Eskom Holdings SOC Limited

# PROPOSED DEVELOPMENT OF THE MAKALU B SUBSTATION AND ASSOCIATED TRANSMISSION LOOP-IN LINES, SASOLBURG, FREE STATE

## SCOPING REPORT

## DRAFT

**May 2017**

[*DEA Reference Number to be issued*]


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# TITLE AND APPROVAL PAGE

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# AMENDMENTS PAGE

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# EXECUTIVE SUMMARY

## PROJECT BACKGROUND AND MOTIVATION

The existing Makalu substation forms part of the Sasolburg Customer Load Network in the Free State Grid. The current nature of the load at Makalu substation is predominately industrial / mining, as well as small commercial, residential and traction loads. Makalu substation is connected to the Transmission (Tx) network by four 275 kV lines, namely two from Lethabo Power Station, one to Everest substation and one to Scafell substation.

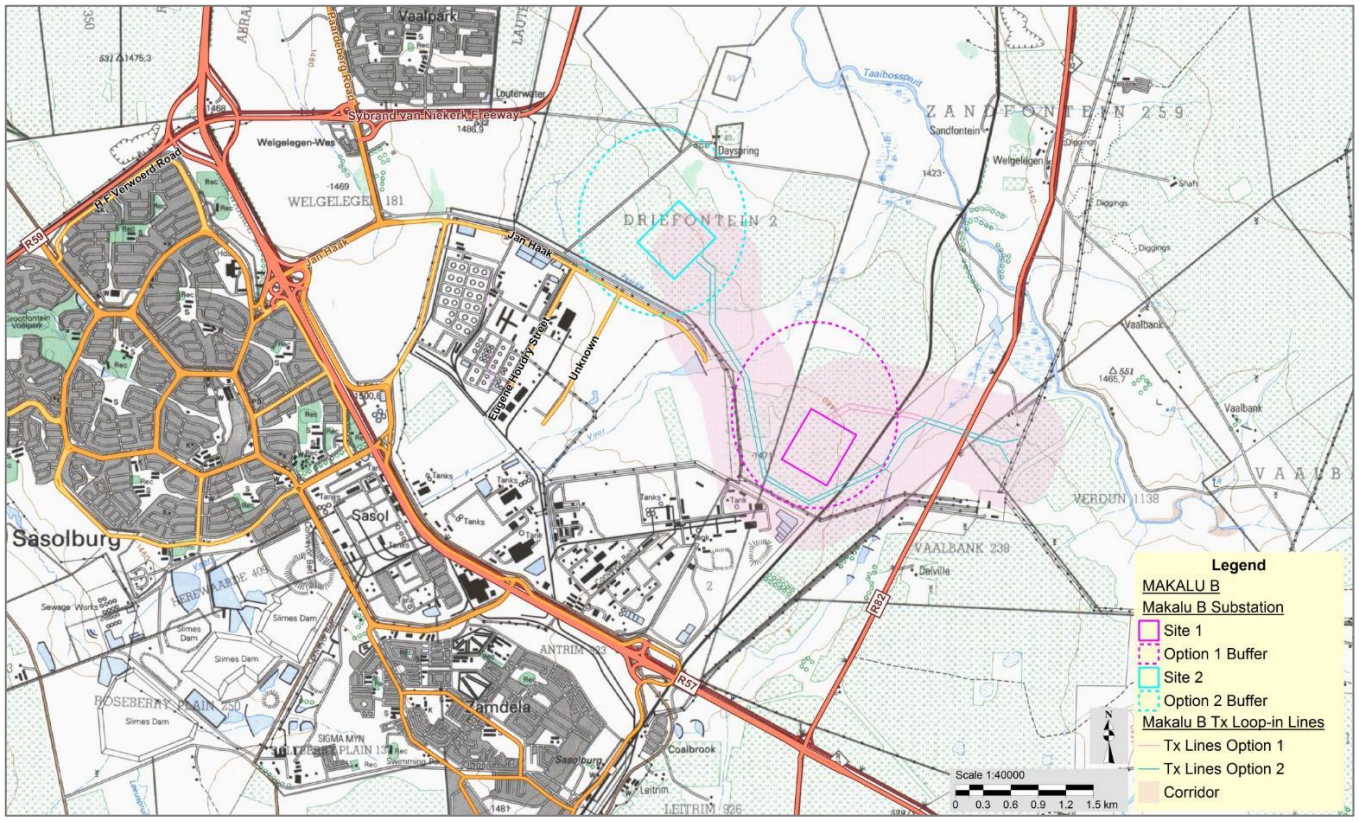
In 2012 studies indicated that the 88 kV fault levels are higher than the equipment rating at Makalu substation which will result in the 275 / 88 kV transformation at Makalu substation becoming unfirm in 2022 and the Distribution (Dx) network will result in constraints. A study was initiated to assess a number of options. The findings of the study indicated that Makalu B substation should be established such that load and current embedded generation be shifted off the existing substation to the new proposed substation. This includes a loop in of one of the existing 275 kV Lethabo – Makalu Lines.

This document serves as the draft Scoping Report for the proposed development of the Makalu B substation and associated Tx loop-in lines. A separate Basic Assessment will be undertaken for the Dx Lines, however, a combined public participation process is being conducted for both of these projects.

## PROJECT LOCATION

The project is located within the Metsimaholo Local Municipality and Fezile Dabi District Municipality, in the north of the Free State. The town of Sasolburg is situated to the west of the project area. The proposed infrastructure is bordered by petro-chemical industries to the west and is located on a combination of agricultural and undeveloped land.

The study area for the Environmental Impact Assessment (EIA) includes a 1 km corridor around the Tx lines (i.e. 500 m on either side of the centre line), as well as a 1km x 1km buffer around the alternative substation sites, as shown in the map to follow.

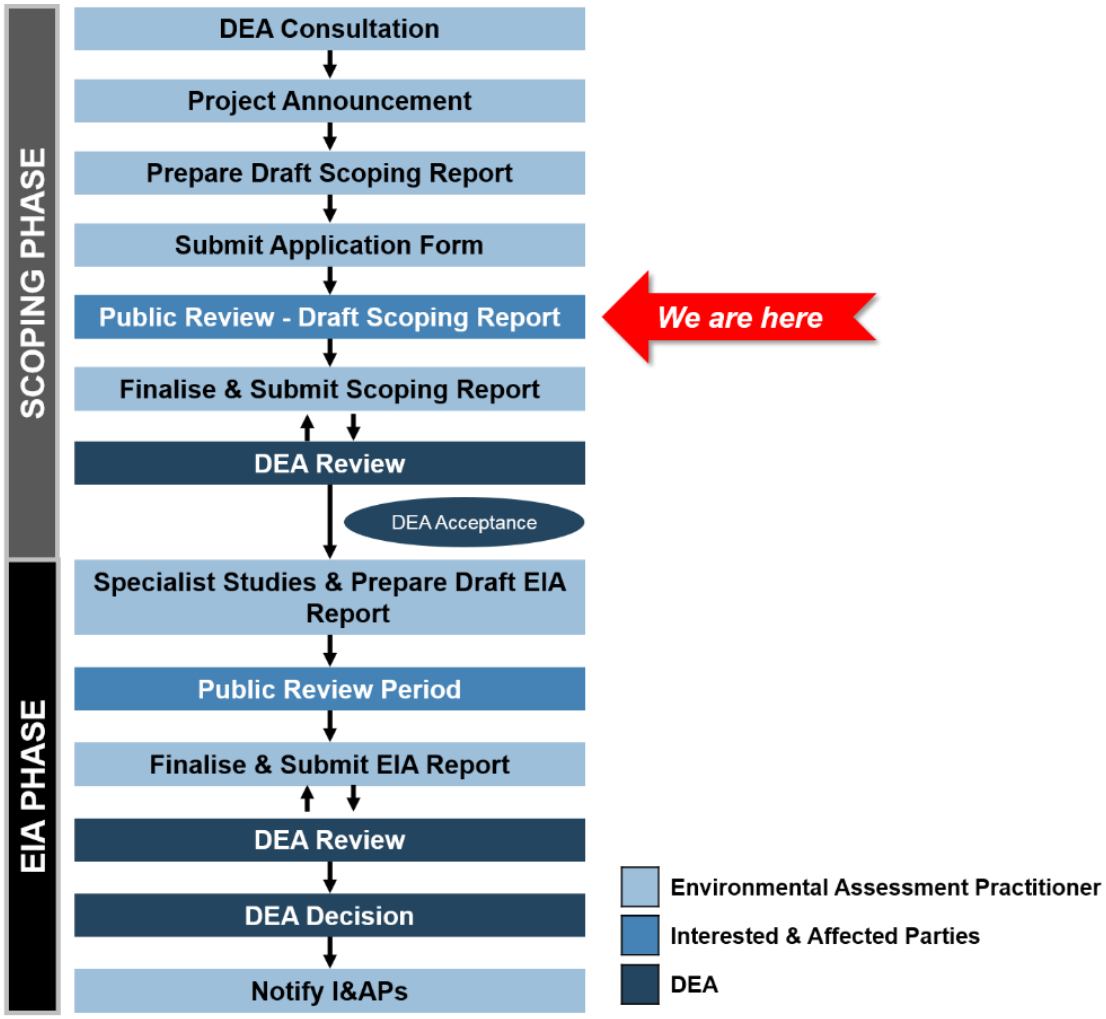



***Locality map of project area***

## SCOPING AND EIA PROCESS

An Application for Environmental Authorisation in terms of the National Environmental Management Act (NEMA) (Act No. 107 of 1998) and the EIA Regulations (2017) will be made for the proposed project. In terms of NEMA the lead decision-making authority for the environmental assessment is the Department of Environmental Affairs (DEA), as the project proponent (Eskom Holdings SOC Limited) is a state-owned entity.

The process for seeking authorisation is undertaken in accordance with Government Notice (GN) No. 326 (7 April 2017), promulgated in terms of Chapter 5 of NEMA. Based on the types of activities involved, which include activities listed in GN No. 327 (Listing Notice 1), GN No. 325 (Listing Notice 2) and GN No. 324 (Listing Notice 3) of 7 April 2017, the requisite environmental assessment for the project is a Scoping and EIA process. An outline of the process follows.




***Overview of Scoping and EIA process***

## PROJECT DESCRIPTION

The proposed project entails reconfiguring the network such that generation and motor loads are supplied at the new Makalu B substation and residential and industrial loads are supplied from the existing Makalu substation.

Two alternative substation locations (and associated Tx line alignments) are being assessed, namely Site 1 and Site 2. The proposed Makalu B Substation includes the following:

- 2 x 275 kV feeder bays, 2 x 275 kV spare feeder bays, 2 x 275 kV future feeder bays;
- 275 kV busbar and a 88 kV busbar;
- 2 x 275 kV transformer bays, 2 x 275 kV future transformer bays, 2 x 88 kV transformer bays, 2 x 88 kV future transformer bays and 2 x 315 MVA 275/88 kV Transformers (design space for 2 future 2 x 315 MVA 275/88 kV Transformers);

- 7 x 88 kV feeder bays to shift load off Makalu substation, 2 x 88 kV spare feeder bays, 2 x 88 kV future feeder bays;
- Make provision for Fault limiting reactors on the 88 kV busbar;
- Establish control room and yard with associated equipment;
- Install new terrace, fencing and earthworks for the common yard; and
- Construct an access road.

The project proposes the construction of 2 x 275 kV line loop-ins to Makalu B substation from the Lethabo – Makalu Lines. The distances of the power line routes to the alternative substation locations are approximately 2.1 km for Site 1 or 5.8 km for Site 2.

The Scoping Report provides an overview of the project life-cycle, and explains the major construction activities associated with the proposed infrastructure.

The implications of the no-go option are also discussed, which include the following:

- The fault level at the existing Makalu substation will not be decreased, which will prevent the accommodation of the embedded generation;
- The Makalu substation will become unfirm in 2022, as indicated by the Tx load forecast; and
- The network will not be able to supply load growth in the area.

## PROFILE OF THE RECEIVING ENVIRONMENT

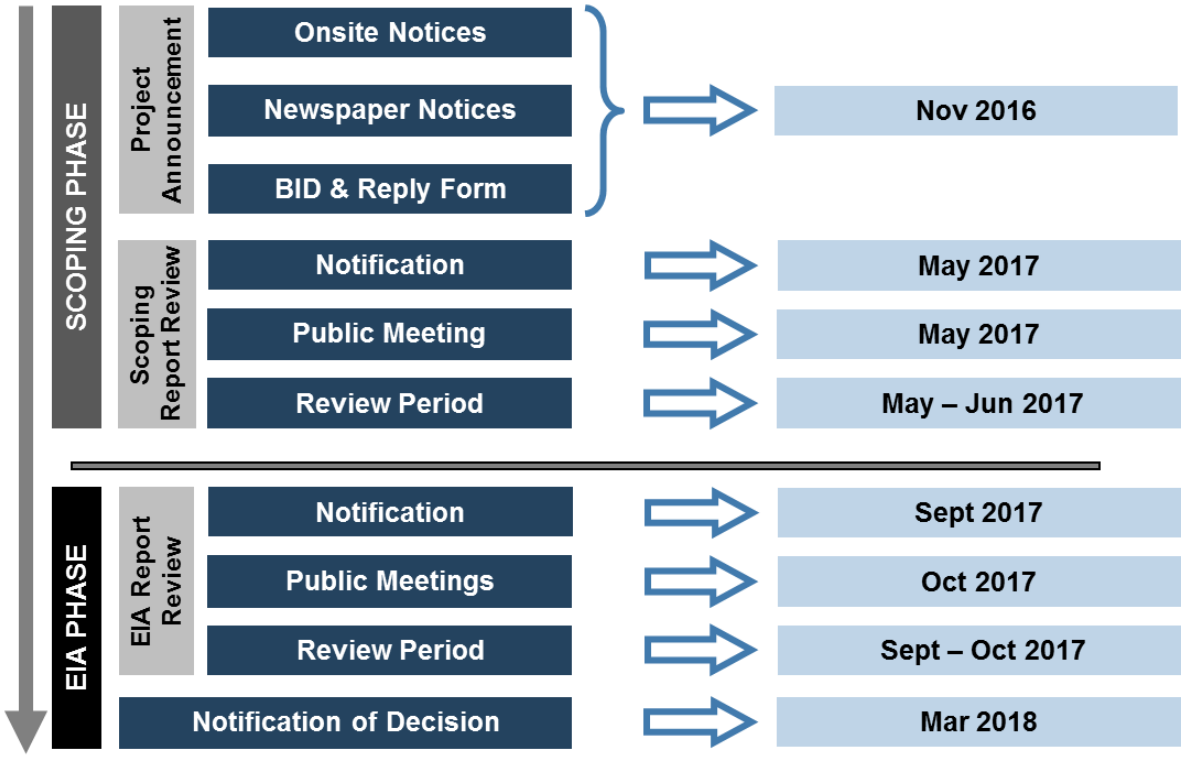
The Scoping Report provides a general description of the status quo of the receiving environment in the project area. This serves to provide the context within which the Scoping exercise was conducted. It also allows for an appreciation of sensitive environmental features and possible receptors of the effects of the proposed project. A brief overview is also provided of the manner in which the environmental features may be affected (positively or negatively) by the proposed project.

The receiving environment is assessed and discussed in terms of the following:

- Land Use and Land Cover
- Climate
- Geology
- Geohydrology
- Soils
- Topography
- Surface Water
- Flora
- Fauna
- Free State Biodiversity Plan
- Socio-Economic Environment
- Agriculture
- Air quality
- Noise
- Historical and Cultural Features
- Planning
- Existing Structures and Infrastructure
- Transportation
- Aesthetic Qualities

## PUBLIC PARTICIPATION

The public participation process is governed by NEMA and GN No. 326 (7 April 2017). The diagram to follow outlines the public participation process for the Scoping (current) and EIA phases (pending) of the proposed project. Note that the dates may change due to the dynamic nature of the EIA process.




***Outline of Public Participation Process***

The Scoping Report provides an account of the tasks undertaken as part of public participation during the announcement and Scoping phases of the EIA process.

## ENVIRONMENTAL ISSUES

In accordance with the purpose of the Scoping exercise as part of the overall environmental assessment, the Scoping Report identifies potentially significant environmental issues for further consideration and prioritisation during the EIA stage. This allows for a more efficient and focused impact assessment in the ensuing EIA phase, where the analysis is largely limited to significant issues and reasonable alternatives.

Pertinent environmental issues, which will receive specific attention during the EIA phase through a detailed quantitative assessment and relevant specialist studies (where deemed necessary), are discussed in the Scoping Report.

Cumulative impacts are identified by combining the potential environmental implications of the proposed Makalu B development with the impacts of projects and activities that have occurred in the past, are currently occurring, or are proposed in the future within the project area.

A methodology to quantitatively assess the potential impacts is also provided, which will be employed during the EIA phase.

## PLAN OF STUDY FOR EIA

The Scoping Report is concluded with a Plan of Study, which explains the approach to be adopted to conduct the EIA for the proposed project in accordance with the following pertinent tasks and considerations:

- Key environmental issues identified during the Scoping Phase to be investigated further;
- Feasible alternatives to be assessed during EIA Phase;
- Specialist studies to be undertaken, which include –
  - Aquatic Impact Assessment;
  - Terrestrial Ecological Impact Assessment;
  - Heritage Impact Assessment;
  - Agricultural Impact Assessment;
  - Avifauna Impact Assessment; and
  - Socio-Economic Impact Assessment.
- Public Participation process to be followed;
- Contents of the EIA Report;
- Consultation with authorities; and
- EIA timeframes.

## CONCLUSION

Key outcomes of the Scoping phase for the proposed Makalu B substation and Tx loop-in lines are as follows:

- Stakeholders were effectively identified and were afforded adequate opportunity to participate in the scoping process;
- Alternatives for achieving the objectives of the proposed activity were duly considered.
- Significant issues pertaining specifically to the pre-construction, construction and operational phases of the project were identified;
- Sensitive elements of the environment to be affected by the project were identified;

- A Plan of Study was developed to explain the approach to executing the EIA phase, which also includes the Terms of Reference for the identified specialist studies; and
- The scoping exercise set the priorities for the ensuing EIA phase.

It is the opinion of the EIA team that Scoping was executed in an objective manner and that the process and report conform to the requirements of Regulation 21 and Appendix 2 of GN No. 326 (7 April 2017), respectively. It is also believed that the Plan of Study for EIA is comprehensive and will be adequate to address the significant issues identified during Scoping, to select the Best Practicable Environmental Option, and to ultimately allow for informed decision-making.

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# LIST OF ACRONYMS & ABBREVIATIONS

| | |
|---|---|
| **AIDS** | Acquired Immunodeficiency Syndrome |
| **AOL** | Anglo Operations Limited |
| **BID** | Background Information Document |
| **BPEO** | Best Practicable Environmental Option |
| **CBA** | Critical Biodiversity Area |
| **CR** | Critically Endangered |
| **°C** | Degrees Celsius |
| **CLN** | Customer Load Network |
| **DAFF** | Department of Agriculture, Forestry and Fisheries |
| **DARD** | Department of Agriculture and Rural Development |
| **DEA** | Department of Environmental Affairs |
| **DESTEA** | Department of Economic, Small Business Development, Tourism and Environmental Affairs |
| **DMR** | Department of Mineral Resources |
| **DPRT** | Department of Police, Roads and Transport |
| **DWA** | Department of Water Affairs |
| **DWS** | Department of Water and Sanitation |
| **Dx** | Distribution |
| **EAP** | Environmental Assessment Practitioner |
| **EIA** | Environmental Impact Assessment |
| **EIR** | Environmental Impact Report |
| **EMF** | Electromagnetic Field |
| **EMPr** | Environmental Management Programme |
| **EN** | Endangered |
| **ESA** | Ecological Support Area |
| **FS** | Free State |
| **FSHRA** | Free State Heritage Resources Authority |
| **GIS** | Geographical Information System |
| **GN** | Government Notice |
| **Ha** | Hectare |
| **HIV** | Human Immunodeficiency Virus |
| **IAP** | Interested and Affected Party |
| **IAPs** | Interested and Affected Parties |
| **IBA** | Important Bird Area |
| **IDP** | Integrated Development Plan |
| **km** | Kilometre |
| **kV** | Kilovolts |

| | |
|---|---|
| **m** | Metre |
| **masl** | Meters above sea level |
| **MW** | Megawatt |
| **NEMA** | National Environmental Management Act (Act No. 107 of 1998) |
| **NFEPA** | National Freshwater Ecosystem Priority Area |
| **No.** | Number |
| **NT** | Near Threatened |
| **NVC** | New Vaal Colliery |
| **NWA** | National Water Act (Act No. 36 of 1998) |
| **OHS** | Occupational Health and Safety |
| **PES** | Present Ecological State |
| **PM10** | Particulate matter with an aerodynamic diameter of less than 10 µm |
| **Ptn** | Portion |
| **RE** | Remainder |
| **SAAB** | South African Association of Botanists |
| **SACNASP** | South African Council for Natural Scientific Professions |
| **SAIEES** | South African Institute of Ecologists and Environmental Scientists |
| **SAHRIS** | South African Heritage Resources Information System ( |
| **SANBI** | South African National Biodiversity Institute |
| **SDF** | Spatial Development Framework |
| **SIP** | Strategic Integrated Project |
| **TDP** | Transmission Development Plan |
| **ToR** | Terms of Reference |
| **Tx** | Transmission |
| **VU** | Vulnerable |
| **WMA** | Water Management Area |

# 1 PURPOSE OF THIS DOCUMENT

Nemai Consulting was appointed by Eskom Holdings SOC Limited to conduct the environmental assessments, in terms of Government Notice (GN) No. 326 (7 April 2017), for the following proposed projects in Sasolburg, Free State (FS) Province:

1. The development of the Makalu B substation and associated Transmission Loop-in Lines; and
2. The Makalu B Distribution Line Strengthening.

This document serves as the draft Scoping Report for the proposed development of the Makalu B substation and associated Transmission loop-in lines. A separate Basic Assessment will be undertaken for the Distribution Lines, however, a combined public participation process is being conducted for both of these projects.

The purpose of Scoping, which constitutes the first phase of the overall Environmental Impact Assessment (EIA) process, includes the following (amongst others):

- Identify the legal framework in terms of the proposed project;
- Identify and engage with Interested and Affected Parties (IAPs) and allow for adequate participation in the process;
- Assess the receiving environment in terms of current state and potential positive or negative impacts;
- Duly consider alternatives for achieving the project's objectives;
- Identify significant issues to be investigated further during the execution of the EIA phase;
- Determine the scope of the ensuing EIA phase, in terms of specialist studies, public participation, assessment of impacts and appraisal of alternatives; and
- Allow for informed decision-making with regard to the EIA process.

# 2 DOCUMENT ROADMAP

As a minimum, the Scoping Report aims to satisfy the requirements stipulated in Appendix 2 of GN No. 326 (7 April 2017). **Table 1** presents the document's composition in terms of the aforementioned regulatory requirements.

**Table 1: Scoping Report Roadmap**

| Chapter | Title | Correlation with GN No. 326, Appendix 2 | Overview |
|---|---|---|---|
| 1 | Purpose of this Document | – | – |
| 2 | Document Roadmap | – | – |
| 3 | Project Background and Motivation | 2(1)(f) | A motivation for the need and desirability for the proposed development. |
| 4 | Project Location | 2(1)(b) & 2(1)(c) | A description of the location of the activity. |
| 5 | Legislation and Guidelines Considered | 2(1)(e) | A description of the policy and legislative context within which the development is proposed. |
| 6 | Scoping and EIA Process | 2(1)(a) | Details of Environmental Assessment Practitioner (EAP) who prepared the report and the expertise of the EAP. |
| 7 | Assumptions & Limitations | – | – |
| 8 | Need & Desirability | 2(1)(f) | A motivation for the need and desirability for the proposed development. |
| 9 | Project Description | 2(1)(c) & 2(1)(d) | A description of the scope of the proposed activity. |
| | | 2(1)(g)(i) | Details of all the alternatives considered. |
| | | 2(1)(g)(vii) | Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected. |
| 10 | Profile of the Receiving Environment | 2(1)(g)(iv) | Environmental attributes associated with the alternatives. |
| | | 2(1)(g)(vii) | Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected. |
| 11 | Public Participation | 2(1)(g)(ii) | Details of the public participation process. |
| | | 2(1)(g)(iii) | A summary of the issues raised by IAPs. |
| 12 | Environmental Issues | 2(1)(g)(v) | Impacts and risks identified for each alternative. |
| | | 2(1)(g)(vii) | Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected. |
| | | 2(1)(g)(vi) | The methodology used in determining and ranking the potential environmental impacts and risks associated with the alternatives. |
| 13 | Plan of Study for EIA | 2(1)(h) | A plan of study for undertaking the environmental impact assessment process. |
| 14 | EAP Affirmation | 2(1)(i) and 2(1)(j) | An undertaking under oath or affirmation by the EAP. |
| N/A | | 2(1)(k) | Where applicable, any specific information required by the competent authority. |
| N/A | | 2(1)(l) | Any other matter required in terms of section 24(4)(a) and (b) of the Act. |

Note that the following sections of Appendix 2 of GN No. 326 (7 April 2017) will be investigated further and reported on in the Environmental Impact Report (EIR), following the execution of the relevant specialist studies and targeted public participation:

- Section 2(1)(g)(v) - *The impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts-*
  *(a) can be reversed;*
  *(b) may cause irreplaceable loss of resources; and*
  *(c) can be avoided, managed or mitigated.*
- Section 2(1)(g)(vii) - *Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.*
- Section 2(1)(g)(viii) - *The possible mitigation measures that could be applied and level of residual risk.*
- Section 2(1)(g)(ix) - *The outcome of the site selection matrix.*
- Section 2(1)(g)(xi) - *A concluding statement indicating the preferred alternatives, including preferred location of the activity.*

# 3 PROJECT BACKGROUND AND MOTIVATION

High voltage Transmission (Tx) Lines (i.e. 765 kV, 400 kV and 275 kV) transmit electricity, which is predominantly generated at the power stations located within the Mpumalanga Province, to Eskom's major substations. At these major substations, the voltage is stepped down to a lower voltage and transmitted to smaller substations via Distribution (Dx) Lines (e.g. 132 kV, 88 kV and 66 kV). The voltage is again stepped down at substations for distribution to the various users via Reticulation Lines. Refer to **Figure 1** for an illustration of the various components associated with the transmission and distribution of electricity.

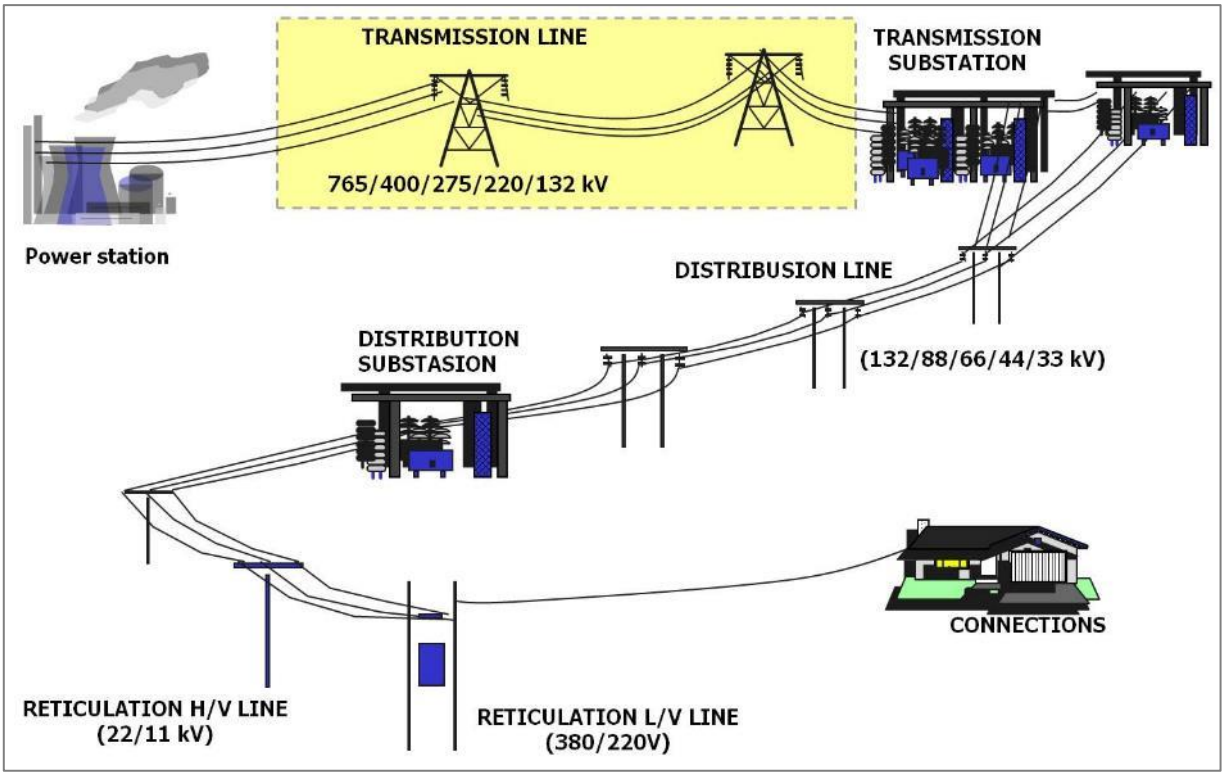


**Figure 1:** **Illustration of the transmission and distribution of electricity**

The existing Makalu substation (shown in **Figure 2**) forms part of the Sasolburg Customer Load Network (CLN) in the FS Grid. The current nature of the load at Makalu substation is predominately industrial / mining, as well as small commercial, residential and traction loads. Makalu substation is connected to the Tx network by four 275 kV lines, namely two from Lethabo Power Station, one to Everest substation and one to Scafell substation. The Vaal Triangle CLN Network is shown in **Figure 2**.

The substation supplies mainly Sasol loads with the major loads being (see **Figure 3**):

- Sasol Chemical Industries East and West (supplied from Sasolburg and Sasol East substations);
- Sasol Polymers (supplied from Coalplex and Afrex substations); and
- National Petroleum Refiners (supplied from Natref Substation).

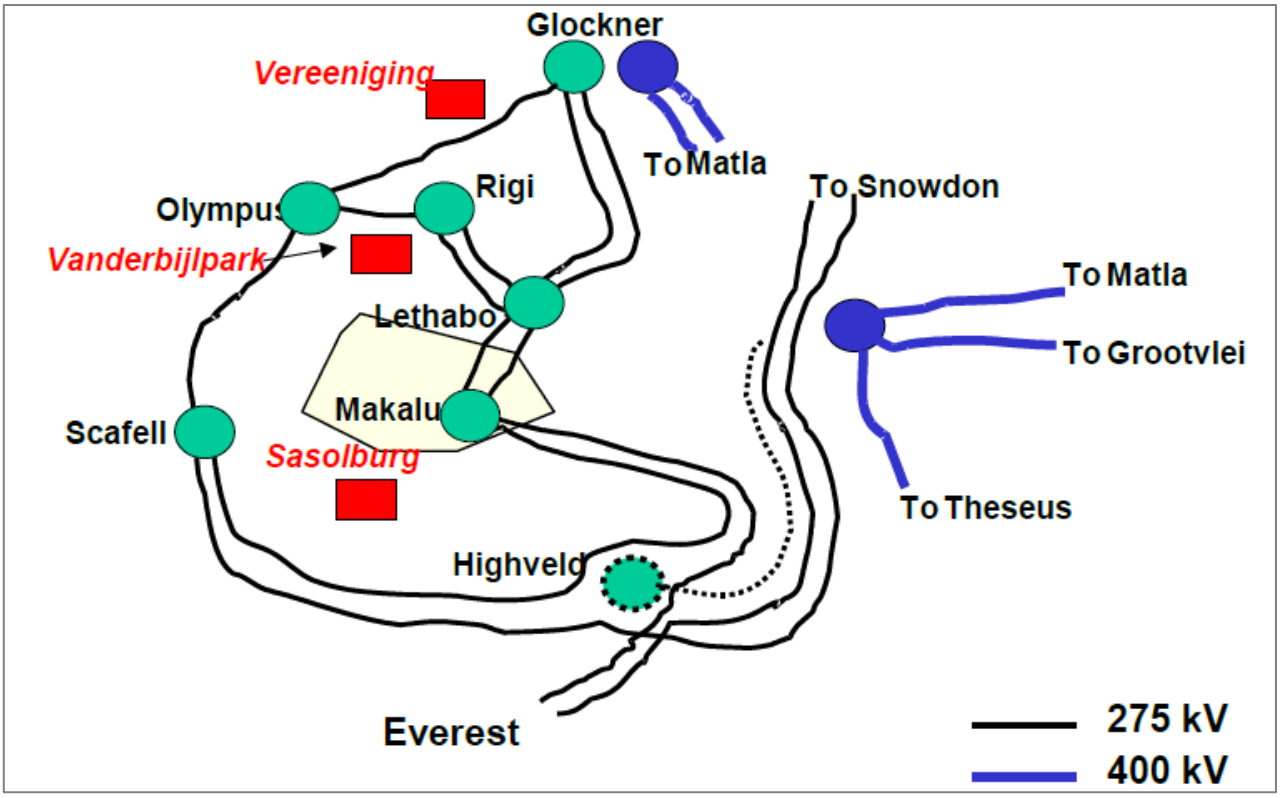


**Figure 2:** Vaal Triangle CLN Network


**Figure 3:** Dx loads fed from Makalu substation

In 2012 studies indicated that the 88 kV fault levels are higher than the equipment rating at Makalu substation which will result in the 275 / 88 kV transformation at Makalu substation becoming unfirm in 2022 and the Dx network will result in constraints. A study was initiated to assess a number of options. The findings of the study indicated that Makalu B substation should be established such that load and current embedded generation be shifted off the existing substation to the new proposed substation. This includes a loop in of one of the existing 275 kV Lethabo – Makalu Lines. This forms the focus of this Scoping Report. This change requires that the existing Dx network be reconfigured, which constitutes the scope of a separate Basic Assessment. The project is being planned jointly by both Eskom Transmission and Distribution in order to ensure alignment, however, each project will be implemented separately by the relevant division.

# 4 PROJECT LOCATION

## 4.1 Geographical Context

The project is located within the Metsimaholo Local Municipality and Fezile Dabi District Municipality, in the north of FS (see **Figure 4**).

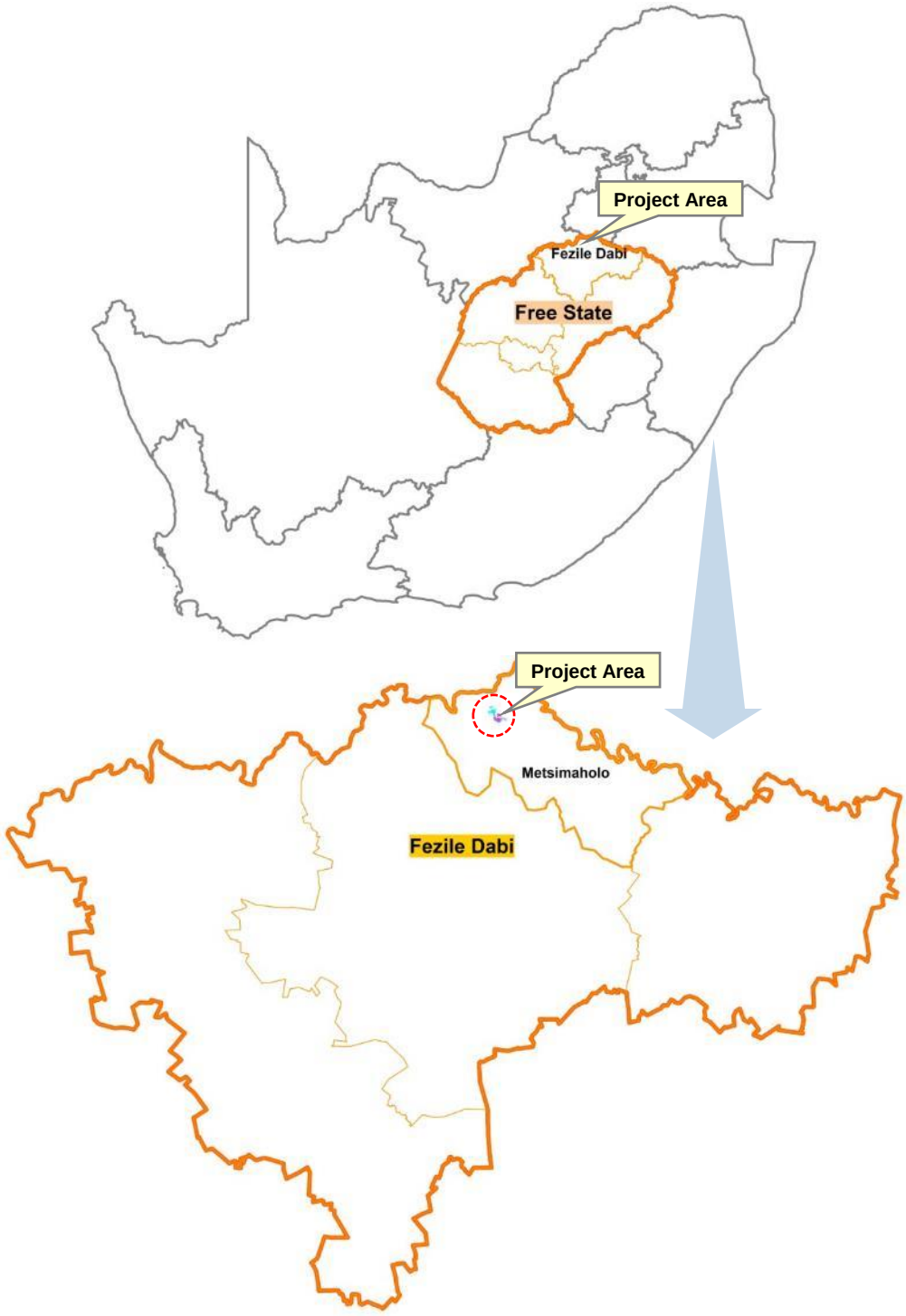


**Figure 4:** **National, provincial and municipal maps showing the project area**

The town of Sasolburg, which forms part of the Vaal Triangle (Vanderbijlpark, Vereeniging and Sasolburg regions), is situated to the west of the project area. The proposed infrastructure is bordered by petro-chemical industries to the west and is located on a combination of agricultural and undeveloped land (see **Figure 5**).

