

Eskom Nokeng Fluorspar Substation and 132kV line
DEA Ref 12/12/20/2528
NEAS Ref DEA/EIA/0000671/2011
DRAFT BASIC ASSESSMENT REPORT
Executive Summary

1. BACKGROUND

Eskom Distribution Northern Region (the Applicant) commissioned Texture Environmental Consultants (the Environmental Assessment Practitioner) to undertake an Environmental Impact Assessment (EIA) for the proposed project.

The current Environmental Impact Assessment application is part of a broader scope of works to strengthen Eskom's network. Nokeng Fluorspar Mine (Pty) Ltd (Nokeng Fluorspar), has applied to Eskom Distribution Northern Region for the supply of electricity to a proposed mining operation. A fluorspar plant and associated infrastructure is proposed to facilitate mining of two major fluorspar deposits immediately south of Vergenoeg Mine. The application for environmental authorisation in respect of the above-proposed mining operation, is not part of this current application. This application concerns the supply of electricity to the Nokeng Fluorspar Mine and entails a substation and powerline to facilitate the supply of power to the mine.

The construction of the Nokeng Fluorspar substation and the associated powerline entail the following:

- Build an approximately **15km 132kV Kingbird line** from the existing Rust de Winter Substation to the proposed Nokeng Fluorspar substation;
- Establish the 2x40 MVA **Substation** (to be called Nokeng Fluorspar) on a terrain of 200x200m;
- Erect a 36 meters Communication Tower inside the new substation;
- Construct an access/ construction road of 8 meters wide for the line and substation;
- Obtain a servitude area of 31metres wide for the power line route.

The applicant is Eskom Distribution Northern Region, Land Development with contact person Ms. Nkateko Msimango, Environmental Management in Polokwane.

1.1 Locality and Regional Context

Two alternative routes are considered for the line. The affected properties for **alternative 1** are the farms **Buffelsdrift 179JR Portion 35, 3 and 37; Rust de Winter 178JR Portion 15 and 0; Rust de Winter 180JR Portion 23, 29, 193, 213, 188, 187, 214, and 0;** and **Kromdraai 209JR Portion 3, 2 (Re) and 11** in the Bela-Bela Local Municipality in Limpopo Province and in the Nokeng tsa Tsaemane Local Municipality in Gauteng Province. The affected properties for **alternative 2** are the farms **Buffelsdrift 179JR Portion 35, 3 and 37; Rust de Winter 178JR Portion 5, 6, 15 and 0; Rust de Winter 180JR Portion 23, 29, 213, 188, 211, and 0;** and **Kromdraai 209JR Portion 5, 3, 2 (Re) and 11** in the Bela-Bela Local Municipality in Limpopo Province and in the Nokeng tsa Tsaemane Local Municipality in Gauteng Province.

The study area is situated on the 1:50 000 topographical base maps 2528AB, 2528AD, 2528BA and 2528BC. The alternatives for the project are found at approximately:

Existing Rust de Winter substation:

Latitude (S) (Degrees Decimal Minutes)		Longitude (E) (Degrees Decimal Minutes)	
25°	12.4498' S	28°	31.61723' E

Proposed Nokeng-Fluorspar substation:

Latitude (S) (Degrees Decimal Minutes)		Longitude (E) (Degrees Decimal Minutes)	
25°	17.0468' S	28°	35.9087' E

Alternatives:	Latitude (S):		Longitude (E):	
Alternative S1 (preferred Alt)				
• Starting point of the activity	25°	12.4498' S	28°	31.61723' E
• Middle point of the activity	25°	13.648' S	28°	35.060' E
• End point of the activity	25°	17.0468' S	28°	35.9087' E
Alternative S2				
• Starting point of the activity	25°	12.4498' S	28°	31.61723' E
• Middle point of the activity	25°	13.494' S	28°	34.995' E
• End point of the activity	25°	17.0468' S	28°	35.9087' E

2. LEGAL FRAMEWORK

An application for environmental authorisation is submitted to the National Department of Environmental Affairs (DEA) in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), read with the Environmental Impact Assessment Regulations, 2010 (GNR 543 of 2010) (EIA Regulations).

The following activities as listed were identified as applicable to the proposed construction of the powerline and substation:

Relevant notice:	Activity No:	Description of each listed activity as per project description:
R 544 of 18 June 2010	10	The construction of facilities or infrastructure for the distribution of electricity outside urban areas with a capacity of 132kV.
R 544 of 18 June 2010	23	The transformation of undeveloped land to institutional use, outside an urban area, where the total area to be transformed is bigger than one hectare for the purpose of a substation.
R 546 of 18 June 2010	3	The construction of a telecommunication tower where the mast: (a) is to be placed on a site not previously used for this purpose, and (b) will exceed 15 meters in height. (activity to be confirmed)
R 546 of 18 June 2010	4	The construction of an access and construction road wider than 4 meters. (activity to be confirmed)

3. STUDY APPROACH

The study approach followed by the Consultants, in short, entailed the following steps:

- Preliminary **site investigations**, to determine the scope of works of the project and to familiarise with the sites, were done by Eskom in **May 2011**.
- Further site investigations were done by the EAPs and Eskom in July 2011.
- **An application for a Basic Assessment was submitted to DEA** and the project was issued with DEA reference number 12/12/20/2528 and NEAS Ref DEA/EIA/0000671/2011.
- Specialist **ecological input** was obtained to investigate the flora, fauna and the general biophysical environment in an attempt to identify the potential impacts of the project.
- The proposed development is covered by the National Heritage Resources Act which incorporates heritage impact assessments in the Environmental Impact Assessment process. A **Phase 1 Heritage Impact Assessment** was therefore done by a specialist to identify the potential impact on heritage resources.
- Input from an **avifauna specialist** was also obtained to determine the impact of the proposed project on birds.
- During the months of **May to November 2011** the EAPs, the **ecologist, the bird impact specialist and the archaeologist/cultural heritage management** consultant conducted **more site investigations**.
- The first phase of the **Public Participation Programme (PPP)** started in **July and continued until November 2011**. It included the identification of landowners and key stakeholders, the distribution of **information letters** with request for comment, as well as **advertising of the project in the press and on site**.
- In addition, invitations to an **information meeting conducted on 14 November 2011** were sent to all IAPs on **28 October 2011**. The purpose of the meeting was to furnish the landowners and other interested parties with information regarding the extent of the project, the proposed alternatives, the process of negotiations for servitudes, and the extent of the Environmental Impact Assessment Process. Project posters with information and maps of the routes were presented at the meeting. Written comment was requested at the meeting.

- A **draft Basic Assessment Report** – this document- was compiled with the main aim to identify issues, potential impacts and potential alternatives associated with this project. It included a description of the status quo of all relevant environmental components as well as the proceedings of the PPP and communication with registered Interested & Affected Parties (IAPs).
- In addition, An **Environmental Management Programme (EMPr)** was compiled to ensure that
 - mitigation measures are identified and implemented to avoid or minimise the expected negative environmental impact and enhance the potential positive impact associated with the project;
 - the developer, construction workers and the operational and maintenance staff are well acquainted with their responsibilities in terms of the environment;
 - communication channels to report on environment related issues are in place.
- On **6 January 2012** the **draft Basic Assessment Report was submitted** for comment to:
 - Limpopo Region Department of Water Affairs: Water Resources & Water Quality Management
 - Gauteng Region Department of Water Affairs: Water Resources & Water Quality Management
 - Limpopo Heritage Resource Authority
 - South African Heritage Resources Agency
 - Gauteng Department of Agriculture, Conservation and Environment: Environmental Impact
 - Limpopo Department of Agriculture, Forestry and Fisheries: Land Use and Soil Management
 - Gauteng Department of Agriculture, Conservation and Environment: Land Use
 - Limpopo Department of Minerals and Energy
 - Gauteng Department of Minerals and Energy
 - SA National Road Agency Ltd
 - Road Agency Limpopo
 - Limpopo Department of Roads and Transport
 - Gauteng Department of Roads and Transport
 - Limpopo Department of Rural Development and Land Reform: Land Claims Commissioner
 - Gauteng Department of Rural Development and Land Reform: Land Claims Commissioner
 - Limpopo Department of Rural Development and Land Reform: State Land Administration
 - Gauteng Department of Rural Development and Land Reform: Land Reform Office
 - Limpopo Department of Cooperative Governance, Human Settlement and Traditional Affairs
 - Gauteng Department of Public Works
 - Agri Limpopo
 - Agri Gauteng
 - Cullinan Boere Unie
 - Pretoria Distrik Landbou Unie
 - Waterberg Distrik Landbou Unie
 - Waterberg District Municipality
 - Bela-Bela Local Municipality
 - Metsweding District Municipality
 - Nokeng Tsa Taemane Municipality
 - Eskom Transmission
 - Eskom Distribution Northern Region
 - Landowners
- The **due date for comment on the draft Basic Assessment Report is 17 February 2012** .
- Subsequently, a **final Basic Assessment Report (BAR)** will be compiled **and submitted to DEA by April 2012**. This report will include all concerns raised to the draft BAR and responses thereto. The Consultants (EAPs) will ensure that all concerns raised are addressed in appropriate detail in the final Basic Assessment Report.

