Johannesburg constitutes 81.3% Africans, 15.7% Whites, 1.7% Coloured, 0.9% Asians and other 0.3%.

Table 16: Distribution of race, City of Johannesburg

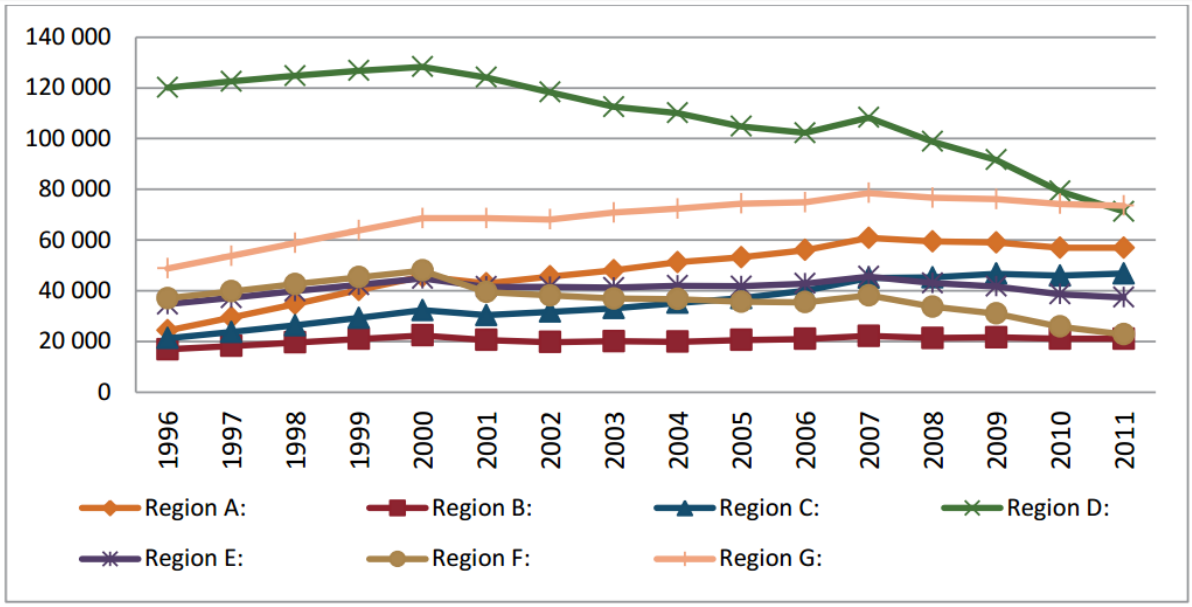
	Black African	Coloured	Indian or Asian	White	Other
CoJ	76.4%	5.6%	4.9%	12.8%	0.8%

e) Education

The most rapidly growing and most flooded category is the matric-only category, which implies that most individuals manage to complete their secondary education. In 1996, 7.8% of CoJ's population had no schooling at all and by 2011, the proportion had fallen to only 2.9%, which shows an improvement in the level of education.

Functional illiteracy indicates the number of people who have not completed their primary education (Grade 7) and are thus deemed functionally illiterate. Functionally illiterate persons are assumed to have no reading and writing skills, thus they are classified as not being able to manage daily life and employment (Stats SA, 2013c). Figure 26 illustrates the functional illiteracy level for different regions in CoJ between 1996 and 2011. Most individuals in this category are skilled in manual labour. There was an increase in persons who cannot read or write in Region A form 1996 to 2011. Most individuals in these areas are from previously disadvantaged homes and they come to the city at very tender ages to seek employment. Very few return to school and most will work in low income jobs for survival

Figure 26: Functional Illiteracy by Region

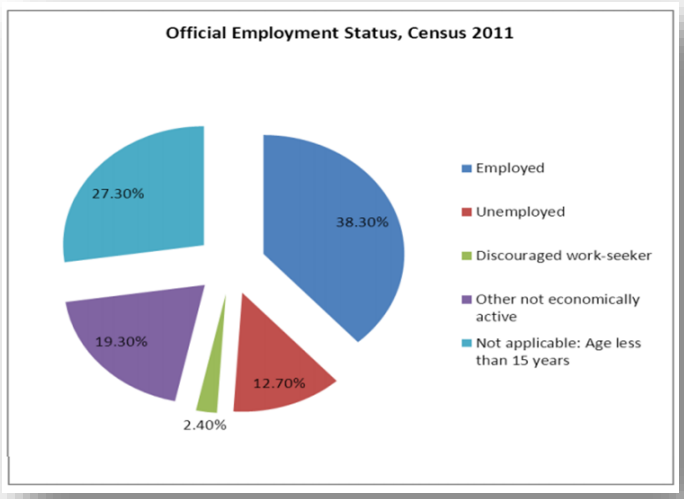


f) Employment status

Census 2011 quotes an official unemployment rate in South Africa of 29.8% and, at the expanded definition at 40%. The highest unemployment rate is among black Africans – the expanded definition of the unemployment gave a rate of 52.9% for African women and 39.8% for African men. The unemployment rate

amongst coloured women was 34.4% and for Indian women it was 23%. In contrast, the expanded unemployment rate among white men was 8.1% and 12.5% among white women. These national statistics also reflect similar challenges in the City of Johannesburg.

Figure 28: Employment Status -2011

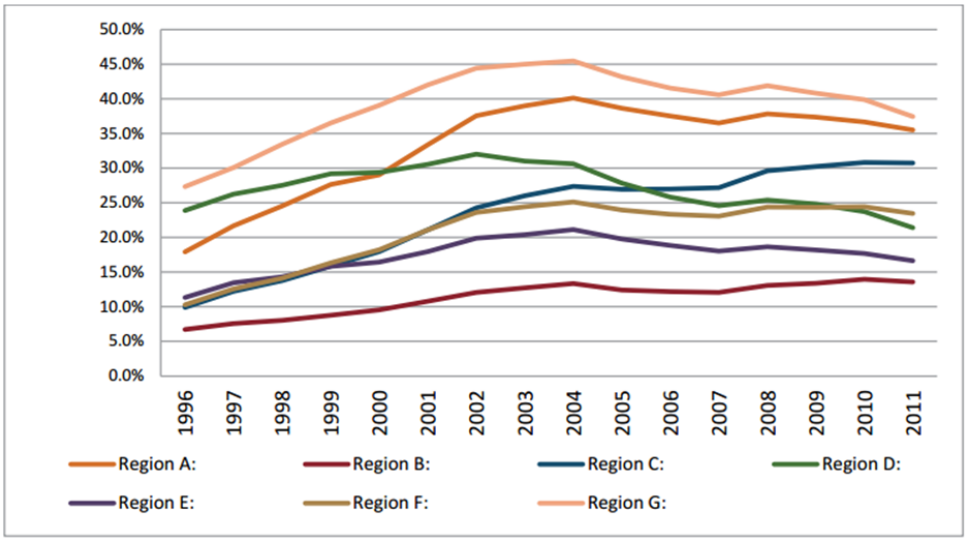


g) People living in poverty

Figure 29 represents the percentage of people living in poverty in the different CoJ regions from 1996 to 2011. The general trend for all regions was an increase in the percentage of people living in poverty from 1996 to 2004, which was a period associated with rapid economic growth. The period from 2005 onwards was characterised by an increase in social welfare payments, including the child support grant, which is reflected by a decline in the percentage of people living in poverty. Region G has the highest number of people living in poverty followed by Regions D and A, while Region B has the lowest number of people living in poverty

Region B (Randburg and Rosebank) had the lowest percentage of people living in poverty for the years under study as result of a large influx of small businesses and employment opportunities.

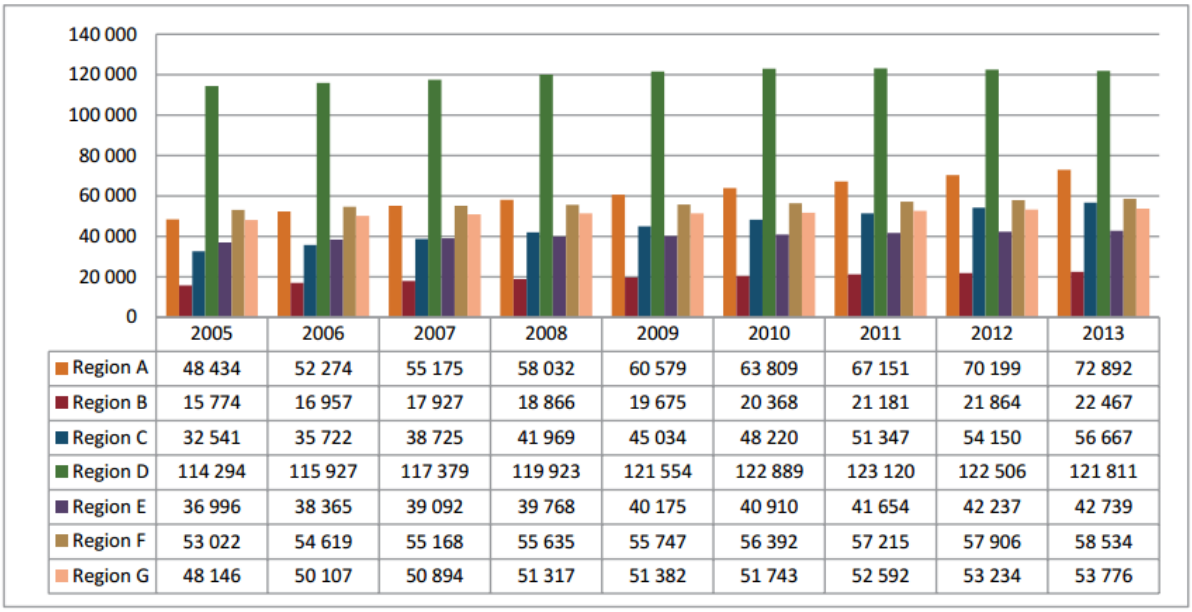
Figure 29: Percentages of People Living in Poverty



h) Health

Figure 30 compares HIV+ estimates of CoJ regions from 1996 to 2016. The number of HIV+ persons in Region A has remained relatively constant and this can be attributed to the success of the various HIV/Aids awareness campaigns aimed at reducing the possibility of further infections.