Details of the properties that are directly affected by and adjacent to the proposed development are contained in **Table 2** (see cadastral map in **Figure 6**).

**Table 2: Properties directly affected by and adjacent to the proposed development**

| No. | SG Code | Farm Name & No. | Erf / Ptn |
|---|---|---|---|
| 1 | F01600000000007800000 | Waagstuk 78 | |
| 2 | F01600000000004900000 | Dayspring 49 | |
| 3 | F01600000000000200000 | Driefontein 2 | RE/2 |
| 4 | F01600080000803100000 | | RE/8031 |
| 5 | F01600080000803100015 | | 15/8031 |
| 6 | F01600000000025900000 | Zandfontein 259 | RE/259 |
| 7 | F01600000000025900009 | Zandfontein 259 | 9/259 |
| 8 | F01600000000113800001 | Verdun 1138 | 1/1138 |
| 9 | F01600000000023800000 | Vaalbank 238 | |
| 10 | F01600000000808000001 | | 1/8080 |
| 11 | F01600080000803900000 | | RE/8039 |
| 12 | F01600080000804500000 | | RE/8045 |

The EIA study area includes a 1 km corridor around the Tx lines (i.e. 500 m on either side of the centre line), as well as a 1km x 1km buffer around the alternative substation sites, as shown in **Figure 5**. This is to allow for any possible deviations from the current proposed alignment of the power line within this corridor or location of the substation within this buffer area, which may be necessary due to the following factors:

- Findings of the impact assessment and specialist studies;
- Outcome of Eskom negotiations with landowners; and
- Technical requirements.

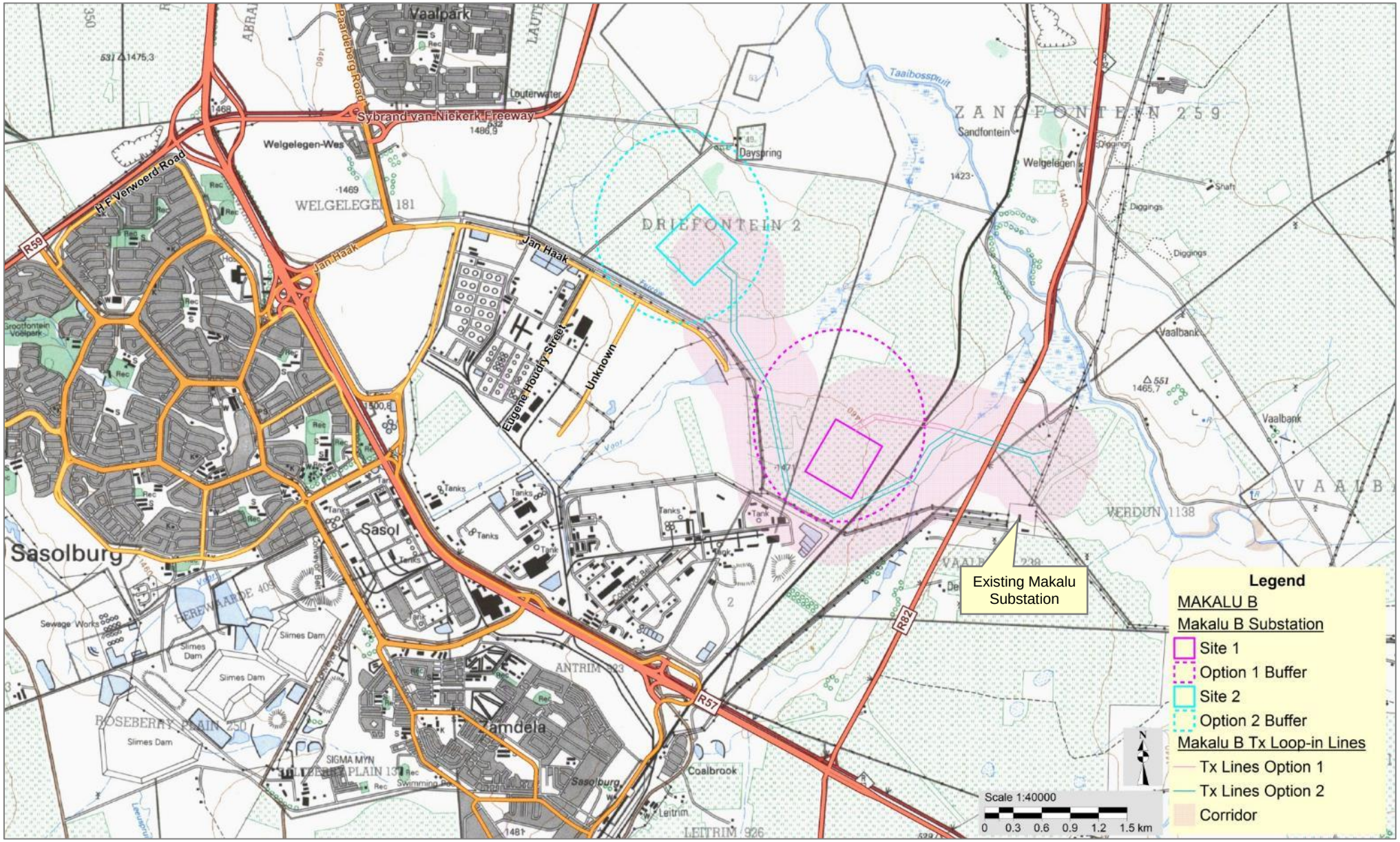


**Figure 5: Locality map**

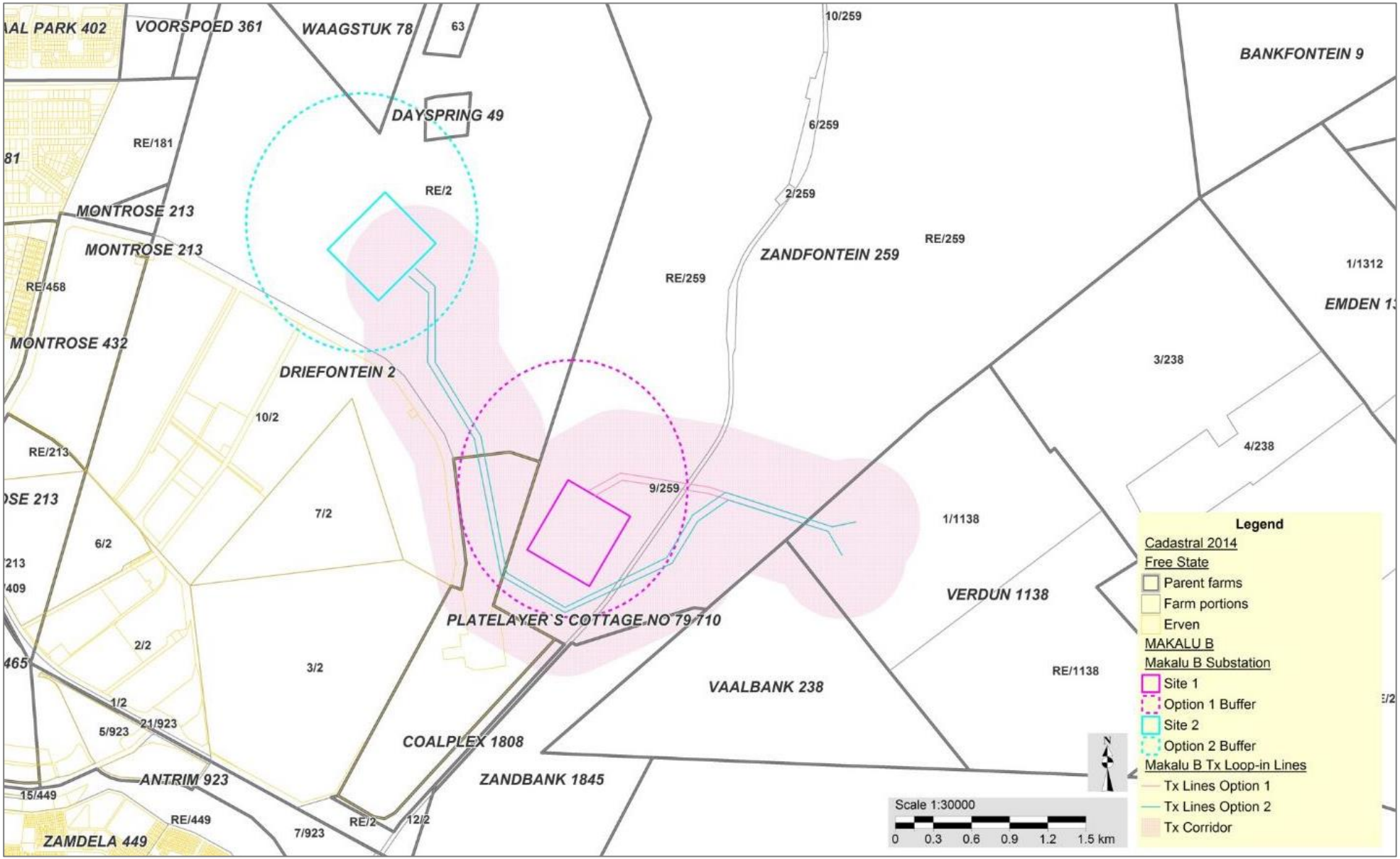


**Figure 6: Cadastral map**

# 5 LEGISLATION AND GUIDELINES CONSIDERED

## 5.1 Legislation

### *5.1.1 Environmental Statutory Framework*

The legislation that has possible bearing on the proposed project from an environmental perspective is captured in **Table 3** below. **Note:** *this list does not attempt to provide an exhaustive explanation, but rather represents an identification of the most appropriate sections from pertinent pieces of legislation*.

**Table 3: Environmental Statutory Framework**

| Legislation | Description and Relevance | |
|---|---|---|
| Constitution of the Republic of South Africa, (No. 108 of 1996) | • Chapter 2 – Bill of Rights.<br>• Section 24 – Environmental Rights. | |
| National Environmental Management Act (NEMA) (No. 107 of 1998) | • Section 24 – Environmental Authorisation (control of activities which may have a detrimental effect on the environment).<br>• Section 28 – Duty of care and remediation of environmental damage.<br>• Environmental management principles.<br>• Authorities – Department of Environmental Affairs (DEA) (national) and FS State Department of Economic, Small Business Development, Tourism and Environmental Affairs (DESTEA) (provincial). | |
| GN No. 326 (7 April 2017) | • Purpose - regulate the procedure and criteria as contemplated in Chapter 5 of NEMA relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for environmental authorisations for the commencement of activities, subjected to EIA, in order to avoid or mitigate detrimental impacts on the environment, and to optimise positive environmental impacts, and for matters pertaining thereto. | |
| GN No. 327 (7 April 2017) (Listing Notice 1) | • Purpose - 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 NEMA.<br>• The investigation, assessment and communication of potential impact of activities must follow the procedure as prescribed in regulations 19 and 20 of the EIA Regulations published in terms of section 24(5) of the Act. However, according to Regulation 15(3) of GN No. 327, S&EIR must be applied to an application if the application is for two or more activities as part of the same development for which S&EIR must already be applied in respect of any of the activities.<br>• Activities under Listing Notice 1 that are relevant to this project follow. | |
| | *GN No. 327 – Activity no. 12:*<br><br>*The development of -*<br>*(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or*<br>*(ii) infrastructure or structures with a physical footprint of 100 square metres or more;*<br><br>*where such development occurs—*<br>*(a) within a watercourse;*<br>*(b) in front of a development setback; or*<br>*(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; —*<br><br>*excluding—* | • *Towers may be built within 32 m from watercourse(s).*<br>• *Access roads may traverse watercourse(s).* |

| Legislation | Description and Relevance | |
|---|---|---|
| | *(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;*<br>*(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;*<br>*(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;*<br>*(dd) where such development occurs within an urban area;*<br>*(ee) where such development occurs within existing roads, road reserves or railway line reserves; or*<br>*(ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.* | |
| | *GN No. 327 – Activity no. 14:*<br><br>*The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.* | *"Dangerous goods" that are likely to be associated with the greater project, are fuel stores during the construction phase or hazardous chemical substances at the substation during the operational phase. Threshold of 80 $m^3$ expected to be exceeded.* |
| | *GN No. 327 – Activity no. 19:*<br><br>*The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;*<br><br>*but excluding where such infilling, depositing, dredging, excavation, removal or moving—*<br>*(a) will occur behind a development setback;*<br>*(b) is for maintenance purposes undertaken in accordance with a maintenance management plan;*<br>*(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies;*<br>*(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or*<br>*(e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.* | • *Towers may be built within 32 m from watercourse(s).*<br>• *Access roads may traverse watercourse(s).* |
| | *GN No. 327 – Activity no. 24:*<br><br>*The development of a road—*<br>*(i) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or*<br>*(ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;*<br><br>*but excluding a road—* | *Access roads to the various sites (construction and operational phases) are expected to exceed thresholds. Dimensions to be confirmed.* |

| Legislation | Description and Relevance | |
|---|---|---|
| | *(a) which is identified and included in activity 27 in Listing Notice 2 of 2014;*<br>*(b) where the entire road falls within an urban area; or*<br>*(c) which is 1 kilometre or shorter.* | |
| | *GN No. 327 – Activity no. 27:*<br><br>*The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-*<br>*(i) the undertaking of a linear activity; or*<br>*(ii) maintenance purposes undertaken in accordance with a maintenance management plan.* | *Clearance of large areas associated with the construction footprint of the substation. Status of vegetation to be confirmed as part of the Terrestrial Ecological Study.* |
| | *GN No. 327 – Activity no. 28:*<br><br>*Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:*<br>*(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or*<br>*(ii) <u>will occur outside an urban area, where the total land to be developed is bigger than 1 hectare</u>;*<br><br>*excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.* | *Footprint of project on agricultural land. This includes the alternative substation sites (500m x 500m) that mostly occur on land used for agricultural purposes, outside of an urban area.* |
| | *GN No. 327 – Activity no. 30:*<br><br>*Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).* | *Possible occurrence of sensitive biodiversity features at affected areas. To be confirmed as part of the Terrestrial Ecological Study.* |
| | *GN No. 327 – Activity no. 48:*<br><br>*The expansion of—*<br>*(i) <u>infrastructure or structures where the physical footprint is expanded by 100 square metres or more</u>; or*<br>*(ii) dams or weirs, where the dam or weir, including infrastructure and water surface area, is expanded by 100 square metres or more;*<br><br>*where such expansion occurs—*<br>*(a) within a watercourse;*<br>*(b) in front of a development setback; or*<br>*(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;*<br><br>*excluding—*<br>*(aa) the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;*<br>*(bb) where such expansion activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;*<br>*(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;* | *Upgrade of existing bridge(s) within 32 m of watercourses along access road(s). To be confirmed.* |

| Legislation | Description and Relevance | |
|---|---|---|
| | *(dd) where such expansion occurs within an urban area; or*<br>*(ee) where such expansion occurs within existing roads, road reserves or railway line reserves.* | |
| | *GN No. 327 – Activity no. 56:*<br><br>*The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre-*<br>*(i) where the existing reserve is wider than 13,5 meters; or*<br>*(ii) where no reserve exists, where the existing road is wider than 8 metres;*<br><br>*excluding where widening or lengthening occur inside urban areas.* | *Access roads to the various sites (construction and operational phases). Dimensions to be confirmed.* |
| | *GN No. 327 – Activity no. 67:*<br><br>*Phased activities for all activities—*<br>*(i) listed in this Notice, which commenced on or after the effective date of this Notice or similarly listed in any of the previous NEMA notices, which commenced on or after the effective date of such previous NEMA Notices;*<br>*excluding the following activities listed in this Notice-*<br>*17(i)(a-d); 17(ii)(a-d); 17(iii)(a-d); 17(iv)(a-d); 17(v)(a-d); 20; 21; 22; 24(i); 29; 30; 31; 32; 34; 54(i)(a-d); 54(ii)(a-d); 54(iii)(a-d); 54(iv)(a-d); 54(v)(a-d); 55; 61; 64; and 65; or*<br>*(ii) listed as activities 5, 7, 8(ii), 11, 13, 16, 27(i) or 27(ii) in Listing Notice 2 of 2014 or similarly listed in any of the previous NEMA notices, which commenced on or after the effective date of such previous NEMA Notices;*<br><br>*where any phase of the activity was below a threshold but where a combination of the phases, including expansions or extensions, will exceed a specified threshold.* | *Possible phased activities that may collectively trigger this listed activity.* |
| GN No. 325 (7 April 2017) (Listing Notice 2) | • Purpose - 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 NEMA.<br>• The investigation, assessment and communication of the potential impact of activities must follow the procedure as prescribed in regulations 21, 22, 23 and 24 of the EIA Regulations published in terms of section 24(5) of the Act, unless otherwise indicated by the Minister in a government notice.<br>• Activities under Listing Notice 2 that are relevant to this project follow. | |
| | *GN No. 325 – Activity no. 4:*<br><br>*The development and related operation of facilities or infrastructure, for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.* | *"Dangerous goods" that are likely to be associated with the greater project, are hazardous chemical substances at the substation during the operational phase.* |
| | *GN. No. 325 – Activity no. 9:*<br><br>*The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is —*<br>*(a) temporarily required to allow for maintenance* | *The project includes the proposed development of two 10 km 275 kV loop-in lines to the new Makalu B Station. These lines are located outside of Sasolburg and Zamdela (outside the urban edge).* |

| Legislation | Description and Relevance | |
|---|---|---|
| | *of existing infrastructure;*<br>*(b) 2 kilometres or shorter in length;*<br>*(c) within an existing transmission line servitude; and*<br>*(d) will be removed within 18 months of the commencement of development.* | |
| | *GN No. 325 – Activity no. 15:*<br><br>*The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for-*<br>*(i) the undertaking of a linear activity; or*<br>*(ii) maintenance purposes undertaken in accordance with a maintenance management plan.* | *Cumulative area to be cleared for entire project (except linear components) exceeds 20 hectares.*<br><br>*Status of vegetation to be confirmed as part of the Terrestrial Ecological Study.* |
| GN No. 324 (7 April 2017) (Listing Notice 3) | • Purpose - list activities and identify competent authorities under sections 24(2), 24(5) and 24D of NEMA, where environmental authorisation is required prior to commencement of that activity in specific identified geographical areas only.<br>• The investigation, assessment and communication of potential impact of activities must follow the procedure as prescribed in regulations 19 and 20 of the Environmental Impact Assessment Regulations published in terms of section 24(5) of the Act. However, according to Regulation 15(3) of GN No. 326, S&EIR must be applied to an application if the application is for two or more activities as part of the same development for which S&EIR must already be applied in respect of any of the activities.<br>• Activities under Listing Notice 3 that are relevant to this project follow. | |
| | *GN No. 324 – Activity no. 4(b):*<br><br>*The development of a road wider than 4 metres with a reserve less than 13,5 metres.* | *Access roads to the various sites (construction and operational phases). Dimensions to be confirmed.*<br><br>*Activity to be confirmed following Terrestrial Ecological Study.* |
| | *GN No. 324 – Activity no. 10(b):*<br><br>*The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.* | *"Dangerous goods" that are likely to be associated with the greater project, are fuel stores during the construction phase or hazardous chemical substances at the substation during the operational phase.*<br><br>*Activity to be confirmed following Terrestrial Ecological Study.* |
| | *GN No. 324 – Activity no. 12(b):*<br><br>*The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.* | *Clearance of large areas associated with the construction footprint.*<br><br>*Activity to be confirmed following Terrestrial Ecological Study.* |
| | *GN No. 324 – Activity no. 14(b):*<br><br>*The development of—*<br>*(i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or*<br>*(ii) infrastructure or structures with a physical footprint of 10 square metres or more;*<br><br>*where such development occurs—*<br>*(a) within a watercourse;*<br>*(b) in front of a development setback; or*<br>*(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;*<br><br>*excluding the development of infrastructure or structures within existing ports or harbours that will not* | • *Towers may be built within 32 m from watercourse(s).*<br>• *Access roads may traverse watercourse(s).*<br><br>*Activity to be confirmed following Terrestrial Ecological Study.* |

| Legislation | Description and Relevance | |
|---|---|---|
| | *increase the development footprint of the port or harbour.* | |
| | *GN No. 324 – Activity no. 18(b):*<br><br>*The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.* | *Access roads to the various sites (construction and operational phases) are expected to exceed thresholds. Dimensions to be confirmed.*<br><br>*Activity to be confirmed following Terrestrial Ecological Study.* |
| | *GN No. 324 – Activity no. 23(b):*<br><br>*The expansion of—*<br>*(i) dams or weirs where the dam or weir is expanded by 10 square metres or more; or*<br>*(ii) infrastructure or structures where the physical footprint is expanded by 10 square metres or more;*<br><br>*where such expansion occurs—*<br>*(a) within a watercourse;*<br>*(b) in front of a development setback adopted in the prescribed manner; or*<br>*(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;*<br><br>*excluding the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.* | *Upgrade of existing bridge(s) along access road(s).*<br><br>*Activity to be confirmed following Terrestrial Ecological Study.* |
| | *GN No. 324 – Activity no. 26:*<br><br>*Phased activities for all activities—*<br>*i. listed in this Notice and as it applies to a specific geographical area, which commenced on or after the effective date of this Notice; or*<br>*ii. similarly listed in any of the previous NEMA notices, and as it applies to a specific geographical area, which commenced on or after the effective date of such previous NEMA Notices—*<br><br>*where any phase of the activity was below a threshold but where a combination of the phases, including expansions or extensions, will exceed a specified threshold; —*<br><br>*excluding the following activities listed in this Notice— 7; 8; 11; 13; 20; 21; and 24.* | *Possible phased activities that may collectively trigger this listed activity.*<br><br>*Activity to be confirmed following Terrestrial Ecological Study.* |
| National Water Act (Act No. 36 of 1998) | • Chapter 3 – Protection of water resources.<br>• Section 19 – Prevention and remedying effects of pollution.<br>• Section 20 – Control of emergency incidents.<br>• Chapter 4 – Water use.<br>• Authority – Department of Water and Sanitation (DWS). | |
| National Environmental Management Air Quality Act (Act No. 39 of 2004) | • Air quality management<br>• Section 32 – Dust control.<br>• Section 34 – Noise control.<br>• Authority – DEA. | |
| National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) | • Management and conservation of the country's biodiversity.<br>• Protection of species and ecosystems.<br>• Authority – DEA. | |
| National Environmental Management: Waste Act (Act No. 59 of 2008) | • Chapter 5 – licensing requirements for listed waste activities - GN No. R. 921 of 29 November 2013.<br>• Authority – Minister (DEA) or MEC (provincial authority) | |

| Legislation | Description and Relevance |
|---|---|
| National Forests Act (No. 84 of 1998) | • Section 15 – Authorisation required for impacts to protected trees.<br>• Authority – Department of Agriculture, Forestry and Fisheries (DAFF) |
| Occupational Health & Safety Act (Act No. 85 of 1993) | • Provisions for Occupational Health & Safety<br>• Authority – Department of Labour. |
| National Heritage Resources Act (Act No. 25 of 1999) | • Section 34 – protection of structure older than 60 years.<br>• Section 35 – protection of heritage resources.<br>• Section 36 – protection of graves and burial grounds.<br>• Section 38 – Heritage Impact Assessment for linear development exceeding 300m in length; development exceeding 5 000m$^2$ in extent, etc.<br>• Authority – FS Heritage Resources Authority (FSHRA) |
| Conservation of Agricultural Resources Act (Act No. 43 of 1983) | • Control measures for erosion.<br>• Control measures for alien and invasive plant species.<br>• Authority – Department of Agriculture. |
| National Road Traffic Act (Act No. 93 of 1996) | • Authority – Limpopo Department of Public Works, Roads and Infrastructure. |

The relationship between the project and certain key pieces of environmental legislation is discussed in the subsections to follow.

### *5.1.2 National Environmental Management Act*

According to Section 2(3) of the National Environmental Management Act (NEMA) (Act No. 107 of 1998), "*development must be socially, environmentally and economically sustainable*", which means the integration of these three factors into planning, implementation and decision-making so as to ensure that development serves present and future generations.

The proposed Makalu B substation and Tx loop-in lines require authorisation in terms of NEMA and the EIA is being undertaken in accordance the EIA Regulations (2017) that consist of the following:

- ❖ EIA procedure - GN No. 326 (7 April 2017);
- ❖ Listing Notice 1 - GN No. 327 (7 April 2017);
- ❖ Listing Notice 2 - GN No. 325 (7 April 2017); and
- ❖ Listing Notice 3 - GN No. 324 (7 April 2017).

The project triggers activities under Listing Notices 1, 2 and 3, and thus needs to be subjected to a Scoping and EIA process. The listed activities are explained in the context of the project in **Table 3**.

As a conservative approach, all possible activities that could possibly be triggered by the project were included in the Application Form (draft included in **Appendix B**) that was submitted to the Department of Environmental Affairs (DEA), and a refinement of these activities will take place as the EIA process unfolds.

### *5.1.3 National Water Act*

The purpose of the National Water Act (NWA) (Act No. 36 of 1998) is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors:

- 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; and
- Managing floods and droughts.

Part 1 of Chapter 4 (Use of Water) of the NWA sets out general principles for regulating water use. In general a water use must be licensed unless it is listed in Schedule I, is an Existing Lawful Use, is permissible under a General Authorisation, or if a responsible authority waives the need for a licence. The Minister may limit the amount of water which a responsible authority may allocate. In making regulations the Minister may differentiate between different water resources, classes of water resources.

The project entails the following activities that constitute water uses in terms of Section 21 of the NWA:

- Section 21(c) - Impeding or diverting the flow of water in a watercourse (instream works associated with access roads' crossings and placing towers within the regulated area of a watercourse); and
- Section 21(i) - Altering the bed, banks, course or characteristics of a watercourse (instream works associated with access roads' crossings and placing towers within the regulated area of a watercourse); and

Separate approval for water uses will be sought from the DWS.

## 5.2 Guidelines

The following guidelines were considered during the preparation of the Scoping Report:

- Integrated Environmental Management Information Series, in particular Series 2 – Scoping (DEAT, 2002);
- Guideline on Alternatives, EIA Guideline and Information Document Series (DEA&DP, 2010a);
- Guideline on Need and Desirability, EIA Guideline and Information Document Series (DEA&DP, 2010b);

- Integrated Environmental Management Guideline Series 5: Companion to the EIA Regulations 2010 (DEA, 2010a);
- Integrated Environmental Management Guideline Series 7: Public Participation in the EIA Process (DEA, 2010b); and
- Guidelines for Involving Specialists in the EIA Processes Series (Brownlie, 2005).

## 5.3 Regional Plans

The following regional plans were or will be considered during the execution of the EIA (amongst others):

- The municipal Spatial Development Framework (SDF);
- The municipal Integrated Development Plan (IDP);
- Fezile Dabi District Municipality Air Quality Management Plan, 2010;
- FS Biodiversity Plan, 2015; and
- Other relevant national, provincial, district and local policies, strategies, plans and programmes.

## 5.4 Specifications

Eskom technical specifications and environmental standards need to be adhered to and incorporated into the EIA documentation, as relevant.

# 6 SCOPING AND EIA PROCESS

## 6.1 Environmental Assessment Practitioner

Nemai Consulting was appointed by Eskom Holdings SOC Limited as the independent EAP to undertake the environmental assessments associated with Makalu B substation, Tx loop-in line and Dx lines (separate application).

In accordance with Appendix 2, Section 2(1)(a) of GN No. 326 (7 April 2017), this section provides an overview of Nemai Consulting and the company's experience with EIAs, as well as the details and experience of the EAPs that form part of the Scoping and EIA team.

Nemai Consulting is an independent, specialist environmental, social development and Occupational Health and Safety (OHS) consultancy, which was founded in December 1999. The company is directed by a team of experienced and capable environmental engineers, scientists, ecologists, sociologists, economists and analysts. The company has offices in Randburg (Gauteng) and Durban (KZN).

The core members of Nemai Consulting that are involved with the Scoping and EIA process for the project are captured in **Table 4** below, and their respective Curricula Vitae are contained in to **Appendix C**.

**Table 4: Scoping and EIA Core Team Members**

| Name | Qualifications | Experience | Duties |
|---|---|---|---|
| Ms D. Naidoo | B.Sc Eng (Chem) | 19 years | • Project Manager<br>• Quality Control<br>• EIA Process |
| Mr D. Henning | M.Sc (River Ecology) | 15 years | • Project Leader<br>• EIA Process<br>• Scoping & EIA Reports |
| Mr C. Chidley | • B.Sc Eng (Civil);<br>• BA (Economics, Philosophy)<br>• MBA | 20 years | • Quality Review<br>• Technical Input<br>• EMPr |

## 6.2 DEA Pre-application Consultation

A Pre-application Consultation Meeting was convened with DEA on 22 April 2016 (refer to **Appendix D** for a copy of the minutes of the meeting). The purpose of the meeting included the following:

- To provide an overview of the project to DEA;
- To seek clarification regarding certain matters that pertain to the EIA process;
- To determine DEA's requirements; and
- To confirm the process and timeframes.

Key outcomes of above pre-application consultation with DEA include the following:

- The following separate applications would be submitted to DEA, as there are separate units within Eskom undertaking these projects –
  - Makalu B substation and Tx loop-in lines – Scoping and EIA; and
  - Dx lines – Basic Assessment.
- Due to the interrelatedness of the two projects a combined public participation process would be undertaken.
- The Basic Assessment Report for the Dx lines will only be submitted to DEA with the EIA Report for Makalu B substation and Tx lines, and not the Scoping Report, to allow for all alternatives to be reviewed simultaneously.
- If DEA decides to grant the Environmental Authorisation, a corridor would be approved. Eskom would then finalise the alignment of the Tx and Dx power lines based on the site walk down by environmental specialists and the technical team. This is DEA's standard approach to Eskom projects.

## 6.3 Environmental Assessment Triggers

Based on the types of activities involved, as reflected in **Table 3**, the requisite environmental assessment for the project is a Scoping and EIA process. Refer to **Section 5** for the project's legal framework and specifically the activities triggered by the project in terms of Listing Notices 1, 2 and 3 of the EIA Regulations of 2017).

A copy of the Application Form is contained in **Appendix B**.

## 6.4 Environmental Assessment Authorities

In terms of NEMA the lead decision-making authority for the environmental assessment is DEA, as the project proponent (Eskom Holdings SOC Limited) is a state-owned entity.

Due to the geographic location of the project the FS DESTEA is regarded as one of the key commenting authorities in terms of NEMA during the execution of the EIA, and all documentation will thus be copied to this Department (amongst others). Various other authorities with jurisdiction over elements of the receiving environment or project activities (refer to **Section 5.1.1**) will also be consulted during the course of the EIA. Refer to the database of Interested and Affected Parties (IAPs) contained in **Appendix G** for a list of the government departments that were notified during the EIA process to date.

## 6.5 Scoping Process

### *6.5.1 Formal Process*

The initial notification conducted as part of public participation was in terms of GN No. 982 (4 December 2014). However, these regulations were amended by GN No. 326 (7 April 2017). As the application had not been submitted prior to the gazetting of the aforementioned, the process for seeking authorisation under NEMA is being undertaken in terms of the prevailing EIA Regulations of 2017.

An outline of the Scoping and EIA process for the proposed Makalu B substation and Tx loop-in lines is provided in **Figure 7**.

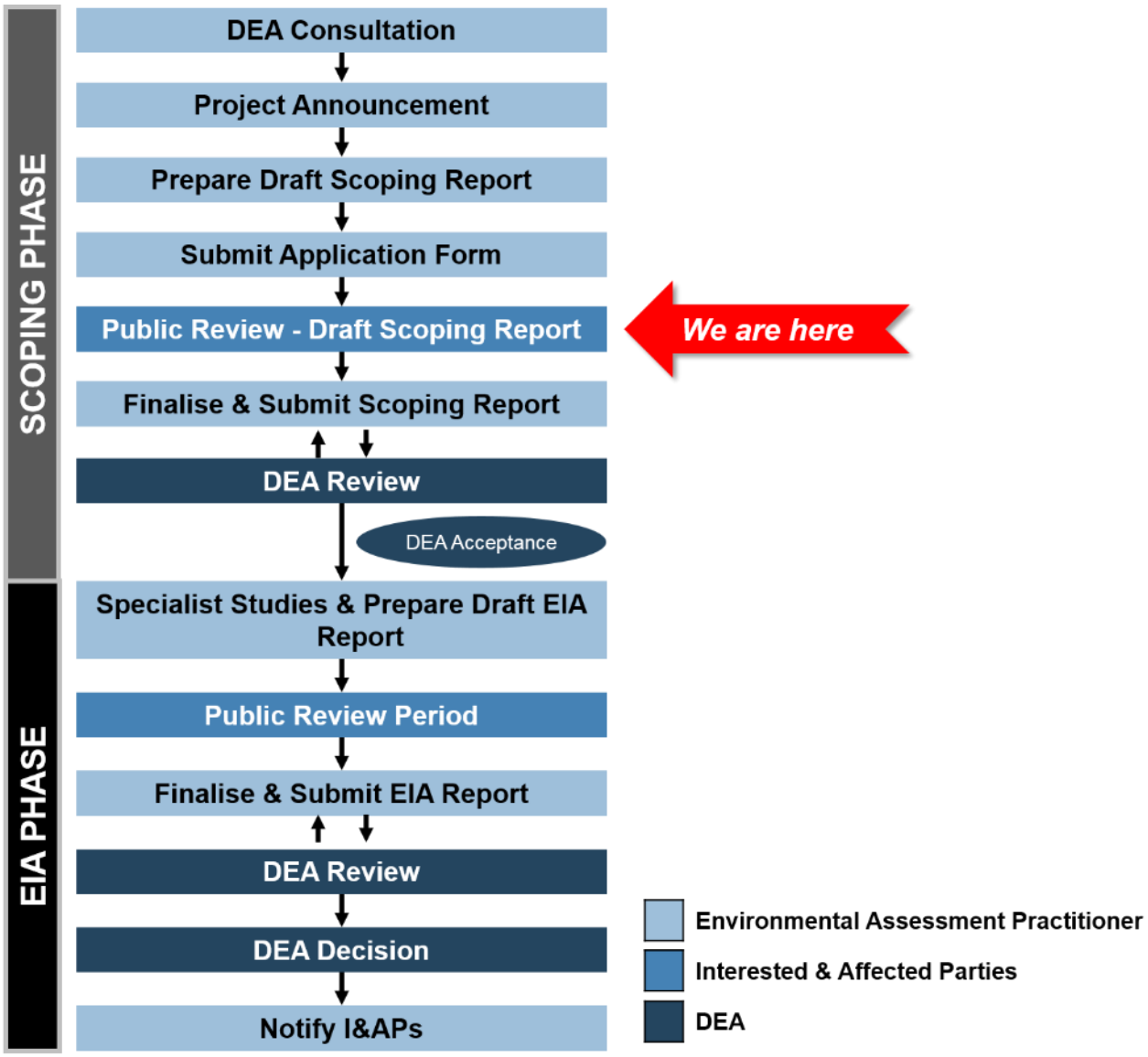


**Figure 7: EIA process**

The purpose of Scoping, which constitutes the first phase of the formal EIA process, is as follows:

- Identify the legal framework in terms of the proposed project;

- Identify and engage with IAPs and allow for adequate participation in the process;
- Duly consider alternatives for achieving the project's objectives;
- Identify significant issues to be investigated further during the execution of the EIA phase;
- Clarify the roles and responsibilities of various stakeholders in the process;
- Determine the scope of the ensuing EIA phase, in terms of specialist studies, public participation, assessment of impacts and appraisal of alternatives; and
- Allow for informed decision-making by DEA and other authorities with regard to the EIA process.

### *6.5.2 Landowner Consent*

According to Regulation 39(1) of GN No. 326 (7 April 2017), if the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land.

This requirement does not apply *inter alia* for linear developments (e.g. pipelines, power lines, roads) or if it is a Strategic Integrated Project (SIP) as contemplated in the Infrastructure Development Act, 2014. Landowner consent was thus not required for the Tx loop-in lines.

The proposed substation Site 1 and Site 2 are located on land that belongs to Anglo Operations Limited (AOL). Proof of landowner consent is contained in **Appendix F**.

### *6.5.3 Landowner Notification*

The details of the various properties affected by the project are provided in **Table 2**. The details of the affected landowners are included in the IAPs database contained in **Appendix G**.

Proof of written notification to the landowners / persons in control of the land is included in **Appendix J**.

### *6.5.4 Application Form*

A copy of the Application Form, which was submitted to DEA, is provided in **Appendix B**.

The Application Form makes provision for all the activities associated with the project and the following associated works:

1. All the construction activities at the various sites;
2. Construction camp(s);
3. Storage facilities;
4. Storage of hazardous materials;
5. Construction plant and equipment; and
6. Access roads.

The activities triggered were confirmed based on the following:

- Project description;
- Information provided by Eskom in terms of project planning and design; and
- Feedback received from DEA and the other environmental authorities.

### *6.5.5 Screening of Alternatives*

Alternatives are the different ways in which the project can be executed to ultimately achieve its objectives. Examples could include carrying out a different type of action, choosing an alternative location or adopting a different technology or design for the project.

Based on the Makalu Network Development Plan, Eskom investigated the following six network configurations to possibly address the need for the project:

1 Do nothing, only new loads to be added at Makalu B. Not feasible under system healthy conditions;
2 Shifting load and Generation of Ring 1 and portions of Ring 3 to Makalu B. Build a line from Makalu B to Vaalpark Substation. Rebuild portions of Ring 2. Not feasible under N-1 Conditions;
3 Shifting load and generation form Ring 1 and portions of Ring 3 to Makalu B. Build a line from Makalu B to Vaalpark and from Makalu B to SAR Pumps. Rebuild portions of Ring 2. Customer constrains on SAR Pumps – Sasol East Feeder;
4 Build a line from Makalu B to Afrex and other line to Sasol Industries and one to SAR Pumps. Rebuild Ring 4 and portions of Ring2. Load to be transferred to Makalu B is less than 200kVA;
5 Rebuild Ring 4 to Tern and 2xTern Conductor connected to Makalu B. Rebuild portions of Ring2 to Tern Conductor. Load to be transferred to Makalu B is less than 200kVA; and
6 Upgrade Ring 4 to Twin Kingbird conductor. Shift ring 3 and ring 1 to Makalu B. Shift Sasol West to Makalu B with a LILO configuration.

