DESCRIPTION OF THE PROPOSED PROJECT CHAPTER 2

Eskom, as the primary supplier of electricity in South Africa, is currently responding to the growing electricity demand and predicted future demand within South Africa through the establishment of new generation and transmission capacity in South Africa.

Eskom uses a modelling tool called Integrated Strategic Electricity Planning (ISEP) to plan its future capacity strategy. By analysing usage patterns and growth trends in the economy, and matching these with the performance features of various generation technologies and demand side management options, ISEP identifies the timing, quantity and type (base load or peaking) of new generation capacity options required in the long-term. These options include the return-to-service of the three mothballed coal-fired Simunye Power Stations (i.e. Camden, Komati and Grootvlei), the establishment of new coal fired power plants, pumped storage schemes, gas-fired power plants, nuclear plants, renewable energy technologies (mainly wind and solar projects), and import options within the Southern African Power Pool. As the older Eskom power plants reach the end of their design life from approximately 2025 onwards, the use of all available technologies will need to be exploited to replace these in order to supply the country's growing electricity demand.

As part of its capacity expansion programme, Eskom is currently constructing the new Medupi coal-fired power station, in the Lephalale area of the Limpopo Province. In order to integrate this power station into the electricity transmission grid, Eskom Transmission is considering linkages to various points within the electricity transmission system. In order to support the upsurge in demand for the platinum group metals in the Mokopane area, and to improve the reliability of electricity supply to the Polokwane area, Eskom Transmission is proposing the introduction of the Mokopane Integration project. This project includes the construction of the following:

- A new transmission substation on a site near Mokopane.
- Two 400 kV transmission power lines in parallel looping in and out of one of the existing Matimba-Witkop 400kV transmission lines (i.e. two lines in parallel for a distance of up to 10 km) in order to integrate the new substation into the transmission system.
- Two new 765 kV transmission power lines in parallel between the Delta Substation (a new substation to be located near the Medupi Power Station) and the existing Witkop Substation (near Polokwane), as follows:
  - A new 765kV transmission power line between the Delta Substation and the new Mokopane Substation (a distance of approximately 150 km); and

a new 765kV transmission power line between the new Mokopane Substation and the Witkop Substation (a distance of approximately 60 km).

- A new 765kV transmission power line between Delta Substation and the Witkop Substation (a distance of approximately 200 km).

- Associated works to integrate the new transmission power lines and substation into the Transmission grid (such as access roads, communication tower, etc) and accommodate the new lines at existing substations (such as the construction of new feeder bays within the existing Witkop substation site).

The background to the selection of reasonable and feasible alternatives for the **proposed 765kV transmission power lines** is discussed in a **separate Draft Scoping Report (Reference Number 12/12/20/1140)**.

This chapter of this report provides the background to the selection of reasonable and feasible alternatives for the **proposed substation and turn-in lines (Reference Number 12/12/20/11870)**.

2.1. The Need for the Proposed Substation and Turn-in Lines

Currently the existing Witkop substation close to Polokwane is the only nodal point within the broader Polokwane area that supports the Pplatinum group metals' load growth. The load forecast for this group indicated a load shift towards the Mokopane area, which cannot be supplied from the Witkop substation alone as a result of thermal, voltage stability and spatial constraints.

2.2. Identification and Description of Alternative Substation Sites

In order to strengthen the power supply to the Mokopane and Polokwane areas, Eskom Transmission is proposing the construction of the following:

- A **new transmission substation** on a site near Mokopane.
- Integration of the new substation into the transmission system/grid by **looping in and out of one of the existing Matimba-Witkop 400kV transmission lines** (i.e. two lines inrunning parallel for a distance of approximately 10 km).
- **Associated works** to integrate the new substation into the Transmission grid (such as access roads, communication tower, etc).

In addition, in order to accommodate the new 765kV transmission lines proposed to be constructed from the new Medupi Power Station in the Lephalale area, Eskom Transmission is proposing the **construction of new feeder bays within the existing Witkop substation site**.

Four technically feasible alternative substation sites have been identified for investigation within the EIA process (refer to Figure 2.1). The four options are situated north of Mokopane on~~and include~~ the farms Doornfontein 721 LS (Option 1), Aronsfontein 722 LS (Option 2), Zuidholland 773 LS (Option 3) and Noord Braband 774 LS (Option 4). The proposed sites are all located in close proximity to the Matimba-Witkop 400kV transmission lines in order to allow for turn-in line infrastructure from these lines into the new Mokopane ~~s~~Substation.

Options 1 and 2 are located approximately 1 km from each other north of the Wit Vinger Nature Reserve and approximately 3 km west of the Segoahleng settlement.

Option 3 is located along the Matimba-Witkop 400kV transmission lines at a distance of approximately 3 km from the N11 national road.

Option 4 is located approximately 4.5 km south-east of Option 3. It is approximately 6 km from the N11 and the closest major settlement, Sekuruwe, is approximately 5 km south-west of the proposed site.

These alternative substation sites are evaluated within this Scoping Report (refer to Chapter 5).

2.2.1. Construction Phase

The proposed substation would be constructed in the following simplified sequence, and will take approximately 12 months to complete:

Step 1: Survey of the substation site
Step 2: Site clearing and levelling and construction of access road to substation site
Step 3: Construction of terrace and substation foundation, including the installation of stormwater drainage on the surface to dispose of such stormwater on the terrace
Step 4: Assembly, erection and installation of equipment (including transformers and control building)
Step 5: Connection of conductors to substation infrastructure
Step 6: Rehabilitation of any disturbed areas and protection of erosion sensitive areas.