4. PROJECT DESCRIPTION

4.1 Need for the project

Nokeng Fluorspar Mine (Pty) Ltd (Nokeng Fluorspar), a wholly owned subsidiary of Sephaku Fluoride (Pty) Ltd has applied to Eskom Distribution Northern Region for the supply of electricity to a proposed mining operation. A fluorspar plant and associated infrastructure is proposed on the portions 4 & 11 and the remaining extent of portion 2 of the farm Kromdraai 209 JR and portion 1 of the farm Naauwpoort 208 JR on which two major fluorspar deposits are located immediately south of Metorex Limited's Vergenoeg Mining Company (Pty) Ltd (Vergenoeg Mine). The ore bodies are pyroclastic and placer outwash fan deposits genetically related to the Vergenoeg volcanic pipe. Nokeng Fluorspar

Mine intend developing these into a fluorspar mine, producing 177,000 tpa, fluorspar. The site for the proposed mine is located approximately 70 km north-east of Pretoria at the general coordinates of Lat: 25° 16' 31.09" S and Long: 28° 35' 17.98" E. The application for environmental authorisation in respect of the above proposed mining operation, is not part of this current application.

As discussed above, Nokeng Fluorspar Mine intends developing a fluorspar mine and has applied to Eskom for the supply of power for the mine.

4.2 Project components

The construction of the Nokeng Fluorspar substation and the associated powerline entail the following:

1. Build an approximately **15km 132kV Kingbird line** from the existing Rust de Winter Substation to the proposed Nokeng Fluorspar substation;
2. Establish the 2x40 MVA **Substation** (to be called Nokeng Fluorspar) on a terrain of 200x200m;
3. Erect a 36 meters Communication Tower inside the new substation;
4. Construct an access/ construction road of 8 meters wide for the line and substation;
5. Obtain a servitude area of 31metres wide for the power line route.

1. *Construct **Nokeng Fluorspar substation** on a terrain of 200m X 200m.*

A servitude area is generally a no building area, except for Eskom structures. Usually, normal farming activities may continue in a servitude with the exception that no trees may be planted or high structures may be erected. For this project however, an area of 200m x 200m will be used as the site for the construction of the substation. The area of 200m x 200m will therefore be registered as an Eskom servitude. The site for the substation is flat and suitable for the construction of the substation.

2. *Erect a 36 metres high **Telecommunication Tower** inside the new substation terrain*

The communication tower will be 36 metres high with microwave antennas. No stays will be needed to ancor the tower. The foundation would be such to make it a self supportive structure.

3. *Construct a **132kV Kingbird line***

It is proposed to construct a 15km 132kV Kingbird line from the existing Rust de Winter Substation to the proposed Nokeng Fluorspar substation. The proposed structure for the 132kV powerline, is a monopole steel structure. In general, these pylons could be placed 220-330 meters apart, for the length of the line. The pylons for a powerline are between 18 to 30 meters high, depending on the terrain and existing land use. The flatter the terrain, the shorter the pylons to be used. The conductor attachment height on a pole is 13m (for 20m intermediate poles) and more for longer poles, depending on the pole length. Ground clearances will adhere to OSH-Requirements of 6.3m and 7.5m.

Strain poles have a planting depth of 2m but intermediate pole planting depths varies between 2.6m (for 20m poles) and 3m (for 24m poles) or more depending on the pole length. The pole is not planted in a slab - The pole foundation is dependant on the soil type and varies in size and consists of a 8:1 good soil:cement mix that are compacted in 200mm layers. A concrete cap of 1.2m x 1.2m is cast around the pole to "seal" the soil around the pole from oxygen - to control oxidation or rust on the pole.

Where the site is relatively flat, single pylons without stays will be used, except for where the powerline has to change direction. Stays will not be used except at turns in the route.

Approval and requirements of the Department of Roads should be obtained for the construction of the powerline adjacent to the D626 and D567 roads. A Wayleave Application should be supplied to the Department, with appropriate plans before the commencement of construction. It is expected that Eskom Land and Rights will apply for exemption from the specific distance requirement in order to construct the line closer to the mentioned roads.

Two Location Alternatives are investigated for the proposed project:

Alternative 1: The route for the line is proposed to run from the Rust de Winter substation to the east along the southern side of the D626 road. Before the crossing of the D626 with the D567, the route will turn slightly south and then east towards the D567 to follow a shorter route to the D567. From there the route will follow the D567 on the southwestern side of the road. Again the route will follow a shorter and straight alignment for a section along the

D567. Closer to the proposed substation site the route will cross the D567 to the eastern side to feed into the substation.

Alternative 2: The route for the line is proposed to run from the Rust de Winter substation to the east along the northern side of the road. At the crossing with the D567 the route will turn southeast and run along the southeastern side of the D567. At the border between Limpopo and Gauteng the route will turn south to run in a straight alignment towards the substation.

The **final proposed route** is **Alternative 1** on the farms **Buffelsdrift 179JR Portion 35, 3 and 37; Rust de Winter 178JR Portion 15 and 0; Rust de Winter 180JR Portion 23, 29, 193, 213, 188, 187, 214, and 0;** and **Kromdraai 209JR Portion 3, 2 (Re) and 11** in the Bela-Bela Local Municipality in Limpopo Province and in the Nokeng tsa Tsaemane Local Municipality in Gauteng Province.

4. *Construct an **construction/access road** for the new lines*

Access to properties for the purpose of construction will be arranged with landowners. The existing roads will be used as far as is feasible. Relevant is the fact that both alternatives are adjacent to roads for most of the alignment. New access will therefore only be required at the sections away from the roads. Should a construction road be unavoidable, then an area of 8m will be selectively cleared, 4m on either side of the center line of the line.

5. ***Obtain a servitude area** of 31 meters wide for the line*

A servitude area is generally a no building area, except for Eskom structures. Usually, normal farming activities may continue in a servitude with the exception that no trees may be planted or high structures may be erected. In general, the servitude for Eskom 132kV powerlines is 31 meters wide, which implies 15,5 meters on either side of the center line underneath the powerline.

5. ALTERNATIVES FOR THE PROJECT

Alternatives for the project have been investigated. The purpose of investigating alternatives is to find the most effective way of meeting the need and purpose of the proposal. This can be attained by enhancing the environmental benefits of the proposed activity, through reducing or avoiding potentially negative impacts.

5.1 Activity Alternatives

5.1.1 Electricity Distribution

Several alternative activities were considered to accomplish the need for the proposed activity. Other options to the proposed project could possibly fulfill in the requested supply of electricity to the Nokeng Fluorspar Mine. Eskom Distribution therefore investigated other options that are briefly summarised below:

Option 1

- Build a 132kV feeder bay at Rust de Winter Substation.
- Build a 10km 132kV line from Rust de Winter Substation to the customer site.
- Construct a 132/11kV substation equipped with 2x40MVA transformers and control plant at the customer site.

Option 2

- Build a 132kV feeder bay at Pelly MTS.
- Build a 132kV line from Pelly MTS to the customer site (33.4km away straight line).
- Construct a 132/11kV substation equipped with 2x40MVA transformers and control plant at the customer site.

Option 3

- T-off from the Pelly - Pienaarsrivier 132kV overhead line
- Build a 18km 132kV line from the new T-off to the customer site.
- Construct a 132/11kV substation equipped with 2x40MVA transformers and control plant at the customer site.

All the above discussed options were technically viable, but are evaluated as follows:

Option 1:

- Integrates better with future plans i.e.

- The planned strengthening of Vergenoeg mine feeder.
- Connection of Marble Hall MTS to the Rust de Winter Substation.
- Easier to implement
- Voltage profile and thermal limits are acceptable.
- Cheaper option

Option 2:

- Voltage profile and thermal limits are acceptable.
- More expensive due to required building of a feeder bay at the Pelly MTS and long lines.

Option 3:

- Voltage profile and thermal limits are acceptable.
- T-off from the Pelly - Pienaarsrivier 132kV overhead line complicate protection settings, thus not preferred.