Configuration 6 was deemed to be the most preferable, as the majority of the Sasol load will be de-loaded to Makalu B, thereby creating enough capacity for Makalu substation to accommodate future load growth.

The feasible options in terms of the substation site and alignment of the Tx loop-in lines are taken forward in the impact prediction, where the potential positive and adverse effects to the environmental features and attributes are examined further. The EIA phase will include a detailed comparative analysis of the project's feasible alternatives that emanate from the Scoping exercise, which will include environmental (with specialist input) and technical evaluations. This will ultimately result in the selection of a Best Practicable Environmental Option (BPEO). Münster (2005) defines BPEO as the alternative that "*provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term*".

See **Section 9** for further discussions on alternatives.

### *6.5.6 Impact Prediction*

The potential environmental impacts associated with the proposed project were identified during the Scoping phase through an appraisal of the following:

- Proposed locations and footprint of the project infrastructure and components, which included site investigations as well as a desktop evaluation with a Geographical Information System (GIS) (various data sources) and aerial photography;
- Activities associated with the project life-cycle (i.e. pre-construction, construction and operation);
- Profile of the receiving environment and the potential sensitive environmental features and attributes;
- Input received during public participation from authorities and IAPs; and
- Legal and policy context.

The Scoping exercise aimed to identify and qualitatively predict significant environmental issues for further consideration and prioritisation during the EIA stage (see **Section 13**). Note that "significance" relates to whether the effect (i.e. change to the environmental feature / attribute) is of sufficient importance that it ought to be considered and have an influence on decision-making.

During the EIA stage a detailed quantitative impact assessment will be conducted via contributions from the project team and requisite specialist studies, and through the application of the impact assessment methodology contained in **Section 14**. Suitable mitigation measures will be identified to manage (i.e. prevent, reduce, rehabilitate and/or compensate) the environmental impacts, and will be included in the EMPr.

## 6.6 Other Applications in Project Area

AOL plans to extend the existing opencast mining operations and pursue new coal reserves to the south of New Vaal Colliery (NVC) (refer to **Figure 35**). This includes the opencast mining of the New Cornelia Block 1 (referred to as "Block 1") coal reserve and the underground mining of the New Cornelia Vaalbank (referred to as "Vaalbank") coal reserve (Golder Associates Africa (Pty) Ltd, 2015). The Makalu B footprint falls within the Cornelia prospecting area and Eskom has engaged with AOL to determine their requirements.

Sasolburg Operations, a division of Sasol South Africa (Pty) Ltd, has proposed the upgrading of the existing Chlor Alkali Tank Farm Road Loading Area at the Midland Site in Sasolburg. A Basic Assessment is currently underway for this project. This project takes place within the existing industrial plant and is thus not affected by Makalu B.

Further information with regards to the above or any additional developments that may influence the project footprint will be included in the EIA Report, as relevant.

# 7 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations accompany the Scoping exercise:

- In accordance with the purpose of Scoping, the report does not include detailed specialist investigations on the receiving environment, which will only form part of the EIA phase. The environment in the project area was primarily assessed in the Scoping phase through site visits and appraisals, desktop screening, incorporating existing information from previous studies, and input received from authorities and IAPs. A refinement of all maps will also be undertaken in the EIA phase, if necessary.
- As the design of the project components is still in feasibility stage, and due to the dynamic nature of the planning environment, the dimensions and layout of the infrastructure may change during the detailed design phase. Provision is made for a 1km buffer around the Tx loop-in lines, as well as a 1km x 1km buffer around the alternative substation sites.

# 8 NEED AND DESIRABILITY

This section serves to expand on the motivation / need and desirability for the proposed development that is provided in **Section 3**. The format contained in the Guideline on Need and Desirability (DEA&DP, 2010b) was used in **Table 5**.

**Table 5: Need and Desirability of the Project**

| No. | Question | Response |
|---|---|---|
| | **NEED ('timing')** | |
| 1. | Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved Spatial Development Framework (SDF) agreed to by the relevant environmental authority? (i.e. is the proposed development in line with the projects and programmes identified as priorities within the IDP). | The Transmission Development Plan (TDP) 2014 – 2023 indicated that load growth in the area will result in the 275 / 88 kV transformation at Makalu substation becoming unfirm in 2022. The introduction of Makalu B and the reconfiguration of the Dx network will result in decreasing the fault level at Makalu substation and enabling embedded generation to be accommodated with ease.<br><br>Electricity provision is one of the key development priorities of the Metsimaholo Local Municipality. Two of the strategies listed in the municipal IDP include (1) addressing electricity bulk infrastructure backlog and (2) electricity network connection and bulk supply. The municipality purchases electricity from Eskom. |
| 2. | Should development, or if applicable, expansion of the town/area concerned in terms of this land use (associated with the activity being applied for) occur here at this point in time? | The proposed footprint of Makalu B falls within an area designated for industrial use, according to the Metsimaholo Local Municipality SDF for 2016 / 2017, and is thus not in conflict with the desired state of the land. The final selected substation site will sterilise land for other development, which will be assessed in the EIA phase. |
| 3. | Does the community/area need the activity and the associated land use concerned (is it a societal priority)? This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate) | The load forecast for Makalu substation 275/88 kV transformation indicates that Makalu substation will exceed N-1 transformation capacity in 2022, which means that Makalu B will need to be in place before then to prevent load problems.<br><br>*See response to no. 1.* |
| 4. | Are the necessary services with appropriate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? | This project is reliant of the strengthening of the Sasolburg network through Tx and Dx refurbishment plans, in order to establish Makalu B. |
| 5. | Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services)? | *See response to no. 1.* |
| 6. | Is this project part of a national programme to address an issue of national concern or importance? | No, it is intended to address local power requirements. |

| No. | Question | Response |
|---|---|---|
| **DESIRABILITY ('placing')** | | |
| 7. | Is the development the best practicable environmental option (BPEO) for this land/site? | The new Makalu B substation is preferred to be close to the 88kV load and thus the alternative sites are located near Sasol West, to the west of the existing Makalu substation.<br><br>A number of factors were considered in selecting the alternative sites for the substation, which included *inter alia* site dimensions, environmental sensitivity, topography, geological and geotechnical characteristics and access.<br><br>The Makalu B footprint falls within the proposed Cornelia prospecting area and Eskom has engaged with AOL to determine their requirements.<br><br>*See response to no. 2.* |
| 8. | Would the approval of this application compromise the integrity of the existing approved municipal IDP and SDF as agreed to by the relevant authorities? | It is not anticipated that the proposed project will contradict or be in conflict with the municipal IDPs and SDFs.<br><br>*See response to no. 2.* |
| 9. | Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g. as defined in EMFs), and if so, can it be justified in terms of sustainability considerations? | The compatibility of the project with the FS Biodiversity Plan (2015) and other environmental management and planning tools will be considered in detail during the EIA phase, following the undertaking of the relevant specialist studies. |
| 10. | Do location factors favour this land use (associated with the activity applied for) at this place? (this relates to the contextualisation of the proposed land use on this site within its broader context). | Yes, as part of the technical analysis a number of locational factors were considered in selecting the alternative sites for the proposed Makalu B substations and associated Tx loop-in lines.<br><br>The specialist studies, as part of the EIA phase, will further investigate the location based on sensitive environmental features and receptors.<br><br>*See response to no. 7.* |
| 11. | How will the activity or the land use associated with the activity applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)? | See compilation of significant environmental issues associated with the proposed project contained in **Section 12.2**. |
| 12. | How will the development impact on people's health and wellbeing (e.g. in terms of noise, odours, visual character and sense of place, etc.)? | |
| 13 | Will the proposed activity or the land use associated with the activity applied for, result in unacceptable opportunity costs? | Opportunity costs, which are associated with the net benefits forgone for the development alternative, will be considered in the Socio-Economic Study during EIA phase. The affected land is rural in nature and primarily used for agricultural purposes. |
| 14 | Will the proposed land use result in unacceptable cumulative impacts? | Cumulative impacts, as considered in **Section 12.3** will be evaluated in the EIA phase. |

# 9 PROJECT DESCRIPTION

## 9.1 General

The proposed project entails reconfiguring the network such that generation and motor loads are supplied at the new Makalu B substation and residential and industrial loads are supplied from the existing Makalu substation.

## 9.2 Substation

### *9.2.1 General*

An electrical substation is a subsidiary station of an electrical generation, transmission and distribution system where voltage is transformed from high to low (or the reverse) for distribution to users (e.g. domestic, commercial). They are self-contained units which are controlled from the main control centres and are mostly in remote areas. They are specially designed to work 24 hours a day without attention and to operate outdoors in all weather conditions.

A substation typically consists of the following components:

- Transformers;
- Circuit breakers;
- Feeder Bay;
- Reactors;
- Busbars;
- Oil holding dams for transformer oils;
- Loop-Out Lines;
- Loop-In Lines;
- Platforms; and
- Buildings.

The following factors are taken into consideration for the siting and design of a substation:

- Site dimensions (ideally the configuration is based on employing conventional Air Insulated Switchgear (AIS) technology);
- Environmental factors (e.g. sensitive environmental features and risks);
- Topography affecting the site grade, stormwater management and communications;
- Geological and geotechnical characteristics of the soil affecting foundations and yard platforms;
- Access and access roads;
- Feeder corridors, especially for overhead lines;
- Environmental factors (including lightning and pollution) affecting system reliability;
- Soil resistivity affecting the earthing design; and
- Telecommunications.

### *9.2.2 Existing Makalu Substation*

The existing Makalu substation (shown in **Figure 8**) is situated on the Farm Vaalbank 238, which is accessed from the R82 to the west. The Transmission station consists out of 4 x160MVA 275/88kv transformers as illustrated in **Figure 9**. The current ages of the transformers are 37, 37, 38 and 1 year old. There are 4 x 275kV lines (2 x Lethabo, 1x Scafell, 1x Everest) and 11 x 88kV feeders and 2 spare feeders.


**Figure 8: Makalu substation (Google Earth image)**

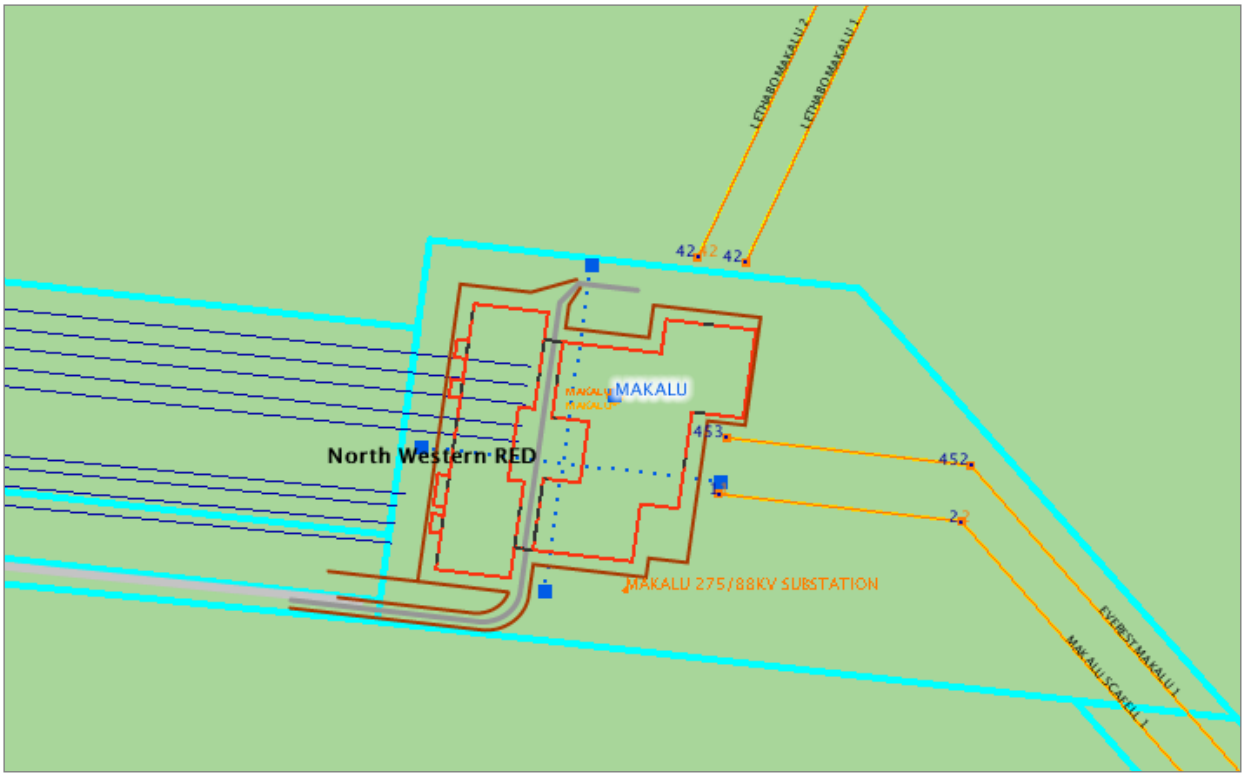


**Figure 9: Makalu substation configuration**

### *9.2.3 Proposed Makalu B Substation*

The area required for the proposed substation is 500 m x 500 m, which covers a total area of 25 Ha. The proposed Makalu B Substation includes the following:

- 2 x 275 kV feeder bays, 2 x 275 kV spare feeder bays, 2 x 275 kV future feeder bays;
- 275 kV busbar and a 88 kV busbar;
- 2 x 275 kV transformer bays, 2 x 275 kV future transformer bays, 2 x 88 kV transformer bays, 2 x 88 kV future transformer bays and 2 x 315 MVA 275/88 kV Transformers (design space for 2 future 2 x 315 MVA 275/88 kV Transformers);
- 7 x 88 kV feeder bays to shift load off Makalu substation, 2 x 88 kV spare feeder bays, 2 x 88 kV future feeder bays;
- Make provision for Fault limiting reactors on the 88 kV busbar;
- Establish control room and yard with associated equipment;
- Install new terrace, fencing and earthworks for the common yard; and
- Construct an access road.

Two alternative substation locations (and associated Tx line alignments) are being assessed, as shown in **Figure 1**. The coordinates of the four corners of the alternative substation sites are shown in **Figures 10** and **11**.


**Figure 10: Makalu B substation – site 1 coordinates**

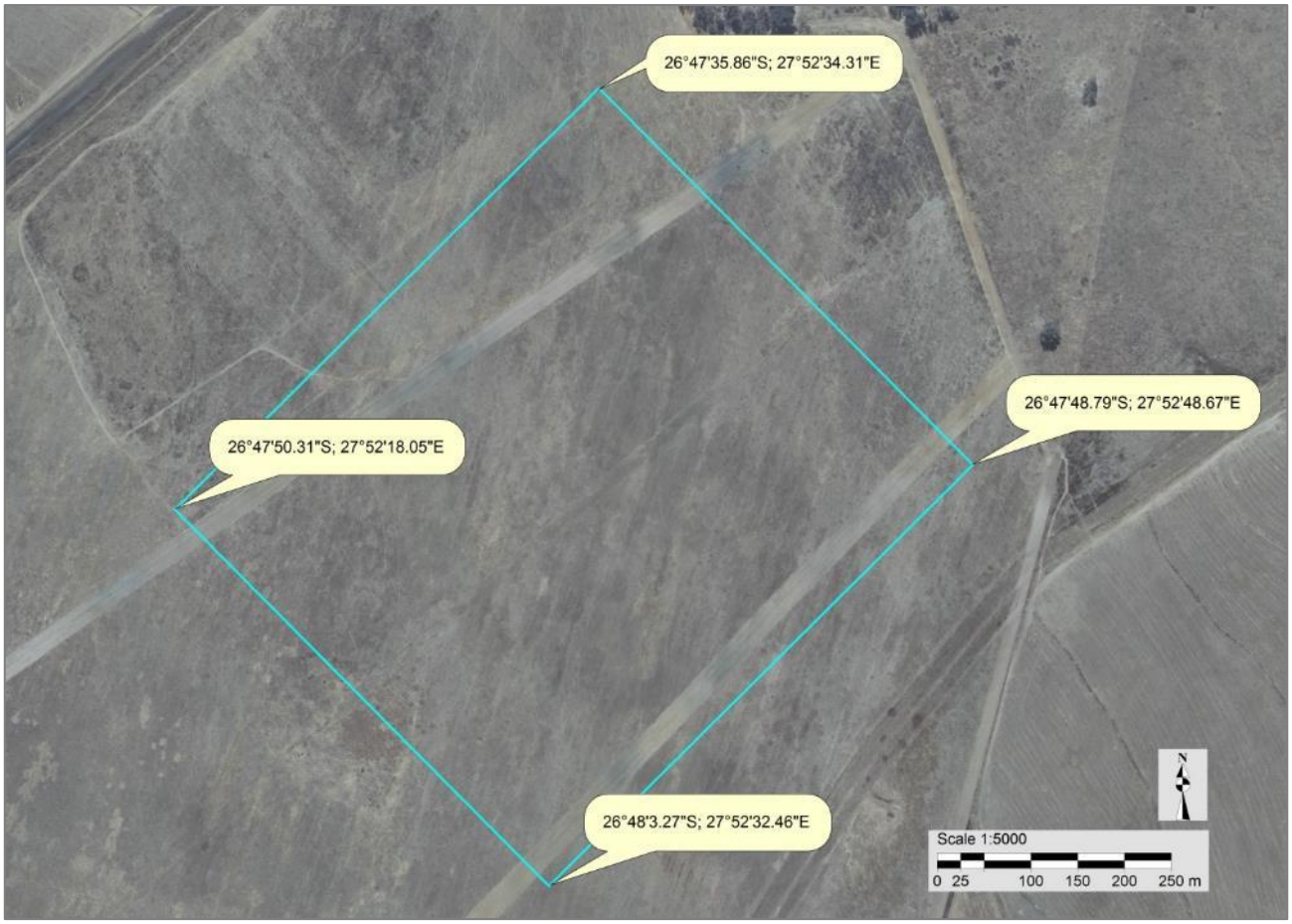


**Figure 11: Makalu B substation – site 2 coordinates**

## 9.3 Transmission Power Lines

### *9.3.1 General*

Key considerations for the route determination of a Tx power line include the following:

- Tie-points (i.e. a point through which the route must pass to achieve the overall goals and requirements of the project / an area towards which the transmission line is attracted between its terminals), which are the substations or significant demand centres along the alignment.
- There are certain areas where the route is attracted in a certain way due to extreme topography at some river crossings, or for considerations of access for maintenance. Existing infrastructure such as rail lines, road or other power lines sometimes attract new routes in an effort to create a utility corridor on an already-disturbed area.
- No-Go areas where it is impractical / impossible to build transmission lines, which could include wetlands, steep or unstable terrain, land subject to mineral rights, buffer zones around landing strips or airfields, dense human settlements or highly corrosive zones along the coastline.

### *9.3.2 Design Considerations*

Certain standard design considerations for a 275 kV transmission line include:

- Standard servitude width is 47 m (i.e. 23.5 m on either side of centre line);

- Tower spacing is 300 – 350 m (depending on the topography of the area);
- On average the tower height is 24 – 30m;
- Line may be no closer than 95 m from the centre line of a national road, unless a relaxation on this is granted by the roads department;
- The standard required ground clearance is 7.4 m;
- Minimum distance between any part of a tree or shrub and any bare phase conductor must be 5.6 m; and
- Minimum safe distance required from the centre of the power line to the beginning of a domestic house is 27.5m.

### *9.3.3 Existing Lethabo – Makalu Lines*

Lethabo Power Station is located less than 10 km to the south of Vereeniging and comprises 6 x 618 MW generating sets. It feeds energy into Eskom's 275 kV transmission network for distribution to its customers. Makalu substation is supplied from Lethabo Power Station by 2 x 275 kV lines, which run in a predominantly south-western direction (see **Figure 12**).

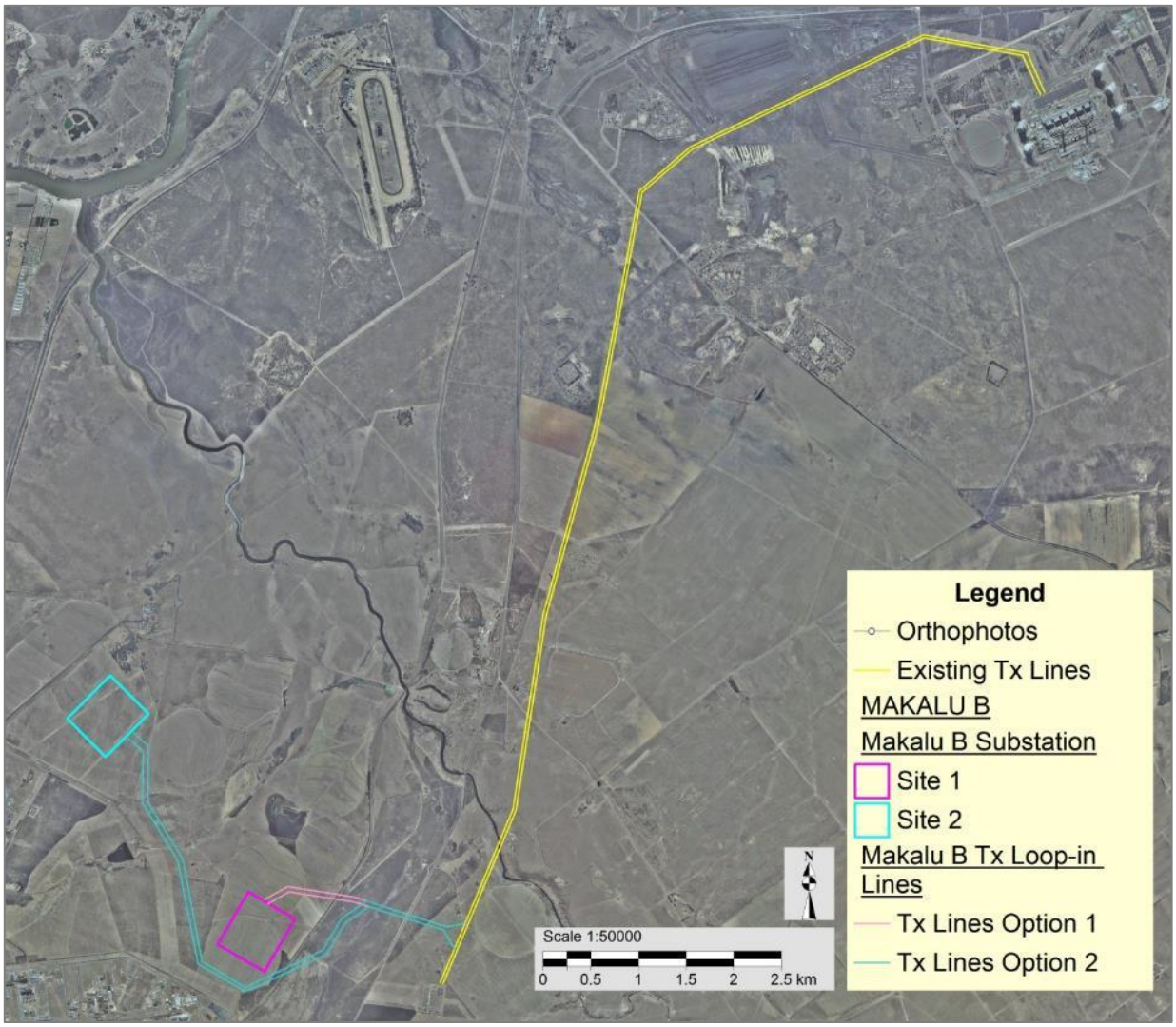


**Figure 12: 275 kV Lethabo – Makalu Power Lines**

### *9.3.4 Proposed Makalu B Tx Loop-in Lines*

The project proposes the construction of 2 x 275 kV line loop-ins to Makalu B substation from the Lethabo – Makalu Lines. The distances of the power line routes to the alternative substation locations are approximately 2.1 km for Site 1 or 5.8 km for Site 2. The coordinates of the bend points for the alternative Tx loop-in lines are listed in **Tables 6** and **7** and shown in **Figures 13** and **14**.

**Table 6: Coordinates of bend points for Tx loop-in lines - route alternative 1 (from west to east)**

| No. | Latitude | Longitude |
|---|---|---|
| **Northern Loop-in Line** | | |
| 1 | 26°48'51.402949"S | 27°53'32.210177"E |
| 2 | 26°48'47.04957"S | 27°53'40.989725"E |
| 3 | 26°48'50.616186"S | 27°54'6.105691"E |
| 4 | 26°49'0.619407"S | 27°54'40.839095"E |
| 5 | 26°48'59.387"S | 27°54'47.752311"E |
| **Southern Loop-in Line** | | |
| 1 | 26°48'52.855122"S | 27°53'33.658574"E |
| 2 | 26°48'48.851595"S | 27°53'41.482877"E |
| 3 | 26°48'52.190767"S | 27°54'5.827824"E |
| 4 | 26°49'1.823498"S | 27°54'39.820249"E |
| 5 | 26°49'7.734075"S | 27°54'43.680445"E |

**Table 7: Coordinates of bend points for Tx loop-in lines - route alternative 2 (from west to east)**

| No. | Latitude | Longitude |
|---|---|---|
| **Northern Loop-in Line** | | |
| 1 | 26°47'55.188413"S | 27°52'42.994136"E |
| 2 | 26°47'59.667167"S | 27°52'48.488648"E |
| 3 | 26°48'18.931717"S | 27°52'48.544398"E |
| 4 | 26°48'37.676249"S | 27°53'1.478218"E |
| 5 | 26°49'12.315119"S | 27°53'8.788642"E |
| 6 | 26°49'21.108655"S | 27°53'25.240254"E |
| 7 | 26°49'8.478081"S | 27°53'54.091098"E |
| 8 | 26°48'57.703691"S | 27°54'1.440443"E |
| 9 | 26°48'51.936735"S | 27°54'10.745089"E |
| 10 | 26°49'0.682475"S | 27°54'41.011609"E |
| 11 | 26°48'59.472"S | 27°54'47.439886"E |
| **Southern Loop-in Line** | | |
| 1 | 26°47'57.133997"S | 27°52'41.141242"E |
| 2 | 26°48'1.354904"S | 27°52'46.633772"E |
| 3 | 26°48'18.945111"S | 27°52'46.389136"E |
| 4 | 26°48'38.317136"S | 27°52'59.609369"E |
| 5 | 26°49'13.134563"S | 27°53'7.237198"E |
| 6 | 26°49'22.397978"S | 27°53'25.250331"E |
| 7 | 26°49'9.912389"S | 27°53'55.635298"E |
| 8 | 26°48'59.27648"S | 27°54'2.832436"E |
| 9 | 26°48'53.840162"S | 27°54'11.507427"E |
| 10 | 26°49'1.823498"S | 27°54'39.820249"E |
| 11 | 26°49'7.843809"S | 27°54'43.744677"E |

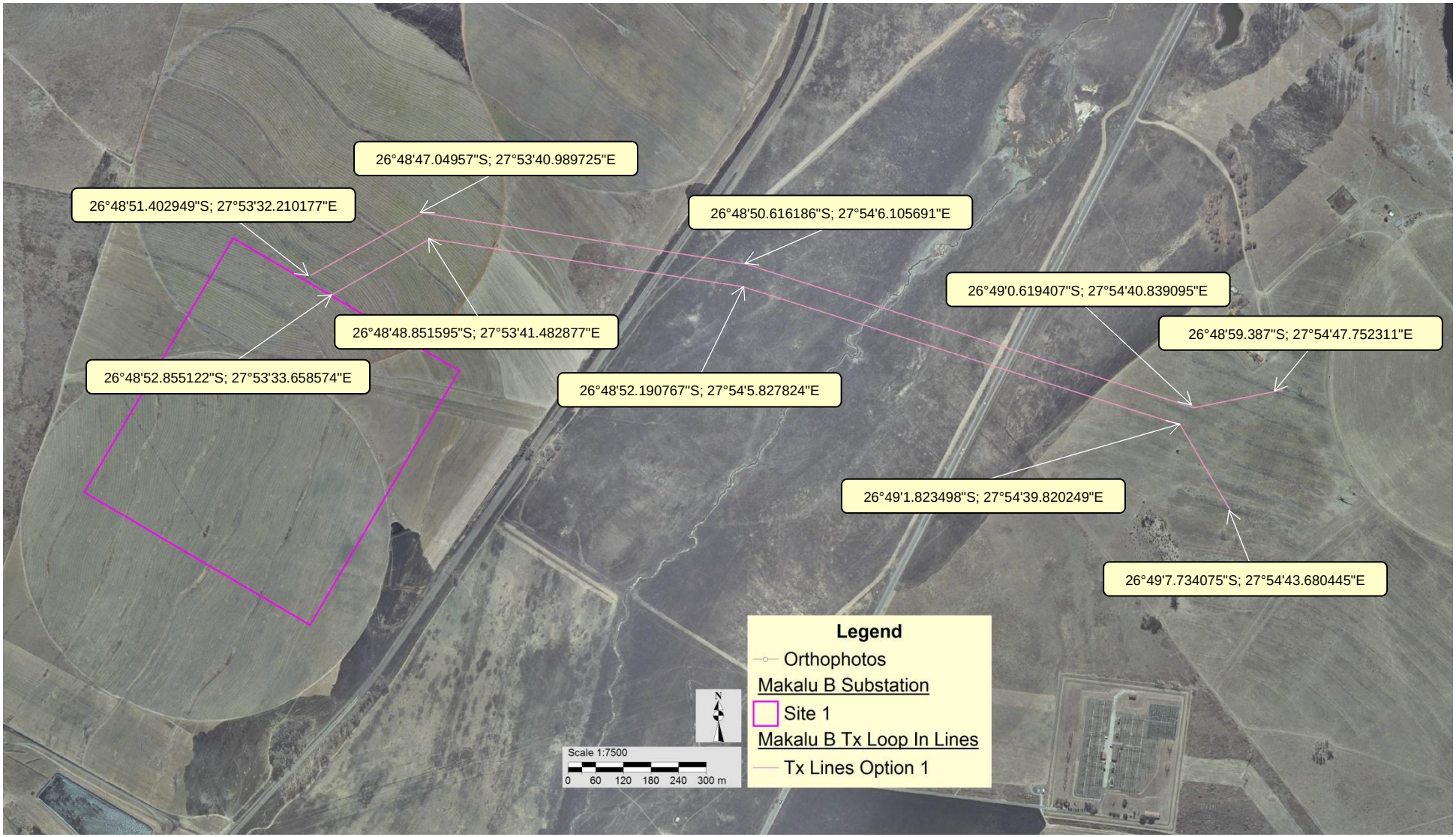


**Figure 13:** **Tx loop-in lines - route alternative 1 coordinates**

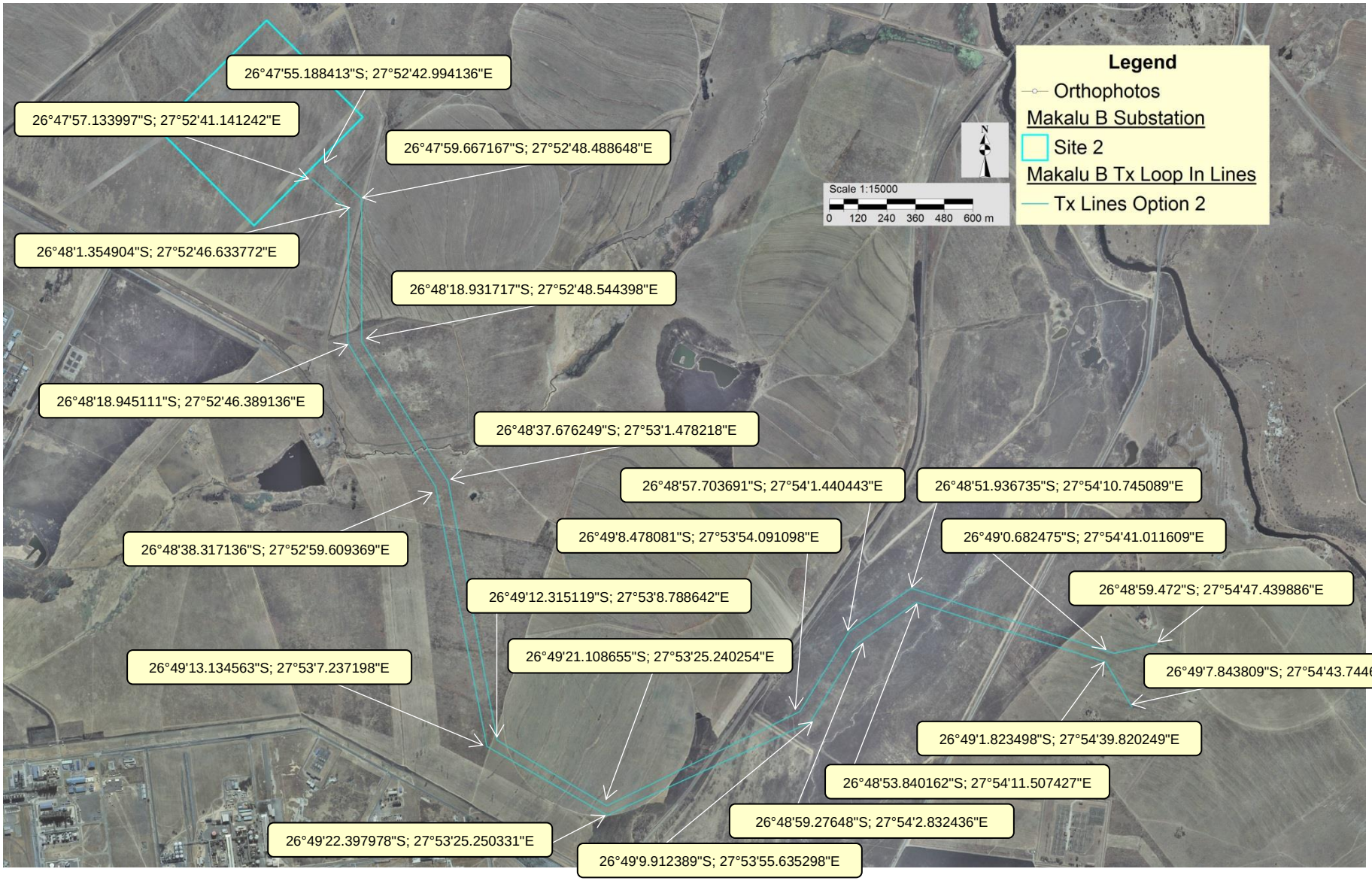


**Figure 14:** **Tx loop-in lines - route alternative 2 coordinates**

### *9.3.5 Power Line Servitude*

Following a contractual agreement with a landowner, an application for registration of the servitude (47 m for a 275 kV Tx line) is lodged with the Provincial Deeds Office against the property deed. A registered servitude grants Eskom certain defined rights for the use of the specific area of land, which include:

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

The landowner is prevented from erecting any structures or carrying out activities under the line that would interfere with the safe operation of the line. However, certain standard farming practices such as some crop cultivation, grazing and the use of farm roads may continue as normal.

### *9.3.6 Tower Structures*

The selection of a tower types depends on several factors, including terrain, costs and recommendations from specialists (where relevant). The towers type has not been finalised as yet, as the type of structure is dependent on the aforementioned factors as well as the final route of the power line. Below are several examples of towers that could be considered for a 275 kV Tx line. Various tower types are shown in **Figures 15 – 18**.

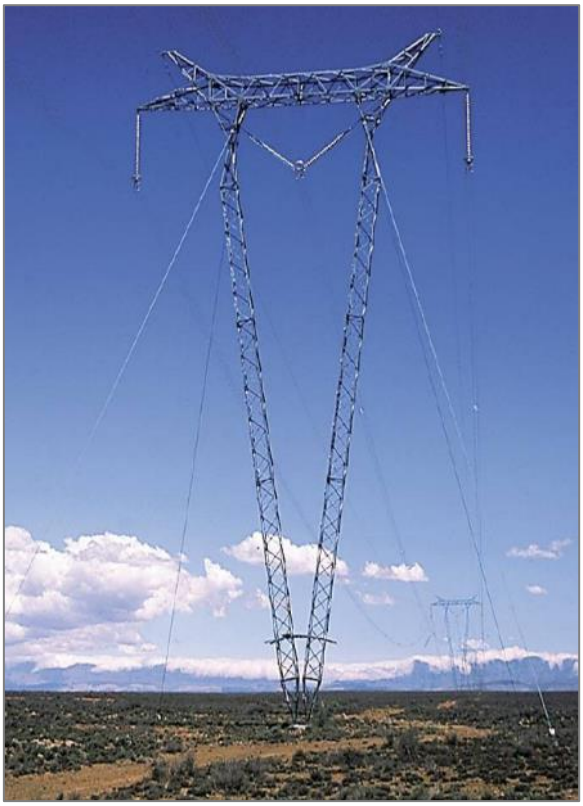

**Figure 15: Tower Type 436B - Guyed-Vee Suspension**

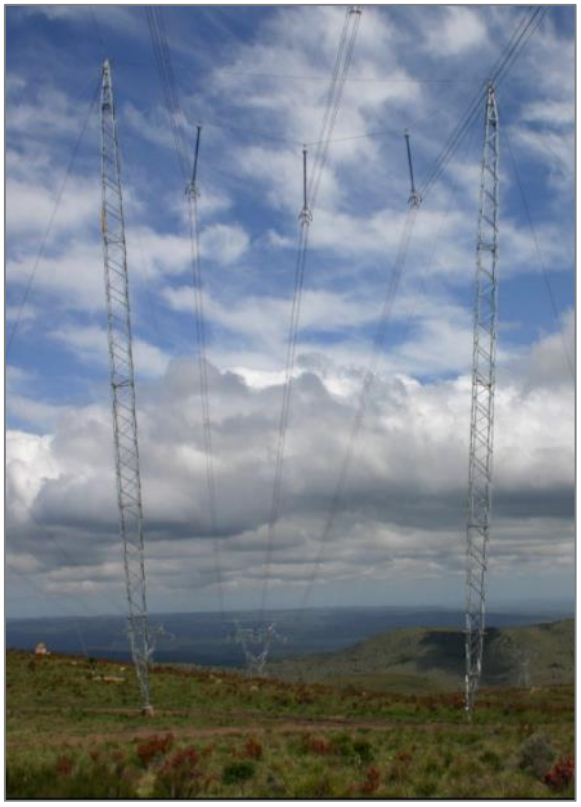

**Figure 16:** **Tower Type 438 A - Cross Rope Suspension tower**

**Figure 17:** **Tower Type 424 A - Self Supporting Suspension tower**

**Figure 18: Tower Type 433A = Self Supporting Suspension tower**

## 9.4 Access Roads

Access to substation site 1 is via the industrial area to the south (see **Figure 19**). The estimated road length is 1.1 km. Discussions are underway with Sasol to seek approval for using internal roads within the industrial plant.