Figure 29: HIV+ estimates of CoJ regions from 1996 to 2016



	2005	2006	2007	2008	2009	2010	2011	2012	2013
Region A	48 434	52 274	55 175	58 032	60 579	63 809	67 151	70 199	72 892
Region B	15 774	16 957	17 927	18 866	19 675	20 368	21 181	21 864	22 467
Region C	32 541	35 722	38 725	41 969	45 034	48 220	51 347	54 150	56 667
Region D	114 294	115 927	117 379	119 923	121 554	122 889	123 120	122 506	121 811
Region E	36 996	38 365	39 092	39 768	40 175	40 910	41 654	42 237	42 739
Region F	53 022	54 619	55 168	55 635	55 747	56 392	57 215	57 906	58 534
Region G	48 146	50 107	50 894	51 317	51 382	51 743	52 592	53 234	53 776

(iv) Economic overview

The contribution of each metro to the national economy has remained fairly constant since 1997. However, CoJ and CoT are the only metros that have managed to increase they shares in the national economy since 1997. It is projected that CoJ's share will increase to 17.2% in the mid-term. Table 19 shows average metro shares in the national economy and highlights that CoJ contributes the most to national output.

Table 17: Metros14 GVA shares in the national economy, 1997-2016

Year	CoC	ETH	EKU	CoJ	NMA	CoT	MAN	BUF
1997 - 1999	10.6%	9.9%	6.3%	15.6%	3.2%	8.6%	1.7%	1.8%
2000 - 2007	10.9%	10.4%	6.3%	16.5%	3.4%	9.2%	1.7%	1.8%
2008 - 2011	11.2%	10.7%	6.4%	16.9%	3.3%	9.7%	1.6%	1.8%
2012 - 2016*	11.4%	10.8%	6.4%	17.2%	3.3%	10.0%	1.6%	1.8%

In terms of GVA contributions to the South African economy, CoJ has the largest share, followed by Cape Town, then eThekwini and Tshwane.

(v) Social infrastructure

a) Housing

Facts about dwelling status in the City of Johannesburg:

- There is a notable increase of 4.5% over the ten year period in the number of households living in houses or brick/concrete block structures on a separate stand or yard or on a farm;
- The proportion of the population that live in town/cluster/semi-detached house (simplex; duplex; triplex) also increased by 4.1% between 2001 and 2011; and
- Positively, there was a reduction of 3.9% in the number of households living in informal dwellings (shack; not in backyard; e.g. in an informal/squatter settlement or on a farm) between 2001 and 2011.

b) Access to water

- Despite an increasing number of households and a growing population in Johannesburg, access to piped water increased between 2001 and 2011;
- 96.7% of the city's population has access to piped water within a distance of less than 200m from dwelling in 2011 – up from 91.2% in 2001; and
- 95.6% of the water sources in the City are operated by the municipality

c) Sanitation

Similarly, the recent release of Census results indicates that access to sanitation has increased between 2001 and 2011 from 88.1% to 94.6%, with backlogs now estimated at 5.4%.

d) Energy

Facts about energy in the City of Johannesburg:

- Despite an increasing number of households and a growing population in Johannesburg, access to electricity increased between 2001 and 2011;
- 90.8% have access to electricity for lighting in 2011, up from 85% in 2001;
- The use of paraffin and candles declined over the ten year period; and
- Solar usage doubled to 0.2% in 2011 over the ten year period, but still remains very low.

Electricity capacity remains a challenge for the City, especially given the effect it has on economic growth and revenue security.

e) Refuse removal

Facts about refuse collection in the City of Johannesburg:

- Despite an increasing number of households and a growing population in Johannesburg, access to refuse collection (removed by local

authority/private company at least once a week) increased by 4.5% between 2001 and 2011 to 95.3%; and

- The proportion of the population with no rubbish disposal decreased by 0.8% to 0.5% over the ten year period to 2011.

4.2.3 Ekurhuleni Metropolitan Municipality

(i) History and Background of Ekurhuleni

The Ekurhuleni Metropolitan Municipality (EMM), being the fourth largest municipality in South Africa, was officially formed on 5 December 2000. This entailed the amalgamation of nine towns Alberton (Thokoza), Benoni (Daveyton, Actonville, Wattvile and Etwatwa), Brakpan (Geluksdal and Tsakane), Boksburg (Vosloorus and Reiger Park), Edenvale/Lethabong, Germiston (Katlehong, Palm Ridge and Zonkizizwe), Kempton Park (Tembisa), Nigel (Duduza) and Springs (Kwa Thema and Bakerton) and 11 local administrations, which include the above-mentioned nine towns as well as the Kyalami Metropolitan Council and the Eastern Gauteng Services Council. Furthermore, after the 2011 Local Government Elections a small portion of the Kungwini Local Municipality, along the Albertina Sisulu (R21) Highway was incorporated into the EMM.

The City has instituted a system of urban management that operates at a regional scale. A map, indicating the 5 regions of Ekurhuleni is included below.

Figure 30: Ekurhuleni's five regions

The proposed transmission line only passes through the northern portion of Ekurhuleni Metropolitan Municipality. The Region affected by the proposed project is Region B.

Region B is situated within the northwestern section of the EMM. The City of Tshwane forms the northern boundary and the City of Johannesburg forms the western boundary of Region B. Region A is towards the south and Region C forms the eastern boundary. The region is made up of the areas of Tembisa, a portion of Kempton Park, Edenvale, Bedfordview, Olifantsfontein/ Clayville and Bredell Agricultural holdings.

(ii) Broad Land Uses

- **Agriculture**

  There are two agricultural hubs that occur in the Ekurhuleni Metropolitan Municipality, namely the Ekurhuleni-Tshwane Region 6 Agricultural Hub and the Lesedi Agricultural Hub. The Ekurhuleni -Tshwane Region 6 Agricultural Hub is situated in the northern section of the municipality and spans over Region B and Region C. The current agricultural activities occurring on high agricultural potential land comprise of 73% of the available high agricultural potential land within Region B.

  Potential development within Region B is the least restricted in terms of the environmental constraints. This is as a result of only an estimated 48% of the region containing environmental constraints, which comprises mainly high agricultural potential land situated within the Ekurhuleni-Tshwane Region 6 Agricultural Hub. The areas where the greatest potential is for development within the region include Kempton Park and Pomona.

- **Heritage and tourism**

  There are a total of 266 heritage, cultural and tourism sites within the five regions. Region B contains the greatest number of existing heritage and tourism sites within the municipality. A total of 103 of these sites occur within the region and are congregated mainly around Edenvale and Kempton Park.

- **Residential**

  The existing residential developments in Region B occur primarily on the western boundary, between the R21 and the EMM/Johannesburg municipal boundary. The only residential development east of the R21 is the Serengeti Golf Estate. Most residential development in Region B is low density residential in nature, but new residential developments are mainly medium to high density. Informal settlements, backyards and hostels are located mostly in the Tembisa area. In the EMM there are approximately 165 000 informal structures in 199 informal settlements. 22% (33 505 units) of these informal structures are located in 12 informal settlements within Region B.

- **Business**

  Business development in Region B is primarily centred on the Edenvale Central Business District (CBD) and along Monument Road in Kempton Park. Furthermore, an emerging business node in the region is at the intersection of Andrew Mapheto and George Nyanga Streets in Tembisa. Smaller business related nodes are scattered throughout the region

- **Industrial**

  Industrial developments occur primarily towards the north, close to Tembisa and to the south, close to Edenvale and ORTIA. Industrial developments in Region B range from heavy to light industries and there are five focus areas for industrial/commercial development in Region B. These areas are:

  - the Olifantsfontein/Clayville area to the north of Tembisa;
  - the R21 development corridor;
  - Sebenza to the west of ORTIA;
  - Eastleigh, also to the west of ORTIA and close to the Edenvale CBD; and
  - Chloorkop to the north-west of ORTIA.

- **Future Development**

  The area surrounding the proposed transmission line corridor is earmarked for Urban Development.

(iii) Demographic Analysis/Profile

Population statistics are important when analysing a region, as the growth in population directly impacts the spatial needs, employment and unemployment and other economic indicators like economic growth and per capita income.

The following table summarises the key indicators regarding the population in Region B.

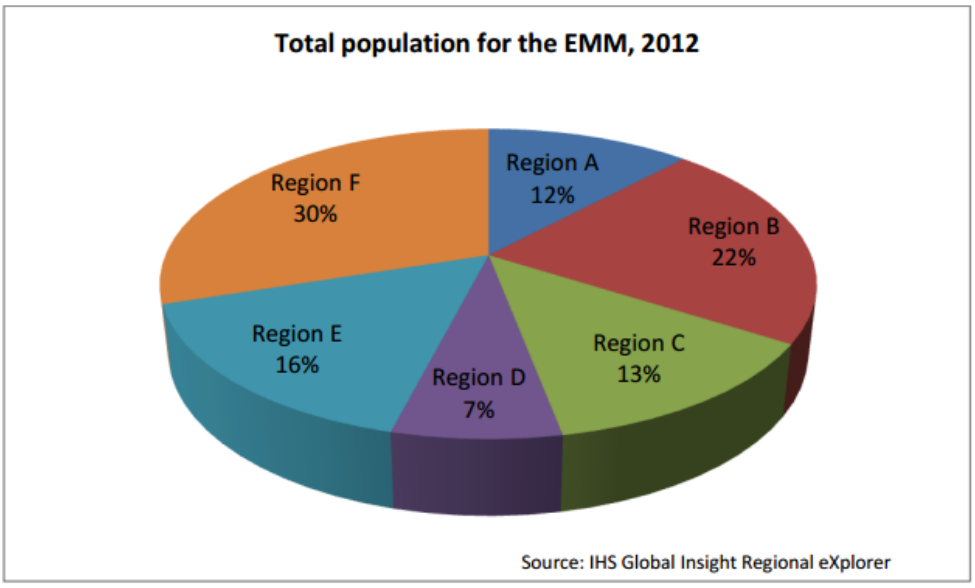
Table 18: Population figures for Region B

REGION B POPULATION INDICATORS	NUMBER/ PERCENTAGE
Total population (2012)	690 000
Number of households (2012) (Average 3 people/household)	244 000
Average annual population growth rate (2002-2012)	3.10%
Projected population growth rate (2015-2020)	1.27%
Population forecast (2020)	784 267
Population density (2012)	1 540 people /km²
Male : female split (2012)	1.07 males per female
Predominant age category (2012)	30 - 34 age category

Source: IHS Global Insight Regional eXplorer version 699

The following figure illustrates the population contribution to EMM per region and indicates that Region B is the second largest region in the EMM.

Figure 32: Total population for the EMM, 2012



The employment levels of the region can be summarised as per the table below.

Table 19: Employment levels in Region B

REGION B EMPLOYMENT LEVELS	NUMBER/ PERCENTAGE
Working age population (15-64 years of age)	494 514 people (2012)
Economically active population ***Definition:*** *The economically active population (EAP) is defined as the number of people (between the age of 15 and 65) who are able, willing and working, or who are actively looking for work. Both employed and unemployed people are included.*	319 000 people (2012)
Labour force participation rate ***Definition:*** *The labour force participation rate (LFPR) is the EAP expressed as a percentage of the total working age population.*	64.4%,
Total employment ***Definition:*** *Total employment consists of two parts: employment in the official economy (formal sector), and then employment in the unofficial economy (informal sector).*	151 000 people
Formal employment	133 000 people
Informal employment	18 500 people
Unemployment ***Definition:*** *The unemployed includes all persons between 15 and 65 who do not have a job, who are available for jobs, or who are actively seeking a job.*	109 000 people (2012)

(iv) Economic overview

The following table summarises significant economic factors relevant to the growth and development of the region.