Option 1 proved to be the preferred due to the above. The option 1 is therefore the option that was found technically viable to be constructed. The EIA further investigates the construction of Option 1.

5.1.2 Agriculture

The construction of powerlines with the resulting clearance of servitudes can lead to a loss in agricultural land.

The proposed construction of the powerline will however not impact significantly on any agricultural activity due to the following:

- The impact to agricultural activities of the proposed powerline will only be for a limited period during construction. The positions of the pylons will be cleared and a construction road of 8m wide could be cleared, if necessary, to construct the powerline. After construction the access road will be revegetated and normal agricultural activities can continue under the powerline as usual.
- It is therefore submitted that the servitude area will not interfere significantly with agricultural activities on the properties. In addition, Eskom will not own the servitude but will purchase the rights to construct and maintain the lines. A change in land use from agriculture to other land uses is not applicable.
- In addition, in terms of the Subdivision of Agricultural Land Act, 1970 (Act 70 of 1970), Section 2(a) Eskom is a statutory body and therefore it is not subjected to the provisions of the Act.

5.1.3 Conservation

The study area is located inside the future expansion area of the Dinokeng Game Reserve.

The Dinokeng project is a 240 000 hectares tourism destination. Dinokeng is one of the Blue IQ Investment Holdings (Blue IQ) projects and has a strong focus on tourism development. Although the study area is not within the demarcated startup areas (Phase 1 and Phase 2) of the Dinokeng Project, it is located within the proposed extended phase.

It is suggested that the construction of a single overhead powerline will not impact significantly to the proposed extended phase of the Dinokeng project. The impact of the pylons are insignificant should the proposed mitigatory measures be followed inter alia not to impact on large indigenous trees if possible, to clear the impacted areas from alien vegetation etc. In addition, the powerline corridor is not proposed in a pristine unspoilt area. The route is proposed adjacent to existing impact i.e. the D626 and D567 tar roads. The impact of the proposed substation and powerline project to the environment is expected to be low.

5.1.4 No-Go

It is suggested that to maintain the status quo is not the best option for the macro environment. Fluorspar is used mainly in the aluminium, steel and chemicals industries. Over the past decade, most of the growth in production of fluorspar has come from existing producers. The benefit of the development of a new Fluorspar Mine includes aiding the market demand as the decline in the availability of fluorspar, and the rapid increase in demand from 2002 to 2007, has encouraged companies to identify new sources of fluorspar. The overall requirement for fluorspar is expected to rise thus providing an additional motivation in developing a South African mine in this limited international market. This

has potentially significant positive impacts on national economic growth and social well-being. Nokeng Fluorspar Mine intends developing this fluorspar mine and has applied to Eskom for the supply of power for the mine. Should this application not be approved then Nokeng Fluorspar Mine will not be able to develop the mine. As indicated in this EIA report the impacts that are likely to occur as a result of the proposed powerline and substation are insignificant and can be mitigated to acceptable levels. The No-Go development alternative could therefore not be considered the responsible way to manage the site.

5.2 Location Alternatives

The proposed project requires the construction of:

- a **Substation** on a terrain of 200x200m;
- a **132kV line** from the existing Rust de Winter substation to the proposed Nokeng Fluorspar substation.

Two alternative localities are investigated for the proposed project:

Alternative 1: The route for the line is proposed to run mostly to the southern side of the D626 and to the southwestern side of the D567 towards the proposed Nokeng Fluorspar substation.

Alternative 2: The route for the line is proposed to run mostly to the northern side of the D626 and to the north eastern side of the D567 towards the proposed Nokeng Fluorspar substation.

The **final proposed route** is **Alternative 1** on the farms **Buffelsdrift 179JR Portion 35, 3 and 37; Rust de Winter 178JR Portion 15 and 0; Rust de Winter 180JR Portion 23, 29, 193, 213, 188, 187, 214, and 0;** and **Kromdraai 209JR Portion 3, 2 (Re) and 11** in the Bela-Bela Local Municipality in Limpopo Province and in the Nokeng tsa Tsaemane Local Municipality in Gauteng Province.

The **two localities** were investigated and briefly discussed below:

5.2.1 Ecological status report

The ecological status report identified the following:

- The construction of the powerline will have a low impact in the broader context of the biodiversity of the area.
- The vegetation types occur over a large area and the power line and new substation site will have minimal negative impact on it. If the site is selected carefully, no natural vegetation needs to be removed, apart from some grass. Current impacts far outstrip the impact of the power lines.
- This development will not impact negatively on the region with regard to plants, plant communities and water courses – from a regional perspective.
- Alternative 1 will use existing servitudes and roads- limited amount of natural vegetation to be cleared.
- Alternative 2 will cross large areas of disturbed natural vegetation, limiting the need for clearing of trees.
- It is strongly recommended that no construction of any sort takes place within aquatic and riparian habitats encountered, as these habitats are viewed as sensitive.
- Of relevance is, that there are rivers and streams present along the powerline corridors. Measures to limit impact to any watercourse are supplied in the BAR.
- From an ecological perspective, any of the alternatives is viable for the construction of the project.

5.2.2 Bird Impact Assessment

In the **Bird Impact Assessment** report, both alternatives emerged with negative scores, indicating that the environment is not particularly sensitive. **Both alternatives would therefore be acceptable** from a bird impact perspective. Of the two alternatives, **alternative 2 emerged as the least sensitive alternative** from a bird impact perspective, and would therefore be the preferred alternative.

5.2.3 Heritage Impact Assessment

The main findings of the Heritage Impact Assessment are as follows:-

The Phase I HIA study for the proposed Eskom Project revealed the presence of the following types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) in and near the Eskom Project Area, namely:

- Two graveyards dating from the historical period and from the recent past. Graveyard (GY01) in the Project Area may be affected by the Eskom Project
- Three Historical Houses which are older than sixty years.

Summary

- Only (GY01) may be affected by the Eskom Project. GY02 is outside the project area.
- None of the three Historical Houses will be affected by the project.

Mitigating the graveyard

Graveyards can be mitigated in two ways depending whether they are to be affected, directly or indirectly, namely:

- It is recommended that GY01 be conserved *in situ* beneath the power line. Pylons should be erected on opposite ends of GY01. The power lines therefore can be strung across and above GY01. Conserving graves and graveyards in power line corridors create the risk that they may be damaged, accidentally, and that Eskom may be held responsible for such damages. Controlled access must exist for any relatives or friends who wish to visit graves or graveyards in power line corridors.

5.3 CONCLUSION

- Activity Alternatives have been considered and option 1 was found the feasible and technically viable option for this project.
- Subsequently, two Location alternatives were investigated for the proposed project.
- From a purely **ecological viewpoint, both location alternatives are suitable** for the construction of the project. The vegetation types occur over a large area and the power line and new substation site will have minimal negative impact on it. If the site is selected carefully, a limited amount of natural vegetation needs to be cleared.
- From the analysis of several risk factors, **alternative 2** emerged as the **preferred alternative** from a **bird impact perspective**, although both alternatives emerged with negative scores, indicating that the environment is not particularly sensitive. Both location alternatives would therefore be acceptable from a bird impact perspective.
- From a **heritage point of view, both** of the location **alternatives are suitable**, for the construction of the project. The Graveyard (GY01) affected by Alternative 1 can be conserved *in situ* beneath the powerline. The powerlines therefore can be strung across and above GY01 and the graveyard need not be affected.
- In **summary**, however, due to close similarities of alternatives 1 and 2 it is imperative that the accumulative weight of other parameters such as feedback from public participation, land tenure issues, construction costs, technical constraints, etc. also be taken into account when deciding on the final alternative between Alternative 1 and Alternative 2. During consultation with landowners it emerged that Alternative 2 will impact on agricultural activities of certain landowners.
- **Subsequently, Alternative 1 is preferred and submitted as the final proposed route.** This Alternative (1) is preferred mainly due to the fact that it impacts less on landowners and their agricultural activities.

6. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

6.1. Impacts that may result from the planning and design phase

The potential impacts that are likely to occur as a result of the planning and design phase are described below. In addition the mitigation measures that may eliminate or reduce the potential impacts are provided:

Impact on natural habitat

This impact is associated with the potential for disruption of sensitive floral habitats and fauna populations. The planning regarding the route of the powerline and the substation site should take into account the ecological sensitivity of the site.