**Figure 19: Access road to substation site 1 (Google Earth image)**

Access to substation site 2 is via Jan Haak Avenue to the south (see **Figure 20**). The estimated road length is 1.3 km.


**Figure 20: Access road to substation site 2 (Google Earth image)**

## 9.5 Project Life-cycle

### *9.5.1 General*

The project life cycle for a new substation and Tx line includes the following primary activities:

- Feasibility phase - This includes selecting a suitable location for the substation and buffer as well as a corridor for the line route, which is assessed as part of the EIA. Servitude negotiations are also initiated during this phase.
- Planning and design phase - This phase, which is only undertaken should environmental authorisation be obtained, includes the following –
  - Aerial survey of the route;
  - Selection of the most appropriate structures;
  - Eskom and environmental specialists (e.g. ecologist, heritage) conduct a walk-down survey to determine the exact locations of the towers, based on sensitive environmental features and technical criteria; and
  - Preparation of relevant planning documentation, including technical and design documentation.
- Construction phase – During the implementation of the project, the construction activities related to the installation of the necessary infrastructure and equipment is undertaken.
- Operational phase - This includes operational activities associated with the maintenance and control of the substation and Tx line.

- Decommissioning - This phase will include measures for complying with the prevailing regulatory requirements, rehabilitation and managing environmental impacts in order to render the affected area suitable for future desirable use.

The sub-sections to follow provide an overview of key activities during selected phases of the project life-cycle.

### *9.5.2 Construction*

The construction period of the Makalu B substation and Tx loop-in lines will take approximately 24 months. It involves the following activities, which are most often undertaken sequentially and by different crews.

#### 9.5.2.1 Vegetation Clearance

The standard for vegetation clearance for new and existing powerlines (with nominal voltage of 220 to 765 kV) for access purposes (inspection, repair and maintenance), safety clearance, and prevention of fires in Servitudes and Wayleaves is as follows (see example in **Figure 21**):

- Clear from the centre of the power line up to the outer conductor, plus an additional 10 meters on either side; and
- Grass and scrubs will be managed in accordance with The Eskom Contract Specification for Vegetation Management Services on Eskom Networks (240-52456757) which is biome and land use dependant.

**Figure 21: Vegetation clearance for stringing**

The Eskom standard Vegetation Management and Maintenance within Eskom Land, Servitudes and Rights of Way (240-70172585) will apply. The following aspects will determine the minimum standards for vegetation clearing and maintenance:

- Where the vegetation poses a safety clearance risk –
  - Vegetation should be controlled where it intrudes on the minimum vegetation clearance distance or will intrude on this distance before the next scheduled clearance as per The Eskom Contract Specification for Vegetation Management Services on Eskom Networks (240-52456757); and
  - Trees and any other vegetation, that could, if they fall over or negatively impact the safe operation of the line or damage the infrastructure, must be identified and managed.
- When access to the Eskom land is hindered –
  - Vegetation should be cleared to allow vehicles access below power lines and related infrastructure as per The Eskom Contract Specification for Vegetation Management Services on Eskom Networks (240-52456757).
- When the vegetation poses a fire risk –
  - Where vegetation poses a potential fire risk to Eskom's infrastructure or to the operation of power lines, there must be a specific fire management programme to reduce this risk and vegetation must be controlled as per The Eskom Contract Specification for Vegetation Management Services on Eskom Networks (240-52456757).
- To comply with legal imperatives –
  - Eskom must clear vegetation if required by any national or provincial legislation as per The Eskom Contract Specification for Vegetation Management Services on Eskom Networks (240-52456757).

It is expected that vegetation clearance for the proposed Makalu B Tx line will be minimal, as the natural vegetation is mostly disturbed by historical land use practices such as agriculture, as well as by the construction of existing infrastructure (including roads, power lines and the railway line).

#### 9.5.2.2 Tower pegging

Following the necessary access negotiations and arrangements with the affected landowners, a surveyor will peg the substation site and Tx central line and then set out the footprint of the development (i.e. Tx line and towers).

Through continual vehicular use, the surveying team will make the first basic track (access route) during their site work. If any flaws with a site are encountered (e.g. gully erosion) the site may need to be relocated.

#### 9.5.2.3 Construction camp establishment

Suitable site(s) for construction camp(s) still need to be selected. Contractors will negotiate the siting and erection of camps with landowners. These sites must strictly adhere to Eskom Transmission's Generic Environmental Management Plan – Line Construction as well as the mitigation measures contained in the Environmental Management Programme (EMPr) that will form part of the EIA Report.

See **Figure 22** for examples of construction camps for Eskom Tx lines.

**Figure 22: Examples of Construction camps**

#### 9.5.2.4 Gate installation

After tower pegging, gates will be installed at the most appropriate locations to allow for future access to the servitude. An example of an access gate for a Tx line is shown in **Figure 23**.

**Figure 23: Access gate for an Eskom Tx line**

#### 9.5.2.5 Access roads

Existing access roads will be utilised as far as possible. For the use of private roads, the requisite negotiations will be conducted with the affected landowners.

Alternatively, roads will be built to gain access to the construction areas. These roads will be constructed to a Type 6 gravel road that comprises the following:

- Widening to a final gravel carriageway width of 6 m on raised earthworks;
- Drainage is to be provided in the form of meadow drains (flat terrain) and "v" drains (steeper terrain). Some new culverts may be required;
- Fencing will be erected where required;
- The total width of carriageway and drainage ranges between about 14 m (flat terrain) and 16 m (rolling terrain); and
- Gravel will be obtained from the nearest existing borrow pit.

Suitable erosion control measures will be implemented at watercourse crossings. Examples include the construction of gabion structures to protect the watercourse (see **Figure 24**). Stormwater management measures will also be considered on steep gradients.

**Figure 24: Access roads**

The walk-down survey will identify sensitive environmental features that need to be avoided when creating the new roads and the final site-specific EMPr will address the associated impacts.

#### 9.5.2.6 Excavation for foundations

Excavations will be made for the foundations and anchors of the towers by a team of 10 to 15 people with equipment (i.e. drilling rig, generator) (see **Figure 25**). Foundation sizes are dependent on *inter alia* the tower type and soil conditions. The foundations are ultimately filled with concrete.

Contractors are required to safeguard excavations, which may include erecting a temporary wire fence around the excavations to protect the safety of people and animals.

**Figure 25: Drilling rig and generator (top) and excavation activities (bottom)**

9.5.2.7 Foundation of steelwork

Following the preparation of the excavations, a separate team will position the premade foundation structures into the holes. Thereafter these structures will be tied together for support (see **Figure 26**).

**Figure 26: Foundation work**

#### 9.5.2.8 Concrete works

A new team will then undertake the concrete filling of the foundation. Concrete is sourced via a 'Ready-mix' truck which accesses the site. If the access roads do not permit use by such a heavy vehicle, concrete will be mixed on site. Once the excavations have been filled, the concrete requires approximately 28 days for curing.

#### 9.5.2.9 Erection of steel structures

Approximately 1 month after the foundation has been poured the steelwork is usually delivered to the site via trucks. The tower will then be assembled on site by a team of approximately 50 people. See examples of steel delivery and assembly shown in **Figure 27**.

**Figure 27: Delivery of steel (top) and assembly of tower (bottom)**

A new team will then be responsible for the erection of the towers, with the use of a mobile 70-ton crane (see **Figure 28**).

**Figure 28: Erection of towers**

#### 9.5.2.10 Stringing of transmission cables

Cable drums (see **Figure 29**), which carry approximately 2.5 km of cable, will then be delivered to the site. The conductors are made of aluminium with a steel core for strength. Power transfer is determined by the area of aluminium in the conductors. Conductors are used singularly, in pairs, or in bundles of three, four or six. The choice is determined by factors such as audible noise, corona, and electromagnetic field (EMF) mitigation. Many sizes of conductor are available, the choice being based on the initial and life-cycle costs of different combinations of size and bundles, as well as the required load to be transmitted.

**Figure 29: Cable drums**

Two cable drums, with a winch in the middle, are placed approximately 5 km apart along the route (depending on the overall length of the route). A pilot cable, which is laid with a pilot tractor that drives along the route, is pulled up on to the pylons with the use of pulleys (see **Figure 30**). The line is generally strung in sections (from bend to bend). Once the tension has been exacted, the conductor cables are strung. Tension is created, the conductors clamped at the tower and the excess cable cut off.

**Figure 30: Stringing with pilot tractor (top) and pulleys (bottom)**

#### 9.5.2.11 Rehabilitation

Site reinstatement and rehabilitation are undertaken for each component of the construction phase, which include the following activities (amongst others):

- Removal of excess building material, spoil material and waste;
- Repairing any damage caused as part of the construction activities;
- Rehabilitating the areas affected by temporary access roads;
- Reinstating existing access roads; and
- Replacing topsoil and planting indigenous grass (where necessary).

#### 9.5.2.12 Inaccessible Sites or Sensitive Areas

For a site that cannot be accessed by vehicle (e.g. kloofs) or where environmental sensitive features are encountered, the following approach is followed:

- Excavations for foundations are done by hand;
- Foundation structures, concrete filling and steel towers (pre-fabricated) are transported and delivered by helicopter; and
- Stringing is performed by helicopter.

This abovementioned approach is an expensive operation and not the preferred method of construction. Due to the nature of the receiving environment for Makalu B, it is not anticipated that this will be necessary.

### *9.5.3 Operation and Maintenance*

During operations, Eskom needs to reach the servitude via access roads to perform maintenance of the Tx line. Line inspections are undertaken on an average of 1 – 2 times per year, depending on the area.

**Figure 31: Example of an access road used for maintenance**

The servitude will need to be cleared occasionally to ensure that vegetation does not interfere with the operation of the line. This will be conducted in terms of Eskom's Transmission Vegetation Management Guideline, which will be included in the EMPr.

## 9.6 Resources Required for Construction and Operation

This section briefly outlines the resources that will be required to execute the project.

### *9.6.1 Water*

During the construction stage, the Contractor(s) will require water for potable use by construction workers and water will also be used in the construction of the foundations for the substation and towers. The necessary negotiations will be undertaken with the landowners / local authorities to obtain water from approved sources.

### *9.6.2 Sanitation*

Sanitation services will be required for construction workers in the form of chemical toilets, which will be serviced at regular intervals by the supplier.

### *9.6.3 Roads*

Refer to **Sections 9.4** and **9.5.2.5** for discussions on access roads.

### *9.6.4 Waste*

Solid waste generated during the construction phase will be temporarily stored at suitable locations (e.g. at construction camps) and will be removed at regular intervals and disposed of at approved waste disposal sites. All the waste disposed of will be recorded.

Wastewater, which refers to any water adversely affected in quality through construction-related activities and human influence, will include the following:

- Sewage;
- Water used for washing purposes (e.g. equipment, staff); and
- Drainage over contaminated areas (e.g. cement batching / mixing areas, workshop, equipment storage areas).

Suitable measures will be implemented to manage all wastewater generated during the construction period.

### *9.6.5 Electricity*

Electricity will be obtained from diesel generators or temporary electricity connections during the construction phase.

### *9.6.6 Construction Workers*

The appointed Contractor will mostly make use of skilled labour for the construction of the substation and Tx power lines. In those instances where casual labour is required, Eskom will request that such persons are sourced from local communities as far as possible.

## 9.7 No-Go Option

As standard practice and to satisfy regulatory requirements, the option of not proceeding with the project is included in the evaluation of the alternatives.

The implications of the no-go option are as follows:

- The fault level at the existing Makalu substation will not be decreased, which will prevent the accommodation of the embedded generation;
- The Makalu substation will become unfirm in 2022, as indicated by the Tx load forecast; and
- The network will not be able to supply load growth in the area.

In contrast, should the proposed Makalu B development not go ahead, any potentially significant environmental issues associated with the project would be irrelevant and the status quo of the local receiving environment would not be affected by the project-related activities. The objectives of the project would however not materialise.

# 10 PROFILE OF THE RECEIVING ENVIRONMENT

## 10.1 General

This section provides a general description of the status quo of the receiving environment in the project area. This serves to provide the context within which the Scoping exercise was conducted. It also allows for an appreciation and identification of sensitive environmental features and possible receptors of the effects of the proposed project.

As mentioned, the EIA study area includes a 1 km corridor around the Tx loop-in lines (i.e. 500 m on either side of the centre line), as well as a 1km x 1km buffer around the alternative substation sites. This allows for possible relocation or deviation within the buffer or corridor, respectively (e.g. avoidance of sensitive features, technical constraints).

Where necessary, the regional context of the environmental features is also explained, with an ensuing focus on the local surrounding environment. More in-depth discussions on the receiving environment will be provided in the EIA Report, where the findings of the requisite specialist studies will be incorporated into the document.

A brief overview is also provided of the manner in which the environmental features may be affected (positively or negatively) by Makalu B during the project life-cycle. Significant environmental issues are discussed further in **Section 12.2**. These preliminary impacts are only discussed concisely on a qualitative level, as part of the Scoping phase. The EIA Report will provide a comprehensive evaluation of the potential impacts, and will quantify the effects to the environment based on the methodology presented in **Section 12.4**.

## 10.2 Land Use & Land Cover

**Status Quo**

The land cover, based on the South African National Land Cover Dataset (2013/2014), is shown in **Figure 32**.

The primary land use and land cover in the project area is as follows:

- Substation sites –
  - Site 1 – agriculture (cultivated commercial fields);
  - Site 2 – agriculture (cultivated commercial pivots and fields);
- Tx lines –
  - Route 1 – agriculture (cultivated commercial pivots and fields) and grassland; and
  - Route 2 – agriculture (cultivated commercial pivots and fields) and grassland.

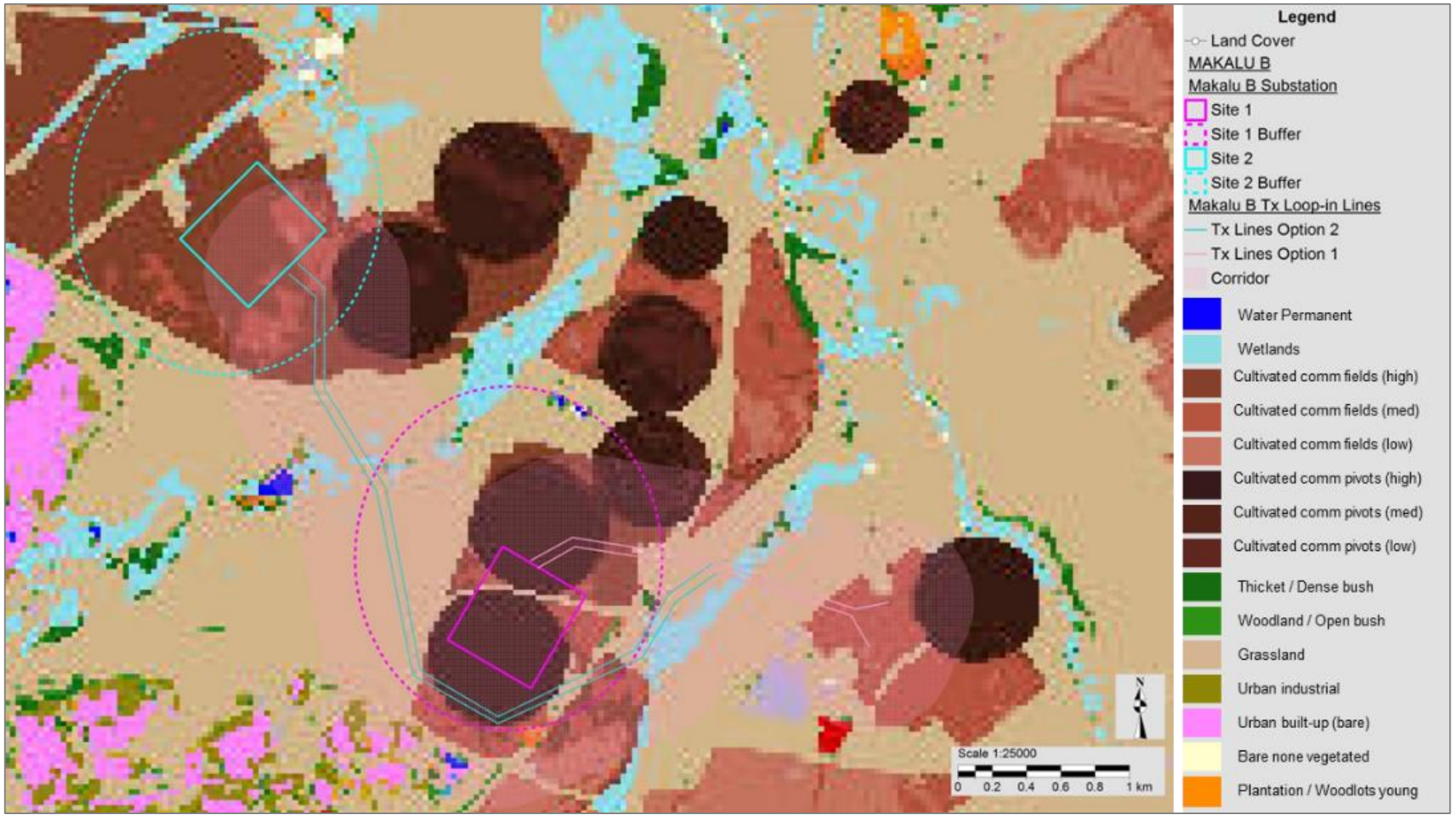


**Figure 32: Land cover in project area (© GEOTERRAIMAGE - 2014)**

**Potential Impacts / Implications**

- Temporary interruptions to agricultural activities during the construction period along Tx lines.
- Permanents loss of agricultural land at substation site and at Tx towers.
- During the operational phase the landowner will be permitted access and certain use of the servitude area (depending on the limitations specified in the servitude agreement).

**Specialist Study Triggered / Additional Investigations**

No direct specialist studies associated with land use to be conducted. Indirect studies include Terrestrial Ecological Impact Assessment, Heritage Impact Assessment, Agricultural Impact Assessment and Socio-economic Impact Assessment.

The EMPr will contain measures to mitigate impacts to existing land uses.

## 10.3 Climate

**Status Quo**

The climate in Sasolburg is mild, and generally warm and temperate. The climate is classified as Cwb by the Köppen-Geiger system. At an average temperature of 21.5 °C, January is the hottest month of the year. In June, the average temperature is 9.2 °C, which is the lowest average temperature per annum. The average annual temperature is 16.6 °C (see **Figure 33**).

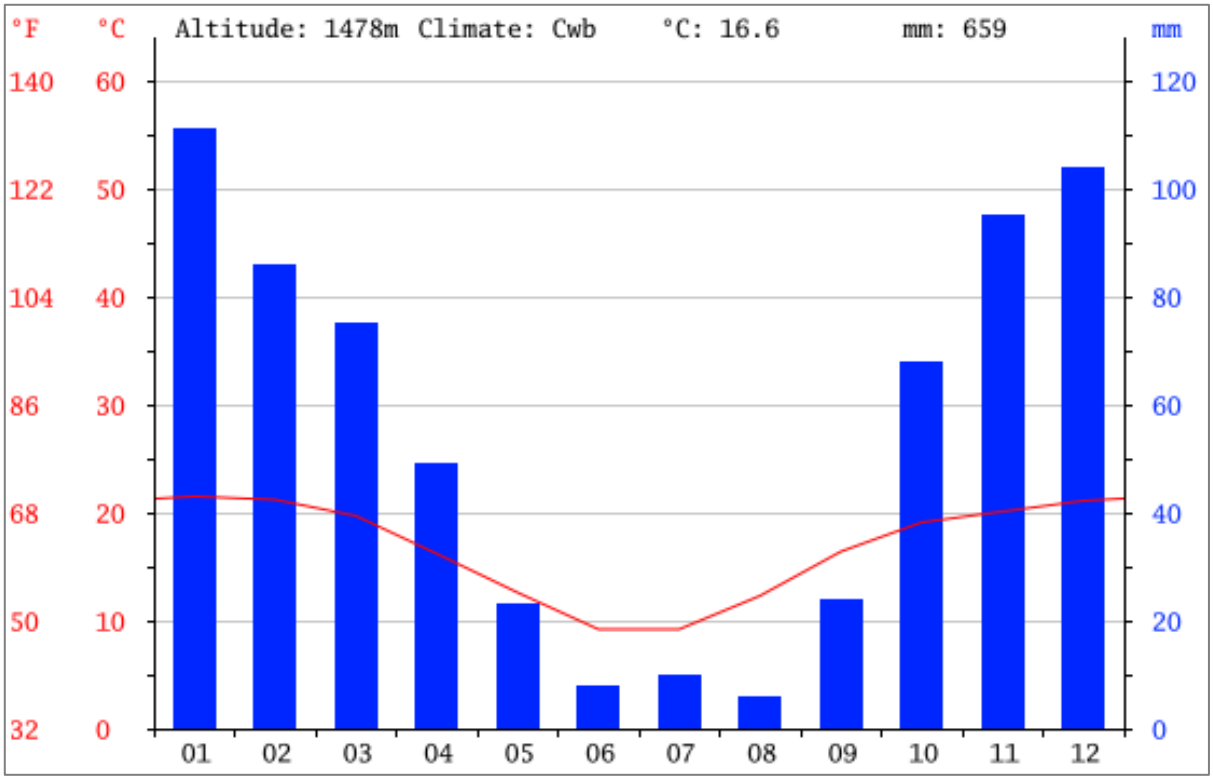


**Figure 33: Climate graph – Sasolburg (http://en.climate-data.org/location/27320/)**

Precipitation averages 659 mm. It is the lowest in August, with an average of 6 mm. Most precipitation falls in January, with an average of 111 mm. Between the driest and wettest months, the difference in precipitation is 105 mm. The average temperatures vary during the year by 12.3 °C.

The prevailing wind direction is north-easterly and north-westerly. Winds are generally light to moderate except during thunderstorms when northerly and north-north westerly winds predominate.

**Potential Impacts / Implications**

There are no direct adverse impacts foreseen in terms of the project to climate. However, measures to reduce the project's carbon footprint will be considered further in the EIA phase.

Climate change may impact on the project through extreme floods, which may pose a risk to the electrical infrastructure.

**Specialist Study Triggered / Additional Investigations**

Electrical infrastructure to be safeguarded against flooding. The substation will be located outside of the 1:100 year floodline of any watercourse.

The EMPr will contain measures to minimise the carbon footprint.

## 10.4 Geology & Geohydrology

**Status Quo**

A desktop Geotechnical Study was undertaken for the substation sites to confirm that these sites are suitable for the proposed development. The project area is primarily underlain by the Vryheid Formation, Ecca Group, Karoo Supergroup. According to the geological map (1:250 000 Geological Series 2626 WES-RAND), the regional geology of the site comprises of sandstone, shale and coal (Pv), overlain by Aeolian Sands (QW), with intrusions of Dolerite Sills and Dykes (Jd) also expected (see **Figure 34**).

According to the 2627 DD SASOLBURG 1:50 000 map, the potential substation sites may have a potential high water table as there are perennial rivers in the area (Eskom, 2015). This will need to be confirmed as part of the detailed geotechnical investigations as part of the final design.

According to the aquifer classification system of South Africa (DWA, 2012), the project area falls within a minor aquifer region, which is a moderately-yielding aquifer system of variable water quality. The aquifer vulnerability is regarded as moderate (DWA, 213). The groundwater in the

general area is primarily utilised for rural domestic needs and livestock watering. Groundwater is also abstracted from dolomitic acquirers for urban, agricultural and mining use in the region.

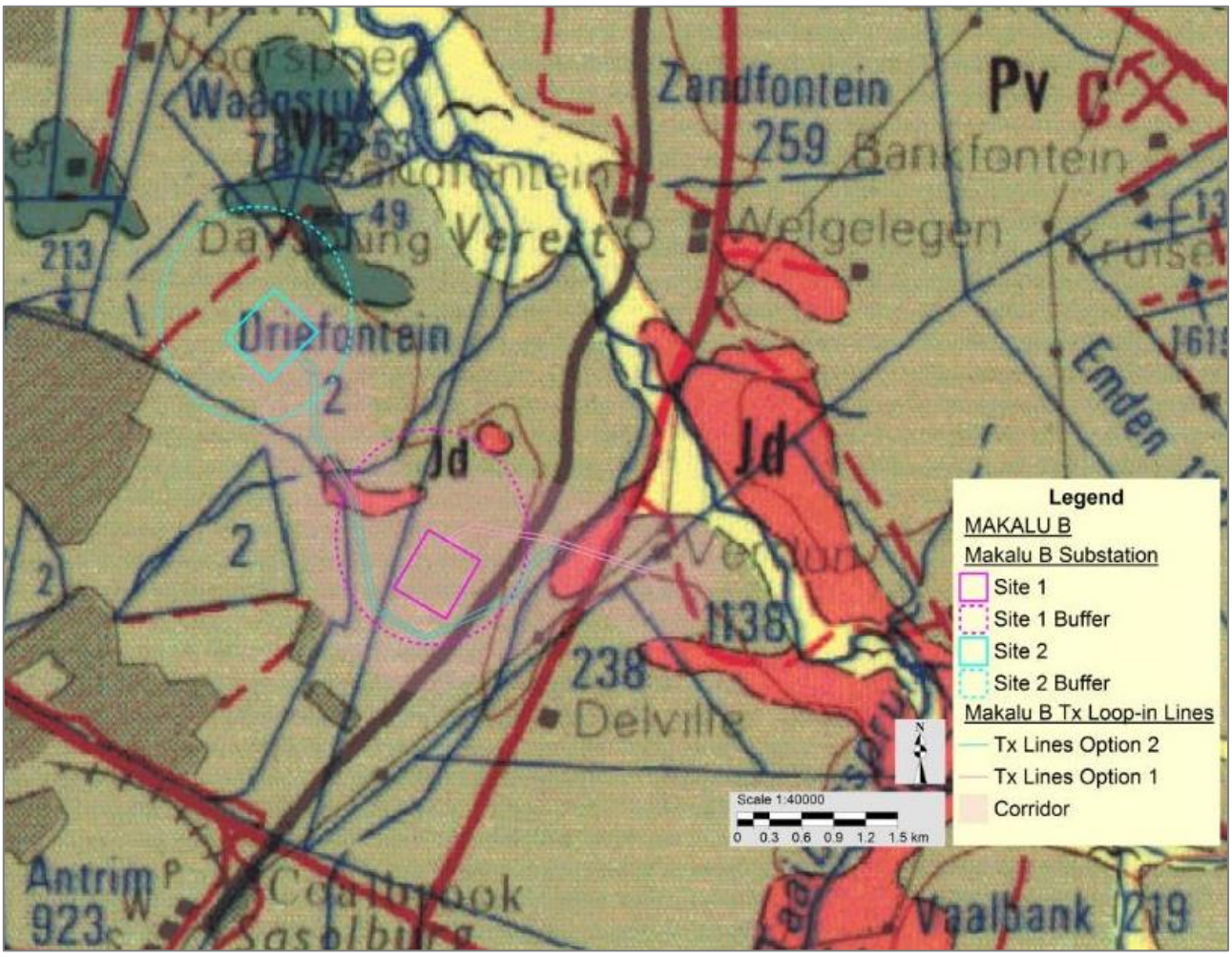


**Figure 34: Regional Geology of the project area**

## Potential Impacts / Implications

The geotechnical characteristics determine the suitability of the substation site in terms of foundations and yard platforms, as well as the conditions for the tower foundations.

The Makalu B footprint is located to the south of the expansion of New Vaal Colliery (NVC), and the associated future open cast mine and future coal reserves are shown in **Figure 35**. Eskom has engaged with AOL to determine their requirements and to ensure that the corridor of the Tx lines and buffers of the substation sites fall outside of the mining areas.

Other potential impacts during the construction phase include:

- Blasting (depending on geotechnical conditions).
- Erosion on steep slopes.
- Disposal of spoil material (i.e. excess soil and rock) from excavations.

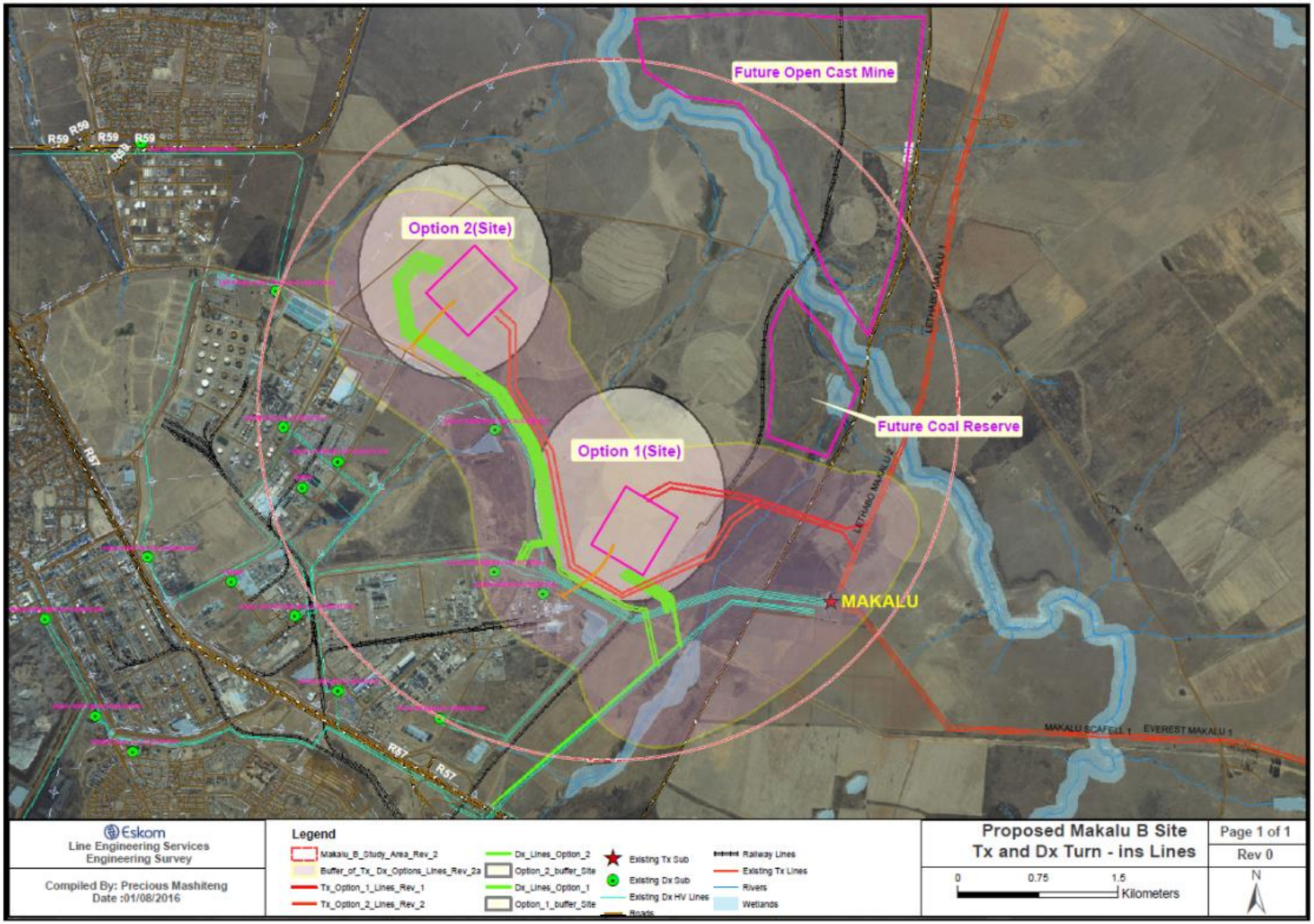


**Figure 35: Future mining near project area**

### Specialist Study Triggered / Additional Investigations

The EIA phase will investigate potential impacts to groundwater (e.g. pollution during construction, blasting) and suitable mitigation measures will be identified to manage these impacts.

As part of the final design a detailed geotechnical investigation will be conducted to provide design parameters and confirm the findings of the desktop investigation.

## 10.5 Soils

### Status Quo

The soil types encountered in the project area constitute imperfectly drained sols, often shallow and often with a plinthic horizon (see **Figure 36**). This soil type may be seasonally wet.

According to the desktop Geotechnical Study (Eskom, 2015), the geology of Sasolburg consists of transported consolidated and unconsolidated sands. Chemical weathering is the predominant mode of rock weathering within this region. It is expected that the parent rock, which is sandstone and shale, will be deeply weathered with varying thickness of transported soils, depending on the topography. Due to chemical weathering, lithomorphic vertisols of highly expansive nature can be anticipated in the area as well as collapsible soils.

### Potential Impacts / Implications

In areas of steep terrain soil erosion could occur following the clearing of vegetation, grading of substation and tower sites, and use of access roads. Use of heavy equipment during the construction phase could lead to soil compaction. Soil could also be contaminated through inadequate storage and handling of hazardous materials, spillages from equipment and plant and poor management of waste, wastewater and cement mixing. Topsoil may also be lost if not properly stripped and stockpiled for use during rehabilitation.

### Specialist Study Triggered / Additional Investigations

The EMPr will contain measures to mitigate against impacts to soil, for example the management of topsoil, preventing soil contamination during construction, etc.

As part of the final design a detailed geotechnical investigation will be conducted to provide design parameters and confirm the findings of the desktop investigation.

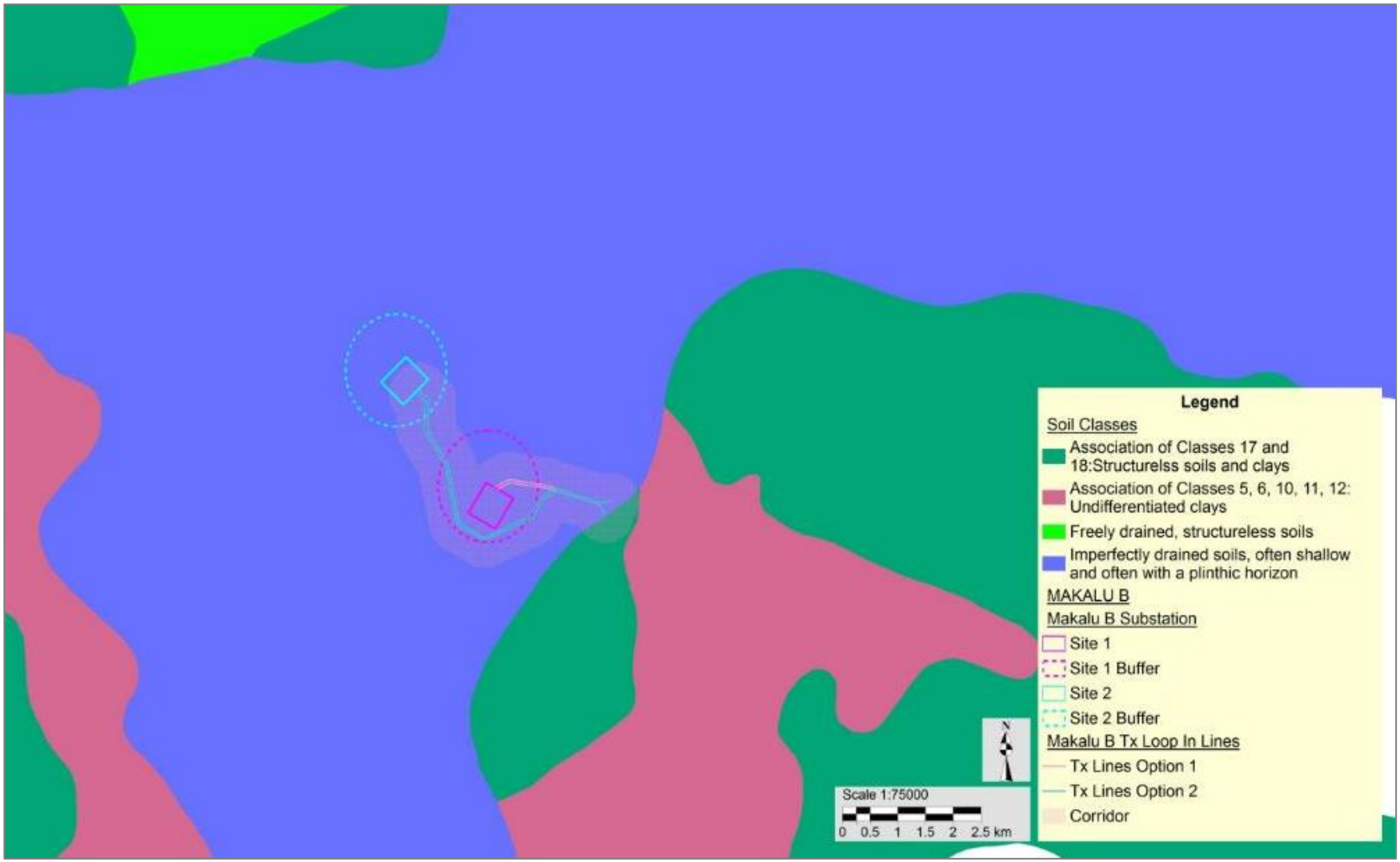


**Figure 36:** **Soil types in the project area**

## 10.6 Topography

### Status Quo

The terrain morphology in the project area is dominated by slightly undulating plains. The footprints of the alternative sites for the proposed substation are representative of the aforementioned topography and are not characterised by any prominent topographical features. The alternative routes of the Tx lines traverse watercourses, which are tributaries of the Taaibosspruit.

The relief of the project area is shown in **Figure 37**. The general direction of drainage is to the north-east, towards the Taaibosspruit. The highest point is located at approximately 1471 metres above sea level (masl) (at substation site 1) and the lowest point is at 1370 masl (at connection of loop-in line to existing Tx line in east).