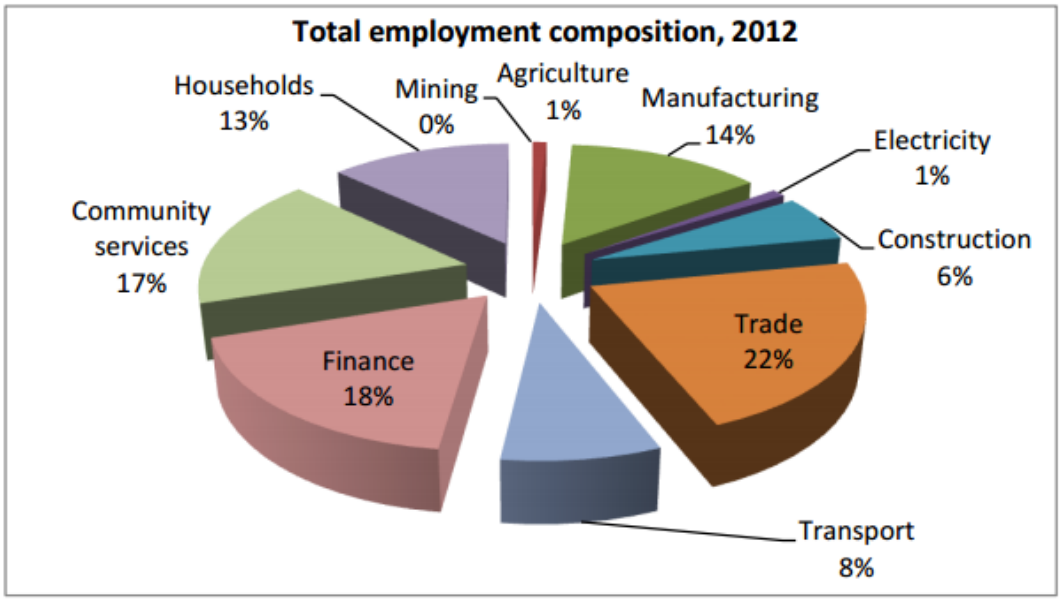
Table 20: Economic figures for Region B

REGION B ECONOMIC INDICATORS	NUMBER/ PERCENTAGE
Gross Domestic Product (GDP) (2012) ***Definition:*** *Gross Domestic Product by Region (GDP-R) represents the value of all goods and services produced within a region, over a period of one year, plus taxes and minus subsidies.*	R 34.6 billion
Contribution to the GDP of EMM (2012)	16.94%
Annual GDP growth rate	3.8%
Contributors to the economy (2012)	Agriculture – 1% Mining – 1% Manufacturing – 19% Electricity – 3% Construction – 5% Trade – 15% Transport – 13% **Finance – 24%** Community services – 19%
Average annual growth rate per sector (2012)	Agriculture – 0.3% Mining – 4% Manufacturing – 3% Electricity – 3% **Construction – 9%** Trade – 5% Transport – 6% Finance – 6% Community services – 4%

From the information above it is evident that the finance sector is the largest contributor to the economy in Region B, with the manufacturing and community services sector in second place. However, the construction sector has the fastest growth rate, followed by the finance and transport sector.

In Region B, the economic sector that recorded the largest employment number in 2012 was the trade sector with a total of 32 400 or 21.5% of the total employment (see below). The finance sector, with a total of 27 400 (18.2%) employed the second highest relative to the rest of the sectors. The mining sector with 616 (0.4%) employed the least number of people in Region B, just less than the electricity sector with 938 (0.6%) people employed.

Figure 32: Total employment per broad economic sector



5 POTENTIAL SOCIAL IMPACTS ASSOCIATED WITH THE BRAVO 3 PROJECT

The energy infrastructure project can potentially deliver many benefits in the long term for communities in the Victor Khanye, Local Municipality and the Metropolitan Municipalities of Tshwane, Johannesburg and Ekurhuleni. Possible negative impacts are also anticipated in the short term, which can be reduced or avoided with management measures.

Potential positive socio-economic impacts during the construction phase:

- Positive economic impacts as the increase in new business sales, generation of additional Gross Value Adding (GVA), creation of new employment opportunities, and an increase in local government earnings as a result of the construction phase of the project.
- Creation of opportunities for skills development and on-site training.

Potential positive socio-economic impacts during the construction phase:

- The operational phase is expected to provide positive impacts such as improved supply of electricity to the project region, electrification of households in the rural areas and creation of additional employment for maintenance of the servitude.
- The improvement of the supply of electricity to the region would enable it to continue growing.
- Employment creation during the operational phase (such as for the maintenance of the servitude) will have a relatively low impact on the regional economy, however this will still provide much needed income for

poor households. In cumulative terms, the significance of the positive economic impacts during operation is high.

Potential negative socio-economic impacts

- Impacts associated with the presence of construction workers on site.
- Impacts on health and social well-being
- Increased risk of stock theft, poaching and damage to farm infrastructure associated with presence of construction workers on the site.
- Increased risk of veld fires associated with construction-related activities.
- Threat to safety and security of farmers associated with the presence of construction workers on site.
- Impact of heavy vehicles, including damage to roads, safety, noise and dust.
- Impact on agricultural and irrigation activities.
- Impact on agricultural land use (loss of productive agricultural land).

The potential impacts that are expected to arise during the construction, operational and maintenance phases will be discussed in this section of the report.

5.1 IMPACTS ON SPATIAL DEVELOPMENT (FUTURE LAND USE)

The new transmission corridor is proposed in an existing servitude and does not have any impact on future urban development proposals. Existing servitudes were considered during the preparation of Spatial Development Frameworks.

5.2 MINING

- Transmission power lines should avoid mining activities due to the possibility of slumping and underground fires. Also, towers pose a risk to mining activities in the form of towers falling over, with health and safety as well as economic impacts as a result.

- In turn, the mining activities might also pose a risk to the safety of the Transmission power line; if for example, blasting takes place at the mining operation.

- Mineral rights holders have rights to the surface area as well as far as they need the surface area to exercise their right to extract minerals. Therefore, any structures on the mineral rights surface areas have to be approved by the holders of these rights.

- Blasting takes place on a regular basis at open cast mining areas, as is associated with many of the mines in the area. Therefore mining operations could have a negative impact on the Transmission power line itself due to blasting (i.e. flying rocks that could potentially hit the Transmission power line, leading to breakdowns and an interruption in electricity supply).

Table 21: Assessment of impact on mining activities

***Nature*:** Impact on mining activities		
	Without mitigation	**With mitigation**
CONSTRUCTION, OPERATION AND MAINTENANCE		
Probability	Probable (3)	Probable (3)
Duration	Medium (3)	Medium (3)
Extent	Local (1)	Local (1)
Magnitude	Low (4)	Low (4)
Significance	Low (24)	Low (24)
Status	Negative	Negative to neutral
Reversibility	N/a	
Irreplaceable loss of resources?	N/A	
Can impacts be mitigated?	Yes	
Mitigation: ***Construction, operation and maintenance phases***	• The location of the Transmission power line should be determined in consultation with mining companies. • It is preferable to avoid mining operations at these plants altogether.	
Cumulative impacts:	N/A	
Residual risks:	Low	

5.3 PRESENCE OF THE TRANSMISSION POWER LINES

Construction phase

Transmission lines and towers do not exist during this phase and no impacts are foreseen.

Operation and maintenance phase

The main social concerns which arise when considering the presence of a transmission power line close to human settlement and potential settlement in the servitude are potential health and safety related impacts, including risks are related to Electro and Magnetic Fields (EMF), electrocution, fire and collapse of structures.

- Scientific research has not demonstrated any significant impacts of EMF from conventional 30-40m high transmission lines. As household appliances and

other electrical equipment also generate electric and magnetic fields (EMF), people are generally exposed to varying levels of EMF in their daily lives at work and at home.

- The Empetus (2006) study summarized the following in terms of present knowledge on the possible health effects of EMF on humans:
    - The main focus of research has been on a possible association between long term exposure to magnetic fields and childhood leukaemia.
    - Based on the epidemiological findings, the risk of EMF being a health hazard is small.
    - Based on current understanding of the topic, EMF is regarded a possible but not proven cause of cancer.
    - The suggestion for this health outcome stems mainly from a fairly consistent pattern of the increased but small risk observed from some epidemiological studies. This finding has not been confirmed by (notably all) controlled laboratory studies.
    - No evidence of a causal relationship between magnetic field exposure and childhood leukaemia has been found and no dose-response relationship has been shown to exist between EMF exposure and biological effects.
    - A possible explanation for the epidemiological findings may be confounding (a factor other than EMF) or bias (subjects studied are not representative of the target population about which conclusions are drawn) which render the data inconclusive and prevent resolution of the inconsistencies in the epidemiologic data.
- Considering electrocution, transmission lines could pose a safety risk. Induced charges can build up on fence wires mounted on wood posts near power lines. This phenomenon is generally restricted to higher voltage lines (200 kV or greater). The magnitude of the build-up depends on a variety of factors:
    - The size of the power line;
    - The length of fence paralleling the line;
    - The distance between the line and the fence;
    - The amount of moisture in the fence posts and the ground; and
    - The presence of grounding devices such as metal fence posts or weeds growing next to the fence.
- A line could cause fatal/traumatic accidents because of collapse of a tower and/or lines because of mechanical failure, fire and mining activities.
- Fire can be caused by of electrical malfunction or human error.

Table 22: Assessment of impact of the presence of transmission power lines

***Nature*:** Possible risks associated with the presence of transmission power lines.		
	Without mitigation	**With mitigation**
OPERATION AND MAINTENANCE PHASE		
Probability	Probable (2)	Probable (2)
Duration	Long term (4)	Long term (4)
Extent	Local (1)	Local (1)
Magnitude	Minor (2)	Minor (2)
Significance	Low (14)	Low (14)
Status	Negative	Negative
Reversibility	Yes, if transmission lines are removed	
Irreplaceable loss of resources?	N/A	
Can impacts be mitigated?	Yes	
Mitigation:	• Scientific studies regarding this possible impact should be studied and the results must be communicated to community.	
Residual Risks:	Moderate	

5.4 IMPACT ON WATERCOURSES

Construction phase

Watercourses are considered rivers, streams, natural channels (perennial and seasonal), wetlands and dams. The construction of the line and upgrading or building of new access roads could cause the following social impacts:

- Waste generated during the construction phase may enter the environment through surface water runoff i.e. litter or pollution such as hydrocarbons can be washed into aquatic systems affecting those systems negatively.