A number of fences will be installed to secure the substation and the substation site. These fences include a 2.4 m high security fence to enclose all assets, a 1.8 m high fence around the yards, and a 1.2 m high boundary fence on the property line.

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Figure 2.1: Map showing the alternate substation sites identified for consideration in the EIA process

Construction crews for construction of the substation will constitute mainly skilled and semi-skilled workers. No construction workers will reside on site. It is most likely that construction workers will be accommodated within formal housing within towns surrounding the study area.

It is expected that construction of the substation would begin late 2010 ~~in~~or early 2011 and would take 3 years to complete.

Comment [J1]: Please confirm

2.2.2. Servitude Negotiation and the EIA Process It is the same process but in terms of substation sites it depends of how big is the farm and what percentage of the farm are you taking.e.g you can't have 60% of the property as a servitude then you have to buy the entire property.

Comment [J2]: I assume this process is the same for the obtaining of the substation sites

Transmission power lines are constructed and operated within a servitude (55 m wide for 400kV lines as would be the case for the turn-in lines) that is established along the entire length of the power line. Within this servitude, Eskom Transmission has certain rights and controls that support the safe and effective operation of the power line. The process of achieving the servitude agreement is referred to as the Servitude Negotiation Process, or simply just the negotiation process. The following important points relating to the negotiation process should be noted:

- Servitude negotiation is a private matter between Eskom Transmission and the appropriate landowner.
- The negotiation process involves a number of stages (see below), and culminates in the 'signing' of a servitude. Here Eskom Transmission enters into a legal agreement with the landowner.
- The servitude is registered as a 'right of way', and Eskom do not purchase the servitude from the landowner. Compensation measures are agreed in each case.
- The agreements will detail such aspects as the exact location and extent of the servitude, and access arrangements and maintenance responsibilities, as well as any specific landowner requirements.
- The negotiation process may take place at any time in the planning of a new power line.
- This process must be completed (i.e. the agreement must be signed) with the relevant landowner before construction starts on that property.
- The negotiation process is undertaken directly by Eskom Transmission and is independent of the EIA process. It is important that the aims of the two processes are seen as separate.

The EIA process has become important in the initial planning and route selection of new transmission lines. For this reason, it is usually preferable that the negotiation process begins after the EIA has been completed. At this stage there

is greater confidence in the route to be adopted, and it would be supported by environmental authorisation. However, it may be required that the negotiation process begins earlier, and may begin before, or run in parallel with the EIA process. This may be due to urgent timeframes for the commissioning of the new power line, knowledge of local conditions and constraints, etc. Eskom Transmission has a right to engage with any landowner at any time, though they do so at risk if environmental authorisation has not been awarded.

2.2.3. The Negotiation Process

Eskom Transmission is responsible for the negotiation process for all new transmission power lines. It is critical that the process is correctly programmed and incorporated into the planning of a new line. The negotiation process involves the following steps:

i. Initial meeting with the landowner.
ii. The signing of an 'option' to secure a servitude (this indicates that the owner will accept that the power line will traverse his property, subject to conditions to be finalised in the negotiation of the servitude agreement). An option is valid for one year.
iii. Once the route is confirmed (i.e. options are signed with the upstream and downstream landowners), the servitude agreement will be finalised with the individual landowners. This agreement will set out the conditions for the establishment, rehabilitation and maintenance of the servitude, and will be site-specific (as different landowners may have different requirements). Compensation payments would be made when the servitude is registered at the Deeds Office[1].
iv. Once construction is complete and the land rehabilitated to the landowners satisfaction (and as agreed prior to construction), the landowner signs a 'Final Release' certificate. Until the 'Final Release' certificate has been signed, Eskom Transmission remains liable for the condition of the land.
v. Once the clearance certificate is signed, the responsibility for the power line and servitude is handed over to the regional Eskom Transmission office.

2.2.4. Technical Details of the Proposed Substation

The main aspects of the proposed substation include:

[1] Compensation will be based on present day property valuations for all properties obtained from registered evaluators. Eskom only pays compensation for the strip of land that is affected at 100% of present day property value. In cases where properties are significantly affected, Eskom may consider purchasing the whole property at present day market value. All improvements will be valued. Sentimental value is not considered in any valuations as it is not measurable. Valuations are done according to the Expropriation Act.

- An area of land approximately 1 km x 1 km is required for the construction of the substation site. Approximately 40% of this area will be used for the High Voltage Yard, which will be fenced off for security purposes. Cnfirmed
- Installation of new equipment (transformers, reactors, etc.) for operation up to 765 kV capacity. This equipment will not contain hazardous substances (PCBs, etc.), but will contain cooling oils and similar potential pollutants necessary for the operation of the equipment. The equipment will be designed according to Eskom specifications.
- The maximum height of the development will be 45 m. Which height are you referring to here, is it the height of the s/s/altitude/height above sea level?

Comment [J3]: Please confirm

Comment [J4]: Please confirm

2.3. Project Operation Phase

The expected lifespan of the proposed substation is between 35 and 40 years, depending on the maintenance undertaken on the substation structures.

During the life-span of the substation, on-going maintenance is performed. Substation inspections are undertaken on an average of 1 – 2 times per year, depending on the area. During this maintenance period, components may require replacement in order to significantly extend the lifespan of the substation. Maintenance of the substation is required to be undertaken in accordance with the specifications of the Environmental Management Plan (EMP) which is to form part of the EIA Report.

The creation of additional employment opportunities during the operational phase of the substation will be limited, and will be restricted to skilled maintenance personnel employed by Eskom.