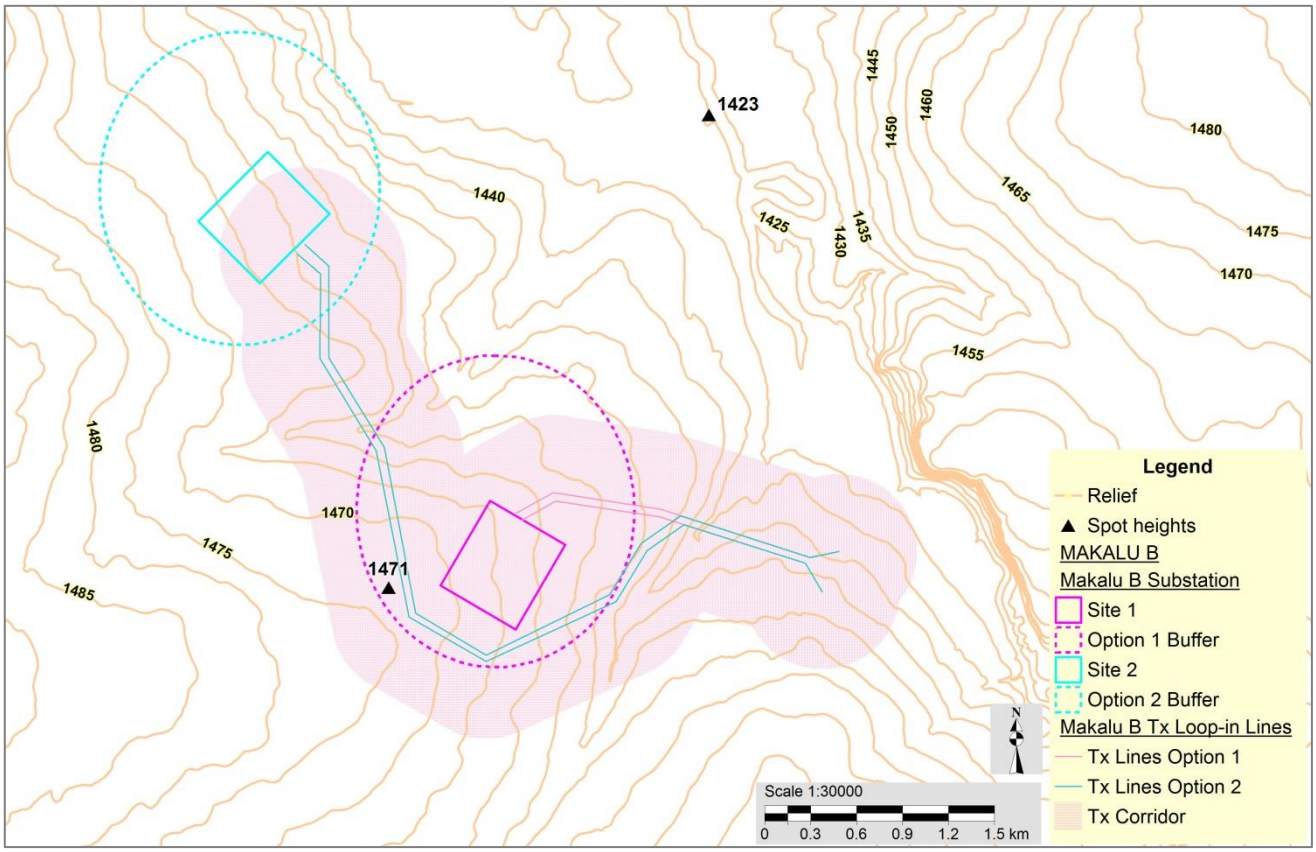


**Figure 37: Relief of the project area**

### Potential Impacts / Implications

- Visual impact caused by proposed project infrastructure.
- Erosion of areas cleared for construction purposes.

### Specialist Study Triggered / Additional Investigations

Visual impacts to be considered further in the EIA phase.

## 10.7 Surface Water

**Status Quo**

### *10.7.1 Hydrology*

The project area is situated within the Leeu-Taaibosspruit catchment, which falls within the C22K quaternary catchment and Upper Vaal Water Management Area (WMA8) (see **Figures 38 – 39**).

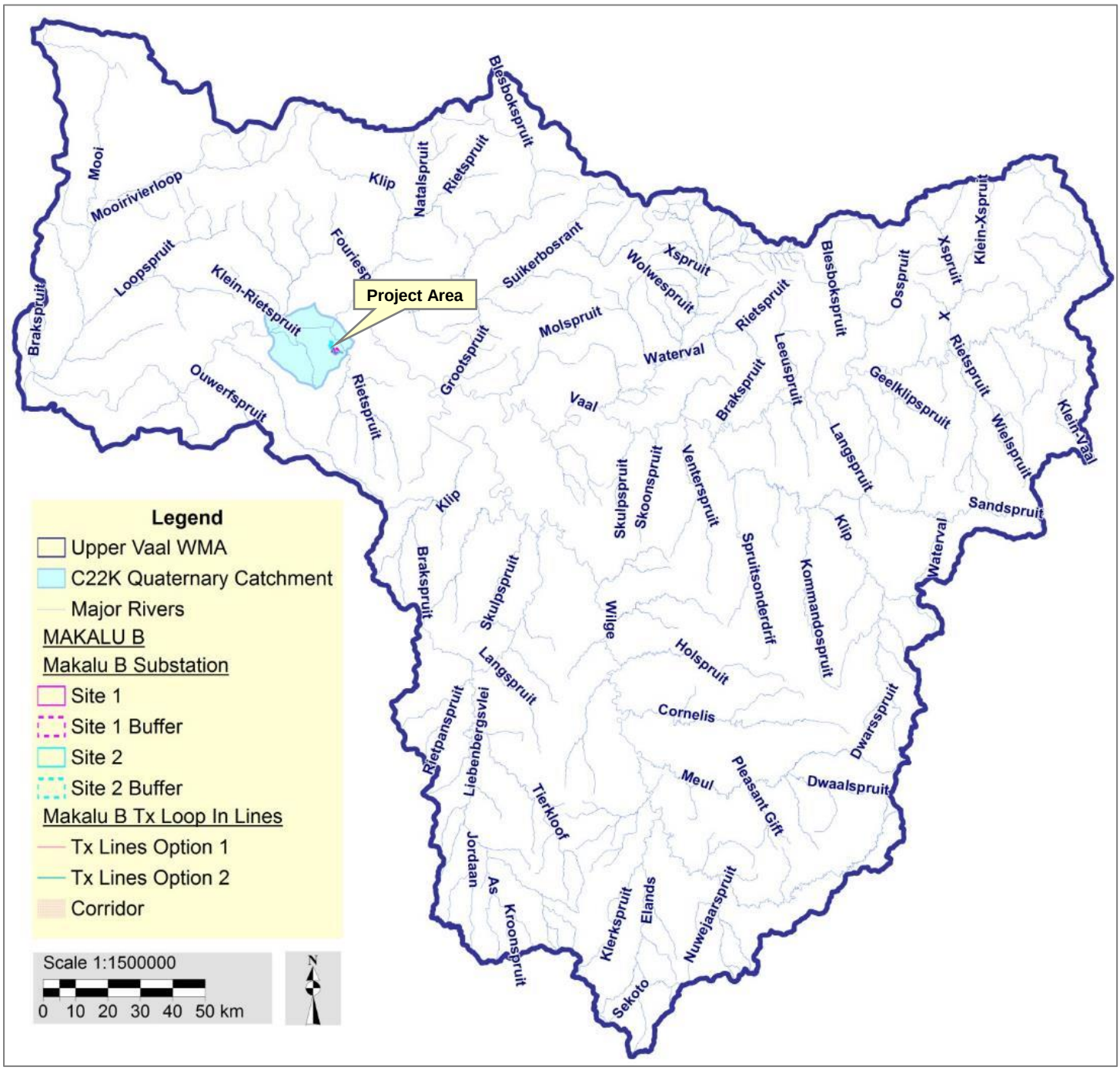


**Figure 38:** **Upper Vaal WMA, C22K quaternary catchment and major rivers**

The total area of C22K is 39 380 Ha, with a Mean Annual Precipitation of 644.37 mm. The project area also falls within the Highveld (11) – Lower Level 1 Ecoregion. The Taaibosspruit is a tributary of the Vaal River, with the confluence located above the Vaal River Barrage.

Route option 1 of the Tx lines crosses 1 perennial tributary of the Taaibosspruit. Route option 2 crosses the same tributary as well as an additional non-perennial tributary along its route to substation site 2. The buffer for substation site 1 also traverses a non-perennial tributary of the Taaibosspruit. Refer to map in **Figure 40**.

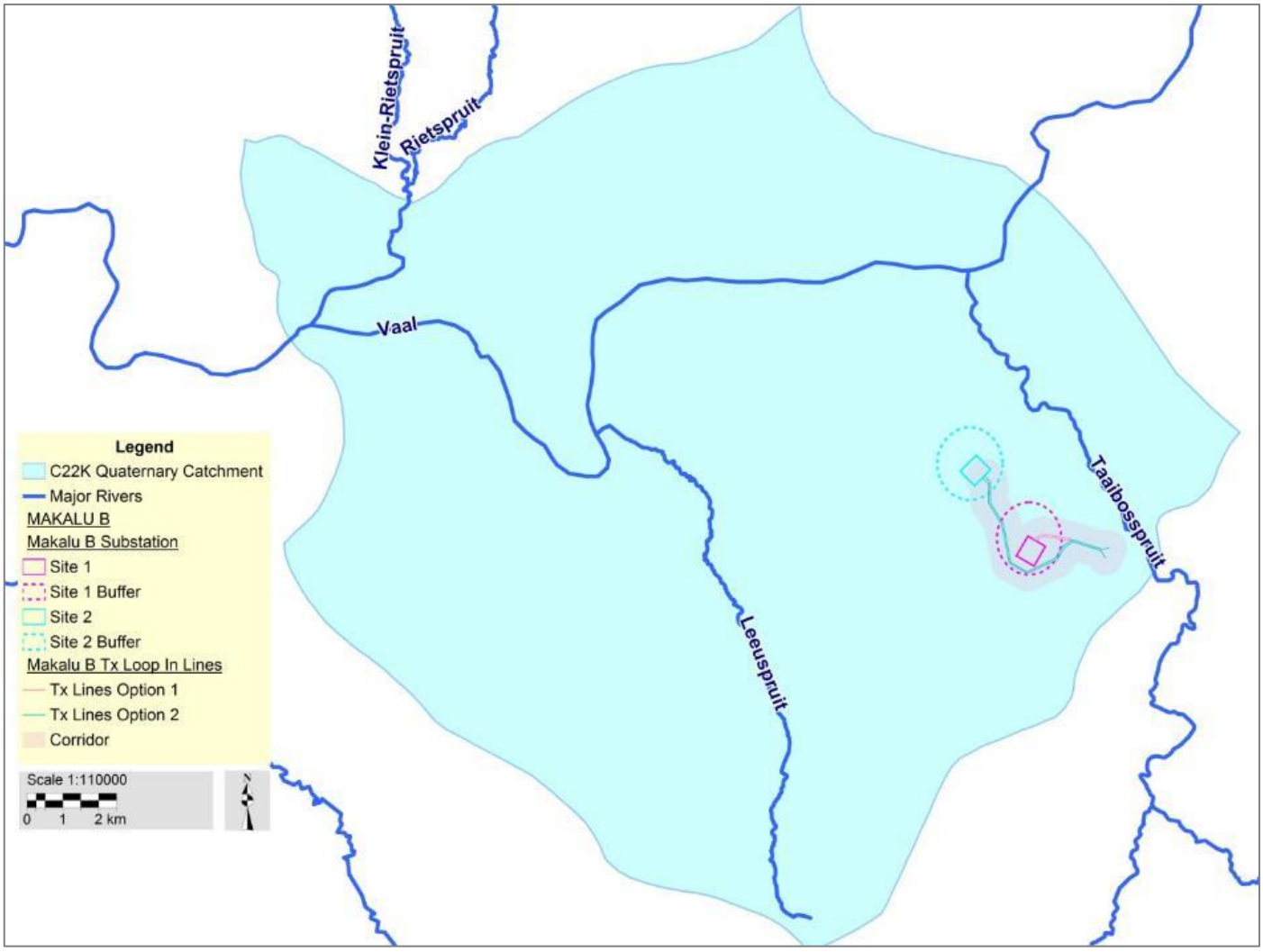


**Figure 39:** **C22K quaternary catchment and major rivers**

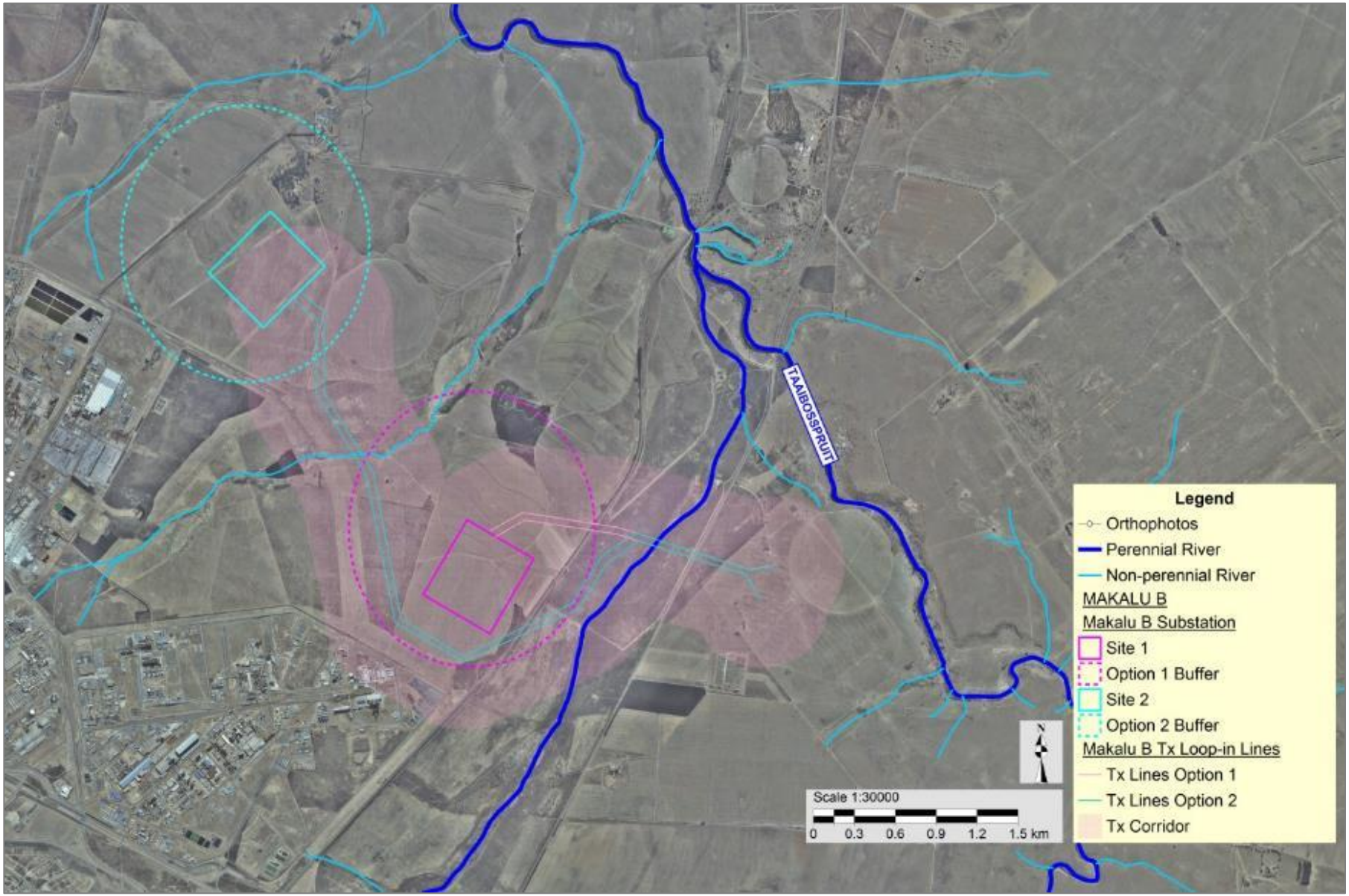


**Figure 40:** **Orthophoto of perennial and non-perennial rivers in project area**

### *10.7.2 Water Quality*

The various pollution sources in the Taaibosspruit catchment include mines, agricultural activities, urban areas, informal areas and industries.

Historical water quality data is contained in **Appendix E** for the following DWS monitoring point on the Taaibosspruit (see **Figure 41**):

- C2H014Q01 - Taaibosspruit at Verdun (latitude: -26.823889; longitude: 27.925833).
- LTS20 - Taaibosspruit at Weir on Jersey Farm (latitude: -26.823056; longitude: 27.933611).

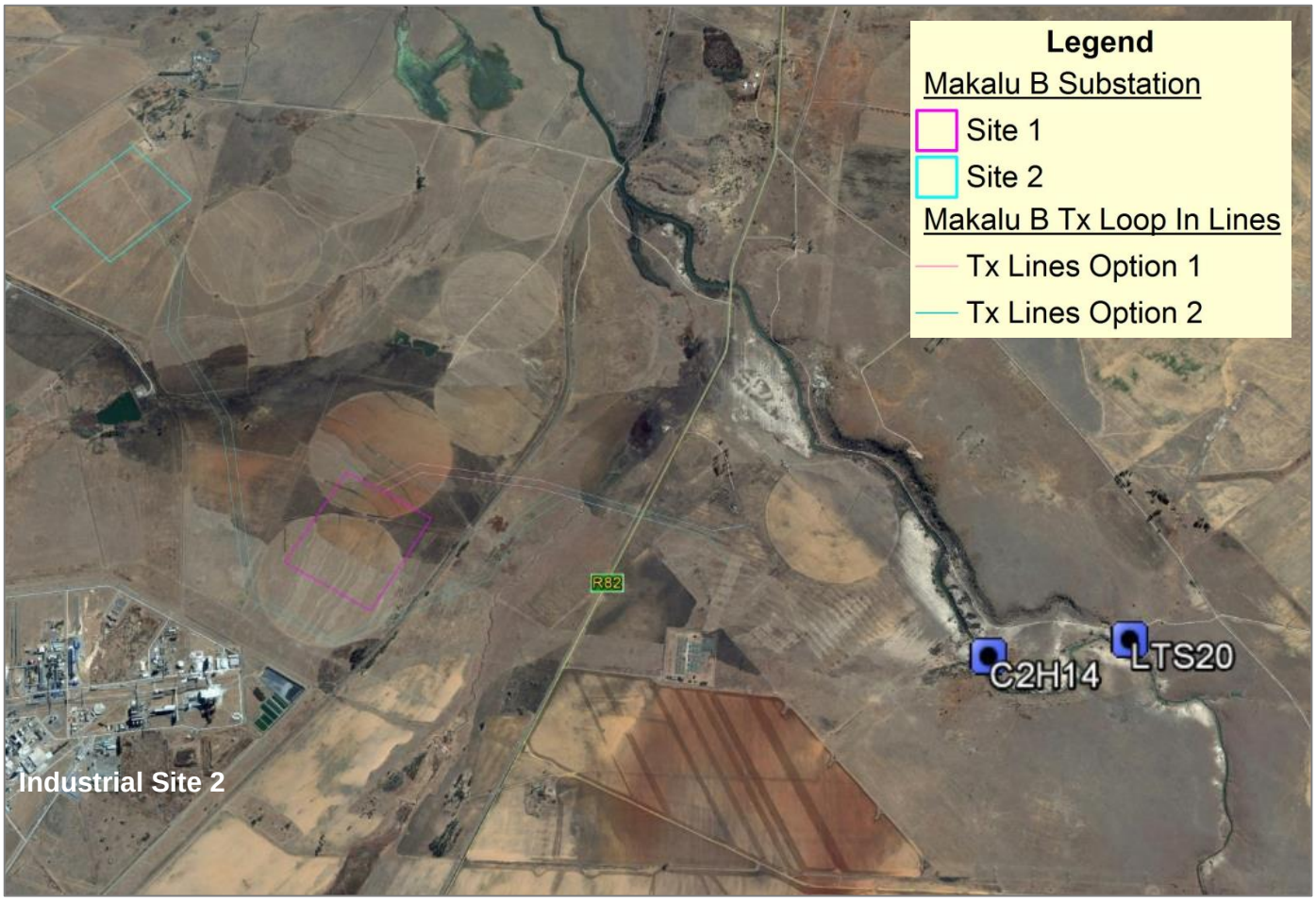


**Figure 41: DWS water quality monitoring points (Google Earth image)**

### *10.7.3 Ecological Status*

An ecological impact assessment of the aquatic ecosystems was undertaken as part of the proposed NVC Life Extension Project (Golder Associates Africa (Pty) Ltd, 2012). This study selected various biomonitoring points for the assessment of the potential impacts associated with the aforementioned project. Site NWV9 (latitude: -26.74676; longitude: 27.86337) is located on the Taaibosspruit to the north of the Makalu B project area. Based on the aquatic macroinvertebrate results the biotic integrity within the Taaibosspruit was ranked as fair to critically impaired. Based on the fish sampled during the 2011 and 2012 surveys, it was also found that biotic integrity within the Upper Taaibosspruit was moderately to critically modified.

**Figure 42: Views of Taaibosspruit (R. Meissner)**

### *10.7.4 Wetlands*

The wetlands in the project area, which were identified on a desktop level based on the National Freshwater Ecosystem Priority Areas (NFEPA) coverage (CSIR, 2011), are shown in **Figure 43**. Note that a number of the 'wetland features' are not natural (e.g. farm dams, pollution control dams) and ground-truthing of wetlands will take place in the EIA phase.

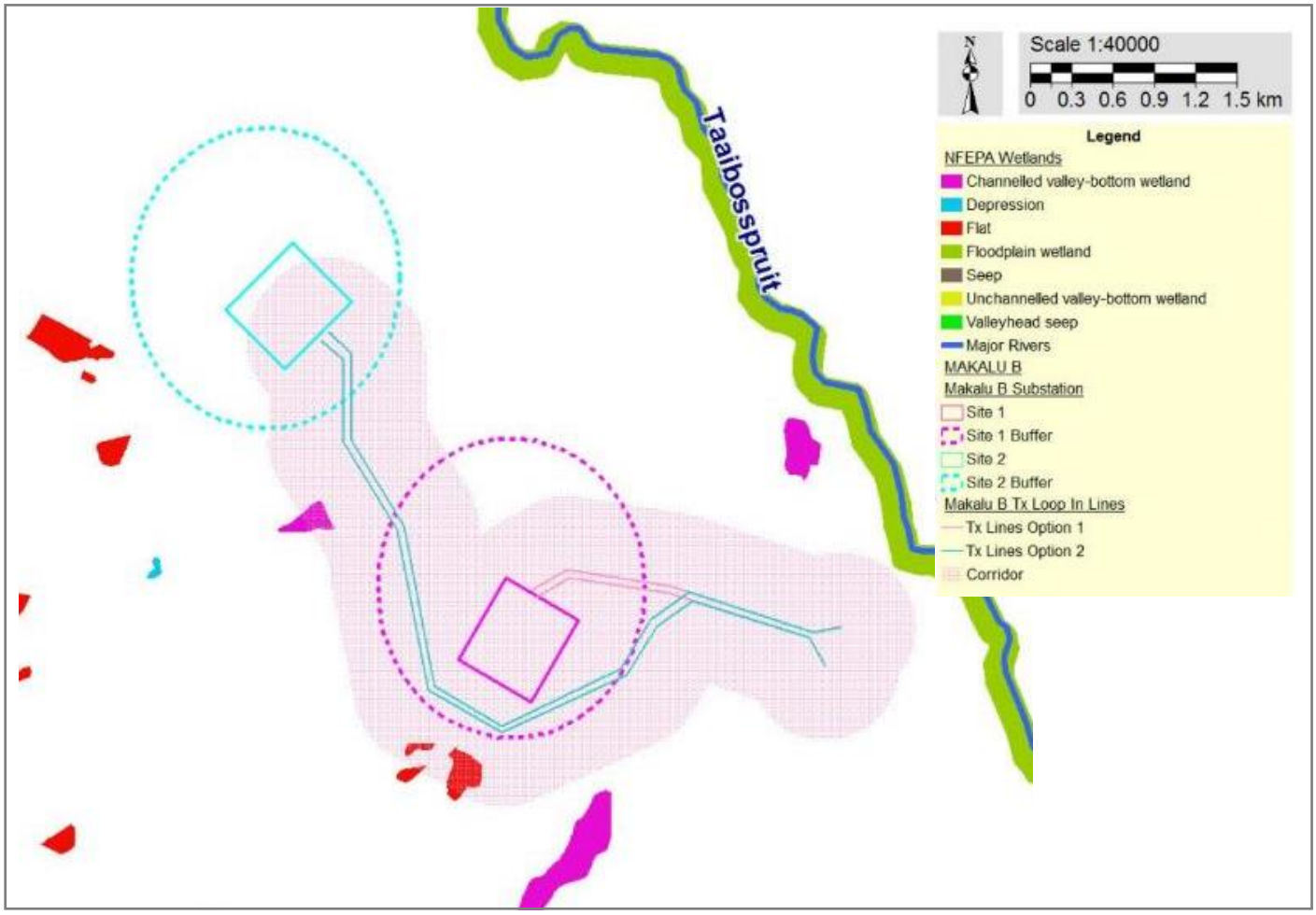


**Figure 43: NFEPA wetlands**

## Potential Impacts / Implications

Impacts to the resource quality of the affected watercourses during the construction phase could include:

- Damage to riparian habitat as part of the clearing of the servitude;
- Destabilisation of morphology (i.e. river structure);
- Reduction of water quality through sedimentation (e.g. access roads over watercourses, silt from the construction site transported via runoff) and poor construction practices (e.g. Improper management of wastewater, incorrect storage of material, spillages);
- Temporary alteration of flow and the structure (i.e. bed and banks) of watercourses at river crossings for access roads; and
- Reduction in biodiversity of aquatic biota as a result of the abovementioned drivers.

Potential impacts during the operational phase include:

- Sedimentation through silt-laden runoff, caused by inadequate stormwater management on access roads and at the substation; and
- Damage to towers from major flood events.

During the siting of the towers, the locations are selected to prevent impacts to watercourses. The towers will also be located outside of the 1:100 year floodlines at the river crossings.

Should construction activities encroach upon the regulated area of a watercourse (i.e. 1:100 year floodline / delineated riparian or 500 m of a wetland habitat) water use authorisation will be required in terms of Section 21 of the National Water Act (Act No. 36 of 1998). In accordance with Section 27 of this Act, the following factors need to be taken into consideration by DWS before an authorisation may be issued:

1. Existing lawful water uses;
2. The need to redress the results of past racial and gender discrimination;
3. Efficient and beneficial use of water in the public interest;
4. The socio-economic impact of the water use or uses if authorised; or of the failure to authorise the water use or uses;
5. Any catchment management strategy applicable to the relevant water resource;
6. The likely effect of the water use to be authorised on the water resource and on other water users;
7. The class and the resource quality objectives of the water resource;
8. Investments already made and to be made by the water user in respect of the water use in question;
9. The strategic importance of the water use to be authorised;
10. The quality of water in the water resource which may be required for the Reserve and for meeting international obligations; and
11. The probable duration of any undertaking for which a water use is to be authorised.

**Specialist Study Triggered / Additional Investigations**

An Aquatic Impact Assessment will be undertaken in the EIA phase. The status of wetlands (including delineation) and impacts to these systems will be assessed as part of this study. Ground-truthing of NFEPA information will also be undertaken.

Best practices to mitigate impacts to watercourses will be included in the EMPr.

## 10.8 Flora

**Status Quo**

### *10.8.1 Regional Vegetation*

The study area falls within the Grassland biome (Rutherford and Westfall, 1994), which is found mainly on the high central plateau of South Africa, the inland areas of KwaZulu-Natal and the Eastern Cape. Grasslands are dominated by a single layer of grasses. Trees are absent, except in a few localised habitats and geophytes are often abundant (Low and Rebelo, 1996). Mucina and Rutherford (2006) classified the study area as falling within the Central Free State Grassland type unit (see **Figure 44**).

The Central Free State Grassland is found in Free State Province and marginally into Gauteng Province. A broad zone of this vegetation type starts from around Sasolburg in the north to Dewetsdorp in the south. Other major settlements located within this unit include Kroonstad, Ventersburg, Steynsrus, Winburg, Lindley and Edenville (Mucina and Rutherford, 2006).

This vegetation type is listed as **Vulnerable,** with a national conservation target of 24%. Only small portions enjoy statutory conservation*, i.e.* Willem Pretorius, Rustfontein and Koppies Dam Nature Reserves, as well as some protection in private nature reserves. Almost a quarter of the area has been transformed either for cultivation or by building of dams (Allemanskraal, Erfenis, Groothoek, Koppies, Kroonstad, Lace Mine, Rustfontein and Weltevrede) (Mucina and Rutherford, 2006).

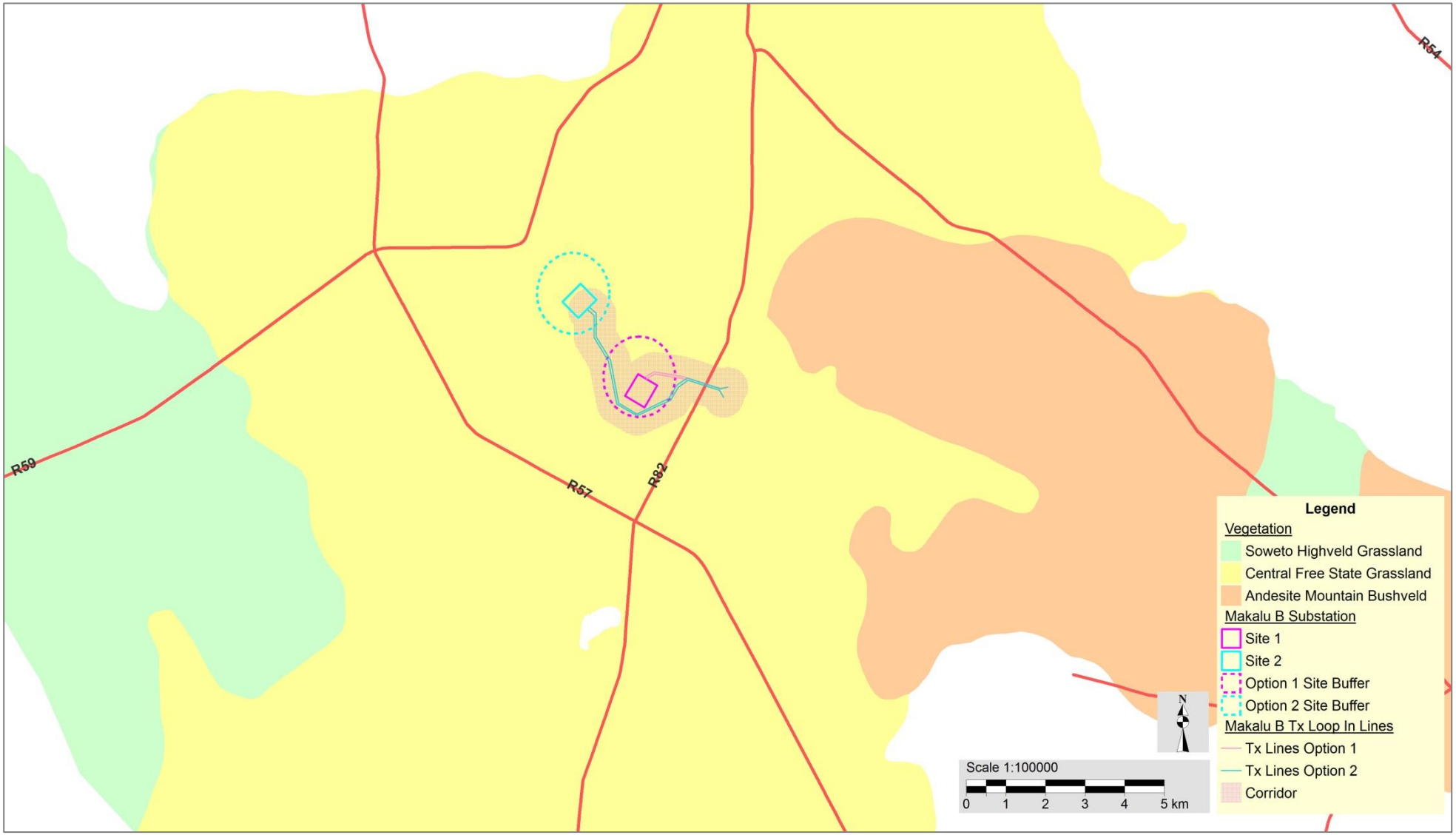


**Figure 44: Vegetation types in project area**

### *10.8.2 Terrestrial Threatened Ecosystems*

The South African National Biodiversity Institute (SANBI), in conjunction DEA, released a draft report in 2009 entitled “Threatened Ecosystems in South Africa: Descriptions and Maps”, to provide background information on the above List of Threatened Ecosystems (SANBI, 2009). The purpose of this report was to present a detailed description of each of South Africa’s ecosystems and to determine their status using a credible and practical set of criteria.

According to the data sourced from SANBI no threatened terrestrial ecosystems were recorded on or near the project area (**Figure 45**). Soweto Highveld Grassland occurs in excess of 5 km from the project area.

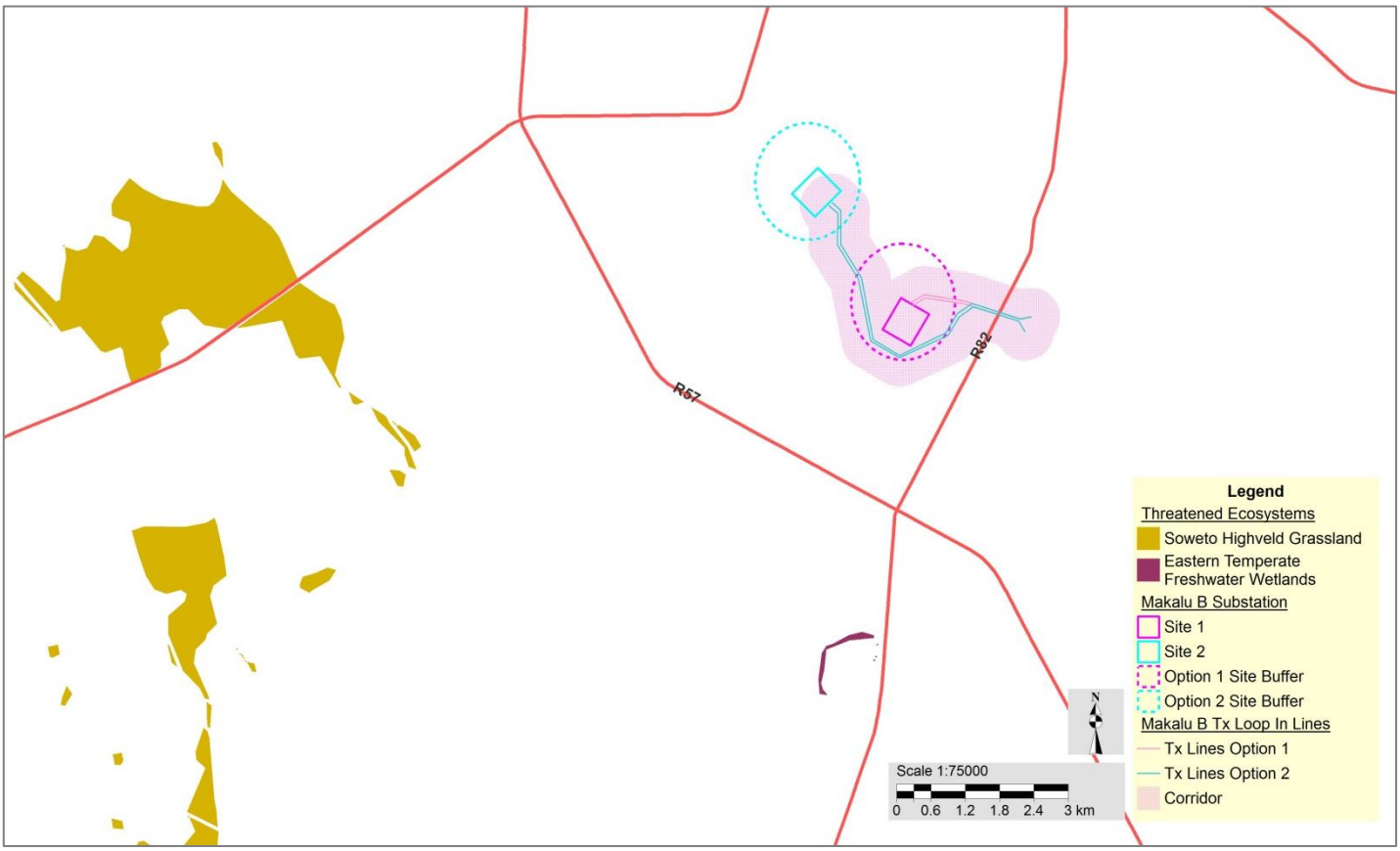


**Figure 45: Terrestrial Threatened Ecosystems in the region**

### *10.8.3 Protected Plant Species*

The project area is located within 2627DD quarter degree square in terms of the 1:50 000 grid of South Africa. SANBI uses this grid system as a point of reference to determine any Red Data plant species or any species of conservation importance occurring in South Africa. **Table 8** provides details on the Red Data plant species which have been recorded in this grid cell. The definitions of the conservation status are provided in **Table 9**.