- Storm-water flowing over the site will also mobilise loose sediments, which may enter the surface water environment affecting water quality.
- Contamination of surface water through sedimentation from instream works, silt laden runoff from disturbed areas, and improper practices (e.g. poor management of waste water and disposal of solid waste).

- Inadequate storm-water management on access roads.

- Damage to towers from major flood events.

Operation and maintenance phase

- Waste generated during the maintenance of the servitude and transmission lines may enter the environment through surface water runoff i.e. litter or pollution such as hydrocarbons can be washed into aquatic systems affecting those systems negatively.

Table 23: Assessment of impact watercourses during the construction phase

***Nature*:** Possible impact on watercourses.		
	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Probability	Probable (3)	Improbable (2)
Duration	Short term (2)	Short term (2)
Extent	Local (2)	Local (2)
Magnitude	Moderate (6)	Low (2)
Significance	Low (14)	Low (14)
Status	Negative	Negative
OPERATION AND MAINTENANCE		
Probability	Probable (3)	Improbable (2)
Duration	Short term (2)	Short term (2)
Extent	Local (2)	Local (2)
Magnitude	Moderate (6)	Low (2)
Significance	Low (14)	Low (14)
Status	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:	• Construction camps to be located not closer than 50m from the edge of riparian habitat / wetland buffer zone. • As far as possible, use existing bridge crossings as access roads. • Storm-water containing sediment can be discharged to grassland buffers to ensure sediments fall out prior to water entering surface water bodies. Care must be taken that storm-water containing hydrocarbons and other pollution sources are not discharged. • Implement suitable storm-water measures during construction to manage ingress of runoff into watercourses. • Ensure proper storage of material (including fuel, paint) that could cause water pollution. • Ensure proper storage and careful handling of hazardous substances with spill prevention materials at hand. • Ensure proper waste management and housekeeping. • Demarcated areas where waste can be safely contained and stored on a temporary basis during the construction phase should be provided. • When adequate volumes of waste (not more than 1 month) have accumulated, all waste is to be removed from site and disposed of at a licensed facility. • Waste is not to be buried on site.	
Residual Risks:	Moderate	

5.5 ECONOMIC IMPACTS

From the demographic profiles of the different municipal areas described under paragraph 4, it is clear that any employment opportunities (either directly or indirectly) created by the proposed project would serve to assist in alleviating unemployment and poverty in the area.

Construction phase

Compensation for servitudes

- Eskom pays a once-off amount to landowners for right of way in the servitude of 55m per 400kV line. Compensation is also paid for the potential loss of livelihood as a result of the servitude.

- The impact of financial gain should be long-term, because although a once-off amount is paid, this amount is deemed to reflect the lifelong economic effect.

- Land owners are increasingly insisting on an annual access fee, which should be revised annually.

- Construction activities will create a number of temporary employment opportunities, for general workers, construction workers (private companies), administrative staff and technical workers (electricians and boilermakers).

Direct formal and/or informal employment opportunities for local individuals

- The project may also create indirect employment in the informal sector, for instance catering for construction workers.

- The families of those who secure work, will benefit as it will impact on their health and wellbeing for duration of the contract. This will amount to a significant number of people taking into account that the average household size is 3.6 for Victor Khnaye, 3 for the City of Tshwane, 3 for the City of Johannesburg and 2.9 for Ekurhuleni.

- During the construction phase of Eskom's projects both unskilled and semi-skilled labourers will receive formal and informal training and develop skills that will substantially improve their chances of finding new jobs. People keep the skills they acquire through formal and on-the-job training while working on Eskom projects.

- Although the impact on employment will be temporary, due to high levels of poverty and unemployment, in the study area any impact on job creation in this area will have a positive impact.

- Although the use of local labour usually results in a more positive attitude towards a project, some community members may be dissatisfied with the process to employ local labour through a third party labour broker.

- The required skills might not be available in the local area, which means that the appropriate skills might have to be 'imported', thereby causing a reduction in the job and income opportunities available to local residents.

- The local community may feel that temporary workers, who are not local enjoys favouritism and preferential treatment, because they are provided with accommodation as well as transport, while local labourers are responsible for their own transport.

- The construction industry does not lend itself to employment of women. In the construction phase, women will have less opportunities to become employed.

Indirect formal and /or informal business opportunities to local individuals.

- Another potential opportunity is the rental of land for the accommodation of the construction workers and storage of equipment in return for financial compensation, albeit confined to the landowner. Housing construction workers within local communities and the use of local contractors to supply material should be considered as this increases the economic investment into the affected area.

- Eskom has a policy of price-matching for local procurement in place whereby local BEE companies are given the opportunity to match the best price for tenders advertised. If they are able to match the best price, such local companies are given preference in the awarding of tenders.

- The use of local sub-contractors may have certain negative implications for the project:

    - Local sub-contractors may not be able to source material on time, and then the Eskom contractors have to supply materials to ensure that the work is completed within the set timeframes.

    - Local sub-contractors are not always able to complete their work on time, due to financial constraints and lack of project management skills.

- Local businesses benefit indirectly as a result of increase local spending by those that are employed which in turn contribute to health and wellbeing for those families.

Operation and maintenance phase

Compensation for servitudes

No compensation for servitudes is paid during this phase.

Direct formal and/or informal employment opportunities for local individuals

- Regular maintenance and emergency repairs of the transmission lines is a highly skilled job seeing as maintenance is normally carried out on live lines to prevent a disruption in the supply.

- It is unlikely that maintenance workers will be sourced from within the local community, due to the skilled nature of the job requirements and it is more likely that Eskom would employ a maintenance team that will cover the entire length of the transmission power lines instead of fragmented maintenance teams that only cover a certain section of these lines.

- However, some local individuals may be employed on servitude maintenance teams, but that would to a large extent depend on the appointed servitude maintenance contractor. The number of people involved in a maintenance team depends on the type of maintenance that has to be conducted.

- Due to the fact that local community members are unlikely to be employed as transmission power line maintenance team members, no tangible economic impacts are foreseen and where local community members are used as servitude maintenance workers, this could lead to an economic impact and local social upliftment.

- There will be short term employment.

Indirect formal and /or informal business opportunities to local individuals

No business opportunities are anticipated during the operational phase.

Property Values

When considering the impact of a transmission power line on property values, the following must be considered:

- The location of the transmission power line (e.g. on the border, through the middle, or cutting a corner of a property);
- The location of transmission power line towers;
- The type of towers used;
- The presence of existing transmission power lines; and
- The presence of any visual mitigation.

In the case of the section between the Minerva substation and the Apollo converter station, the proposed transmission power line will follow an existing corridor that currently contains existing transmission power lines. The corridor runs between residential property estates, but it is however, envisaged that lines will not cross properties and that there is no requirement for towers to be located on residential properties. The current proximity of transmission power lines also means that the value implications of their presence will in general already be

reflected in values for residential properties in proximity to the transmission power line.

An exception may be applied to properties bordering a new corridor, which may cause a slight decrease in property value for the bordering properties of approximately 5-10%.

Electricity supply and economic growth

- Resources and infrastructure, such as electricity, water and fuel, enables normal economic growth as most economic activities are dependent on a sufficient and steady supply of electricity.

- Normal economic activities, e.g. industry and businesses, are affected when electricity is not available. The economic impact on such services increases the longer services such as electricity is unavailable.

- The proposed transmission power line would enhance the electricity supply to the local area, thereby stimulating economic growth through the establishment and/or expansion of businesses and industries. This in turn creates additional employment opportunities, which further enhances economic growth, permitting a positive economic impact to filter down to a more grassroots level

Table 24: Assessment of Economic Impacts

***Nature*:** Economic impacts include: • Compensation for servitude • Direct formal and/or informal employment opportunities for local individuals, and • Indirect formal and /or informal business opportunities to local individuals. • Electricity supply and economic growth		
	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Probability	Highly probable (4)	Highly probable (4)
Duration	Short term (2)	Short term (2)
Extent	Local – Regional (2) (Rated as 2 due to potential opportunities for local communities and businesses)	Local – Regional (3) (Rated as 2 due to potential opportunities for local communities and businesses)
Magnitude	Low (4)	Low (4)
Significance	Medium (32)	Medium (36)
Status	Positive	Positive
OPERATION AND MAINTENANCE PHASE		
Probability	Probable (3)	Probable (3)
Duration	Short term (1)	Short term (1)
Extent	Local (1)	Local (1)
Magnitude	Minor(1)	Minor(1)
Significance	Low (9)	Low (9)
Status	Positive	Positive

Reversibility	N/A
Irreplaceable loss of resources?	N/A
Can impacts be mitigated?	YES
Mitigation: ***Construction phase***	**Compensation:** • Appoint a land valuator with experience be experience. • The process should be conducted with the necessary respect, and the negotiator should be transparent about the process and expectations (do not engage in "empty promises"). • The negotiation should be done for the whole servitude and not part of the servitude. • Contracts should be reviewed by an independent body. • Land owners should be made aware that a pre- and post-evaluation of their land value is possible. • In the case of tribal authorities, Eskom should consider establishing a trust fund in consultation with the tribal authority (as a form of compensation) for the community that is jointly administrated by Eskom and the tribal authority. Community development projects can then be funded from the trust fund, which would aid sustainable development in the area. **Employment:** • Unskilled job opportunities should be afforded to the inhabitants of the communities closest to the proposed construction site. Means to achieve this are suggested below: • Identify types and levels of employment that the development can offer. • Local individuals should be employed for work components that do not require a substantial amount of skill, e.g. foundation excavation, vegetation clearance, erection of gates, cleaning services, and security guards • Appoint a local labour broker. The process of procurement should be monitored by Eskom to ensure that the process was transparent and equal opportunities were afforded. • Refer contractors to jobseeker's databases kept by local community structures when sourcing local labour. • Individuals with the potential to develop their skills should be afforded training opportunities. • Identify targets for BEE and local employment. • Reserve agreed percentage of higher level positions for local employment. • Location of appropriate transport providers who would be available to assist contractors in transporting worker to and from these sites.