Relevant to the project is the following:

- The construction of the power line will have a low impact in the broader context of the biodiversity of the area.
- The vegetation types occur over a large area and the power line and new substation site will have minimal negative impact on it. If the site is selected carefully, no natural vegetation needs to be removed, apart from some grass. Current impacts far outstrip the impact of the power lines.
- Currently the natural vegetation and habitat of the study area is in a fair condition and historic and current land use practices impact negatively on the area. Apart from roads and the existing power line, land-use includes mining, grazing, cultivation of cash crops and limited wood collection. Large areas are cleared for grazing and grass cutting and in some areas, encroachment (*Dichrostachys cinerea*) is evident.
- Rivers and streams are present along the powerline corridors.

Mitigation for impact on natural habitat

Proper planning will limit the impact of the powerline and substation on the natural habitat and therefore the following is proposed:

- Site specific measures in terms of ecology as identified by the ecologist, Wynand Vlok (Tel 082 200 5312) must be included in the contract with the Contractor and implemented by the Contractor during the construction phase. These measures are included in the EMP of the BAR.
- Various species of indigenous trees and bush are protected by law in terms of the National Forests Act No 84 of 1998, which stipulates that it is necessary to obtain a permit from the relevant provincial office of the Department of Agriculture, Forestry and Fisheries in order to cut them. All protected trees must be recorded during the walk down phase (once final route is pegged) and the presence or absence of *Sclerocarya birrea* must be confirmed.
- It is strongly recommended that no construction of any sort takes place within aquatic and riparian habitats encountered, as these habitats are viewed as sensitive.
- Of relevance is, that there are rivers and streams present along the powerline corridors. Measures to limit impact to any watercourse are supplied in the BAR and EMP.
- North of the border of Gauteng with Limpopo, the corridor will cross a low ridge and it is suggested to keep the corridor as near as possible to the road, as it will lower impacts in the area. There are some farm roads near the fence that can be used as access roads during construction.
- Alternative 1 will use existing servitudes and roads- limiting the amount of natural vegetation to be cleared.
- Alternative 2 will cross large areas of disturbed natural vegetation, limiting the need for clearing of trees.
- The placement distance between pylons can be up to 330 meters. Therefore any sensitive areas, with proper planning, could be completely missed.
- In summary, the ecological status report indicated that both alternative routes are viable from an ecological perspective.
- It was concluded that, from a vegetation and fauna perspective, if duly mitigated and planned, the project will not impact significantly on the environment.

Social Impact

- The construction of new powerlines could potentially impact on landowners if not planned and designed to accommodate the needs of the landowners.
- In addition, the possibility exists that a project might impact also upon residents who are not landowners. Land users or lands rights holders could farm on the portion of land affected by the proposed line or rent a house and not own it. The compensation for the servitude is always paid to the landowner and not to the land user.
- Any possible impact on landowners as well as land users should be identified and accommodated before construction of the route.
- The development on State land allocated to a tribe requires the consent of the Minister of the Department of Rural Development and Land Reform as nominal landowner of the land. The land rights holders must be

consulted, must participate in the decision making process, and consent to the development in the form of a tribal resolution.

Mitigation for Social Impact

The route of powerlines should be designed to accommodate the needs of landowners and landusers.

- The design for the powerline route and the placement of structures should be accommodating to existing structures in the alignment of the route.
- Routes with evident visual disturbance caused by existing powerlines or roads are in general more acceptable than traversing through pristine area.
- For the reasons above the alternatives for the project were designed to impact as minimal as possible on the receiving environment and the affected landowners.
- The powerline was proposed (Alternative 1 and 2) to run adjacent to existing roads, D626 and D567.
- Alternative 1 is supported by the landowners that is affected by this route. Alternative 2 impacts on the agricultural activities of Buffelsdrift 179JR Portion 37 and therefore Alternative 1 is slightly preferred.
- During the course of the EIA, all affected landowners were identified and consulted with regarding the proposed project.
- The properties in question (servitude) will not be purchased and the registered owner will receive compensation for the use of the servitude. Further negotiations are taking place to confirm the details for the acquisition of the servitude and compensation therefore.
- The negotiator will confirm the specific requests/requirements with each landowner. These will be stipulated in the final document, an option document. The option document is a binding document that reflects all the requirements of the landowner, for example: the exact positions of the pylons on his property; the negotiated compensation for the servitude; specific access arrangements to his property etc.

6.2 Impacts that may result from the construction phase

The potential impacts that are likely to occur as a result of the construction phase are described below. In addition, the mitigation measures that may eliminate or reduce the potential impacts are provided:

Risk of Surface and Groundwater Pollution

- Construction materials and construction equipment will be stored at the campsite and used on site. The pollution of groundwater may result from any spillages that may occur. In addition, the campsite may accommodate construction workers, in which case solid and liquid effluents will be produced, including sewage and domestic solid waste.
- Therefore possible diesel, oil and lubricant spills are the main concern in respect of water pollution during construction together with organic pollution caused by inadequately managed facilities at site camps and at the work sites. The above may result in a change in groundwater quality with the associated negative impact on humans and the natural habitat.
- A management plan must be in place to rehabilitate any such spills. Part of the management strategy must further include the proper storage and removal of any by-products and building rubble.
- Watercourses are crossed by the powerline corridors and it is strongly recommended that no construction of any sort takes place within aquatic and riparian habitats encountered, as these habitats are viewed as sensitive.

Mitigation of Surface and Groundwater Pollution

Construction camp

- Preferably camp site, storage facilities and other necessary temporary structures to be erected within the grounds of the proposed substation site.
- Encourage the construction contractor to employ local people as far as is reasonably practical and encourage the contractor to transport them daily to and from site. This will reduce solid and liquid waste production and water demand at the site camps.
- According to the applicant and their contractors, accommodation for the construction workers is mostly rented in the nearest town. Sewage disposal will therefore be through the Municipality's main sewer line. Should

accommodation in a construction camp be unavoidable, then the measures as stipulated in the EMPr must be adhered to.

- Included as requirement in the EMPr under heading “*Waste Management*” is the following: The disposal of chemical toilets should be at a registered or licensed sewage disposal facility. Proof of agreement between the applicant and the sewage disposal facility for such disposal, confirming that there will be enough capacity to accommodate additional waste, should be submitted to the Department of Water Affairs.
- No water for drinking or cooking purposes should be used from out of streams, vleis or farm dams in the vicinity. It is important for relevant management or contractors to ensure that staff/workers are supplied regularly with adequate clean drinking and cooking water.
- The water used to supply the site with potable water is sourced/purchased from farmers in the area with pre-existing rights. The contractor should deliver the water to the site in the applicable water tankers. These requirements are included in the EMPr under the headings “*Construction site*” and “*Ground and Surface Water*”.
- In all cases, abstraction of water for construction purposes will require a permit from the Department of Water Affairs unless pre-existing rights are purchased from farmers. For this project, water tanks will be used during construction.
- Mixing of cement, concrete, paints, solvents, sealants and adhesive must be done in specified areas on concrete aprons or on protected plastic linings to contain spillage or overflows onto soil to avoid contamination of underground water.

Diesel, hydraulic fluid and lubricants

- Minimize on-site storage of petroleum products. Relevant to this project, is that the relevant dangerous goods to be stored on site is diesel. The diesel tank can hold 2000 litres (2 cubic metres). Of relevance is: GNR 544 of 2010, activity nr 13 that states “...storages of dangerous goods with a capacity above 80 cubic metres...”. The amount of diesel that will be stored on site is 2 cubic metres and is therefore a relatively small amount and well below the threshold of the listed activity of 80 cubic metres.
- Precautionary methods to be implemented for handling of oil and substances that could impact on the soils, ground- and surface water :
- No hazardous substances may be stored on site for a period exceeding 90 days. (Note that the Department of Water Affairs requires a permit for a waste disposal site in the event that longer storage periods apply).
- All hazardous substances at the site must be adequately stored and accurately identified, recorded and labelled. The storage of any hazardous substances must take place in a secured lock-up building or covered area.
- Build adequate structures (berms and containment structures) to contain any oil spills which might emanate from transformers.
- Bund storage tanks to 120% of capacity.
- Ensure proper maintenance procedures in place for vehicles and equipment.
- Servicing of vehicles to be in designated areas with appropriate spill management procedures in place.
- Ensure measures to contain spills readily available on site (spill kits).
- A container filled with sand to soak up any spillages, as well as an empty container into which the “contaminated” sand could be placed and stored for collection by the supplier of the chemicals or oils must be provided.
- The Regional Representative of the Department of Water Affairs should immediately be informed if pollution of any groundwater or soils occurs. They will give instruction on actions to be taken in this regard.

Site camp domestic waste (kitchens, showers)

- Deposit solid waste in containers and dispose of regularly. Any waste that cannot be recycled will be transported to the appropriate landfill site licensed in terms of section 20 (b) of the National Environment Management Waste Act, 2008 (Act No 59 of 2008). Proof to be kept by contractor.
- Dispose of liquid waste (grey water) with sewerage.