**Table 8: Red Data plant species recorded in grid cell 2627DD**

| Family | Species | Threat status | Growth forms |
|---|---|---|---|
| Amaryllidaceae | *Crinum bulbispermum* (Burm.f.) Milne-Redh. & Schweick. | Declining | Geophyte, hydrophyte |
| Apiaceae | *Alepidea attenuata* Weim. | NT | Herb |
| Apocynaceae | *Brachystelma incanum* R.A.Dyer | VU | Geophyte, succulent |
| Apocynaceae | *Stenostelma umbelluliferum* (Schltr.) S.P.Bester & Nicholas | NT | Geophyte, herb, succulent |
| asphodelaceae | *Kniphofia typhoides* Codd | NT | Herb, succulent |
| Fabaceae | *Indigofera hybrida* N.E.Br. | VU | Herb |
| Hypoxidaceae | *Hypoxis hemerocallidea* Fisch., C.A.Mey. & Avé-Lall. | Declining | Geophyte |

***Note***: VU=Vulnerable, NT=Near Threatened

**Table 9: Definitions of Red Data status (Raimondo *et al.* 1999)**

| Symbol | Status | Description |
|---|---|---|
| VU | Vulnerable | A taxon is **Vulnerable** when the best available evidence indicates that it meets any of the five International Union for Conservation of Nature (IUCN) criteria for Vulnerable and it is therefore considered to be facing a high risk of extinction in the wild. |
| NT | Near Threatened | A taxon is **Near Threatened** when available evidence indicates that it is close to meeting any of the five IUCN criteria for Vulnerable and it is therefore likely to qualify for a threatened category in the near future. |
| | Declining | A taxon is **Declining** when it does not meet any of the five IUCN criteria and does not qualify for the categories Critically Endangered, Endangered, Vulnerable or Near Threatened, but there are threatening processes causing a continuing decline in the population. |

## Potential Impacts / Implications

The main reasons for managing the vegetation under power lines include the following:

- Ensuring safe clearances under and around power lines;
- Ensuring adequate access for inspection, maintenance and repair activities; and
- Reduction of fuels for fires under power lines that cause flashovers.

Potential impacts to vegetation resulting from the construction of the proposed Tx lines include the clearance of vegetation in accordance with The Eskom Contract Specification for Vegetation Management Services on Eskom Networks (240-52456757). The substation site will also be cleared of vegetative cover.

During the operational phase, vegetation that could possibly interfere with the operation and/or reliability of the power line must be trimmed or completely cleared. Invasive alien species in the servitude is cleared and chemically treated for the total width of the servitude.

**Specialist Study Triggered / Additional Investigations**

The Terrestrial Ecological Impact Assessment in the EIA phase will assess the status of the sensitive ecological features. Areas to be affected by project activities and infrastructure will be surveyed to identify sensitive and significant floral species. Suitable mitigation measures will be identified and recommendations will be made to address potential impacts.

The compatibility of the project with the FS Biodiversity Plan (2015) and other environmental management and planning tools will be considered further during the EIA phase.

Mitigation measures will be established during the EIA phase to manage the potential impacts to vegetation, removal of protected trees and medicinal plants, encroachment by exotic species and to address the overall reinstatement and rehabilitation of the area affected within the construction domain (outside of the permanent infrastructure footprint).

## 10.9 Fauna

**Status Quo**

### *10.9.1 Mammals*

The potential mammal species that could be found in the project area are those which have been recorded in the grid cell 2627DD (ADU, 2016) and are listed in **Table 10**. According to this list, only Roan Antelope and Sable antelope are mammal species of conservation importance known to occur in the region, and neither of these is expected to be present.

**Table 10: Mammal species recorded in grid cell 2627DD (ADU, 2016)**

| Family | Genus | Species | Subspecies | Common name | Red list category | Atlas region endemic |
|---|---|---|---|---|---|---|
| Bathyergidae | *Cryptomys* | *hottentotus* | | Southern African Mole-rat | Least Concern | Yes |
| Bovidae | *Alcelaphus* | *buselaphus* | | Hartebeest | Not listed | Yes |
| Bovidae | *Antidorcas* | *marsupialis* | | Springbok | Least Concern | Yes |
| Bovidae | *Connochaetes* | *gnou* | | Black Wildebeest | Least Concern | Yes |
| Bovidae | *Connochaetes* | *taurinus* | *taurinus* | Blue (Common) wildebeest | Least Concern | |
| Bovidae | *Damaliscus* | *pygargus* | *phillipsi* | Blesbok | Least Concern | |
| Bovidae | *Hippotragus* | *equinus* | | Roan Antelope | Vulnerable | Yes |
| Bovidae | *Hippotragus* | *niger* | *niger* | Sable antelope | Vulnerable | |
| Bovidae | *Kobus* | *ellipsiprymnus* | *ellipsiprymnus* | Waterbuck | Least Concern | |
| Bovidae | *Kobus* | *leche* | | Lechwe | Not listed | Yes |
| Bovidae | *Oryx* | *gazella* | | Gemsbok | Least Concern | Yes |
| Bovidae | *Raphicerus* | *campestris* | | Steenbok | Least Concern | Yes |
| Bovidae | *Sylvicapra* | *grimmia* | | Bush Duiker | Least Concern | Yes |
| Bovidae | *Syncerus* | *caffer* | | African Buffalo | Least Concern | Yes |
| Bovidae | *Tragelaphus* | *angasii* | | Nyala | Least Concern | Yes |
| Bovidae | *Tragelaphus* | *oryx* | | Common Eland | Least Concern | Yes |
| Canidae | *Otocyon* | *megalotis* | | Bat-eared Fox | Least Concern | Yes |
| Cervidae | *Dama* | *dama* | | Fallow Deer | Introduced | Yes |
| Emballonuridae | *Taphozous* | *mauritianus* | | Mauritian Tomb Bat | Least Concern | Yes |
| Herpestidae | *Cynictis* | *penicillata* | | Yellow Mongoose | Least Concern | Yes |

| Family | Genus | Species | Subspecies | Common name | Red list category | Atlas region endemic |
|---|---|---|---|---|---|---|
| Leporidae | *Lepus* | *saxatilis* | | Scrub Hare | Least Concern | Yes |
| Molossidae | *Tadarida* | *aegyptiaca* | | Egyptian Free-tailed Bat | Least Concern | Yes |
| Mustelidae | *Ictonyx* | *striatus* | | Striped Polecat | Least Concern | Yes |
| Soricidae | *Suncus* | *infinitesimus* | | Least Dwarf Shrew | Data Deficient | Yes |
| Vespertilionidae | *Neoromicia* | *capensis* | | Cape Serotine | Least Concern | Yes |
| Viveridae | *Genetta* | *maculata* | | Common Large-spotted Genet (Rusty-spotted Genet) | Least Concern | |

### *10.9.2 Avifauna*

Bird distribution data of the Southern African Bird Atlas Project (SABAP1 – Harrison *et al.*, 1997) obtained from the Avian Demography Unit of the University of Cape Town was used in order to ascertain which species could occur in the study area (**Table 11**). The more recent SABAP2 data was consulted online (http://sabap2.adu.org.za/v1/gap_analysis.php).

**Table 11: Red Data bird species recorded in the grid cell 2627DD (ADU, 2016)**

| Common name | Scientific Name | Status |
|---|---|---|
| Lesser Kestrel | *Falco naumanni* | Vulnerable |
| Greater Flamingo | *Phoenicopterus ruber* | Near Threatened |
| Secretarybird | *Sagittarius serpentarius* | Near Threatened |
| Caspian Tern | *Sterna caspia* | Near Threatened |
| Lanner Falcon | *Falco biarmicus* | Near Threatened |
| African Marsh-Harrier | *Circus ranivorus* | Vulnerable |
| Yellow-billed Stork | *Mycteria ibis* | Near Threatened |
| Black-winged Pratincole | *Glareola nordmanni* | Near Threatened |
| Melodious Lark | *Mirafra cheniana* | Near Threatened |
| African Openbill | *Anastomus lamelligerus* | Near Threatened |
| Blue Korhaan | *Eupodotis caerulescens* | Near Threatened |
| White-bellied Korhaan | *Eupodotis senegalensis* | Vulnerable |
| Peregrine Falcon | *Falco peregrinus* | Near Threatened |
| Lesser Flamingo | *Phoenicopterus minor* | Near Threatened |
| Blue Crane | *Anthropoides paradiseus* | Vulnerable |
| Greater Painted-snipe | *Rostratula benghalensis* | Near Threatened |
| White-backed Night-Heron | *Gorsachius leuconotus* | Vulnerable |
| African Grass-Owl | *Tyto capensis* | Vulnerable |
| African finfoot | *Podica senegalensis* | Intermediate |
| Black Harrier | *Circus maurus* | Vulnerable |
| Half-collared Kingfisher | *Alcedo semitorquata* | Near Threatened |
| Denham's Bustard | *Neotis denhami* | Vulnerable |
| Corn Crake | *Crex crex* | Vulnerable |
| Black-winged Pratincole | *Glareola nordmanni* | Near Threatened |
| Pallid Harrier | *Circus macrourus* | Near Threatened |
| Great White Pelican | *Pelecanus onocrotalus* | Near Threatened |
| Pink-backed Pelican | *Pelecanus rufescens* | Vulnerable |
| Black Stork | *Ciconia nigra* | Near Threatened |

As previously mentioned, the study area falls within the Grassland biome and this biome is considered as a home to 52 of the 122 Important Bird & Biodiversity Area (IBA) in South Africa (O'Connor and Bredenkamp, 1997). Threatened grassland bird species range from LBJs (such as Yellow-breasted Pipit, Rudd's Lark and Botha's Lark) to the larger charismatic species (such as

Secretarybird, Denham's Bustard, African Grass-Owl and Southern Bald Ibis) (Barnes, 1998). This is why the grasslands hold priority IBAs. However, there are no IBAs occurring in or near the Makalu B project area. The nearest IBA is the Suikerbosrand Nature Reserve IBA, which is situated approximately 40km north east of the project area (**Figure 46**).

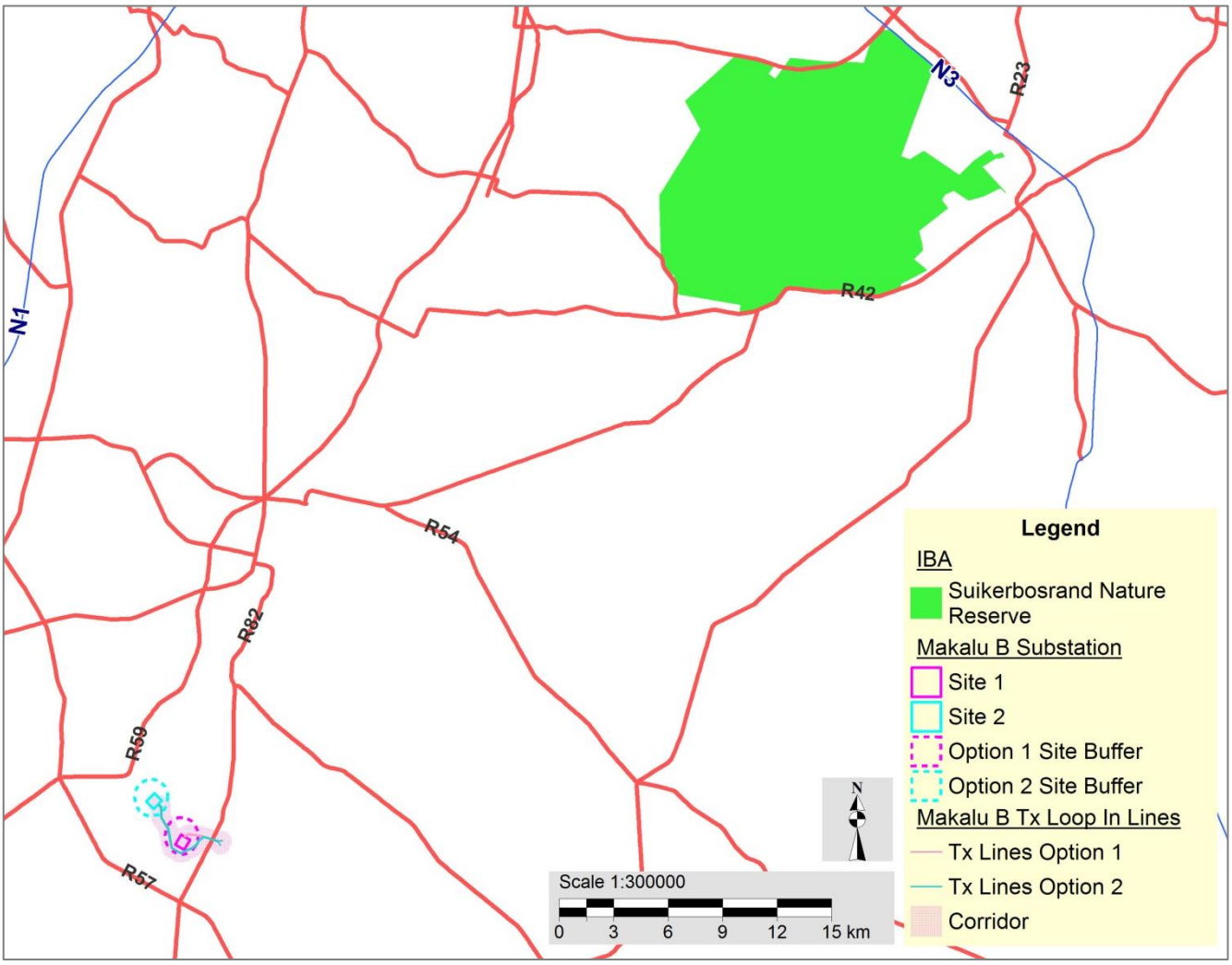


**Figure 46: IBAs in the region**

### *10.9.3 Herpetofauna (Reptiles and Amphibians)*

Riparian habitats are traditionally rich in reptile diversity and densities due to the habitat supporting a high abundance of prey species, such as frogs, birds and small mammals (Branch, 2001). Reptilian species are largely dependent on habitat unit structures and prey abundance, which, in turn, also depends on general habitat unit structure and condition. Many reptilian species, together with a large proportion of their prey species, have been shown to be broadly tolerant to a variety of habitat types. Vegetative cover is also greater within this habitat type. Species are also very often “ousted” into wetland and riparian zones due to transformation of lands for urban and agricultural purposes.

Amphibians are an important component of South Africa's exceptional biodiversity and are such worthy of both research and conservation effort. This is made additionally relevant by international concern over globally declining amphibian populations, a phenomenon currently undergoing intensive investigation but is still poorly understood (Wyman, 1990 & Wake, 1991). This decline seems to have worsened over the past 25 years and amphibians are now more threatened than either mammals or birds, though comparisons with other taxa are confounded by a shortage of reliable data. Frogs are particularly restricted to aquatic habitats (wetlands and other surface water bodies) and, thus, impacts on these habitats (as a result of the clearing of the vegetation) are likely to negatively impact on amphibian species. Frogs also require terrestrial habitats adjoining aquatic habitats. The presence of amphibians is also generally regarded as an indication of intact ecological functionality and therefore construction activities within these habitat units should be undertaken in an ecologically-sensitive manner.

**Table 12** lists reptile species which were recorded in the grid cell 2627DD based on the data from the South African Reptile Conservation Assessment (ADU, 2016). According to the list, no reptile species of conservation importance is known to occur in the region.

According to Frog Atlas of Southern African (ADU, 2016) for the grid cell 2627DD, only one Red data frog species is known to occur in the region, namely the Giant Bull Frog. **Table 13** lists frogs that were recorded in grid cell 2627DD.

**Table 12: Red Data reptile species recorded in the grid cell 2627DD (ADU, 2016)**

| Family | Genus | Species | Subspecies | Common name | Red list category | Atlas region endemic |
|---|---|---|---|---|---|---|
| Agamidae | *Agama* | *atra* | | Southern Rock Agama | Least Concern (SARCA 2014) | |
| Colubridae | *Crotaphopeltis* | *hotamboeia* | | Red-lipped Snake | Least Concern (SARCA 2014) | |
| Colubridae | *Dasypeltis* | *scabra* | | Rhombic Egg-eater | Least Concern (SARCA 2014) | |
| Elapidae | *Hemachatus* | *haemachatus* | | Rinkhals | Least Concern (SARCA 2014) | |
| Gekkonidae | *Lygodactylus* | *capensis* | *capensis* | Common Dwarf Gecko | Least Concern (SARCA 2014) | |
| Lamprophiidae | *Aparallactus* | *capensis* | | Black-headed Centipede-eater | Least Concern (SARCA 2014) | |
| Lamprophiidae | *Boaedon* | *capensis* | | Brown House Snake | Least Concern (SARCA 2014) | |
| Lamprophiidae | *Homoroselaps* | *lacteus* | | Spotted Harlequin Snake | Least Concern (SARCA 2014) | Yes |
| Lamprophiidae | *Lamprophis* | *aurora* | | Aurora House Snake | Least Concern (SARCA 2014) | Yes |
| Lamprophiidae | *Lycodonomorphus* | *rufulus* | | Brown Water Snake | Least Concern (SARCA 2014) | |
| Lamprophiidae | *Psammophis* | *crucifer* | | Cross-marked Grass Snake | Least Concern (SARCA 2014) | |
| Lamprophiidae | *Psammophylax* | *rhombeatus* | *rhombeatus* | Spotted Grass Snake | Least Concern (SARCA 2014) | |
| Leptotyphlopidae | *Leptotyphlops* | | | | Not listed | |
| Pelomedusidae | *Pelomedusa* | *galeata* | | South African Marsh Terrapin | Not evaluated | |
| Scincidae | *Acontias* | *gracilicauda* | | Thin-tailed Legless Skink | Least Concern (SARCA 2014) | Yes |
| Scincidae | *Trachylepis* | *capensis* | | Cape Skink | Least Concern (SARCA 2014) | |

| Family | Genus | Species | Subspecies | Common name | Red list category | Atlas region endemic |
|---|---|---|---|---|---|---|
| Scincidae | *Trachylepis* | *punctatissima* | | Speckled Rock Skink | Least Concern (SARCA 2014) | |
| Typhlopidae | *Afrotyphlops* | *bibronii* | | Bibron's Blind Snake | Least Concern (SARCA 2014) | |

**Table 13: Red Data amphibian species recorded in the grid cell 2627DD (ADU, 2016)**

| Family | Genus | Species | Common name | Red list category |
|---|---|---|---|---|
| Brevicepitidae | *Breviceps* | *adspersus* | Bushveld Rain Frog | Least Concern |
| Bufonidae | *Sclerophrys* | *capensis* | Raucous Toad | Least Concern |
| Bufonidae | *Sclerophrys* | *garmani* | Olive Toad | Least Concern |
| Bufonidae | *Sclerophrys* | *gutturalis* | Guttural Toad | Least Concern |
| Hyperoliidae | *Kassina* | *senegalensis* | Bubbling Kassina | Least Concern |
| Pipidae | *Xenopus* | *laevis* | Common Platanna | Least Concern |
| Pyxicephalidae | *Amietia* | *fuscigula* | Cape River Frog | Least Concern |
| Pyxicephalidae | *Cacosternum* | *boettgeri* | Common Caco | Least Concern |
| Pyxicephalidae | *Pyxicephalus* | *adspersus* | Giant Bull Frog | Near Threatened |
| Pyxicephalidae | *Strongylopus* | *fasciatus* | Striped Stream Frog | Least Concern |
| Pyxicephalidae | *Tomopterna* | | | Not listed |
| Pyxicephalidae | *Tomopterna* | *cryptotis* | Tremelo Sand Frog | Least Concern |

### *10.9.4 Invertebrates*

According to the ADU (2016), no butterfly species of conservation importance are known to occur in and around the project area. Butterfly species recorded by Mecenero *et al*. (2013) in the region indicates 54 species which are listed as least Concern.

No Red Data scorpions or spiders are known to occur in the region (ADU, 2016).

## Potential Impacts / Implications

Potential impacts to fauna during the construction phase include the following:

- Loss of habitat (e.g. removal of trees);
- Temporary emigration of animals away from area;
- Poaching and wilful harming of animals by construction workers;
- Risk of harm from construction activities (e.g. open excavations); and
- Loss of livestock though improper access control.

Birds are particularly susceptible to impacts from Tx lines, which include electrocution, collision with power lines and loss of habitat.

## Specialist Study Triggered / Additional Investigations

A Terrestrial Ecological Impact Assessment and Avifauna Impact Assessment will be undertaken in the EIA phase. Areas to be affected by project activities and infrastructure to be surveyed to identify sensitive and significant faunal species and associated habitat. Suitable mitigation measures to be identified as part of these specialist studies and recommendations to be made to

address impacts. Mitigation measures will also be identified to reduce the impacts of collisions of birds with the proposed power lines.

The compatibility of the project with the FS Biodiversity Plan (2015) and other environmental management and planning tools will be considered further during the EIA phase.

## 10.10 FS Biodiversity Plan

According to FS DESTEA (2015), the following terminologies describe features in the FS Biodiversity Plan:

- **CBA1 (Critical Biodiversity Area: Irreplaceable) -**
  A site that is irreplaceable or near-irreplaceable for meeting biodiversity targets. There are no or very few other options for meeting biodiversity targets for the features associated with the site. The loss of a CBA1 site implies that biodiversity targets will not be met.
- **CBA2 (Critical Biodiversity Area: Optimal) -**
  These are areas of high biodiversity significance; their loss will not result in the targets of biodiversity features not being achieved.
- **ESA1 (Ecological Support Area: Natural) -**
  Planning units (PU) identified to be Ecological Support Areas (ESA) and of which <= 10 percent of the surface has been transformed or degraded. PUs belonging to this category are mostly natural and are considered to represent prime corridor areas.
- **ESA2 (Ecological Support Area: Other) -**
  Planning units identified to be ESAs and of which <= 50 percent of the surface has been transformed. It follows that PUs of which 100% of their area has been degraded are included in this class. Degraded areas mostly consist of old lands on which some form of natural vegetation has established and are therefore considered to be suitable areas to facilitate animal movement.
- **Other -**
  Areas of natural vegetation that have not been classified as CBA1, CBA2, ESA1 or ESA2.
- **Degraded -**
  The remainder of land; constituting transformed and degraded areas.

A map showing the FS Biodiversity Plan in relation to the project area is provided in **Figure 47**. According to this map, the project footprint falls within the ESA1, ESA2 and Degraded.

The project area is located near urban and industrial areas and is traversed by existing powerlines and a railway line. However, natural features in the form of watercourses and grasslands still exist in the area.

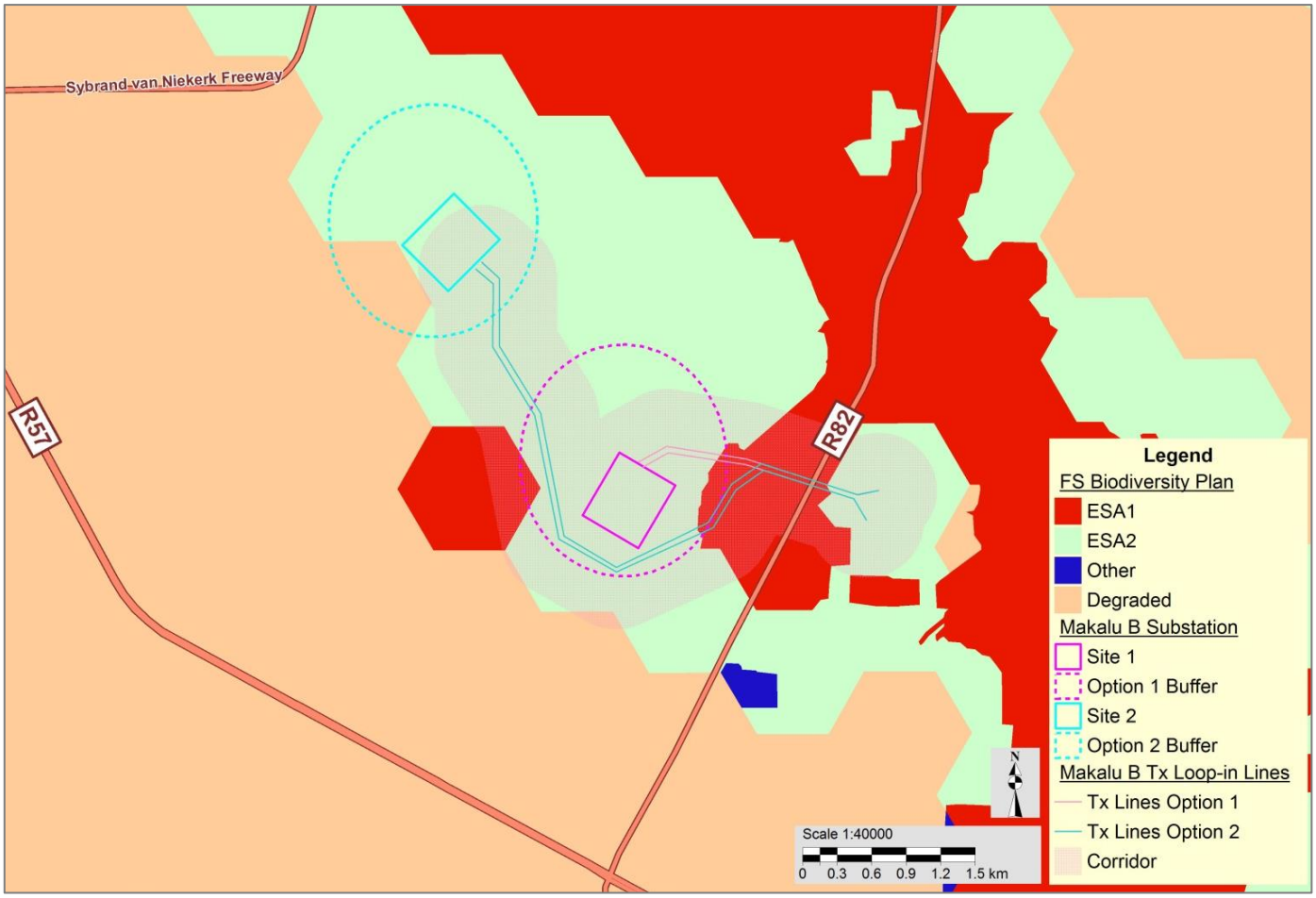


**Figure 47: FS Biodiversity Plan in relation to project area**

## 10.11 Socio-Economic Environment

**Status Quo**

### *10.11.1 General*

The proposed infrastructure is bordered by petro-chemical industries to the west and is located on a combination of agricultural and undeveloped land. The land where the alternative substations are located belongs to AOL. The Tx lines traverse municipal and privately-owned land, as well as servitudes for road and rail infrastructure.

### *10.11.2 Socio-Economic Baseline*

Sasolburg is the administrative seat of the Metsimaholo Local Municipality. It is sub-divided into three areas, namely Sasolburg proper, Vaalpark and Zamdela.

Data pertaining to the socio-economic profile of the following wards (see **Figure 48**) within the Metsimaholo Local Municipality (based on Census 2011) is presented in the tables to follow: Ward 7, Ward 18 and Ward 19.

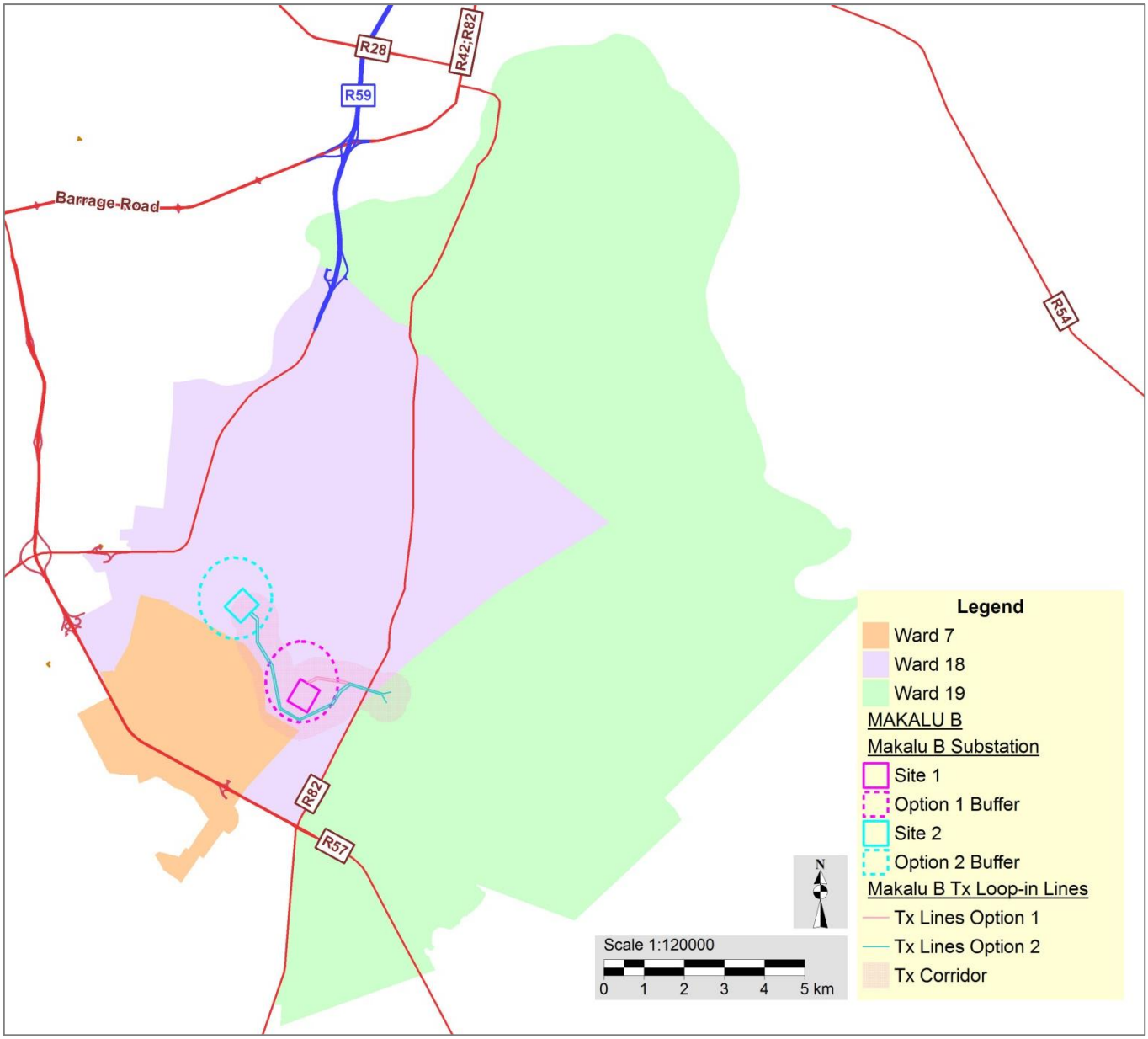


**Figure 48:** **Wards in project area**

**Table 14:** **Age groups in 5 years by Geography and Gender (Statistics SA, 2013)**

| | 42004007: Ward 7 | | 42004018: Ward 18 | | 42004019: Ward 19 | |
|---|---|---|---|---|---|---|
| | Male | Female | Male | Female | Male | Female |
| 00 - 04 | 234 | 231 | 129 | 117 | 852 | 813 |
| 05 - 09 | 183 | 165 | 87 | 87 | 555 | 588 |
| 10 - 14 | 183 | 156 | 114 | 90 | 501 | 474 |
| 15 - 19 | 219 | 216 | 114 | 69 | 453 | 513 |
| 20 - 24 | 261 | 237 | 180 | 111 | 582 | 531 |
| 25 - 29 | 240 | 198 | 234 | 162 | 834 | 780 |
| 30 - 34 | 132 | 123 | 153 | 144 | 918 | 693 |
| 35 - 39 | 114 | 123 | 135 | 108 | 702 | 495 |
| 40 - 44 | 117 | 123 | 117 | 111 | 423 | 312 |
| 45 - 49 | 90 | 138 | 117 | 96 | 276 | 261 |
| 50 - 54 | 66 | 87 | 99 | 63 | 270 | 177 |

| | 42004007: Ward 7 | | 42004018: Ward 18 | | 42004019: Ward 19 | |
|---|---|---|---|---|---|---|
| | Male | Female | Male | Female | Male | Female |
| 55 - 59 | 51 | 84 | 75 | 81 | 201 | 117 |
| 60 - 64 | 42 | 51 | 33 | 24 | 111 | 63 |
| 65 - 69 | 33 | 36 | 21 | 39 | 48 | 39 |
| 70 - 74 | 3 | 21 | 24 | 18 | 24 | 24 |
| 75 - 79 | 6 | 18 | 9 | 12 | 6 | 15 |
| 80 - 84 | 6 | 6 | 6 | 3 | - | 6 |
| 85+ | 3 | 18 | 3 | - | 6 | 12 |
| **Total** | **1986** | **2025** | **1662** | **1347** | **6759** | **5913** |

**Table 15: Annual household income by Geography (Statistics SA, 2013)**

| | 42004007: Ward 7 | 42004018: Ward 18 | 42004019: Ward 19 | Grand Total |
|---|---|---|---|---|
| No income | 111 | 105 | 852 | 1068 |
| R 1 - R 4800 | 66 | 18 | 321 | 405 |
| R 4801 - R 9600 | 99 | 9 | 453 | 561 |
| R 9601 - R 19 600 | 225 | 135 | 645 | 1005 |
| R 19 601 - R 38 200 | 282 | 171 | 1011 | 1464 |
| R 38 201 - R 76 400 | 204 | 66 | 693 | 963 |
| R 76 401 - R 153 800 | 69 | 120 | 288 | 477 |
| R 153 801 - R 307 600 | 15 | 222 | 147 | 384 |
| R 307 601 - R 614 400 | - | 228 | 30 | 258 |
| R 614 001 - R 1 228 800 | - | 69 | 9 | 78 |
| R 1 228 801 - R 2 457 600 | - | 9 | - | 9 |
| R 2 457 601 or more | - | 3 | 3 | 6 |
| **Grand Total** | **1071** | **1155** | **4452** | **6678** |

**Table 16: Highest educational level (grouped) by Geography (Statistics SA, 2013)**

| | 42004007: Ward 7 | 42004018: Ward 18 | 42004019: Ward 19 |
|---|---|---|---|
| No schooling | 162 | 192 | 450 |
| Some primary | 1050 | 432 | 2598 |
| Completed primary | 237 | 111 | 576 |
| Some secondary | 1386 | 606 | 4029 |
| Grade 12/Std 10 | 600 | 717 | 2493 |
| Higher | 102 | 657 | 270 |
| Other | - | - | - |
| Unspecified | 6 | 12 | 24 |
| Not applicable | 468 | 273 | 2232 |

**Table 17: Official employment status by Geography (Statistics SA, 2013)**

| | 42004007: Ward 7 | 42004018: Ward 18 | 42004019: Ward 19 |
|---|---|---|---|
| Employed | 978 | 1626 | 3468 |
| Unemployed | 690 | 105 | 2460 |
| Discouraged work-seeker | 165 | 18 | 201 |
| Other not economically active | 885 | 495 | 2574 |
| Age less than 15 years | - | - | - |
| Not applicable | 1299 | 765 | 3972 |

**Table 18: Piped water by Geography (Statistics SA, 2013)**

| | 42004007: Ward 7 | 42004018: Ward 18 | 42004019: Ward 19 | Grand Total |
|---|---|---|---|---|
| Piped (tap) water inside dwelling/institution | 837 | 945 | 2076 | 3858 |
| Piped (tap) water inside yard | 231 | 180 | 1890 | 2301 |
| Piped (tap) water on community stand: distance less than 200m from dwelling/institution | 3 | 9 | 315 | 327 |
| Piped (tap) water on community stand: distance between 200m and 500m from dwelling/institution | 3 | - | 153 | 156 |
| Piped (tap) water on community stand: distance between 500m and 1000m (1km) from dwelling /institution | - | - | 3 | 3 |
| Piped (tap) water on community stand: distance greater than 1000m (1km) from dwelling/institution | - | 3 | 6 | 9 |
| No access to piped (tap) water | 3 | 21 | 18 | 42 |
| Unspecified | - | - | - | - |
| Not applicable | - | - | - | - |
| **Grand Total** | **1077** | **1158** | **4461** | **6696** |

**Table 19: Toilet facilities by Geography (Statistics SA, 2013)**

| | 42004007: Ward 7 | 42004018: Ward 18 | 42004019: Ward 19 | Grand Total |
|---|---|---|---|---|
| None | 3 | - | 213 | 216 |
| Flush toilet (connected to sewerage system) | 1065 | 1089 | 963 | 3117 |
| Flush toilet (with septic tank) | 6 | 18 | 18 | 42 |
| Chemical toilet | - | - | 153 | 153 |
| Pit toilet with ventilation (VIP) | 6 | 3 | 54 | 63 |
| Pit toilet without ventilation | 3 | 39 | 2520 | 2562 |
| Bucket toilet | - | 6 | 15 | 21 |
| Other | - | 6 | 516 | 522 |
| Unspecified | - | - | - | - |
| Not applicable | - | - | - | - |
| **Grand Total** | **1083** | **1161** | **4452** | **6696** |

**Table 20: Energy or fuel for lighting by Geography (Statistics SA, 2013)**

| | 42004007: Ward 7 | 42004018: Ward 18 | 42004019: Ward 19 | Grand Total |
|---|---|---|---|---|
| Electricity | 1065 | 1122 | 1014 | 3201 |
| Gas | - | - | 27 | 27 |
| Paraffin | - | - | 984 | 984 |
| Candles (not a valid option) | 9 | 30 | 2391 | 2430 |
| Solar | 3 | - | 15 | 18 |
| None | - | 3 | 24 | 27 |
| Unspecified | - | - | - | - |
| Not applicable | - | - | - | - |
| **Grand Total** | **1077** | **1155** | **4455** | **6687** |

**Table 21: Energy or fuel for heating by Geography (Statistics SA, 2013)**

| | 42004007: Ward 7 | 42004018: Ward 18 | 42004019: Ward 19 | Grand Total |
|---|---|---|---|---|
| Electricity | 834 | 939 | 969 | 2742 |
| Gas | 18 | 102 | 459 | 579 |
| Paraffin | 18 | 15 | 1260 | 1293 |
| Wood | 24 | 39 | 174 | 237 |
| Coal | 42 | 9 | 705 | 756 |
| Animal dung | - | - | 6 | 6 |
| Solar | - | 3 | 6 | 9 |
| Other | - | - | - | - |
| None | 138 | 51 | 873 | 1062 |
| Unspecified | - | - | - | - |
| Not applicable | - | - | - | - |
| **Grand Total** | **1074** | **1158** | **4452** | **6684** |

**Table 22: Energy or fuel for cooking by Geography (Statistics SA, 2013)**

| | 42004007: Ward 7 | 42004018: Ward 18 | 42004019: Ward 19 | Grand Total |
|---|---|---|---|---|
| Electricity | 1035 | 1050 | 1002 | 3087 |
| Gas | 9 | 69 | 1353 | 1431 |
| Paraffin | 21 | 12 | 2004 | 2037 |
| Wood | 6 | 21 | 39 | 66 |
| Coal | 3 | - | 36 | 39 |
| Animal dung | - | 3 | 6 | 9 |
| Solar | 3 | - | 12 | 15 |
| Other | - | 6 | - | 6 |
| None | - | - | 6 | 6 |
| Unspecified | - | - | - | - |
| Not applicable | - | - | - | - |
| **Grand Total** | **1077** | **1161** | **4458** | **6696** |

## Potential Impacts / Implications

Possible impacts to the socio-economic environment during the construction phase include (amongst others):

- Loss of land (including cultivated areas) through project infrastructure;
- Change in demographics due to the influx of employment seekers;
- Risk to livestock as a result of construction-related hazards;
- Damage to property (e.g. gates, fences, structures);
- Loss of income from crop production during construction;
- Influx of people seeking employment and associated impacts (e.g. foreign workforce, cultural conflicts, squatting, demographic changes);
- Safety and security;
- Reduction in property value;
- Use of local road network;
- Nuisance from dust and noise;

- Consideration of local labourers and suppliers in area – stimulation of local economy (positive impact);
- Transfer of skills (positive impact); and
- Relocation of structures situated within servitude.