	• Younger people tend to have higher levels of education and may stand in line for higher levels of employment. Opportunities for the employment of younger people should be maximised. • Individuals with the potential to develop their skills should be afforded training opportunities. • Equal opportunities for employment should be created to ensure that the local female population also has access to these opportunities. • Through consultation with relevant key stakeholders, identify the segment that might benefit from informal indirect opportunities, and promote skills development and subsidisation initiatives that are sustainable. • Encourage, in consultation with key stakeholders, construction workers to use local services. • Mechanisms should be developed to provide alternative solutions for creating job security upon completion of the project. • Payment should comply with applicable Labour Law legislation in terms of minimum wages. • Where local labourers are employed on a more permanent basis, these labourers should be registered with the Unemployment Insurance Fund (UIF), Pay as You Earn or any other official bodies as required by law. This would enable the workers to claim UIF as a means of continuous financial support when the workers' positions during construction itself have become redundant or once the construction phase comes to an end. **Property Values:** • Implementation of visual mitigation measures as proposed in the Visual Impact Assessment. **Business:** Make use of local suppliers of goods and services where possible. Means to achieve this are suggested below: • Engage with local businesses to assist with meeting requirements for tender processes and documentation. • Identify targets for BEE and local procurement • Communicate supply chain opportunities through the project's website and communication materials. • Communicate supply chain opportunities through local business networks. • Expedite process of registering local service providers on Eskom's procurement database.

	• Engage with local stakeholders to establish a local business forum to increase access to opportunities. • Provide information regarding the types of business opportunities and economic and economic spin-offs that may arise from the proposed development. • Participatory workshops in which interested members of local communities can be guided with regards to types of business opportunities that could arise. • Provide the local business network in advance of construction with a list of required goods and services as well as procurement tendering requirements. • Investigate ways of enabling potential sub-contractors from low-income areas to tender. • Set up linkages for small business loans, as well as small business skills training.
Mitigation: Operational and Maintenance phase	**Employment:** • Individuals with the potential to develop their skills should be afforded training opportunities. Eskom should be involved in this process. • Make use of local labour on unskilled maintenance components, such as servitude maintenance. • Where local labourers are employed on a more permanent basis, cognisance should be taken of the Labour Law in terms of registering the worker with the Unemployment Insurance Fund (UIF), Pay as you earn (PAYE), workman's compensation and all other official bodies as required by law. This would enable the worker to claim UIF as a means of continuous financial support when the worker's position on the construction team has either become redundant or once the construction phase comes to an end. **Electricity supply and economic growth:** • None
Cumulative impacts:	Opportunity to up-grade and improve skills levels, additional business and economic opportunities in the area. However, due to relatively small number of local employment opportunities this benefit is likely to be limited.
Residual risks:	Low

5.6 INFLUX OF CONSTRUCTION WORKERS

Construction phase

Given the specialists nature of transmission line construction, specialist contractor and subcontractor teams would be appointed by Eskom for the construction phase of the project. These contractor teams would consist of highly skilled specialists and semi-skilled workers with specific experience within the field of erecting transmission lines and towers such as project and construction managers, contract supervisors, construction foremen and general labourers. The nature, extent and intensity of this impact would thus depend on the number of locals that could form part of the contractor teams and whether construction camps would be set up to house the temporary "outside" workforce within the study area.

Where sourcing of local labour is not possible, "outsiders" will need to be employed in order to provide necessary skills. These employees may be accommodated in a construction camp. Historically, such camps created social changes by introducing new people to an area. These changes can be both positive and negative:

- Positive in that people exchange ideas and backgrounds, and outside workers provide a small stimulus to the local economy if accommodation for such workers could be procured locally, and

- Negative in terms of conflict that these differences may evoke. The construction camp may also attract women who may use the opportunity to generate income.

Two types of accommodation could be used by contractors coming from other areas, namely:

- Bulk accommodation, e.g. hostel housing or private houses, catering for groups of 15 to 60 people for general construction labourers, that only need a place to stay; and

- More formal accommodation, e.g. guesthouses, for management and administration that only come for short periods to render services to their companies.

Construction workers not sourced locally may contribute to creating numerous social problems and especially for the surrounding towns situated within close proximity from the proposed corridor. These problems include:

- Potential conflict between outside workers and the local community, enhanced by a feeling of competition for scarce resources, e.g. much needed employment opportunities.

- The presence of construction workers from elsewhere could aggravate existing social problems, particularly alcohol and drug abuse.

- An influx of people with disposable income might lead to an increase in prostitution, which can impact on the HIV and unwanted pregnancy rate in the area. There can be a number of spin-offs like alcohol abuse, disintegration of families and sexually transmitted diseases (STD's).

- The community could feel that the construction workers from elsewhere pose a threat to their personal safety, because undesirable people will be attracted to the area, there will be strangers on farms servicing the power lines and fires could start as a result of the possible theft of conductors of transmission lines.

- General intrusions with regards to the inflow of construction teams relate to noise generated by these workers, possible littering, and possible unauthorised entry to properties.

- It is furthermore not expected that the inflow of temporary workers would put additional pressure on the current infrastructure and service delivery in the area, as their immediate needs would be provided through the construction camp infrastructure and services provided on site, or by the existing infrastructure and services available in the study area.

Operation and maintenance phase

Possible negative intrusion impacts are, however, foreseen where maintenance personnel would have to access private properties without prior notice to the property owner as in the case of emergencies or when workers are responsible for misconduct (e.g. possible poaching of small livestock or game, neglect to close farm gates and driving through the veld). This impact is however anticipated to be of a short duration with a low intensity.

Table 25: Assessment of Impact of Influx of Construction Workers

***Nature*:** Potential impacts on family structures and social networks associated with the presence of construction workers		
	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Probability	Probable (3)	Probable (3)
Duration	Short term for community as a whole (2) Long term-permanent for individuals who may be affected by STD's etc. (5)	Short term for community as a whole (2) Long term-permanent for individuals who may be affected by STD's etc. (5)
Extent	Local (3) (Rated as 3 due to potential severity of impact on local communities)	Local (2) (Rated as 1 due to potential severity of impact on local communities)

Magnitude	Low for the community as a whole (4) High-Very High for specific individuals who may be affected by STD's etc. (10)	Low for the community as a whole (4) High-Very High for specific individuals who may be affected by STD's etc. (10)
Significance	Low for the community as a whole (27) Moderate-High for specific individuals who may be affected by STD's etc. (57)	Low for the community as a whole (24) Moderate-High for specific individuals who may be affected by STD's etc. (51)
Status	Negative	Negative
OPERATION AND MAINTENANCE PHASE		
Probability	Probable (3)	Probable (3)
Duration	Short term (1)	Short term (1)
Extent	Local (1)	Local (2)
Magnitude	Moderate (6)	Moderate (6)
Significance	Medium (30)	Medium (30)
Status	Negative	Negative
Reversibility	No in case of HIV and AIDS	
Irreplaceable loss of resources?	Yes, if people contract HIV/AIDS. Human capital plays a critical role in communities that rely on farming for their livelihoods.	
Can impacts be mitigated?	Yes, to some degree. However, the risk cannot be eliminated.	
Mitigation: ***Construction phase***	• Raise awareness amongst construction workers about local traditions and practices. • Inform local businesses about the expected influx of construction workers so that they can plan for the extra demand. • Before construction commences, representatives from the local municipality and community-based organisations, as well as neighbouring and/or affected residents should be informed of the details of the construction company (contractor), size of the workforce and construction schedules. • Ensure that the local communities communicate their expectations of construction workers' behaviour. • Conditions stipulated by property owners in terms of the construction activities should be implemented and monitored. • Maximise local employment to minimise the need for housing of temporary workers which could lead to social problems of integration with the local community. • All construction activities should be restricted to working areas.	

	• Construction workers should wear name tags and clothing to ensure that they can be readily identified as belonging to the construction workforce. This should be applicable to all construction workers, including those locally recruited. • What workers bring on site should be monitored. The provision of catering on-site will reduce the chances that substances such as alcohol are brought on-site or used during working hours, reducing the likelihood of alcohol related conflict and disturbances. • Workers should receive fines if they do not adhere to the conditions, rules and regulations. • Workers should be made aware of property owners' concerns regarding construction work on their properties so that they are familiar with the sensitive issues. • A specific contact person should be identified to allow community members and property owners to easily direct their queries and concerns and obtain general information regarding the construction process.
Mitigation: Operational and maintenance phase	• Eskom personnel should preferably not access private properties without prior notification of the property owners. • Eskom maintenance personnel should be in possession of the required identification documents and clothing when undertaking maintenance work. • Vehicles used should be clearly marked. • Eskom personnel should behave properly at all times.
Cumulative impacts:	• Impacts on family and community relations that may, in some cases, persist for a long period of time. Also in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community. • Possible criminal activities undertaken on properties.
Residual risks:	• Medium

5.7 INFLUX OF JOB SEEKERS

Construction phase

As news regarding a proposed project spreads, expectations regarding possible employment opportunities may take root. Consequently the areas surrounding the corridor could experience an influx of job seekers. It is not possible to accurately predict the amount of job seekers that would flood to the area,

which could range from a single job seeker to hundreds and thousands of job seekers.

The study area has a high unemployment level and competition over scarce employment opportunities may give rise to conflict between local residents and newcomers.

The influx of job seekers into the environment will lead to an increased demand on local services and will not necessarily lead to a boost in the local economy, seeing as these job seekers are mostly unemployed.

It is likely that the influx of job seekers could lead to the expansion of informal settlements, as these people have no resources and therefore aim to settle as close to the construction site, as possible.

The more an informal settlement continues to grow, the more socio-economic conditions will continue to deteriorate (with more people trying to access the same amount of limited resources), and the more the quality of life of other local (neighbouring) residents will be affected. However, restricting the influx of job seekers and the associated expansion of existing informal settlements is a mammoth task and often beyond the contractors' control.

As a main portion of the proposed transmission corridor is situated in an urbanised area, the main influx of jobseekers from these towns/settlements can be expected.

Operation and maintenance phase

Regular maintenance and emergency repairs of the substation and transmission lines would be conducted by specialised teams of permanent Eskom personnel and no new job opportunities will be created, which would make the inflow of jobseekers negligible.

No mitigation measures are thus proposed.

Table 26: Assessment of Impact of the possible Influx of Unemployed job seekers and temporary workers.