Site camp sewage

- Minimize on-site accommodation.
- Supply, maintain and enforce the use of mobile toilets at the work sites.
- Install appropriate facilities at the campsites. Preferably utilize municipal systems (conservancy tanks with periodic removal) or chemical toilets.
- Included as requirement in the EMPr under heading “*Waste Management*” is the following: The disposal of chemical toilets should be at a registered or licensed sewage disposal facility. Proof of agreement between the

applicant and the sewage disposal facility for such disposal, confirming that there will be enough capacity to accommodate additional waste, should be submitted to the Department of Water Affairs.

Site camp inert waste (waste concrete, reinforcing rods, waste bags, wire, timber etc)

- Ensure compliance with stringent clean up requirements on site. As a general requirement, disposal should be at least twice a week.
- The solid waste will be transported off site by the contractor and returned to Eskom Stores where the scrap will be handed over to buyers (scrap dealers). Mostly the waste is steel that is recycled and taken to the Eskom stores. Other waste is normally the used cement bags and this is disposed of in the construction hole for the pylon. The bags will be mixed into the cement and used to fill the excavated hole of the pylon. Any other waste that cannot be recycled (this is minimal) will be transported to an appropriate landfill site licensed in terms of section 20 (b) of the National Environment Management Waste Act, 2008 (Act No 59 of 2008). The disposal of any construction waste will be the responsibility of the developer and should be done at least twice a week. A letter of agreement between the developer and the Permit Holder of the waste disposal site shall be provided to the DWA.
- These measures are also included as requirements in the EMPr under the headings “*Appointment of Contractors*” and “*Waste Management*”. Also refer to the other mitigation measures under the same headings.

Rivers and drainage lines

- It is strongly recommended that no construction of any sort takes place within aquatic and riparian habitats encountered, as these habitats are viewed as sensitive.
- During and after construction, storm water control measures should be implemented especially around stockpiled soil, excavated areas, trenches etc. so that export of soil into the watercourse is avoided.
- Of relevance is, that there are rivers and streams present along the powerline corridors. Measures to limit impact to any watercourse are supplied and are inter alia
 - The power line will cross drainage lines and it is recommended that the pylons are placed at least 50m from the outer edge of any riparian zone.
 - This must be confirmed once the final route is pegged and a walk down evaluation can be done.
 - All stream crossings are considered as sensitive areas and no traffic are allowed through it (only at properly constructed bridges) during construction or maintenance of the power line.
 - The site for the substation should be at least 50m away from any drainage lines.
 - Further north to the substation, the corridor crosses a stream which is part of the headwaters of the Elands River. It is suggested that the new power line follows the existing corridor of the power line and old road, slightly further west of the D567. This will give access to the existing corridor for vehicles during construction and lower the need to clear vegetation. The riparian zone where the proposed power line will cross is impacted by the existing servitude (power line and old road) and will lower the need to trim or cut trees.
 - Further to the north, the proposed power line crosses the Elands River. This is again considered as a sensitive area and no vehicles can cross through the river during construction or maintenance (only bridges must be used). Pylons to the south of the river must be placed at least 50 m from the macro channel of the river (outside the floodplain area). The placement must be confirmed during the walk down phase with the specialist to ensure the sensitive area is not compromised.
- There will therefore be *no impact on any watercourse or waterflow with regards to impeding flow or altering flow as discussed in Section 21 c & i of the Water Act and relevant General Authorisations.*
- It is suggested that the applicant is complying with all aspects of the Water Act and General Authorisations, including all of the above points mentioned and there would therefore be no need to obtain a water use license or even register as a water user in terms of the General Authorisations.
- It should however be noted, that If there are any activities which relates to section 21 water uses of the National Water Act 1998 (Act No. 36 of 1998), the applicant will need to get authorisation from the Department before such activities commences.

Impact of erosion

- Unnecessary clearing of vegetation can result in exposed soil prone to erosive conditions.
- Insufficient soil coverage after placing of topsoil, where large surface areas are applicable, could also cause erosion.
- To cause the loss of soil by erosion is an offence under the Soil Conservation Act, Act No 76 of 1969.)

- The management of surface water runoff during construction is important to prevent soil erosion on the site. If construction takes place during the rainy season, sufficient storm water management will be required to manage water runoff.
- In summary, excavation of foundations for pylons, movement of vehicles and people and the run-off from cleared areas can cause erosion.

Mitigation of Impact of erosion

- Erosion in the area is low due to the flat plains.
- Neither drainage nor erosion are seen to be a significant threat should the mitigation as proposed be implemented.
- Construction activities should be well managed to prevent erosion and the following is relevant:
- It is strongly recommended that no construction of any sort take place within aquatic habitats encountered, as these habitats are viewed as sensitive.
- Construction must be limited to drier periods.
- Access roads must be kept to a minimum. These same roads need to be used later for access during site inspections, line maintenance, etc. In other words, proper planning must be done so that on completion of the project there will be no need for the subsequent construction of other access roads.
- Unnecessary clearing of flora resulting in exposed soil prone to erosive conditions should be avoided.
- No trees or existing grass strata outside of the powerline corridor should be removed to lower any kinetic energy of potential run-off.
- Indigenous vegetation, which does not interfere with the safe operation of the substation/ powerline, should be left undisturbed.
- The eradication of any alien vegetation should be followed up as soon as possible by replacement with indigenous vegetation to ensure quick and sufficient coverage of exposed soil.
- Pro-active measures must be implemented to curb erosion and to rehabilitate eroded areas. All areas susceptible to erosion must be installed with temporary and permanent diversion channels and berms to prevent concentration of surface water and scouring of slopes and banks, thereby countering soil erosion.
- Specifications for topsoil storage and replacement to ensure sufficient soil coverage as soon as possible after construction activities as identified in the Environmental Management Programme must be implemented.
- All cleared areas must be ripped and rehabilitated after construction. The top 200mm layer of topsoil must be removed and stockpiled in heaps not higher than 2m and replaced on the construction areas once the activities have been completed. The affected areas should be replanted with a grass mixture indigenous to the area.

Solid Waste

- It is expected that a small amount of construction waste will be generated during construction.
- Expected waste could be unused steel, conductor cables, cement or concrete and general waste around the construction site (plastic, tins and paper), which may degrade the environment if not disposed in the correct manner.
- Solid waste might remain on site after the completion of construction. This can cause pollution to the environment and be detrimental to animals.

Mitigation of Solid waste

- The construction teams should ensure that all waste is removed from the site and that they recycle the items that can be used again. Unusable waste steel and aluminium will be sold to scrap dealers for recycling at the Eskom stores.
- The solid waste will be transported off site by the contractor and returned to Eskom Stores where the scrap will be handed over to buyers (scrap dealers). Mostly the waste is steel that is recycled and taken to the Eskom stores. Other waste is normally the used cement bags and this is disposed of in the construction hole for the pylon. The bags will be mixed into the cement and used to fill the excavated hole of the pylon.
- Any other waste that cannot be recycled (this is minimal) will be transported to an appropriate landfill site licensed in terms of section 20 (b) of the National Environment Management Waste Act, 2008 (Act No 59 of 2008).
- The disposal of any construction waste will be the responsibility of the developer and should be done at least twice a week. A letter of agreement between the developer and the Permit Holder of the waste disposal site shall be provided to the DWA.

- These measures are also included as requirements in the EMPr under the headings “*Appointment of Contractors*” and “*Waste Management*”. Also refer to the other mitigation measures under the same headings.
- Stockpiling of construction material should be such that pollution of water resources is prevented and that the materials will be retained in a storm event.
- Once construction is completed, the contractor has to obtain written consent from the relevant landowner that the construction site, construction areas, access routes, etc. are sufficiently and adequately rehabilitated to the landowner’s satisfaction.

Impact of labourers

An uncontrolled influx of labourers with associated squatter and increased crime problems create pressure on the natural environment (placement of snares, removal of trees for firewood, careless waste disposal, etc.). This could be severe resulting in permanent damage to the environment if not mitigated properly.