Potential impacts associated with the operational phase include:

- Loss of livestock though improper access control;
- Land use restrictions associated with the Tx line servitude; and
- Threats to human and animal health from EMF.

**Specialist Study Triggered / Additional Investigations**

A Socio-economic Impact Assessment will be undertaken as part of the EIA phase, and mitigation measures will need to be identified to manage the impacts to the local social and economic environments.

## 10.12 Agriculture

**Status Quo**

Agricultural activities in the project area include cultivated commercial pivots and fields. As shown in **Figure 49**, the land capability is classified as moderate potential arable land.

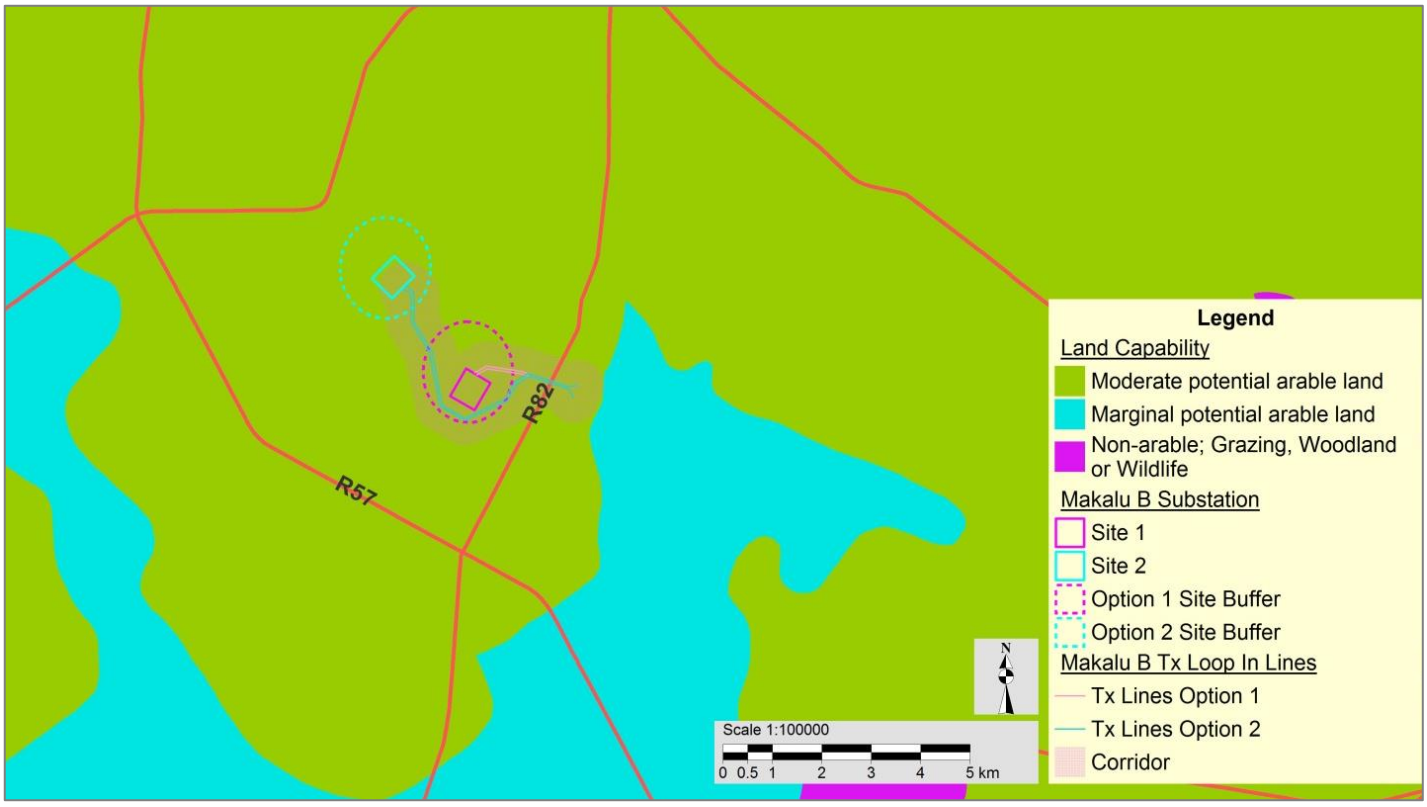


**Figure 49: Land capability (Schoeman *et al.*, 2000) in project area**

**Potential Impacts / Implications**

The project footprint impacts directly on the following agricultural land uses:

- Substation sites –
  - Site 1 – agriculture (cultivated commercial fields);
  - Site 2 – agriculture (cultivated commercial pivots (x2) and fields);
- Tx lines –
  - Route 1 – agriculture (cultivated commercial pivots and fields); and
  - Route 2 – agriculture (cultivated commercial pivots and fields).

Eskom will need to purchase the land for the substation and register a servitude for the Tx lines, following compensation of the landowner. The proposed Tx lines will not result in the sterilisation of all the land within the servitude, and certain agricultural practices (e.g. some crop cultivation, grazing and the use of farm roads) are still permissible.

Potential impacts to agriculture during the construction phase include:

- Loss of arable land;
- Risk of harm to livestock from construction activities (e.g. open excavations);
- Loss of livestock though improper access control; and
- Theft of farming produce during construction.

Potential impacts to agriculture during the operational phase include:

- Loss of livestock though improper access control;
- The potential of magnetic radiation affecting pregnant cattle;
- Power cables influencing the GPS signals used for precision farming;
- Farms with power lines are charged extra for crop spraying;
- Introduction of exotic weed species; and
- Limitation of the height of trees.

**Specialist Study Triggered / Additional Investigations**

An Agricultural Impact Assessment will be conducted during the EIA phase. Amongst others, this will quantify the agricultural areas lost as a result of the proposed project and consider possible mitigation measures. It will also identify the preferred project options from an agricultural perspective.

## 10.13 Air quality

**Status Quo**

Potential air pollution sources in the region include the following:

- Agricultural activities;
- Biomass burning (veld fires);

- Domestic fuel burning;
- Industrial operations;
- Mining;
- Vehicle tailpipe emissions;
- Waste treatment and disposal (landfills and incineration);
- Vehicle entrainment of dust from paved and unpaved roads; and
- Other fugitive dust sources such as wind erosion of exposed areas.

The major findings of an air quality assessment undertaken as part of the district's Air Quality Management Plan (Fezile Dabi District Municipality, 2010), based on the available ambient air quality monitoring data for Metsimaholo Local Municipality, indicate that:

- Particulate concentrations are elevated in the Sasolburg region, with PM10 concentrations generally approaching and exceeding both the daily and annual average standards;
- Sulphur dioxide concentrations are also elevated in Sasolburg with short-term hourly concentrations exceeding the standard at all stations;
- Nitrogen dioxide concentrations are low in Sasolburg although a seasonal signature is observed with increased concentrations during the winter months. Nitrogen dioxide concentrations have a regional impact.

## Potential Impacts / Implications

Potential impacts to air quality during the construction phase include:

- Dust from the use of dirt roads;
- Dust from bare areas that have been cleared for construction purposes;
- Emissions from construction equipment and machinery; and
- Tailpipe emissions from construction vehicles.

Potential impacts to air quality during the operational phase include:

- Dust from the use of dirt roads; and
- Tailpipe emissions from maintenance vehicles.

## Specialist Study Triggered / Additional Investigations

No specialist air quality study will be undertaken as it is not deemed necessary for the type of activities associated with this project. Mitigation measures will be included in the EMPr to ensure that the air quality impacts during the construction phase are suitably managed and that regulated thresholds are not exceeded.

## 10.14 Noise

### Status Quo

Noise in the region emanates primarily from industrial activities to the south and west, farming operations (e.g. use of farming equipment), vehicles on the surrounding road network and trains passing on the railway.

### Potential Impacts / Implications

During construction, localised increases in noise may be caused by:

- Blasting (if required);
- Construction equipment, machinery and vehicles;
- Construction material delivery vehicles; and
- General activities at the construction camp.

Potential sources of noise during the operational phase include:

- Maintenance vehicles and activities; and
- "Crackling" noise (called "corona") from transmission lines.

### Specialist Study Triggered / Additional Investigations

Noise that emanates from construction and operational activities will be addressed through targeted best practices for noise monitoring and management in the EMPr. The associated regulated standards need to be adhered to.

## 10.15 Historical and Cultural Features

### Status Quo

The original town layout of Sasolburg Proper was proclaimed in 1954. Sasolburg proper was established as a town to house the workers for Sasol 1 which was developed as a pilot aimed at refining oil from coal. The location was selected for its proximity to large coal deposits, the Vaal River, and the Witwatersrand markets.

The Phase I Heritage Impact Assessment (Pistorius, 2012) undertaken for the proposed NVC Life Extension Project revealed the following types and ranges of heritage resources in the project area (to the north and east of the Makalu B project footprint):

- Farmstead complexes associated with historical houses, outbuildings (second residences, wagon sheds, rondavels) and in some instances cattle enclosures; and
- Informal and formal graveyards.

It is noted that the area earmarked for Makalu B infrastructure has been disturbed by previous construction activities associated with roads and the railway line, as well as land use practices (mostly agriculture).

**Potential Impacts / Implications**

Potential damage to heritage resources as a result of construction activities.

**Specialist Study Triggered / Additional Investigations**

A Phase 1 Heritage Impact Assessment, in accordance with the National Heritage Resources Act (Act No. 25 of 1999), will be conducted during the EIA phase and will be submitted to the FSHRA for decision-making. The site will also be screened further against the Fossil Sensitivity Map on SAHRIS. All the relevant protocols need to be abided by and permits will need to be obtained with regard to heritage resources (where necessary).

## 10.16 Planning

**Status Quo**

A map showing planning in the Metsimaholo Local Municipality, as obtained from the SDF, is provided in **Figure 50**. The project footprint falls within an area earmarked for light industry.

The project area is predominantly located in Ward 18 of the Metsimaholo Local Municipality, with a small section of the Tx lines in the east situated in Ward 19 and the corridor of route 2 of the Tx lines encroaching into Ward 7 to the south (see **Figure 48**).

**Potential Impacts / Implications**

The proposed Makalu B development is not in direct conflict with the planning framework of the affected Municipality.

Electricity provision is one of the key development priorities of the Metsimaholo Local Municipality. Two of the strategies listed in the municipal IDP include (1) addressing electricity bulk infrastructure backlog and (2) electricity network connection and bulk supply. Makalu B will strengthen the Sasolburg network to accommodate increase in future power demands.

As mentioned, the Makalu B footprint is located to the south of the expansion of NVC (see **Figure 35**). Eskom has engaged with AOL to determine their requirements and to ensure that the corridor of the Tx lines and buffers of the substation sites fall outside of the mining areas.

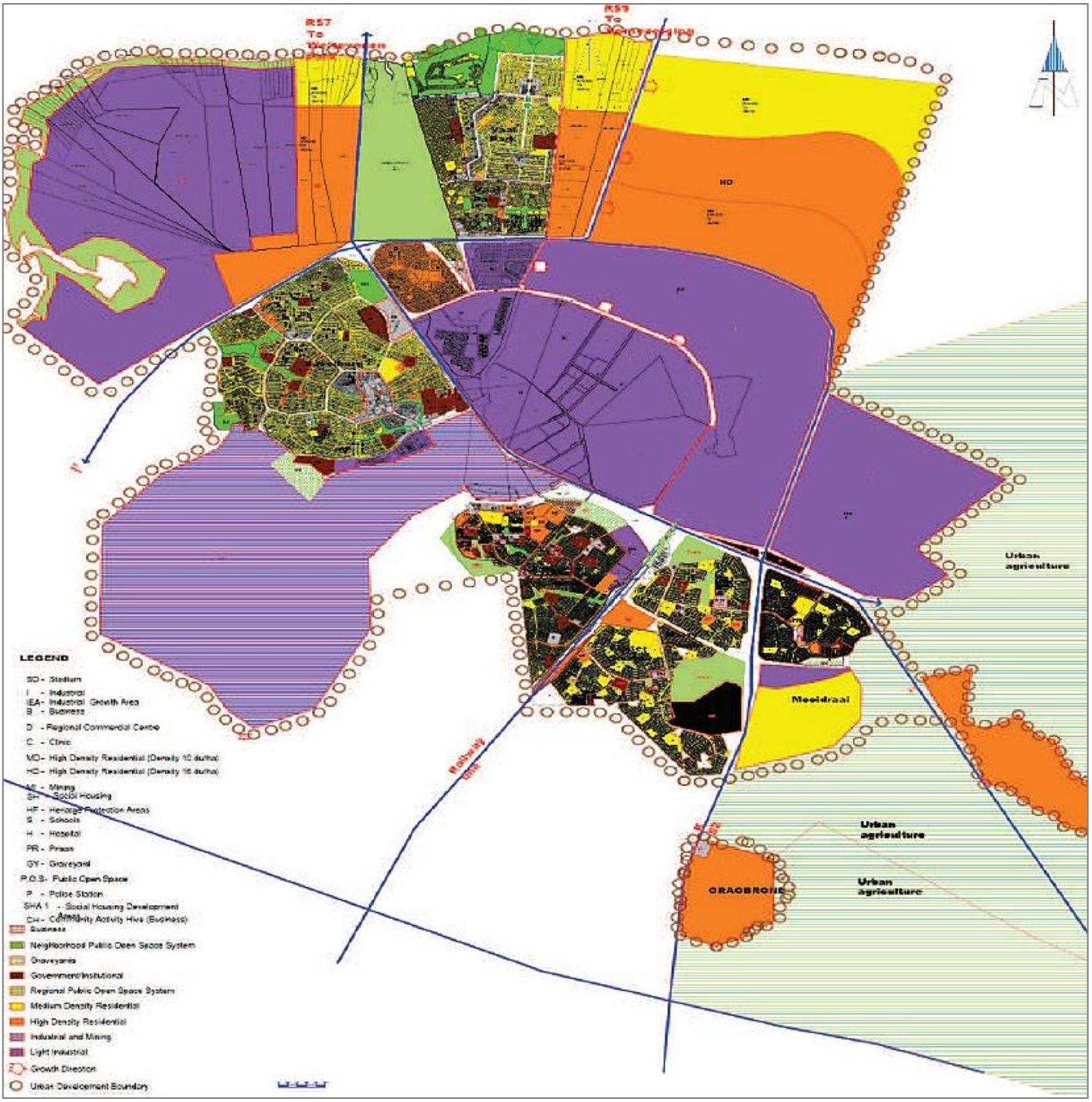


**Figure 50:** **Municipal wide planning (Metsimaholo Local Municipality, 2015)**

## Specialist Study Triggered / Additional Investigations

The influence of the proposed project to matters pertaining to planning and land use will receive further attention in the EIA phase.

## 10.17 Existing Structures and Infrastructure

**Status Quo**

Following engagement with Sasol it was confirmed that the following pipelines run to the south of the Substation site 1 buffer and the Tx line 2 (see **Figure 51**):

- GNP: Gauteng Network Pipeline;
- SAS08: Sasolburg Secunda 8" Liquid Propylene pipeline;
- SAS12: Sasolburg Secunda 12" Ethane pipeline;
- Sas14: Sasolburg Secunda 14" Ethylene pipeline; and
- SNI: Secunda Natref Integration pipeline.

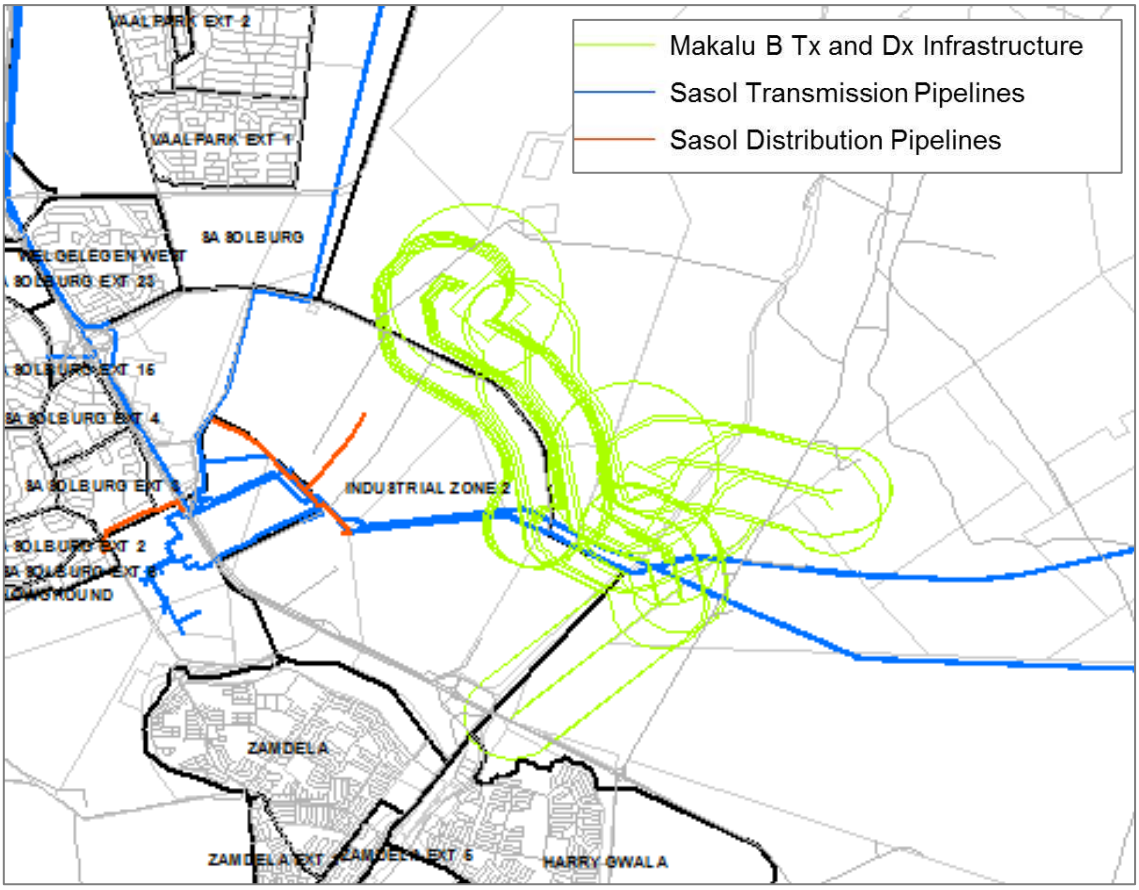


**Figure 51: Municipal wide planning (Metsimaholo Local Municipality, 2015)**

The following was observed during Scoping in terms of other structures in the project area (see **Figure 52**):

- Substation site 1 –
  - Two farm dams and a railway line fall within the northern and eastern part of the buffer, respectively.
- Substation site 2 –
  - Structures are located to the immediate north of the substation site. Other structures are also situated within the northern part of the buffer. It is assumed that they form part of the transportation company that owns the property; and

- The buffer encroaches on the industrial site to the south, as well as a canal and public roads.

❖ Tx line 1 –

- Structures, existing power lines and roads located within eastern part of the corridor; and
- A railway line travels through the central part of the corridor.

❖ Tx line 2 –

- Structures, existing power lines, roads and a railway line are located within the eastern part of the corridor;
- The corridor encroaches into the industrial site to the south;
- A Dx substation and power lines are located in the southern part of the corridor.

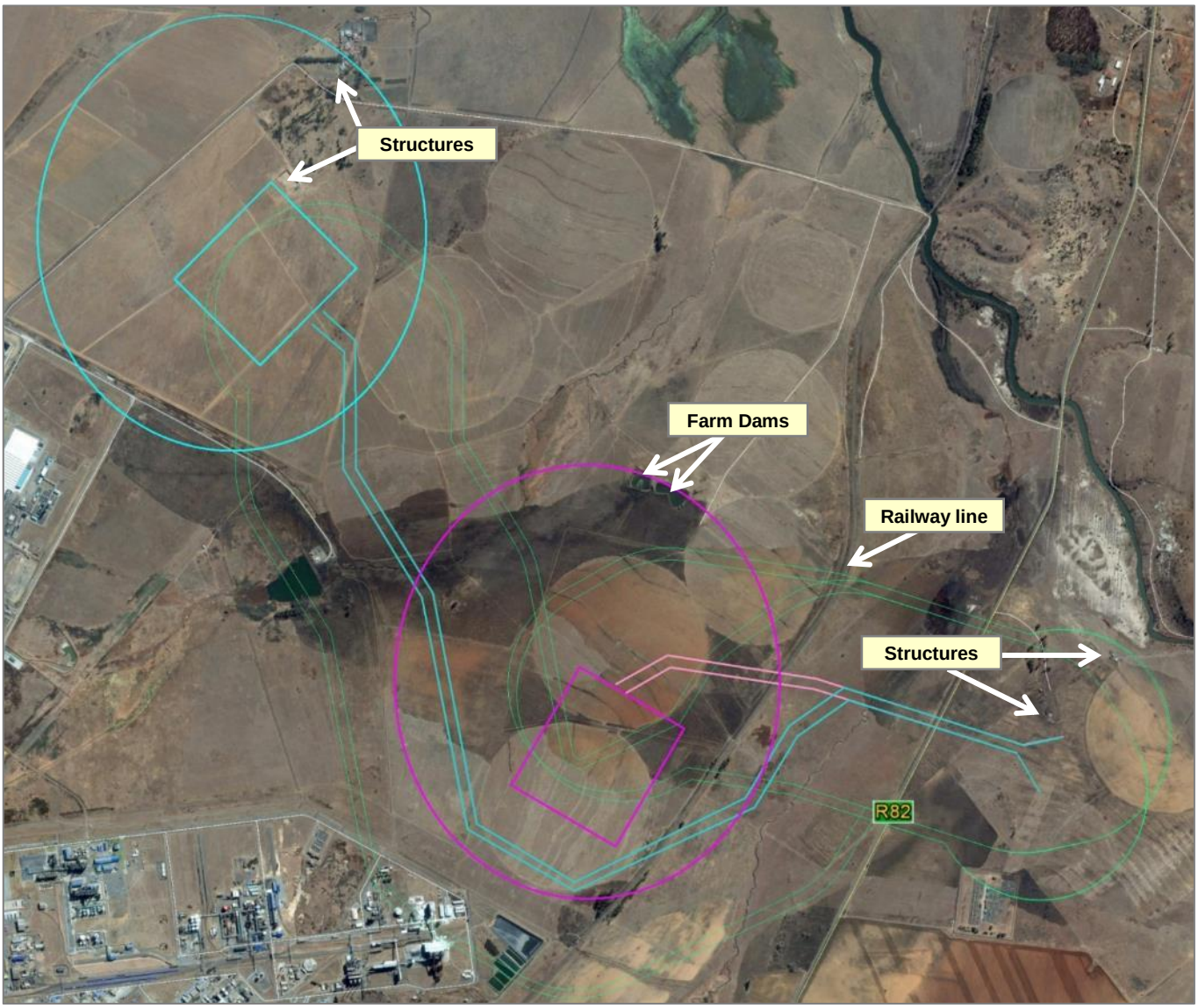


**Figure 52:** **Structures within project area (Google Earth image)**
(map not exhaustive)

**Potential Impacts / Implications**

The current locations of the alternative substation sites and routes of the Tx lines attempt to avoid direct impact to structures. However, certain linear infrastructure (e.g. road and railway line) is not avoidable. Eskom will need to comply with the requirements of the custodians of existing linear infrastructure (e.g. Transnet and Sasol) and the appropriate wayleave procedures will need to be followed.

Certain restrictions associated with the power line servitude will need to be adhered to during the operational phase of the project.

**Specialist Study Triggered / Additional Investigations**

Optimisation of Tx line routes to be considered in the EIA phase and subsequent walk-down survey to avoid existing structures and buildings, as far as possible. All structures and buildings that will be affected by the project will be identified and suitable compensation measures need to be established.

Mitigation measures to be identified during the EIA phase to safeguard or relocate existing structures and agricultural infrastructure on private farms or to compensate the owners.

## 10.18 Transportation

**Status Quo**

The transportation network in the project area is shown in **Figure 53**. Noteworthy roads in the immediate area include:

- R82 (east) – provincial route that connects Johannesburg with Kroonstad via Vereeniging and Sasolburg;
- R57 (south) – provincial route that connects Vanderbijlpark with Phuthaditjhaba via Sasolburg, Heilbron and Reitz; and
- Jan Haak Avenue (south).

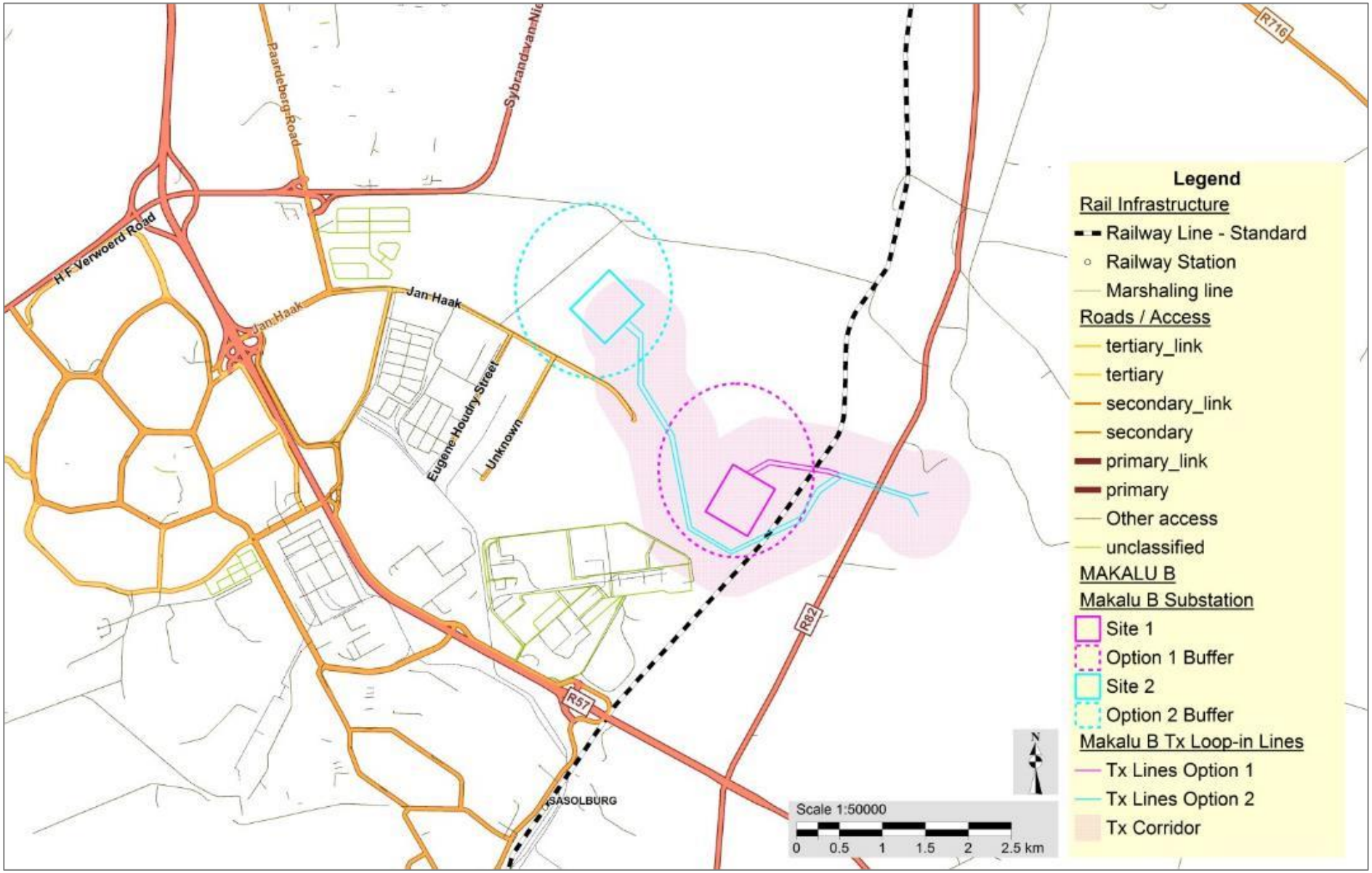


**Figure 53:** **Transportation network in project area**

**Potential Impacts / Implications**

Both the alternative routes of the proposed Tx lines cross the R82 and farm tracks, as well as a railway line. The alternative substation sites also affect farm tracks.

**Specialist Study Triggered / Additional Investigations**

No traffic impact study will be undertaken for proposed Makalu B development as it is not deemed necessary for the type of activities associated with this project. Suitable mitigation measures in terms of traffic and the use of roads will be included in the EMPr.

## 10.19 Aesthetic Qualities

**Status Quo**

As shown in the photographs in **Figure 54**, the general sense of place of the immediate environment of the project footprint is rural agricultural. Industrial and residential land uses occur to the south and west.

**Figure 54: General views of project area**

The views towards the proposed project area will include views from the surrounding roads (such as the R82, R57 and Jan Haak Avenue) and other farm roads, as well as farmsteads located within the surrounding area. Views from residential areas will include the views from the Vaalpark

residential area (located more than 2 km to the north-west from substation site 2). The proposed project will also be seen from existing industrial areas to the south and west.

## Potential Impacts / Implications

Potential visual impacts during the construction phase include:

- Clearing of vegetation;
- Construction-related activities;
- Inadequate waste management and housekeeping; and
- Inadequate reinstatement and rehabilitation of construction footprint.

Potential visual impacts during the operational phase include:

- High visibility of transmission lines and substation;
- Loss of “sense of place”;
- Section of cleared vegetation along access road; and
- Inadequate reinstatement and rehabilitation of construction footprint.

## Specialist Study Triggered / Additional Investigations

The potential impacts to the aesthetics as a result of the proposed project activities and infrastructure will be assessed further during the EIA phase. The sensitive receptors (e.g. residences) that could potentially be influenced by any visual impacts will also be considered.

The EMPr will further include measures to manage visual impacts and to rehabilitate areas affected by construction activities.

# 11 PUBLIC PARTICIPATION

## 11.1 General

The purpose of public participation includes:

1. Providing IAPs with an opportunity to obtain information about the project;
2. Allowing IAPs to express their views, issues and concerns with regard to the project;
3. Granting IAPs an opportunity to recommend measures to avoid or reduce adverse impacts and enhance positive impacts associated with the project; and
4. Enabling Eskom and the project team to incorporate the needs, concerns and recommendations of IAPs into the project, where feasible.

The public participation process that was followed for the proposed Makalu B development is governed by NEMA and GN No. 326 (7 April 2017). **Figure 55** outlines the public participation process for the Scoping phase (current) and EIA phase (pending). Note that the dates may change due to the dynamic nature of the EIA process.

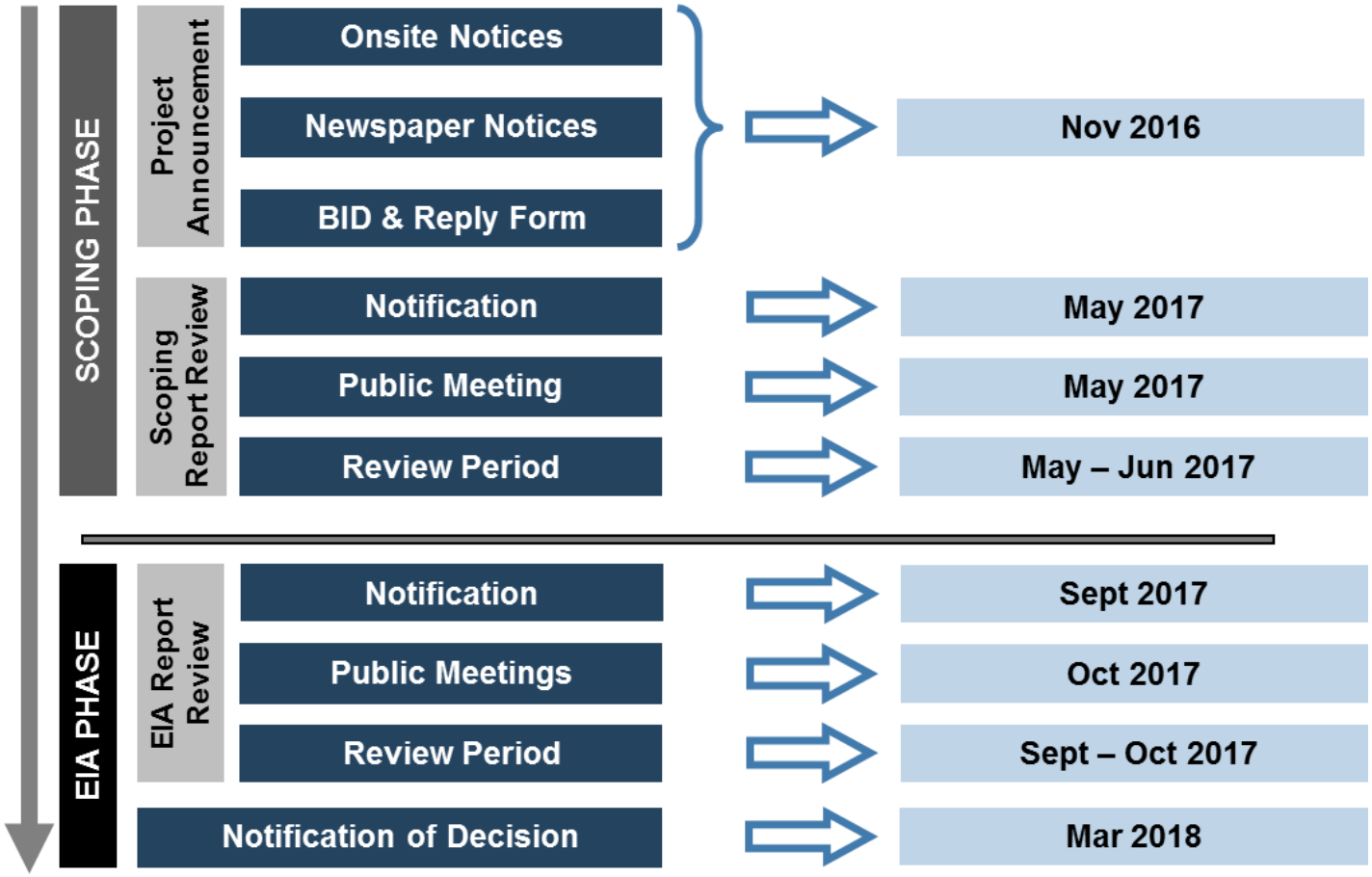


**Figure 55: Outline of Public Participation Process**

## 11.2 Pre-Application Consultation

A Pre-application Consultation Meeting was convened with DEA on 22 April 2016 (refer to **Appendix D** for a copy of the minutes of the meeting). The purpose of the meeting included the following:

- To provide an overview of the project to DEA;
- To seek clarification regarding certain matters that pertain to the EIA process;
- To determine DEA's requirements; and
- To confirm the process and timeframes.

## 11.3 Database of IAPs

A database of IAPs, which includes authorities, different spheres of government (national, provincial and local), parastatals, ward councillors, stakeholders, landowners, interest groups and members of the general public, was prepared for the project and is contained in **Appendix G**. This database will be maintained and updated as necessary during the course of the EIA.

## 11.4 Landowner Notification

The properties that are directly affected by the proposed development are shown in **Figure 6** and listed in **Table 2**. The details of the affected landowners are included in the IAP database.

According to regulation 39(1) of GN No. 326 (7 April 2017), if the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land. This requirement does not apply *inter alia* for linear developments (e.g. pipelines, power lines, roads) or if it is a SIP as contemplated in the Infrastructure Development Act, 2014.

The proposed substation site 1 and site 2 are located on land that belongs to AOL. Proof of landowner consent is contained in **Appendix F**.

## 11.5 Project Announcement

The initial notification conducted as part of public participation was in terms of GN No. 982 (4 December 2014). However, as these regulations were amended by GN No. 326 (7 April 2017), the public participation process following the submission of the Application Form is being conducted in terms of the prevailing EIA Regulations of 2017.

### *11.5.1 Background Information Document*

A Background Information Document (BID) and Reply Form (refer to **Appendix H**) was forwarded to each of the IAPs contained in the database.

The BID provided the following information in a succinct format:

- Project background and overview;
- EIA process; and
- Details of the public participation process and where more information could be obtained.

The BID included a Reply Form, which granted the opportunity to register as an IAP and to raise queries or concerns regarding the project. Copies of the completed Reply Forms and other correspondence received from IAPs are contained in **Appendix L**.

### *11.5.2 Onsite notices*

Onsite notices (English, Afrikaans and isiZulu), which also served to announce the project, were placed at strategic points within the project area (listed in **Table 23**). Onsite notices were primarily placed in proximity to the project components, based on the availability of public access.