***Nature*:** Possible influx of unemployed job seekers and temporary workers		
	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Probability	Highly probable (4)	Probable (3)
Duration	Short term (2)	Short term (2)
Extent	Local (2)	Local (2)
Magnitude	Low (5)	Low (4)
Significance	Medium (45)	Low (24)
Status	Negative	Negative
OPERATION AND MAINTENANCE		
Probability	Very improbable (1)	Very improbable (1)
Duration	Long term (4)	Long term (4)
Extent	Regional (3)	Regional (3)
Magnitude	Minor (2)	Minor (2)
Significance	Low (9)	Low (9)

Status	Negative	Negative
Reversibility	N/A	
Irreplaceable loss of resources?	N/A	
Can impacts be mitigated?	Yes	
Mitigation: Construction phase	• Maximise local employment according to strategies outlined previously. • The number of job opportunities available as part of the proposed project and the recruitment process should be clearly communicated. • The communication strategy should ensure that unrealistic employment expectations are not created. • Access to the construction site should be controlled. • Have clear rules and regulations for access to the construction camp to control loitering. • The use of local labour should be maximised through contractual conditions set for the sub-contractors. • Construction workers should be clearly identifiable by wearing proper construction uniforms displaying the logo of the construction company. • Construction workers must also be provided with identification tags.	
Mitigation: Operation and maintenance phase	• None	
Cumulative impacts:	• The influx of job seekers or temporary workers could lead to the expansion of informal settlements. The more an informal settlement continues to grow, the more socio-economic conditions will continue to deteriorate and the more the quality of life of other local (neighbouring) residents will be affected. • Added pressure on service delivery and the existing infrastructure with resultant additional socio-economic burdens for the local municipalities and surrounding property owners should the jobseekers come from outside the study area, but permanently remain in the area after the construction period has ceased.	
Residual risks:	• Medium	

5.8 RELOCATION OF HOUSEHOLDS

Construction phase

Settlements are situated in various locations in close proximity to the proposed route corridor or in some cases within the proposed servitude of the route corridor. This may imply that relocation will have to take place of households that have settled within the existing servitude.

In all instances it is not foreseen that these households would necessarily have to be resettled as it might also be possible to fine-tune the alignment that is preferred in the end to avoid such households. Furthermore, the possibility cannot be ruled out that some areas will not be inhabited by the time

construction commences, notably where the alignment comes in close proximity to the informal settlement at Olievenhoutbosch.

It is important to note that even if the proposed transmission power line is aligned in such a manner that it does not traverse any inhabited areas, the possibility cannot be ruled out that some areas will not be inhabited by the time construction commences. Incidences occurred in the past where households had deliberately settled in an area that is known to be earmarked as a servitude. Such households then claimed to have been living in that area for an extended period of time and then claimed compensation from Eskom for having to be resettled.

Operation and maintenance

The development of informal settlements near or in servitude areas will not only obstruct access of Eskom to their servitudes for routine maintenance or an emergency (malfunctioning) on the line and causing delays, but people settling within the servitude would also impact on their own health and safety.

Relocation will then be necessary and the impact of relocation depends on the level of attachment to a place, which in turn is informed by variables such as age and number of years spent in that particular area. It is believed that if the servitude is inspected for settlement on a regular basis, Eskom would be able to remove people and/or households from the servitude without causing severe negative impacts. The sooner that people are removed from the servitude, the less likely it becomes that they have become attached to the area, as they have only been living there for a short space of time. The impact is therefore not viewed as purely negative due to the fact that Eskom would have unrestricted access to their servitude in case of emergency. The safety of the relocated party would also be enhanced if they are removed from the servitude.

Table 27: Assessment of impact of the possible relocation of people

***Nature*:** Relocation of existing and new households and/or population segments		
	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Probability	Probable (3)	Improbable (2)
Duration	Permanent (5)	Permanent (5)
Extent	Local (2)	Local (2)
Magnitude	Moderate (5)	Low (4)
Significance	Medium (36)	Low (22)
Status	Positive	Positive
OPERATION AND MAINTENANCE		
Probability	Probable (3)	Improbable (2)
Duration	Permanent (5)	Permanent (5)
Extent	Local (2)	Local (2)
Magnitude	Moderate (5)	Low (4)
Significance	Medium (36)	Low (22)
Status	Positive	Positive
Reversibility	Low	
Irreplaceable loss of resources?	N/A	

Can impacts be mitigated?	Yes
Mitigation: Construction, operation and maintenance phases	• Avoid the resettlement and/or displacement of households as far as possible. • If resettlement is unavoidable, residents should be sufficiently compensated and assisted with the relocation process. • A form of compensation should also be granted to individuals who are residing in informal settlements within the servitude. • A formal grievance procedure should be implemented and communicated to landowners to ensure a fair and transparent process. • Eskom (or its appointed contractor) should monitor areas where people gather in the field on a regular basis as this is normally the first indication that settlement might take place in the area. These people should be removed in co-operation with the local SAPS to prevent the formation and/or expansion of informal settlements in such an area, especially if it encroaches upon the servitude. • The servitude should be inspected on a regular basis to determine whether any settlement has taken place, either within the servitude, or encroaching upon the servitude. • Households that encroach upon or settle within the servitude have to be relocated as soon as possible. • Eskom or its appointed contractors should assist these households with the relocation process. • Educate surrounding communities about the dangers of living in the servitude. • A form of signage on the towers should also indicate that it is dangerous. • In some way, a barrier (psychological and/or physical) should indicate that no structures should be built in the servitude. • One way of achieving such a barrier is to educate community leaders on the health and safety aspects of the servitude, who then in turn can ensure that settlement does not take place within the servitude.
Cumulative impacts:	• Households may deliberately settle in a servitude area then claimed compensation from Eskom for having to be resettled.
Residual risks:	• Medium

5.9 IMPACT ON FARMING ACTIVITIES

Construction phase

- Farms throughout the study area are used for crop production and grazing. The proposed power line could thus have an impact on some of these farming activities during the construction phase due to the increased risk of veld fires as a result of the presence of construction workers in the area.

- In most cases these possible negative impacts are expected to manifest in the long term as any damage to the veld and/or crops could take some time to be rehabilitated or recover and the possible loss of animals/wildlife could be seen as a permanent negative impact with severe financial consequences. It should, however, be noted that if the contractor adhere to the guidelines stipulated in the Environmental Management Programme and the contract with Eskom, these negative impacts are not likely to occur.

- Construction activities would further intrude on private properties such as the farms found in the study area. Disruptions to these property owners' existing infrastructure (e.g. gates, fences, roads etc.) could occur as the construction activities would lead to an increase in vehicles and machinery making use of private gravel roads. In areas, where erosion is already taking place this would be problematic, especially if workers do not keep to the roads.

- If workers do not close gates it could result in stock losses. These negative impacts could thus indirectly impact on the effectiveness of the farming activities undertaken. Should additional access roads have to be constructed it could possibly sterilise grazing land and areas for crop production.

- A temporary loss of cultivated land can be expected during the construction of the proposed transmission power line due to the physical space needed for these construction activities. This would mean that a farmer would not have access to a part of his/her land for the cultivation and/or harvesting of crops for the duration of the construction activities, which in turn would result in a temporary loss of income for that portion of the land. Where crops are cleared for the servitude, this would have an economic impact on the farmer as a result of a reduced harvest.

- As is the case with cultivated land, a temporary loss of grazing land can also be expected during the construction phase due to the physical space needed for the construction activities. This would mean that a farmer would not have access to a part of his/her grazing land for the duration of the construction activities, which might have planning and economic implications.

- In terms of crop irrigation, it is preferable that 400kV lines do not cross centre pivots, because of the proximity of the water to the Transmission power line. Also, the towers might interfere with sub surface irrigation pipes, and the space needed for the centre pivot. No centre pivots are located in the proposed transmission corridor servitude or within a distance of 1km away way from the alignment.

- Tower positions could limit the area/extent of land used for the cultivation of crops and could have a long term impact on the productivity of agricultural land.

- Normally the loss of cultivated land is considered during the negotiation process and included in the compensation amount payable to the landowner.

Operational and maintenance phase

- In the long term, even if the farming activities would be maintained, the negative impacts are not perceived to be severe as most farming activities could continue underneath transmission lines, although there will be a permanent loss of portions of crop lands due to the occupation of towers.

- The presence of towers and Transmission power lines on grazing land pose fewer problems, as livestock can move around towers and therefore less land is lost. The portion of land that was used for construction activities is handed back to the landowner upon completion of these activities. Livestock can move freely under Transmission power lines and around towers to graze. The permanent loss of grazing land is therefore not regarded as significant.

- The lack of maintenance within the servitude and around the towers resulting in the growth of weeds which could become problematic for crop production if not attended to. Littering (paper and disused steel and other materials) is also a source of concern and should be attended to by the Eskom maintenance personnel.

Table 28: Assessment of impact on farming activities

***Nature*:** Impact on farming activities		
	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Probability	Highly probable (4)	Probable (3)
Duration	Long term-permanent if disturbed areas are not rehabilitated (5)	Short term if damaged areas are rehabilitated (1)
Extent	Local (2)	Local (1)
Magnitude	Low (4)	Minor (2)
Significance	Medium (44)	Low (12)
Status	Negative	Negative
OPERATION AND MAINTENANCE		
Probability	Very improbable (1)	Very improbable (1)
Duration	Long term (4)	Long term (4)
Extent	Regional (3)	Regional (3)
Magnitude	Minor (2)	Minor (2)
Significance	Low (9)	Low (9)
Status	Negative	Negative
Reversibility	Yes, but long period required	
Irreplaceable loss of resources?	No. Affected land can be restored, provided appropriate rehabilitation is implemented.	
Can impacts be mitigated?	Yes	
Mitigation: Construction phase	• The footprint associated with the construction related activities (access roads, construction platforms, workshop etc.) should be minimised. • Initial servitude clearing on the farmland should take place after the harvesting season, as far as possible. Landowners should be compensated for the loss of cultivated land.	

	• Compensation for the temporary loss of cultivated land should be included in the negotiation process with the landowner. • Mitigation measures should be implemented to avoid any negative impact on animals (e.g. fencing off the construction area). • Eskom or its appointed contractor(s) should assist with the temporary relocation of livestock during construction. • An Environmental Control Officer (ECO) should be appointed to monitor the establishment phase of the construction phase. • All areas disturbed by construction related activities, such as access roads on the site, construction platforms, workshop area etc. should be rehabilitated at the end of the construction phase. • Eskom should discuss the construction schedule and activities with the affected farmers to enable them to plan their farming activities and animal movement accordingly. • The location of the construction camps where workers would be housed should be carefully considered to limit any possible negative social impacts. • The construction camp should be located near support services, and ideally not in the vicinity of residential dwellings. • Eskom must liaise with the farmers' associations and a protocol for gaining access to farms should be established and distributed to all parties involved. The impact of careless conduct on the side of contractors must be acknowledged and the contractors should receive an induction in terms of the relevant code of conduct to which they should adhere. • Access to the construction site should be controlled. • Have clear rules and regulations for access to the construction camp to control loitering. • Construction workers should be clearly identifiable by wearing proper construction uniforms displaying the logo of the construction company. • Construction workers must also be provided with identification tags.
Mitigation: Operation and maintenance phase	• Eskom or its appointed contractor(s) should assist with the relocation of livestock back to their original grazing area once construction in an area is completed • Grazing areas should be rehabilitated to their original grazing conditions to ensure that cattle can continue to graze in the area once they are returned to that area. • Where the area cannot be rehabilitated to its original condition within a reasonable period of time, Eskom or its appointed contractor(s) should provide funding to obtain alternative food sources to the farmer for the

	time period required for natural rehabilitation to occur within the grazing area. • The implementation of a rehabilitation programme should be included in the terms of reference for the contractor/s appointed. The specifications for the rehabilitation programme should be drawn up the Environmental Consultants appointed to undertake the EIA. • The implementation of the Rehabilitation Programme should be monitored by the ECO.
Cumulative impacts:	• The impacts would occur on land not currently affected by similar impacts. No cumulative impacts are therefore associated with the development.
Residual risks:	• Medium

5.10 SOCIAL CONFLICTS/DISPUTES

Construction phase

The treatment of workers on-site by labour brokers and contractors could lead to disputes. These could include:

- Labour brokers could take large percentages of wages that would be paid to workers. Local labour brokers, having a closer relationship with the community, could provide the same service and charge significantly less, thus leaving a more significant portion.