Mitigation of impact of labourers

- Mitigation measures to counter impact on the natural environment and limit potential for crime include specifications in terms of control of construction workers (i.e. provision of toilet and cooking facilities, provision of either accommodation facilities or transport facilities, implementation of Environmental Educational Programmes, etc.). Accommodation for labourers must either be limited to guarding personnel on the construction site (with labourers transported to and from existing neighbouring towns) or a separate fenced and controlled area where proper accommodation and relevant facilities are provided.
- Prepare a comprehensive Environmental Management Programme (EMPr) for the control of environmental impacts at the site camps.
- The EMPr is to include specific provision for the management of the following:
 - Site location
 - Solid waste
 - Liquid effluent (sewage)
 - Storm water
 - Litter
 - Nuisance (Noise)
 - Hazardous substances
 - Social pathologies (prostitution, drunkenness, theft)
 - HIV/Aids prevention.
- Develop an HIV/Aids workplace policy.
- Ensure that the contractors develop a comprehensive site camp management plan. This should apply even in the case of the limited accommodation camps recommended above.
- Plan campsites an appropriate distance from any facility where it can cause a nuisance.

Impact on Safety and Security

A range of safety and security issues could result from the construction of the project. These could be i.e. a threat to the safety of children or individuals in the area; mortality to stock and other farm animals close to the site; an increase in crime, including stock theft and poaching.

In terms of safety, it should be noted that the project involves the excavation of land for the structures of the powerline. The excavated area for the pylons could be approximately 3 meters deep by 1,5 meters wide. In addition, the footprint for the proposed substation will be excavated. Excavations and open trenches can act as a trap for children (and also snakes, small mammals and lizards). Blasting could also create a safety risk in terms of flying objects and damage to properties.

The negative impact of noise and dust, generally associated with construction activities, are temporary, occurring mostly during the construction phase.

Mitigation of Impact on Safety and Security

Safety mitigation measures

- During construction, the Contractor should, put up a temporary fence around the campsite and work areas.

- All construction activities should take place within fenced or otherwise demarcated areas.
- All excavated areas for pylons must be fenced and barrier tape must be placed around them to prevent humans and animals from falling into them.
- The contractors must appoint their own guards to safeguard their materials.
- Construction workers should wear clearly identifiable clothing that allows landowners to easily identify contract workers on site.
- Once construction is completed, the contractor has to obtain written consent from the relevant landowner that the construction site, construction areas, access routes, etc. are sufficiently and adequately rehabilitated to the landowners' satisfaction.
- Should blasting be deemed necessary, it may only be undertaken by specialists in the field and should be limited to localised areas. All relevant legislation must be adhered to.
- All adjacent landowners have to be informed of the blasting programme prior to any blasting taking place. Contractors must liaise personally with adjacent landowners. All communication in this regard must be documented.
- A Fire Management Plan has to be identified during the pre-construction phase and must be implemented throughout the construction and operational phases of the project.

Noise mitigation measures:

- Construction hours will be restricted to specific periods which exclude Sundays and public holidays.
- All construction workers will be allowed only for specified day light hours and will be transported from the site by the contractors.

Dust mitigation measures:

According to the applicant and their contractors, dust suppression is not required due to the following reasons:

- The servitude areas receive minimal bush clearance. Indigenous vegetation which does not interfere with the safe operation of the power line is left undisturbed. Further to the above, vegetation is not ploughed, but mowed and therefore no areas are left without vegetation cover.
- In terms of access roads, existing roads are used and the impact to these roads is insignificant. The reason is that construction material is minimal (a pylon - planted approximately 330m apart, cement - to plant the pylon, and cable - for the overhead wires). Therefore a small number of construction vehicles deliver the material to the site. Speed of above 30km/hour will not be exceeded. A limited/ insignificant amount of dust is therefore emitted in the atmosphere.

Impact on natural habitat

The construction of the powerlines will have impact on the natural environment. This impact is associated with disturbance to and/or destruction of the flora component.

- During construction the project could cause a significant impact where insensitive clearing for construction and access purposes, etc. is required. Insensitive clearing can cause the destruction of habitat. Not only does vegetation removal represent a loss of seed and organic matter, but it is also a loss of protection to plants and small animals. Insensitive vegetation clearance can also cause erosion.
- Pressure on the natural environment will occur as a result of an influx of labourers into the area that could involve the collection of firewood and medicinal plants, as well as uncontrolled veld fires.
- Various species of indigenous trees and bush are protected by law in terms of the National Forests Act No 84 of 1998, which stipulates that it is necessary to obtain a permit from the relevant provincial office of the Department of Agriculture, Forestry and Fisheries in order to cut, trim or remove them.

Mitigation of impact on natural habitat

- Site-specific measures for the specific property as identified by the ecologist, must be implemented by the Contractor during the construction phase and by Eskom and the maintenance teams during the operational phase. Refer to mitigation measures provided in the Planning phase.
- Relevant to this project is that no proposed impacts on the ecology of the environment were identified as possibly being beneficial. The nature of the impacts are such that small, continuous footprints are left on the ground by the pylons of the powerlines. If the clearing of natural vegetation is limited, along with the proper implementation of all mitigating measures, then the nature of the impacts will be low.

- Ensure that no trees, or existing grass strata outside of the servitude corridor be removed to lower any kinetic energy of potential run-off, that disturbed surface areas in the construction phase be restored and lastly that no open trenches or mounds of soils created during construction be left.
- The procedures for vegetation clearance and maintenance within servitudes and on Eskom owned land as prescribed by Eskom must be implemented. Selective bush clearing must take place, i.e. indigenous vegetation, which does not interfere with the safe operation of the structure, should be left undisturbed.
- Where clearing of access for construction is essential, the maximum width to be cleared is 8m, 4m on either side of the alignment for the powerline. Clearing for tower positions must be the minimum required for the specific tower.
- No fires may be made for the burning of vegetation and waste.
- Fire fighting equipment must be readily available on site during welding and cutting operations.
- Branches and other debris resulting from pruning processes should not be left below conductors or in areas where it will pose a risk to infrastructure.
- Fires shall not be made for the purpose of chasing or disturbing indigenous fauna.
- No firearms should be allowed at the construction sites.
- No animals or birds may be fed, disturbed, hunted or trapped.
- Construction workers should be barred from collecting firewood or any medicinal and protected plant species.
- All exotic plants must be removed during construction and cleared areas must be rehabilitated. Areas where exotic plants are cleared should be rehabilitated and re-planted with approved indigenous species.
- Care must be taken to ensure alien vegetation is not spread as a result of vegetation management processes through the transport of seeds or other vegetative material from one site to another.
- Alien vegetation in servitudes shall be managed in terms of Regulation GNR.1048 of 25 May 1984 (as amended) issued in terms of the Conservation of Agricultural Resources Act, Act 43 of 1983. In Terms of these regulations, Eskom shall “control” i.e. combat category 1, 2 and 3 plants to the extent necessary to prevent or to contain the occurrence, establishment, growth, multiplication, propagation, regeneration and spreading of such plants within servitude areas or land owned by Eskom. Due to the nature of alien vegetation, a control programme for alien vegetation control must be implemented. The implementation thereof can be more frequent than the three year interval recommended for indigenous vegetation. Alien vegetation can grow at rates significantly faster than 1 meter per year.
- Damage can result in habitat modification or erosion as a result of the proposed powerline construction activities. This can be avoided in general, by not allowing any construction of any sort to take place within aquatic habitats encountered, as these habitats are viewed as sensitive.

Impact on Birds

The possible impacts of the proposed construction of powerlines on birds are the following:

Loss of breeding, foraging and roosting habitat through habitat transformation

During the construction phase and maintenance of powerlines and substations, some habitat destruction and alteration inevitably takes place. This happens with the construction of access roads, and the clearing of servitudes. These activities have an impact on birds breeding, foraging and roosting in or in close proximity of the site, through the modification of habitat.

Mitigation of Impact on Birds

Relevant to this study:

Habitat destruction

The risk of habitat destruction is regarded as low. The site of the proposed Fluorspar Substation is situated in woodland. This habitat type is ubiquitous in the study area and transformation of 2 hectares (200 x 200m) to accommodate the new substation should not impact significantly on birds currently using this area. Due to the mobility of the larger species, they could conceivably move out of the immediate area and forage elsewhere in similar habitat. The species that are most likely to be affected by the loss of habitat are the smaller, common species that are currently resident in that hectare of vegetation. It is not envisaged that any Red Data species will be displaced by the habitat transformation that will take place as a result of the construction of the Fluorspar substation.

Recommendation: Strict adherence to Eskom's standard EMPr requirements for construction and maintenance of distribution power lines. In addition, the recommendations provided in the Ecological Specialist Study which forms part of this EIA should be implemented. If at all possible, the removal of large trees should be avoided.

Disturbance

The potential for the disturbance of Red Data breeding birds caused by the construction of new power lines is possible, especially in areas with large trees, as those areas are often favoured by raptors, e.g. along the Elands River and the Enkeldoringspruit. The risk of disturbance is therefore regarded as medium.