**Table 23: Locations of onsite notices**

| No. | Coordinates | Description |
|---|---|---|
| 1 | 26°47'56.70"S; 27°51'49.42"E | Jan Haak Ave, Stols Vervoer Access |
| 2 | 26°48'07.79"S; 27°52'11.33"E | T-junction: Jan Haak Ave & Henry Street |
| 3 | 26°48'30.88"S; 27°52'44.70"E | End of Jan Haak Ave |
| 4 | 26°48'49.89"S; 27°52'52.83"E | Along dirt road (alongside Ss site 1) |
| 5 | 26°48'59.87"S; 27°52'53.35"E | Along dirt road (alongside Dx lines) |
| 6 | 26°49'17.56"S; 27°52'58.12"E | Dirt road next to railway line (adjacent to Ss site 1) |
| 7 | 26°50'26.34"S; 27°52'40.88"E | Start of proposed Dx lines, along R57 |
| 8 | 26°49'25.97"S; 27°54'10.35"E | Access road to existing Makalu Substation |
| 9 | 26°48'57.15"S; 27°54'25.94"E | Crossing of proposed Tx lines over R82 |
| 10 | 26°50'31.48"S; 27°50'46.51"E | Zamdela Library |
| 11 | 26°49'04.82"S; 27°49'33.29"E | Sasolburg Library |

Details of the locations of the onsite notices and accompanying photographs are contained in **Appendix I**.

### *11.5.3 Newspaper Advertisements*

Advertisements were placed in the following newspapers as notification of the project (refer to copies of the newspaper advertisements contained in **Appendix K**):

- Vaalweekblad - 2 to 4 November 2016; and

- Sasolburg Ster – 8 to 12 November 2016.

### *11.5.4 Comments Received during the Announcement Phase*

Copies of the comments received during the EIA announcement phase are included in **Appendix L**.

## 11.6 Review of Draft Scoping Report

### *11.6.1 Notification of Review of Draft Scoping Report*

In accordance with Regulation 43(1) of GN No. 326 (7 April 2017), registered IAPs are granted an opportunity to review and comment on the Draft Scoping Report.

The following notifications were provided with regards to the review of the Draft Scoping Report:

- Landowners, authorities and registered IAPs were notified via email;
- Notices were placed in the following newspapers (copies of the newspaper advertisements to be contained in the Final Scoping Report) -
  - Vaalweekblad;
  - Sasolburg Ster; and
- Onsite notices were placed at the same points listed in **Table 23** (proof to be contained in the Final Scoping Report).

### *11.6.2 Accessing the Draft Scoping Report*

Copies of the document were placed at the locations provided in **Table 24**. A 30-day review period (from 16 May – 16 June 2017) was provided.

**Table 24: Locations for review of Draft Scoping Report**

| Copy | Location | Address | Tel. No. |
|---|---|---|---|
| 1. | Sasolburg Library | John Vorster Avenue, Sasolburg | 016 973 8467 |
| 2. | Zamdela Library | Next to Zamdela Hall on the Main Road, Zamdela | 016 974 2163 |

Copies of the Draft Scoping Report were provided to the following parties, which include key regulatory and commentary authorities:

- DEA;
- FS DESTEA;
- DWS FS Regional Office;
- FS Department of Police, Roads and Transport (DPRT);
- FSHRA;
- Fezile Dabi District Municipality; and
- Metsimaholo Local Municipality.

The Draft Scoping Report can also be downloaded from the following website - http://www.nemai.co.za/environmental.html.

A Comment Sheet is provided in **Appendix M**, which can be used to provide comments on the Draft Scoping Report.

### *11.6.3 Public Meeting to Present the Draft Scoping Report*

The details of the public meeting that is scheduled to present the Draft Scoping Report are as follows:

- Date: 23 May 2017;
- Time: 16h30 – 18h30; and
- Venue: Technical High School Sasolburg (School Hall), 13 Harry Smith Street, Sasolburg.

The minutes of the meeting will be included in the Final Scoping Report.

### *11.6.4 Comments Received on the Draft Scoping Report*

Comments received from authorities and IAPs during the review period for the Draft Scoping Report will be included in the Final Scoping Report.

## 11.7 Issues raised by IAPs

The Scoping phase serves to identify and prioritise issues for further assessment during the EIA phase. Accordingly, the comments received from authorities and IAPs during public participation as part of Scoping will be afforded due consideration and further investigation during the pending EIA stage. A Comments and Responses Report will be included in the Final Scoping Report, which will summarise the salient issues raised by IAPs and the project team's response to these matters.

# 12 ENVIRONMENTAL ISSUES

In accordance with the purpose of the Scoping exercise as part of the overall environmental assessment, this section aims to identify potentially significant environmental issues for further consideration and prioritisation during the EIA stage. This allows for a more efficient and focused impact assessment in the ensuing EIA phase, where the analysis is largely limited to significant issues and reasonable alternatives.

## 12.1 Approach

### *12.1.1 Predicting Significant Environmental Issues*

The potential environmental issues associated with the proposed project were identified during the Scoping phase through an appraisal of the following:

- Project-related components and infrastructure (see **Sections 9.2 – 9.4**);
- Activities associated with the project life-cycle (see **Section 9.5**);
- Resources required for construction and operation (see **Section 9.6**);
- Nature and profile of the receiving environment and potential sensitive environmental features and attributes (see **Section 10**), which included a desktop evaluation (via literature review, specialist input, GIS, topographical maps and aerial photography) and site investigations;
- Review of technical information received from Eskom;
- Understanding of direct and indirect effects of the project as a whole;
- Input received during public participation from authorities and IAPs; and
- Legal and policy context (see **Section 5**).

Apart from explaining the receiving environment, **Section 10** succinctly discusses possible impacts during primarily the construction and operational phases of the project. The significant environmental issues were distilled from this information and are summarised in **Section 12.2**. Cumulative impacts are briefly explained in **Section 12.3**.

### *12.1.2 Mitigation of Impacts*

During the EIA stage a detailed assessment will be conducted to evaluate all potential impacts (paying particular attention to the significant issues listed in the Scoping Report), with input from the project team, requisite specialist studies and IAPs and through the application of the impact assessment methodology contained in **Section 12.4**.

Suitable mitigation measures will be identified to manage the environmental impacts according to the following hierarchy:

1. Initial efforts will strive to **prevent** the occurrence of the impact;

2. If this is not possible, mitigation will include measures that reduce or **minimise** the significance of the impact to an acceptable level;
3. **Remediation** and **rehabilitation** will take place if measures cannot suitably prevent or reduce the impacts, or to address the residual impacts; and
4. As a last measure, **compensation** will be employed as a form of mitigating the impacts associated with a project.

The mitigation measures will be incorporated into the EMPr, which will form part of the EIA Report. This deliverable, together with the Environmental Authorisation, can act as a standalone document that can be used to *inter alia* monitor against compliance of the project with its pre-determined objectives, targets and management actions.

## 12.2 Summary of Environmental Issues

Pertinent environmental issues, which will receive specific attention during the EIA phase through a detailed quantitative assessment and relevant specialist studies (where deemed necessary), are listed in the tables to follow.

**Table 25: Pertinent Issues (Construction Phase) for prioritisation during the EIA phase**

| Environmental Factor | Potential Issues / Impacts | Further Investigations / EIA Provisions |
|---|---|---|
| **Land Use** | ❖ Loss of land used for agriculture<br>❖ Sterilisation of land for future expansion of industrial of mining use<br>❖ Servitude restrictions | ❖ Agricultural Impact Assessment<br>❖ Socio-economic Impact Assessment<br>❖ EMPr |
| **Geology** | ❖ Unsuitable geological conditions<br>❖ Blasting (if required) | ❖ Geotechnical Study<br>❖ EMPr |
| **Topography** | ❖ Visual impact<br>❖ Crossing topographic features (watercourses)<br>❖ Erosion of affected areas on steep slopes | ❖ EMPr |
| **Soil** | ❖ Soil erosion<br>❖ Soil contamination | ❖ EMPr |
| **Geohydrology** | Groundwater pollution due to spillages and poor construction practices | ❖ EMPr |
| **Surface Water** | ❖ Surface water pollution due to spillages and poor construction practices<br>❖ Encroachment of construction activities into riparian zones / wetlands<br>❖ Impacts where access roads and Tx lines cross watercourses, such as:<br>• Loss of riparian and instream vegetation within construction domain<br>• Destabilisation of banks of watercourses<br>• Sedimentation | ❖ Aquatic Impact Assessment<br>❖ Floodline Analysis<br>❖ EMPr |
| **Terrestrial Ecology** | ❖ Impacts to sensitive terrestrial ecological features | ❖ Terrestrial Ecological Impact Assessment |

| Environmental Factor | Potential Issues / Impacts | Further Investigations / EIA Provisions |
|---|---|---|
| | ❖ Potential loss of significant flora and fauna species<br>❖ Damage / clearance of habitat of conservation importance in construction domain<br>❖ Proliferation of exotic vegetation | ❖ EMPr |
| **Socio-economic Environment** | ❖ Loss of land within construction domain<br>❖ Risk to livestock from construction activities<br>❖ Nuisance from dust and noise<br>❖ Influx of people seeking employment and associated impacts (e.g. foreign workforce, cultural conflicts, squatting, demographic changes, anti-social behaviour, and incidence of HIV/AIDS)<br>❖ Safety and security<br>❖ Use of local road network<br>❖ Light pollution | ❖ Socio-economic Impact Assessment<br>❖ EMPr |
| **Agriculture** | ❖ Loss of cultivated land within construction domain<br>❖ Loss of grazing land within construction domain<br>❖ Risk to livestock from construction activities<br>❖ Disruptions to farming operations<br>❖ Loss of fertile soil through land clearance | ❖ Agricultural Impact Assessment<br>❖ Socio-economic Impact Assessment<br>❖ EMPr |
| **Air Quality** | ❖ Excessive dust levels<br>❖ Greenhouse gas emissions | ❖ EMPr |
| **Noise** | ❖ Localised increases in noise during construction | ❖ EMPr |
| **Historical and Cultural Features** | ❖ Destruction or damage of heritage resources through construction activities | ❖ Heritage Impact Assessment<br>❖ EMPr |
| **Existing Structures & Infrastructure** | ❖ Crossing of existing infrastructure by Tx lines (including roads and railway line)<br>❖ Relocation of structures | ❖ Relocation of affected infrastructure and structures (where necessary)<br>❖ Compensation (where necessary)<br>❖ Satisfy requirements of infrastructure owners (including Transnet, FS DPRT)<br>❖ EMPr |
| **Transportation** | ❖ Increase in traffic on the local road network<br>❖ Develop access roads<br>❖ Risks to road users | EMPr |
| **Solid Waste** | ❖ Waste generated from site preparations (e.g. plant material)<br>❖ Domestic waste<br>❖ Surplus and used building material<br>❖ Hazardous waste (e.g. chemicals, oils, soil contaminated by spillages, diesel rags)<br>❖ Wastewater (sanitation facilities, washing of plant, etc.) | EMPr |
| **Aesthetics** | Visual impacts associated with construction activities | ❖ EMPr |

**Table 26: Pertinent Issues (Operational Phase) for prioritisation during the EIA phase**

| Environmental Factor | Potential Issues / Impacts | Further Investigations / EIA Provisions |
|---|---|---|
| **Land Use** | ❖ Loss of land used for agriculture<br>❖ Sterilisation of land for future expansion of industrial of mining use<br>❖ Servitude restrictions | ❖ Agricultural Impact Assessment<br>❖ Socio-economic Impact Assessment<br>❖ EMPr |
| **Geology** | Unsuitable geological conditions – risks to structural integrity of substation and towers | ❖ Geotechnical Study<br>❖ EMPr |
| **Topography** | ❖ Visual impact<br>❖ Crossing topographic features (watercourses)<br>❖ Erosion of affected areas on steep slopes | ❖ EMPr |
| **Soil** | ❖ Soil erosion at areas that were not suitably reinstated and rehabilitated<br>❖ Soil contamination from improper handling of hazardous substances at the substation | ❖ EMPr |
| **Surface Water** | ❖ Inadequate stormwater management at substation and along access roads<br>❖ Damage to substation and towers from major flood events<br>❖ Impacts to characteristics of riparian zones and wetlands at areas where they are encroached upon by the project footprint | ❖ Aquatic Impact Assessment<br>❖ Floodline Analysis<br>❖ EMPr |
| **Terrestrial Ecology** | ❖ Encroachment by exotic species through inadequate eradication programme<br>❖ Clearing of vegetation along servitude and maintenance road<br>❖ Risk to birds from collision with infrastructure and from electrocution | ❖ Terrestrial Ecological Impact Assessment<br>❖ EMPr |
| **Socio-economic Environment** | ❖ Use of local road network for operation and maintenance purposes<br>❖ Light pollution<br>❖ Safety and security issues through improper access control during inspections and maintenance activities<br>❖ Threats to human and animal health from EMF | ❖ Socio-economic Impact Assessment<br>❖ Compensation<br>❖ EMPr |
| **Agriculture** | ❖ Permanent loss of cultivated and grazing land within project footprint<br>❖ Loss of livestock though improper access control | ❖ Agricultural Impact Assessment<br>❖ Socio-economic Impact Assessment<br>❖ EMPr |
| **Existing Structures & Infrastructure** | Disturbances to infrastructure traversed by Tx lines during maintenance activities | ❖ Satisfy requirements of infrastructure owners (including Transnet and FS DPRT)<br>❖ EMPr |
| **Transportation** | Use of permanent access and maintenance roads | ❖ Traffic Impact Assessment<br>❖ Re-alignment of affected roads<br>❖ EMPr |
| **Aesthetics** | ❖ High visibility of transmission lines<br>❖ Inadequate reinstatement and rehabilitation of construction footprint | ❖ EMPr |

## 12.3 Cumulative Impacts

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

Cumulative impacts can be identified by combining the potential environmental implications of the proposed Makalu B development with the impacts of projects and activities that have occurred in the past, are currently occurring, or are proposed in the future within the project area.

The following potential cumulative impacts will be considered as part of the EIA:

- Route 2 of the Tx lines runs alongside existing Dx lines, next to the industrial area to the south, for approximately 500 m. This will increase the overall visual impact of the power lines and mat lead to an incremental increase in the EMF. However, the alignment of infrastructure along existing linear disturbances may be preferred, as it limits the fragmentation of the affected land.
- The construction period may cause traffic-related impacts in terms of the local road network, which will be associated with heavy vehicle construction traffic for the delivery of material and the transportation of construction workers. This may compound traffic impacts if other large scale projects are planned during the same period.
- Land clearing activities and other construction-related disturbances could lead to the proliferation of exotic vegetation. The associated cumulative impact in relation to other activities in the affected areas, such a livestock grazing and farming, will need to be considered further.
- Threats to agricultural land in the region include the expansion of mining, industrial and urban areas. The proposed substation will have a relatively large footprint (25 Ha), which will lead to the permanent loss of land currently used for agricultural purposes (both alternative sites).
- The Terrestrial Ecological Impact Assessment will need to identify species of conservation significance that could be adversely affected by the project activities. This study will need to consider the existing local impacts to the biodiversity and the incremental loss of conservation-worthy species, within the context of the provincial conservation goals and targets.
- The alternative routes of the Tx lines cross over properties that are already traversed by existing infrastructure linear. These properties will thus have a network of infrastructure with the associated servitude restrictions.
- The cumulative impacts associated with Makalu B and the proposed expansion of NVC need to be assessed further.

The project was initiated to strengthen the local power network based on future demands and current constraints of the existing electrical infrastructure. In turn, this will have a positive impact on the macro socio-economic environment.

## 12.4 Methodology to Assess the Identified Impacts

The EIA quantitative impact assessment will further focus on the direct and indirect impacts associated with the project. All impacts will be analysed with regard to their nature, extent, magnitude, duration, probability and significance. The following definitions and criteria apply:

**Nature (/Status)**
The project could have a positive, negative or neutral impact on the environment.

**Extent**
- Local - extend to the site and its immediate surroundings.
- Regional - impact on the region but within the province.
- National - impact on an interprovincial scale.
- International - impact outside of South Africa.

**Magnitude**
Degree to which impact may cause irreplaceable loss of resources.
- Low - natural and social functions and processes are not affected or minimally affected.
- Medium - affected environment is notably altered; natural and social functions and processes continue albeit in a modified way.
- High - natural or social functions or processes could be substantially affected or altered to the extent that they could temporarily or permanently cease.

**Duration**
- Short term - 0-5 years.
- Medium term - 5-11 years.
- Long term - impact ceases after the operational life cycle of the activity either because of natural processes or by human intervention.
- Permanent - mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.

**Probability**
- Almost certain - the event is expected to occur in most circumstances.
- Likely - the event will probably occur in most circumstances.
- Moderate - the event should occur at some time.
- Unlikely - the event could occur at some time.
- Rare/Remote - the event may occur only in exceptional circumstances.

**Significance**
Provides an overall impression of an impact's importance, and the degree to which it can be mitigated. The range for significance ratings is as follows-
0 – Impact will not affect the environment. No mitigation necessary.
1 – No impact after mitigation.
2 – Residual impact after mitigation.
3 – Impact cannot be mitigated.

# 13 PLAN OF STUDY FOR EIA

## 13.1 General

This Plan of Study, which explains the approach to be adopted to conduct the EIA for the proposed Makalu B substation and Tx loop-in lines, was prepared in accordance with Appendix 2 of GN No. 326 (7 April 2017).

## 13.2 Key Environmental Aspects and Issues identified during Scoping Phase

The Scoping exercise aimed to identify and qualitatively predict significant environmental issues for further consideration and prioritisation. During the EIA stage a detailed quantitative impact assessment will be conducted via contributions from the project team and requisite specialist studies, and through the application of the impact assessment methodology contained in **Section 12.4**. Suitable mitigation measures will be identified to manage (i.e. prevent, reduce, rehabilitate and/or compensate) the environmental impacts, and will be incorporated into an EMPr.

Pertinent environmental issues identified during Scoping, which will receive specific attention during the EIA phase are listed in **Table 25** (construction phase) and **Table 26** (operation phase).

## 13.3 Feasible Alternatives to be assessed during EIA Phase

The EIA phase will include a detailed comparative analysis of the project's feasible alternatives that emanate from the Scoping exercise, which will include environmental (with specialist input) and technical evaluations. This will ultimately result in the selection of a BPEO.

The feasible alternatives to be assessed in the EIA phase include the two substation sites and the related routes of the Tx loop-in lines.

## 13.4 Specialist Studies

### *13.4.1 Overview*

According to Münster (2005), a 'trigger' is "*a particular characteristic of either the receiving environment or the proposed project which indicates that there is likely to be an issue and/or potentially significant impact associated with that proposed development that may require specialist input*". The requisite specialist studies 'triggered' by the findings of the Scoping process, aimed at addressing the key issues and compliance with legal obligations, include:

- Aquatic Impact Assessment;
- Terrestrial Ecological Impact Assessment;
- Heritage Impact Assessment;

- Agricultural Impact Assessment;
- Avifauna Impact Assessment; and
- Socio-Economic Impact Assessment.

The Terms of Reference (ToR), both general and specific, for the abovementioned specialist studies follow in the sub-sections below. Amongst others, the *Guideline for determining the scope of specialist involvement in EIA processes* (Münster, 2005) was used in compiling the general Terms of Reference for the specialist studies. The following guidelines were also employed to prepare the specific ToR for the respective specialists (where appropriate):

- Guideline for involving biodiversity specialists in EIA processes (Brownlie, 2005);
- Guideline for involving visual and aesthetic specialists (Oberholzer, 2005);
- Guideline for involving heritage specialists in EIA processes (Winter & Baumann, 2005); and
- Guideline for involving social assessment specialists in EIA processes (Barbour, 2007).

In addition to the above guidelines, the relevant specialists need to satisfy specific requirements stipulated by the following key environmental authorities:

- DEA and FS DESTEA;
- DWS;
- FSHRA;
- FS Department of Agriculture and Rural Development (DARD); and
- FS DAFF.

For the inclusion of the findings of the specialist studies into the EIA report, the following guideline will be used: *Guideline for the review of specialist input in EIA processes* (Keatimilwe & Ashton, 2005). Key considerations will include:

- Ensuring that the specialists have adequately addressed IAPs' issues and specific requirements prescribed by environmental authorities;
- Ensuring that the specialists' input is relevant, appropriate and unambiguous; and
- Verifying that information regarding the receiving ecological, social and economic environment has been accurately reflected and considered.

### *13.4.2 Terms of Reference – General*

The following general ToR apply to all the EIA specialist studies to be undertaken for the proposed project:

1. Address all triggers for the specialist studies contained in the subsequent specific ToR.
2. Address issues raised by IAPs, as contained in the Comments and Response Report, and conduct an assessment of all potentially significant impacts. Additional issues that have not been identified during Scoping should also be highlighted to the EAP for further investigations.

3. Ensure that the requirements of the environmental authorities that have specific jurisdiction over the various disciplines and environmental features are satisfied.
4. Approach to include desktop study and site visits, as deemed necessary, to understand the affected environment and to adequately investigate and evaluate salient issues. Indigenous knowledge (i.e. targeted consultation) should also be regarded as a potential information resource.
5. Assess the impacts (direct, indirect and cumulative) in terms of their significance (using suitable evaluation criteria) and suggest suitable mitigation measures. In accordance with the mitigation hierarchy, negative impacts should be avoided, minimised, rehabilitated (or reinstated) or compensated for (i.e. offsets), whereas positive impacts should be enhanced. A risk-averse and cautious approach should be adopted under conditions of uncertainty.
6. Consider time boundaries, including short to long-term implications of impacts for project life-cycle (i.e. pre-construction, construction, operation and decommissioning).
7. Consider spatial boundaries, including:
    a. Broad context of the proposed project (i.e. beyond the boundaries of the specific site);
    b. Off-site impacts; and
    c. Local, regional, national or global context.
8. The provision of a statement of impact significance for each issue, which specifies whether or not a pre-determined threshold of significance (i.e. changes in effects to the environment which would change a significance rating) has been exceeded, and whether or not the impact presents a potential fatal flaw or not. This statement of significance should be provided for anticipated project impacts both before and after application of impact management actions.
9. Recommend a monitoring programme to implement mitigation measures and measure performance. List indicators to be used during monitoring.
10. Appraisal of alternatives (including the No-Go option) by identifying the BPEO with suitable justification.
11. Advise on the need for additional specialists to investigate specific components and the scope and extent of the information required from such studies.
12. Engage with other specialists whose studies may have bearing on your specific investigation.
13. Present findings and participate at public meetings, as necessary.
14. Information provided to the EAP needs to be signed off.
15. Review and sign off on EIA Report prior to submission to DEA to ensure that specialist information has been interpreted and integrated correctly into the report.
16. Sign a declaration stating independence.
17. The appointed specialists must take into account the policy framework and legislation relevant to their particular studies.
18. All specialist reports must adhere to Appendix 6 of GN No. 326 (7 April 2017).

### *13.4.3 Terms of Reference – Specific*

#### 13.4.3.1 Aquatic Impact Assessment

**Summary of Key Issues & Triggers Identified During Scoping**

- Impacts posed by the project infrastructure to surface water, in terms of:
  - Watercourse crossings (Tx lines and access roads); and
  - Encroachments into riparian habitats and wetlands.

**Approach**

- Undertake desktop study (literature review, topographical maps and aerial photographs) and baseline aquatic survey and describe affected aquatic environments/watercourses within the project footprint.
- Determine ecological status of the receiving aquatic environment, including the identification of endangered or protected species.
- Delineate riparian habitat and all wetlands in accordance with the guideline: *A practical field procedure for identification and delineation of wetlands and riparian areas* (DWAF, 2005) (or any prevailing guidelines prescribed by DWS). This includes assessing terrain, soil form, soil wetness and vegetation unit indicators to delineate permanent, seasonal and temporary zones of the wetlands. Allocate conservation buffers from the outer edge of the temporary zones of the wetlands (provincial-specific).
- Provide a concise description of the importance of the affected aquatic environments/watercourses in terms of pattern and process, ecosystem goods and services, as appropriate.
- Assess impacts of proposed project to aquatic environments/watercourses.
- Provide suitable mitigation measures to protect the aquatic ecosystems during project life-cycle.

**Nominated Specialist**

| | |
|---|---|
| **Organisation:** | The Biodiversity Company |
| **Name:** | Andrew Husted & Peter Kimberg |
| **Qualifications:** | MSc – Aquatic Health |
| **No. of years experience:** | 10 |
| **Affiliation (if applicable):** | Professional Natural Scientist |

#### 13.4.3.2 Terrestrial Ecological Impact Assessment

**Summary of Key Issues & Triggers Identified During Scoping**

- Potential loss of significant flora and fauna species.
- Impacts to sensitive terrestrial ecological features.
- Management actions for controlling exotic vegetation.

**Approach**

- Undertake baseline survey and describe affected environment within the project footprint from a biodiversity perspective.
- Take into consideration the provincial conservation goals and targets.
- Assess the current ecological status and the conservation priority within the project footprint and adjacent area (as deemed necessary). Provide a concise description of the importance of the affected area to biodiversity in terms of pattern and process, ecosystem goods and services, as appropriate.
- Undertake sensitivity study to identify protected and conservation-worthy species. Prepare a biodiversity sensitivity map with the use of GIS, based on the findings of the study.
- Assess impacts to fauna and flora, associated with the project. Consider cause-effect-impact pathways for assessing impacts to biodiversity related to the project.
- Identify potential fatal flaws associated with the project and its alternatives from a biodiversity perspective.
- Comply with specific requirements and guidelines of DEA and FS DESTEA.
- Consider the FS Biodiversity Plan (2015) and other relevant policies, strategies, plans and programmes.

**Nominated Specialist (to be reviewed by an external specialist)**

| | |
|---|---|
| **Organisation:** | Nemai Consulting |
| **Name:** | Ronald Phamphe |
| **Qualifications:** | MSc – Botany |
| **No. of years experience:** | 8 |
| **Affiliation (if applicable):** | ❖ Professional Natural Scientist-Ecological Science (Reg number: 400349/12) with South African Council for Natural Scientific Professions (SACNASP)<br>❖ Professional member of South African Institute of Ecologists and Environmental Scientists (SAIEES)<br>❖ Professional member of South African Association of Botanists (SAAB) |

#### 13.4.3.3 Heritage Impact Assessment

**Summary of Key Issues & Triggers Identified During Scoping**

- Potential occurrence of heritage resources, graves and structures older than 60 years within project footprint.

**Approach**

- Undertake a Heritage Impact Assessment in accordance with the South African Heritage Resources Act (No. 25 of 1999).
- The identification and mapping of all heritage resources in the area affected, as defined in Section 2 of the National Heritage Resources Act, 1999, including archaeological and palaeontological sites on or close (within 100 m) of the proposed developments.
- Undertake a desktop palaeontological assessment (evaluate site in terms of SAHRIS).
- The assessment of the significance of such resources in terms of the heritage assessment criteria as set out in the regulations.
- An assessment of the impact of development on such heritage resources.
- An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development.
- Prepare a heritage sensitivity map (GIS-based), based on the findings of the study.
- Identify heritage resources to be monitored.
- Comply with specific requirements and guidelines of FSHRA.

**Nominated Specialist**

| | |
|---|---|
| **Name:** | Jean Beater (lead specialist) |
| **Qualifications:** | MA (Heritage Studies) |
| **No. of years experience:** | Jean Beater - 21 years |
| **Affiliation (if applicable):** | ❖ Member: HIA Adjudication Committee for the Gauteng Provincial Heritage Resources Authority<br>❖ Affiliate member - Association of Southern African Professional Archaeologists – member No. 349 |

#### 13.4.3.4 Agricultural Impact Assessment

**Summary of Key Issues & Triggers Identified During Scoping**

- Loss of fertile soil, cultivated areas and grazing land in project footprint.
- Disruptions to farming practices during construction.
- Loss of farming-related infrastructure.

**Approach**

- Determine agricultural potential in project footprint.
- Determine impacts of project from an agricultural perspective.
- Suggest suitable mitigation measures to address the identified impacts.

**Nominated Specialist**

| | |
|---|---|
| **Name:** | Dr Andries Gouws |
| **Qualifications:** | PhD Integrated Land Use Modelling |
| **No. of years experience:** | 29 |
| **Affiliation (if applicable):** | ❖ Council of Natural Sciences.No:400036/93, Category: Agricultural sciences.<br>❖ Member of the Soil Science Society of South Africa |

#### 13.4.3.5 Avifauna Impact Assessment

**Summary of Key Issues & Triggers Identified During Scoping**

- Impacts to avifauna associated with Tx lines.
- Possible occurrence of sensitive avifauna species in project area.

**Approach**

- Determine ecological status of the receiving environment from an avifauna perspective, including the identification of endangered or protected avifauna species.
- Prepare an avifauna sensitivity map, based on the findings of the study.
- Assess impacts to avifauna population as a result of the project.
- Provide suitable mitigation measures to protect avifauna during project life-cycle.
- Make recommendations on preferred options from an avifauna perspective.
- Recommend monitoring programme and indicators for project life-cycle, where findings from survey would serve as baseline data.

- Comply with specific requirements and guidelines of mandated authorities.

**Nominated Specialist**

| | |
|---|---|
| **Organisation:** | WildSkies Ecological Services |
| **Name:** | Jon Smallie |
| **Qualifications:** | ❖ BSc (hons) Wildlife Science – University of Natal<br>❖ Msc Env Sc – University of Witwatersrand |
| **No. of years experience:** | 13 |
| **Affiliation (if applicable):** | South African Council for Natural Scientific Professions; Registration no. 400020/06 (Ecological Science) |

#### 13.4.3.6 Socio-Economic Impact Assessment

**Summary of Key Issues & Triggers Identified During Scoping**

- Loss of land in project footprint.
- Construction-related impacts.

**Approach**

- Determine the specific local socio-economic, land utilisation and acquisition implications of the project.
- Collect baseline data on the current socio-economic environment.
- Assess socio-economic impacts (positive and negative) of the project, and quantify the economic impacts.
- Undertake a thorough review of the following:
  - Minutes of public meetings and individual meetings; and
  - Comments and Response Report.
- Suggest suitable mitigation measures to address the identified impacts.
- Make recommendations on preferred options from a socio-economic perspective.

**Nominated Specialist**

| | |
|---|---|
| **Organisation:** | Nemai Consulting |
| **Name:** | ❖ Ciaran Chidley<br>❖ Sameera Munshi |
| **Qualifications:** | ❖ Ciaran Chidley<br>• BA (Economics); BSc Eng (Civil); MBA<br>❖ Sameera Munshi<br>• BA Hon (Econ) |
| **No. of years experience:** | Ciaran Chidley – 12 years |
| **Affiliation (if applicable):** | N/A |

## 13.5 Public Participation – EIA Phase

### *13.5.1 Updating of IAP Database*

The IAP database will be updated as and when necessary during the execution of the EIA.

### *13.5.2 Review of Draft EIA Report*

A 30-day period will be provided to IAPs to review the Draft EIA Report, and copies of the document will be lodged for public review at the following venues:

**Table 27: Locations for review of Draft EIA Report**

| Copy | Location | Address | Tel. No. |
|---|---|---|---|
| 1. | Sasolburg Library | John Vorster Avenue, Sasolburg | 016 973 8467 |
| 2. | Zamdela Library | Next to Zamdela Hall on the Main Road, Zamdela | 016 974 2163 |

Copies of the Draft EIA Report will be provided to the regulatory and commenting authorities listed in **Section 11.6.2**. The Draft EIA Report will also be placed on the following website - http://www.nemai.co.za/index.html.

All parties on the IAPs database will be notified via email, fax or post of the opportunity to review the Draft EIA Report at the abovementioned locations, the review period and the process for submitting comments on the report. The public will also be notified in this regard via advertisements in the following newspapers:

- Vaalweekblad; and
- Sasolburg Ster.

All comments received from IAPs and the responses thereto will be included in the final EIA Report, which will be submitted to DEA.

### *13.5.3 Public Meeting*

Public meetings will be held during the review period for the Draft EIA Report. The aims of these meetings will be as follows:

- To present the project details;
- To explain the EIA process;
- To present the findings of the specialist studies;
- To address key issues raised during the Scoping Phase;
- To elaborate on the potential environmental impacts (qualitative and quantitative), and the proposed mitigation of these impacts; and
- To allow for queries and concerns to be raised, and for the project team to respond.

### *13.5.4 Comments and Responses Report*

A Comments and Responses Report will be compiled and included in the EIA Report, which will record the date that issues were raised, a summary of each issue, and the response of the team to address the issue.

In addition, any unattended comments from the Scoping Phase or where the status of the previous responses has changed, will also be addressed in the Comments and Responses Report for the EIA phase.

### *13.5.5 Notification of DEA Decision*

All IAPs will be notified via email, fax or post after having received written notice from DEA on the final decision on the application. Advertisements will also be placed in the newspapers listed in **Section 13.5.2**. These notifications will include the appeal procedure to the decision.

## 13.6 EIA Report

The EIA Report will contain the information that is necessary for DEA to consider and come to a decision on the application. As a minimum, the EIA Report will contain the information stipulated in Appendix 3 of GN No. 326 (7 April 2017).

The following critical components of the EIA Report are highlighted:

- A description of the policy and legislative context;
- A detailed description of the proposed development (full scope of activities);
- A detailed description of the proposed development site, which will include a plan that locates the proposed activities applied for as well as the associated structures and infrastructure;
- A description of the environment that may be affected by the activity and the manner in which physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed development;
- The methodology of the stakeholder engagement process;
- The Comments and Responses Report and IAPs Database will be provided as an appendix to the EIA Report;
- A description of the need and desirability of the proposed development and the identified potential alternatives to the proposed activity;
- A summary of the methodology used in determining the significance of potential impacts;
- A description and comparative assessment of the project alternatives;
- A summary of the findings of the specialist studies;
- A detailed assessment of all identified potential impacts;
- A list of the assumptions, uncertainties and gaps in knowledge;
- An environmental impact statement;
- Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;

- A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;
- An opinion by the consultant as to whether the development is suitable for approval within the proposed site;
- An EMPr that complies with Appendix 4 of GN No. 326 (7 April 2017);
- Copies of all specialist reports appended to the EIA report; and
- Any further information that will assist in decision making by the authorities.

## 13.7 Authority Consultation

The EIA will only commence if DEA accepts the Scoping Report and the Plan of Study for the EIA. If relevant, the necessary revisions will be made to the aforementioned documents if requested by this Department.

An authorities meeting will be scheduled during the EIA public participation process to present salient findings. In addition, copies of the Draft EIA Report will be provided to the following key regulatory and commenting authorities:

- DEA;
- FS DESTEA;
- DWS FS Regional Office;
- FS DPRT;
- FSHRA;
- Fezile Dabi District Municipality; and
- Metsimaholo Local Municipality.

The final EIA Report will be submitted to DEA. Any requested amendments will be discussed with the Department to ensure that their queries are adequately and timeously attended to.

For the remainder of the Scoping process and EIA the interaction with DEA will be as follows:

- Submission of the Final Scoping Report;
- Meet with designated DEA Environmental Officer to explain the project and arrange a site visit (if required by DEA);
- Address comments on Scoping Report;
- Arrange an authorities meeting during the EIA stage;
- Submit EIA Report;
- Address comments on EIA Report; and
- Obtain a decision.

## 13.8 EIA Timeframes

The table to follow presents the proposed timeframes for the EIA process. *Note that these dates are subject to change*.

**Table 28: EIA Timeframes (dates may changes during the course of the EIA)**

| EIA Milestone | Start | Finish |
|---|---|---|
| Submit Application Form and Draft Scoping Report to DEA | 15/05/17 | 15/05/17 |
| Review of Draft Scoping Report by authorities & IAPs | 16/05/17 | 16/06/17 |
| DEA Review and Decision | 26/06/17 | 08/08/17 |
| Review of Draft EIA Report by authorities & IAPs | 21/09/17 | 24/10/17 |
| Submit Final EIA Report & EMPr to DEA | 03/11/17 | 07/11/17 |
| DEA Review and Decision | 08/11/17 | 15/03/18 |
| IAP Notification Period | 16/03/18 | 20/03/18 |

# 14 CONCLUSION

The scope of an environmental assessment is defined by the range of issues and alternatives it considers, the nature of the receiving environment, and the approach towards the assessment.

Key outcomes of the Scoping phase for the proposed Makalu B substation and Tx loop-in lines are as follows:

- Stakeholders were effectively identified and were afforded adequate opportunity to participate in the scoping process;
- Alternatives for achieving the objectives of the proposed activity were duly considered.
- Significant issues pertaining specifically to the pre-construction, construction and operational phases of the project were identified;
- Sensitive elements of the environment to be affected by the project were identified;
- A Plan of Study was developed to explain the approach to executing the EIA phase, which also includes the Terms of Reference for the identified specialist studies; and
- The scoping exercise set the priorities for the ensuing EIA phase.

No fatal flaws were identified in terms of the proposed activities and the receiving environment that would prevent the environmental assessment from proceeding beyond the Scoping phase. It is the opinion of the EIA team that Scoping was executed in an objective manner and that the process and report conform to the requirements of Regulation 21 and Appendix 2 of GN No. 326 (7 April 2017), respectively. It is also believed that the Plan of Study for EIA is comprehensive and will be adequate to address the significant issues identified during Scoping, to select the BPEO, and to ultimately allow for informed decision-making.

# 15 OATH OF ENVIRONMENTAL ASSESSMENT PRACTITIONER

*I (name and surname)* Donovan Henning

*Of (address)* 147 Brian Fisher Drive, Ferndale, 2194

*ID No.* 7612065057 080 *Contact No.* 082 7811730

*I hereby make an oath and state that:*

*In accordance with Appendix 2 of Government Notice No. 326 (7 April 2017), this serves as an affirmation by the Environmental Assessment Practitioner (EAP) in relation to:*

*Section 2(1)(i) -*

1. *The correctness of the information provided in this report;*
2. *The inclusion of comments and inputs from stakeholders and interested and affected parties; and*
3. *Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties.*

*Section 2(1)(i) -*

*The level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment.*

*1. I know and understand the contents of this declaration.*

*2. I do not have any objection in taking prescribed oath.*

*3. I consider the prescribed oath to be binding on my conscience.*

*Signature* _____ *Date:* 8 May 2017

*I certify that the deponent has acknowledged that he/she knows and understands the contents of the statement and the deponent signature was placed there on in my presence.*

COMMISSIONER OF OATH

BRENDA PERUMAL

FULL NAME

FINANCIAL MANAGER

DESIGNATION

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