- The handling of labour disputes could be perceived as racism.

Operation and Maintenance phase

Only specialised teams of permanent Eskom personnel are involved during the operational phase and social conflict and disputes are not anticipated.

Table 29: Assessment of impact of possible disputes

***Nature*:** Possible disputes between workers, contractors and labour-brokers		
	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Probability	Highly probable (4)	Probable (3)
Duration	Short term (2)	Short term (2)
Extent	Local (2)	Local (2)
Magnitude	Low (5)	Low (4)
Significance	Medium (45)	Low (24)
Status	Negative	Negative
OPERATION AND MAINTENANCE PHASE		
Probability	N/A	N/A
Duration		
Extent		
Magnitude		
Significance		
Status		

Reversibility	N/A
Irreplaceable loss of resources?	N/A
Can impacts be mitigated?	Yes
Mitigation: ***Construction phase***	• Establish a community stakeholders' forum where labour related issues can be addressed in consultation with local community representatives on a regular basis, to improve relationships and build trust. • Make use of local labour brokers. • Ensure utmost sensitivity in the treatment of workers on-site, particularly regarding potential racial issues that may be implicated. This also applies to the manner on which labour disputes, when they occur, are handled by contractors and, when necessary, Eskom Project Managers.
Cumulative impacts:	May lead to strikes and the project may not be finished in time.
Residual risk:	Low

5.11 IMPACT ON COMMUNITY HEALTH

Construction phase

- Dust Emission - During the construction period the construction works and traffic increase may cause temporary and limited dust pollution and may sometimes result respiratory problem on construction workers and local communities.

- Noise - Noise pollution due to the construction of the transmission lines and access road is temporary and limited.

- Sexually Transmitted Infections (STIs) - The major impacts on health and safety are related to the work force engaged in the construction and operation of the transmission line. Communicable diseases like sexually transmitted infections (e.g. HIV/AIDS, Hepatitis, etc.) and malaria can be spread around and in the construction areas. The influx of labour to the construction areas and their inter action with the locals can cause opportunities for the spread of communicable disease in the area and an increase in STIs resulting from the project is inevitable.

- Other Infectious Diseases - Some diseases like intestinal cases, hepatitis, respiratory cases, and respiratory cases including TB case may occur in situations where a large work force is not provided with proper sanitary and work place facilities.

- Alcohol abuse among construction workers may be a problem, especially after workers had received payment. Except for the obvious health risks

associated with alcohol abuse, issues also relate to alcohol's effect on behaviour – sometimes causing irresponsible behaviour that could escalate to violence or conflict between individuals or groups.

Operation and maintenance phase

Construction workers form part of a significant section of the population known as migratory workers. Due to their unique situation, construction workers engage in behaviour that makes them vulnerable, such as risky sexual behaviour (e.g. unprotected sex) and destructive behaviour (e.g. alcohol abuse, damaging the environment), which could be explained by their migratory status.

When they are separated from their homes, they are also distanced from traditional norms, prevailing cultural traditions and support systems that normally regulate behaviour within a stable community.

In addition, it might also be that construction workers who are faced with dangerous working conditions and the risk of physical injury might be more preoccupied by immediate (direct) risks and therefore tend to disregard salient (more indirect) risks, such as HIV infection. Again, it is likely that HIV transmission occurs, as the local population might be uneducated about the risk and transmission of HIV and would therefore more easily engage in risky behaviour as a result of ignorance.

Construction workers' situations seem to make them vulnerable to high-risk sexual behaviour. There are ample research results to indicate that there is a direct link between temporary migration and HIV infection.

The spread of STI and HIV is a matter of great concern, in view of the fact that construction workers move out of the area into another area where the spread of these STI and HIV continues.

Table 30: Assessment of impact of on community and workers' health

***Nature*:** Impact on community and workers' health, including effects of dust, noise, sexually Transmitted Infections (STIs) and other infectious diseases		
	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Probability	Highly probable (4)	Probable (3)
Duration	Long term to permanent (5)	Long term to permanent (4)
Extent	National (5)	National (5)
Magnitude	Moderate (6)	Moderate (5)
Significance	High (64)	Medium (42)
Status	Negative	Negative
OPERATION AND MAINTENANCE		
Probability	Highly probable (4)	Probable (3)
Duration	Long term to permanent (5)	Long term to permanent (5)
Extent	National (5	National (5
Magnitude	Moderate (6)	Moderate (6)
Significance	High (64)	Medium (42)
Status	Negative	Negative

Reversibility	N/A
Irreplaceable loss of resources?	N/A
Can impacts be mitigated?	For some health issues, yes
Mitigation:	• The impact of dust can be limited through taking proper dust abatement measures like watering of roads and control of traffic speed limit. The contractors will be required to incorporate such issue in to the management plan and submit with their contract proposals • Noise pollution beyond the stated limits, can be minimized by the provision and use of proper hearing equipment for construction workers and working time should be limited in order not to affect the local communities in the vicinities. • An aggressive STI and HIV/AIDS awareness campaign should be launched, which is not only directed at the construction workers, but also at the community as a whole. • Condoms should be distributed by placing them at centrally located points and by ensuring that construction workers and community members area aware of the availability and locality of condoms. • Access to the construction site should be controlled to prevent sex workers from either visiting and/or loitering at the site. • Local women should be empowered. This could be achieved by employing them to work on the project, which in turn would decrease their (financial) vulnerability. • Regular leave should be given to contractors. • Provide entertainment to workers. • The construction work camps shall be maintained in a clean and healthy condition as prescribed by international standards.
Cumulative impacts:	As construction workers migrate, infectious disease can spread easily to their families and regionally.
Residual risks:	Negative

5.12 INCREASE IN TRAFFIC AND IMPACT ON ACCESS

Construction phase

- The use of the road network will play a large role in delivering materials and resources to the construction camp during construction.

- Increase traffic can result in the disruption of daily movement patterns. Depending on access routes that are used, construction vehicles could impact on the safety and daily movement patterns of residents in the surrounding communities.

- Portion of the proposed transmission corridor is situated in close proximity to urbanised area and access to the construction sites near these townships may affect residential, industrial and other areas. During the construction of the remainder of the transmission line, contractors will need access over farm portions and landowners might experience a feeling that their privacy is invaded with the construction of the transmission power lines.

- The road infrastructure may not be adequate to accommodate heavy vehicles and the increase in traffic volumes. Tower steel is usually delivered on a 24-ton truck to their required position in the field. An 8-ton crane truck is generally used to erect the structures.

- Given servitudes and legal requirements regarding the distances these structures must be from each other, farmers may be concerned about the number of roads running across their farms and how it would compromise physical farming. In livestock farming, gates must be closed to keep the animals in specific areas and away from roads. Farmers may be concerned that gates will be left open when construction vehicles access their farms.

- The movement of heavy construction vehicles during the construction phase has the potential to damage roads and create noise, dust and negative safety impacts for other road users and local communities in the area.

- Heavy machinery is often required for construction works. This machinery contributes to a tremendous amount of noise. Such noise elevations affect the environment by:

    - Sonically vibrating structures, and

    - Presenting a danger to human welfare. Even when it is not perceived consciously, the noise elevations can affect human welfare in varying degrees, both physiologically and psychologically. It becomes a source of annoyance, creating communication problems and leading to elevated stress levels as well as associated behavioural and health effects.

The extent of this potential impact is localized to the adjacent landowners (farms & erven) and those using the farm roads during the construction of the proposed power lines.

Operation and maintenance phase

During the maintenance of the transmission line, contractors will need access over farm portions and through the residential areas of nearby towns. Farm owners might experience a feeling that their privacy is invaded during the maintenance of the transmission power lines.

Table 31: Assessment of the impacts associated with the increase in traffic

***Nature*:** Impact of the increase in traffic, including construction vehicles – access routes, dust, noise		
	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		

Probability	Highly probable (4)	Probable (3)
Duration	Short term (2)	Short term (2)
Extent	Local (2)	Local (1)
Magnitude	Low (4)	Minor (2)
Significance	Low (24)	Low (15)
Status	Negative	Negative
OPERATION AND MAINTENANCE		
Probability	Probable (3)	Probable (3)
Duration	Short term (1)	Short term (1)
Extent	Local (1)	Local (1)
Magnitude	Minor (2)	Low (1)
Significance	Low (12)	Low (9)
Status	Negative	Negative
Reversibility	N/A	
Irreplaceable loss of resources?	N/A	
Can impacts be mitigated?	Yes	
Mitigation:	• Construction activities should be planned to minimise added disruption of traffic, especially during peak hours. • The closing of gates, especially in livestock farming areas must be reiterated. • Land owners should be informed in advance of any planned maintenance activities.	
Cumulative impacts:	If damage to roads is not repaired then this will affect the farming activities in the area and result in higher maintenance costs for vehicles of local farmers and other road users. The costs will be borne by road users who were no responsible for the damage.	
Residual risks:	Low	

5.13 SAFETY AND SECURITY

Construction phase

- Construction activities will result in increased traffic in the area, particularly from heavy vehicles, as well as disruptions to traffic flow along affected roads. This increase in traffic together with construction activities such as open trenches will lead to an increase in safety risks for local residents, motorists and passengers.

- Heavy vehicle movement during the project construction may cause road accidents, mainly on local residents who are not accustomed to heavy traffic and heavy vehicles.

- During construction period, some work accidents (e.g., fall from above, hit by object, car accidents, etc.) may also occur mainly due to lack of safety precautions.

- People may pretend to be construction workers and to be looking for job opportunities, using the access roads over farms to construction sites. This and additional traffic on the farm roads may increase the risk of the personal safety of farmers and also of theft. The extent of this potential impact is localized and may potentially only affect landowners adjacent to the proposed development.

- Farm murders are a reality in the South African society. Farmers do not feel safe on their own farms, and any strangers are met with suspicion. The idea of construction teams working on their farms and technical teams fixing the power lines is not welcomed by many farmers.