Recommendation: The alignment should be inspected prior to the construction commencing, in order to establish if there are any Red Data raptors breeding in close proximity to the proposed line.

Impact on cultural heritage resources

Construction can destroy heritage resources ('national estate') should it occur in or near the proposed project area.

Mitigation of impact on cultural heritage resources

The Phase I HIA study for the proposed Eskom Project revealed the presence of the following types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) in and near the Eskom Project Area, namely:

- Two graveyards dating from the historical period and from the recent past. Graveyard (GY01) in the Project Area may be affected by the Eskom Project
- Three Historical Houses which are older than sixty years.

Summary

- Only (GY01) may be affected by the Eskom Project. GY02 is outside the project area.
- None of the three Historical Houses will be affected by the project.

Coordinates for graveyards in and near the Eskom Project Area

Graveyards	Coordinates	Location	Significance
<u>Inside the Project Area</u>			
Graveyard 01 (GY01)	25° 12.476'; 28° 33.590'	Rust De Winter 180JR	HIGH
<u>Outside the Project Area</u>			
Graveyard 02 (GY02)	25° 12.604'; 28° 34.182'	Rust De Winter 180JR	HIGH

Coordinates for Historical Houses near the Eskom Project Area

Historical Houses	Coordinates	Location	Significance
HH01	25° 12.413'; 28° 33.439'	Rust De Winter 180JR	Low-Med
HH02	25° 12.429'; 28° 33.442'	Rust De Winter 180JR	Low-Med
HH03	25° 12.917'; 28° 34.010'	Rust De Winter 180JR	Low-Med

Recommendations:

Mitigating the graveyard

Graveyards can be mitigated in two ways depending whether they are to be affected, directly or indirectly, namely:

- It is recommended that GY01 be conserved *in situ* beneath the power line. Pylons should be erected on opposite ends of GY01. The power lines therefore can be strung across and above GY01. Conserving graves and graveyards in power line corridors create the risk that they may be damaged, accidentally, and that Eskom may be held responsible for such damages. Controlled access must exist for any relatives or friends who wish to visit graves or graveyards in power line corridors.
- GY01 can be exhumed and relocated. The exhumation of human remains and the relocation of graveyards are regulated by various laws, regulations and administrative procedures. This is not recommended.
- If any heritage resources of significance is exposed during construction the South African Heritage Resources Authority (SAHRA) should be notified immediately, all development activities must be stopped and an archaeologist accredited with the Association for Southern African Professional Archaeologist (ASAPA) should be

notify in order to determine appropriate mitigation measures for the discovered finds. This may include obtaining the necessary authorisation (permits) from SAHRA to conduct the mitigation measures.

Visual impact

The visual impact resulting from the construction of a powerline can be substantial in a more rural environment. Should sensitive vegetation clearing as proposed in the mitigating measures, be exercised then the visual impact of the powerline should not be significant.

Mitigation of visual impact

The following is relevant to this project:

- Impact to the natural habitat as a result of the project is to be expected. Construction could cause a significant impact to the habitat where insensitive clearing for construction and access purposes, etc. is required.
- It is suggested that any existing servitude roads as well as existing roads must be used during construction and maintenance of the powerlines.
- The procedures for vegetation clearance and maintenance within overhead powerline servitudes and on Eskom owned land, updated September 2009 must be implemented. These procedures includes i.e. the following:
 - Where clearing for an access road is essential, the maximum width to be cleared is 8m.
 - Clearing for pylon positions must be the minimum required for the specific tower, not more than a 5m radius around the structure position.
 - Indigenous vegetation, which does not interfere with the safe operation of the powerline, should be left undisturbed.

Loss of agricultural land

The construction of powerlines with the resulting clearance of servitudes can lead to a loss in agricultural land.

Mitigation of impact on Agriculture

The proposed construction of the powerlines will not impact significantly on any agricultural activity. The following is relevant to this project:

- The land capability of the study area is considered to be restricted to grazing for the flatter areas and wilderness for the rocky and sloping areas.
- The impact to agricultural activities will only be for a limited time during construction. It is not envisaged that any construction roads will be needed. It is recommended to use any existing roads or powerline servitudes during construction. Should it be deemed necessary, an access road of 8m wide could be cleared to construct the powerline. After construction, the access road will be revegetated and normal agricultural activities can continue under the powerline as usual.
- No change in land use from agriculture to other land uses will take place. Eskom will not own the servitude but will purchase the rights to construct and maintain the interconnector lines.
- In addition, in terms of the Subdivision of Agricultural Land Act, 1970 (Act 70 of 1970), Section 2(a) Eskom is a statutory body and therefore it is not subjected to the provisions of the Act.

6.3 Impacts that may result from the operational phase

The potential impacts that are likely to occur as a result of the operational phase are described below. In addition the mitigating measures that may eliminate or reduce the potential impacts are provided:

Impact on Birds

Two common problems in Southern Africa are the electrocution of birds (and other animals) and birds colliding with powerlines.

Electrocutions: Electrocution refers to the scenario where a bird is perched or attempts to perch on the electrical structure and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components.

Collisions: Collisions are when birds collide with the conductors or earth wires of overhead powerlines.

Mitigation of impact on birds

Relevant to this study:

Electrocution

Electrocution will not be a major risk in this instance for the following reasons:

- It seems that the vultures have largely disappeared from the area. It is however possible that Cape Vultures may still forage in the area from time to time. There are large numbers of livestock and game in the surrounding area, and should a carcass be available to the birds, they might attempt to roost on the poles.
- The risk of phase-earth electrocution is therefore evaluated to be medium.
- It should be mentioned that the pole design holds no inherent electrocution risk for other large solitary species such as eagles, as they almost never perch together in large numbers next to each other.

Recommendation: The poles should be fitted with bird perches on top of the poles to draw birds, particularly vultures, away from the potentially risky insulators, to reduce the chances of electrocution.

Collisions

The most direct impact that the proposed line could potentially have on Red Data birds is collisions with the overhead earth wire. There is a low-medium collision threat that will be posed to Red Data species by the proposed power line. Red Data species that could be impacted on through collision with the earth wire, and the likely locality of this impact, are as follows:

- Black Stork: Where the proposed alignments cross larger drainage lines, and at all larger dams.
- Secretarybird and Lanner Falcon: Old lands.
- Cape Vulture: When congregating at any carcass which happens to be located within a few hundred metres of the line.

Recommendation: The spans that run parallel to and cross major drainage lines and old lands should be marked with Bird Flight Diverters on the earth wire of the line, five metres apart, alternating black and white.

Visual impact

Impact on the esthetics of an area is related primarily to the visual impact of the proposed powerline and substation and secondary to the impact of habitat destruction. Factors to consider regarding the visual impact are the following:

- The ability of the surrounding environment to absorb the visual impact of the powerline.
- The structures to be used for the powerline.

Mitigation of Visual Impact

It is not expected that significant additional visual impact will occur as a result of the powerline due to the following:

- The visual experience of the area can be described as medium due to existing disturbance of natural habitat such as through cultivation, and urbanisation of the area.
- The substation and powerline is proposed adjacent to roads with existing impact. This will limit further impact to habitat.
- In addition, visual impact could generally be mitigated to some extent by constructing the powerlines with monopole steel structures. From previous experience the steel poles are known to weather and with time blend into the environment.

Impact of alien vegetation

One of the impacts of concern is the introduction of alien plants to the project area.

Mitigation of alien vegetation

- The excessive and incorrect use of herbicides has caused a worldwide problem of the build-up of toxins in ecosystems. It is strongly felt that due to the grassland nature of the study areas there is no need for the use of herbicides.
- The introduction of alien vegetation is always a potential problem. The area has a low infestation of alien plants, but a number of species have the potential to become serious problems. The quickest way most weeds get a foothold in an area is by colonising disturbed soils quicker and more efficiently than many of the indigenous species. To reduce the level of these potential impacts is to ensure that all relevant mitigating and management measures are implemented.
- An ongoing programme should be implemented to mechanically control alien plant species that invade the disturbed soils around the newly erected pylons, including areas that were disturbed and rehabilitated during the construction phase. This should be done in such a way as to allow the natural grasses to colonise the disturbed area, thereby keeping alien plants at bay. Most alien plants in the area are typically annual or bi-annual herbaceous plants and can be effectively controlled by slashing. In other words, not by hoeing which further disturbs the soils. This control is most effective if done early in the summer while the plants are still young and before they go to seed, thereby preventing further spread and infestation for the following growing season.
- Mechanical control of alien species to be implemented within two months of completion of construction of the powerline. Thereafter every six months or preferably late in the spring and then again late in the summer. Keeping in mind the project falls in a summer rainfall area and it is during this time plants are growing most actively. Once winter arrives or after veld fires it will be difficult to distinguish between alien and indigenous plant species.
- Surface area under powerlines to be mowed and not ploughed. Ploughing will disturb soils, creating opportunity for invasive weeds to colonise the area. Furthermore, due to the flat, grassland nature of the area it will be easy enough to mow.
- No chemical control to be used in the control of alien plants or indigenous plants.