Operation and maintenance phase

Only specialised teams of permanent Eskom personnel are involved during the operational phase and they need access over privately owned land, therefore concerns may still exist for personal safety.

Table 32: Assessment of impacts associated with security and safety risks

***Nature*:** Assessment of possible security and safety risks.		
	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Probability	Probable (3)	Improbable (2)
Duration	Short term (2)	Short term (2)
Extent	Local (2)	Local (2)
Magnitude	High (8)	Low(4)
Significance	Medium (36)	Low (16)
Status	Negative	Negative
OPERATION AND MAINTENANCE PHASE		
Probability	Probable (3)	Improbable (2)
Duration	Short term (2)	Short term (2)
Extent	Local (2)	Local (2)
Magnitude	Moderate (6)	Low(4)
Significance	Medium (30)	Low (16)
Status	Negative	Negative
Reversibility	N/A	
Irreplaceable loss of resources?	N/A	
Can impacts be mitigated?	Yes	
Mitigation: Construction phase:	• Construction workers should be clearly identifiable. Overalls should have the logo of the construction company on it and construction workers should wear identification cards. • Construction sites should be fenced and access should be controlled. • Loitering of outsiders at the either the construction site or at the construction village should not be allowed. Loiterers at the site should be removed in cooperation with the	

	local branch of the South African Police Service (SAPS). • Contractors should regularly provide adequate safety equipment and orientation to his employees. • Project related vehicles will be required to abide by good driving conducts, obey speed limits and follow the rules of safe driving.
Mitigation: Operation and maintenance phase:	• Construction workers should be clearly identifiable. Overalls should have the logo of the construction company on it and construction workers should wear identification cards.
Cumulative impacts:	No, provided losses are compensated for.
Residual risk:	Negative

5.14 VISUAL IMPACT SENSE OF PLACE

Construction phase

During this phase the main visual impact associated with the construction phase would be the actual construction sites, and possible storage of material and equipment, as well as the disruption of the soil and vegetation due to the tower footprints and new access routes.

The actual construction sites are temporary and will thus have a limited temporary negative visual impact.

Operation and maintenance phase:

The assessment of sense of place from a social perspective relates to people's perception of the project in relation to the area. Typically a study area such as this one can consist of three distinct (public) interest groups:

- People living in poverty who are often unemployed;
- Residents of different residential areas which are adjacent to the proposed Bravo 3 (Phase 3) corridor; and
- Upper middle-class to wealthier landowners of residential estates and on farms surrounding the project site.

These groups are all affected in different ways by the project and therefore it follows that their interest in the project would differ, hence their sense of place would be affected in different ways. This can be explained by the following examples:

- People living in poverty who are unemployed would expect positive impacts from the project (that of being employed) – often with little to no regard for the longer term impacts (visual impacts, air pollution, presence of the power

station, etc.). For this group of people the placement of a substation or transmission lines close to their area of residence would in all likelihood be regarded as a positive impact on their sense of place as it could create a sense of development in their areas that could improve their quality of life, and at the same time enable them to easily access perceived job opportunities.

- Private landowners on farms and residential estates surrounding the site are more aware of the potential negative impacts that the proposed power station might have on their quality of life (e.g. impacts on agricultural land, property values, etc.). This implies that their sense of place will be negatively affected as they are accustomed to a different way of life, which is often described as "pristine" and "unique" with a greater sense of preserving natural resources for future generations.

- Residents of other towns/villages in the study area not in in close proximity of the proposed project might be more indifferent to the project in general and therefore their sense of place might not be adversely affected one way or the other.

- Research on the psychological experience of sense of place suggests that people rapidly discount a landscape as soon as the first scar occurs, rather like a stain ruining a favourite garment (Petrich 1993). Thereafter, any additional impacts on the landscape have a correspondingly smaller effect. The aesthetic impact of placing a transmission line in a landscape that already bears the marks of development would be less than that of placing it in a relatively unspoilt environment. The study area is characterised by energy related land-uses, for example existing transmission lines, power stations, coal mines, etc. and the proposed transmission line will have a smaller impact on the sense of place.

Table 33: Assessment of impacts associated with sense of place

Nature: Visual impact and impact on sense of place		
	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Probability	Probable (3)	Probable (3)
Duration	Short (2)	Short (2)
Extent	Local (1)	Local (1)
Magnitude	Low (4)	Low (4)
Significance	Low (21)	Low (21)
Status	Negative	Negative
OPERATION AND MAINTENANCE PHASE		
Probability	Probable (3)	Probable (3)
Duration	Long term (4)	Long term (4)
Extent	Local (1)	Local (1)
Magnitude	Moderate (6)	Moderate (4)
Significance	Medium (33)	Low (27)

Status	Negative	Negative to Neutral
Reversibility	Yes, transmission lines and substations can be removed.	
Irreplaceable loss of resources?	N/A	
Can impacts be mitigated?	Yes	
Mitigation:	• Develop and implement a Community Engagement and Interaction policy to create protocols and positive interactions with the local community in particular neighbouring landowners. • New infrastructure should be located in close proximity to existing infrastructure of a similar nature, as far as possible. • Rehabilitation of land to its previous condition should take place as soon as a pipeline is removed from a property. • Inform neighbouring property owners when construction will take place, including information on the nature and timeframe of the construction activities.	
Cumulative impacts:	Potential impact on current rural sense of place.	
Residual risks:	Negative	

6 ASSESMENT OF A NO-DEVELOPMENT OPTION

Doing nothing would have a major impact on the economics of the region, as no new customers or load increase would be able to be accommodated by the network. This approach will also severely limit the evacuation capacity of energy from a new power station.

On a positive note this would reduce the impact on the aesthetic value of the natural environment, because the introduction of power lines into the landscape changes the sense of place.

However, the need for electricity is a national concern and not increasing the capacity to generate electricity could potentially stunt economic growth both in Mpumalanga and in South Africa in general. Considering the need for a steady supply of electricity in the province and country in general, this option was considered unrealistic. The no-development option will result in the loss of the benefits have no impact as it maintains the current status quo. However, the potential opportunity costs in terms of the loss of employment, skills and development training would be lost which would also represent a negative impact.

Table 34: Assessment of no-development option

***Nature*:** Impact of no-development option		
	Without mitigation	**With mitigation**
OPERATION AND MAINTENANCE		

Probability	Highly probable (4)	Highly probable (4)
Duration	Long term (4)	Long term (4)
Extent	Regional (4)	Regional (4)
Magnitude	Moderate (6)	Moderate (6)
Significance	Medium (56)	Medium (56)
Status	Negative	Negative
Reversibility	Yes, transmission lines and substations can be developed.	
Irreplaceable loss of resources?	N/A	
Can impacts be mitigated?	N/A	

7. CONCLUSION

The significance of the majority of potential negative impacts during the construction phase with mitigation was assessed to be of ***Low*** significance. The majority of the potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented.

The positive economic impact, e.g. job creation was assessed to be of ***Medium*** significance.

However, the negative impact on individuals e.g. construction workers and members of the community, that will be infected by HIV/ AIDS, was assessed to be of ***Medium-High*** significance. At a community level the potential risk posed by construction workers and or job seekers was found to be low. This will be if the majority of the construction force be sourced locally. The potential risk to local family structures and social networks is therefore likely to be low. Table 35 summarises the significance of the impacts associated with the construction phase.

The majority negative impacts during the operation and maintenance phase were assessed to be of ***Low*** significance with the implementation of mitigation measures.

The impact of the no-development option is negative and assessed to be of ***Medium*** significance. The no-development option also represents a lost opportunity in terms of the employment and business opportunities (construction phase) this also represents a negative social cost.

Table 35: Summary of the significance impacts associated with the Bravo 4 project.

CONSTRUCTION PHASE		
Impact	**Significance No mitigation**	**Significance With mitigation**
On mining activities	Low (24)	Low (24)
Possible risks associated with the presence of transmission power lines	n/a	n/a

On watercourses	Low (14)	Low (14)
Economic impacts including: • Compensation for servitude • Direct formal and/or informal employment opportunities for local individuals, and • Indirect formal and /or informal business opportunities to local individuals. • Electricity supply and economic growth.	Medium (32)	Medium (36)
On family structures and social networks associated with the presence of construction workers.	Low for the community as a whole (27) Moderate-High for specific individuals who may be affected by STD's etc. (57)	Low for the community as a whole (24) Moderate-High for specific individuals who may be affected by STD's etc. (51)
Possible influx of unemployed job seekers and temporary workers.	Medium (45)	Low (24)
Relocation of existing and new households and/or population segments.	Medium (36)	Low (22)
On farming activities	Medium (44)	Low (12)
Possible disputes between workers, contractors and labour-brokers.	Medium (45)	Low (24)
On community and workers' health, including effects of dust, noise, sexually Transmitted Infections (STIs) and other infectious diseases.	High (64)	Medium (42)
Impact of the increase in traffic, including construction vehicles – access routes, dust, noise.	Low (24)	Low (15)
Possible security and safety risks.	Medium (36)	Low (16)
Visual impact and impact on sense of place.	Low (21)	Low (21)
Impact of no-development option	n/a	n/a
OPERATIONAL AND MAINTENANCE PHASE		
On mining activities	Low (24)	Low (24)
Possible risks associated with the presence of transmission power lines.	Low (14)	Low (14)
On watercourses	Low (14)	Low (14)
Economic impacts including: • Compensation for servitude • Direct formal and/or informal employment opportunities for local individuals, and • Indirect formal and /or informal business opportunities to local individuals. • Electricity supply and economic growth.	Low (9)	Low (9)
On family structures and social networks associated with the presence of construction workers.	Medium (30)	Medium (30)

Possible influx of unemployed job seekers and temporary workers.	Low (9)	Low (9)
Relocation of existing and new households and/or population segments.	Medium (36)	Low (22)
On farming activities	Low (9)	Low (9)
Possible disputes between workers, contractors and labour-brokers.	n/a	n/a
On community and workers' health, including effects of dust, noise, sexually Transmitted Infections (STIs) and other infectious diseases.	High (64)	Medium (42)
Impact of the increase in traffic, including construction vehicles – access routes, dust, noise.	Low (12)	Low (9)
Possible security and safety risks.	Medium (30)	Low (16)
Visual impact and impact on sense of place.	Medium (33)	Low (27)
Impact of no-development option	Medium (56)	Medium (56)

8 RECOMMENDATION

The increase in electricity supply is much needed, not only on local lever, but also on a regional and national level and will be beneficial to the socio-economic development of the region as a whole. Fortunately, the communities within the study area will ultimately benefit from the construction of the new transmission line, known as Bravo 3 (Phase 3).

Based on the findings of this Social Impact Assessment it is recommended that the facility as proposed be supported, subject to the implementation of the recommended mitigation measures and management actions contained in the report.

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