Impact on Safety and Security

Fire Hazard:

Poor maintenance, bird collision, electrical faults as well as pylons struck by lightning could result in veld fires that could result in destruction of habitat and property and even severe injury and/or death. It is important to note Eskom's responsibilities in terms of the National Veld and Forest Fire Act, Act No 101 of 1998. Reference is made to Section 3(1) of the National Veld and Forest Fire Act that clearly indicates that Owners may form an association for the purpose of predicting, preventing, managing and extinguishing veld fires. This implicates that it is voluntary to join a Fire Protection Agency and not mandatory according to the Act. As it is not mandatory to join a Fire Protection Agency, Eskom's maintenance staff working in the different areas is encouraged to join the Fire Protection Agencies if their workload and staff availability allows this. Section 12 (1) of the National Veld and Forest Act reads as follows: "Every owner on whose land a veldfire may start or from whose land it may spread must prepare and maintain a firebreak on his or her side of the boundary between his or her land and adjoining land." Servitudes are registered for all Eskom sub-transmission (33 to 132kV) powerlines and a way leave agreement is obtained for the reticulation powerlines (11 and 22 kV). According to a legal opinion obtained from the Corporate Legal Department, Eskom is not the landowner of powerline servitudes or rights of way, but only where Eskom purchased the land for a substation and is in possession of a title deed.

Risk of Electrocution:

There could be concern about the safety of people and animals in the environment of substations and powerlines. To prevent the risk of electrocution no structures are allowed in the servitude areas of the powerlines.

Mitigation of Impact on Safety and Security

Fire Hazard:

- The existing complaints structure must be revised by Eskom and be updated on a regular basis and communicated with all affected landowners to ensure effective response and service supply (especially in terms of reporting of obvious electrical faults).
- The applicable Emergency telephone numbers should always be available on site. Ms Nkateko Msimango of Environmental Management, Eskom Distribution Northern Region is the relevant contact person (072 018 5167/ 015 299 0012).
- Annual fire management programmes will need to be implemented to manage the risk appropriately.

- Branches and other debris resulting from pruning processes should not be left below conductors or in areas where it will pose a risk to infrastructure.
- Debris shall not be burnt under any circumstances.
- Fires shall not be made for the purpose of chasing or disturbing indigenous fauna.
- Eskom encourages affected landowners and maintenance staff to participate in the Fire Protection Agency.

Risk of Electrocutation:

- To prevent the risk of electrocution no structures are allowed in the servitude area of the powerlines.

Safety of landowners/ land rights users:

Security measures to safeguard the property and the landowner/ landuser are the following:

- Eskom needs to make an appointment with the affected landowner to maintain the line on his property.
- Only in case of an emergency, Eskom will have the right to enter the property at any hour.
- Communication between landowners and Eskom is of importance in case of emergency breakdowns.
- Security measures such as the usage of existing gates with Eskom locks are proposed.
- Eskom should compensate the landowner for any damage to the landowners' property.
- Security measures are provided in the Environmental Management Programme (EMPr) of the EIA Report.

Impact to conservation

The current location of the proposed 132kV line and Nokeng Fluorspar Substation may ultimately be located inside the future expansion area of the Dinokeng Game Reserve.

Mitigation of impact to conservation

Specialist ecological input was obtained to investigate the flora, fauna and the general biophysical environment in an attempt to identify the potential impacts of the project. In addition a Phase 1 Heritage Impact Assessment was undertaken by a specialist to identify the potential impact on heritage resources. Input from an avifauna specialist was also obtained to determine the impact of the proposed project on birds. None of the specialist studies identified environmental impact that is expected to result in significant costs to the environment as a result of the project, should the proposed mitigation measures be implemented. The identified site for the Nokeng Fluorspar substation was found to be suitable for the construction of a substation.

Impact to eco-tourism

It is understood that the visibility of the powerline could well impact negatively on the proposed future expansion area of the Dinokeng Game Reserve since visitors would not be able to escape the sights of human intervention. This could culminate in a loss of income and loss of jobs for local labour, which will impact on the whole community.

Mitigation of impact to eco-tourism

On the other hand it is argued that the impact to eco-tourism will be insignificant as the proposed route for the powerline is adjacent to provincial roads with significant existing impact.

In addition the visual impact of the new powerline could generally be mitigated to some extent by constructing the power lines with a single steel pole/structure.

It is recommended that any existing servitude roads as well as existing roads must be used during construction and maintenance of the powerline. In addition strict procedures for vegetation clearance within the powerline servitude will be followed to limit impact to the natural habitat and the resulting visual impact.

6.4 Impacts that may result from the decommissioning and closure phase

It is not envisaged that the powerline or substation will be decommissioned. This project is part of the future infrastructure to supply the proposed Nokeng Fluorspar Mine with power.

Should there be a need to decommission the powerline and substation then the following mitigation measures that may eliminate or reduce the potential impact are applicable:

- The powerline and substation will have to be physically removed which would entail the reversal of the construction process.
- The construction teams will ensure that all waste is removed from the sites and that they recycle the items that can be used again. Unusable waste steel and aluminium will be sold to scrap dealers for recycling at the Eskom stores.
- The disposal of materials will have to be at an approved waste disposal facility.
- The routes of the powerlines and the site of the substation will have to be rehabilitated.
- Once the decommissioning is completed, the contractor has to obtain written consent from the relevant landowner that the construction site, construction areas, access routes, etc. are sufficiently and adequately rehabilitated to the landowner's satisfaction.

6.5 Positive impacts of the proposed substation and line project

- Long-term, regional benefits of reliable power supply and the resultant socio-economic benefits.
 - Included in this is the fact that any infrastructure development as a secondary impact will ultimately positively influence the development of the SMME- sector through electricity provision.
 - On the opposite pole the lack thereof will most certainly be to the detriment of SMMEs, especially in rural developing areas, where the lack of, as well as inconsistent, infrastructure could seriously lead to the detriment of economic development directly impacting on social well-being.
- Potential reduction in crime as a result of short-term job creation during construction (providing farm safety and security measures are implemented)
- Possible local growth in the economy of the surroundings towns and others in the sub-region, and for local businesses depending on where the construction camp is.
- Economic benefits for contractors and other suppliers of goods and services.
- The project as proposed will ensure significant capital investment that will contribute to the economical growth of the area.
- Private business opportunities could be stimulated.
- It is suggested that to maintain the status quo is not the best option for the macro environment. South Africa's fluorspar reserves (natural calcium fluoride) exceed 30 million tons. It has the third largest reserves in the world and accounts for around 30 per cent of the western world's reserves and about 10 per cent of all known reserves. Fluorspar is used mainly in the aluminium, steel and chemicals industries. Over the past decade, most of the growth in production of fluorspar has come from existing producers and this pattern is likely to continue through to 2014. While mine output is likely to increase, this will not mean additional supply for the rest of the world as the Chinese fluorochemical industry is forecast to grow at 12% per year, once the economy has recovered from the current global downturn.
- The benefit of the development of this Fluorspar Mine includes aiding the market demand as the decline in the availability of fluorspar, and the rapid increase in demand from 2002 to 2007, has encouraged companies to identify new sources of fluorspar. The overall requirement for fluorspar is expected to rise thus providing an additional motivation in developing a South African mine in this limited international market. Without the implementation of this project, the mentioned benefits would not be realised. This has potentially significant negative impacts on national economic growth and social well-being.
- Nokeng Fluorspar Mine intends developing this fluorspar mine and has applied to Eskom for the supply of power for the mine. Should this application not be approved then Nokeng Fluorspar Mine will not be able to develop the mine. The No-Go development alternative could therefore not be considered the responsible way to manage the site.

7. ENVIRONMENTAL MANAGEMENT PROGRAMME

An **Environmental Management Programme (EMPr)** was compiled to ensure that

- mitigation measures are identified and implemented to avoid or minimise the expected negative environmental impact and enhance the potential positive impact associated with the project;

- the developer, construction workers and the operational and maintenance staff are well acquainted with their responsibilities in terms of the environment;
- communication channels to report on environment related issues are in place.

8. RECOMMENDATIONS

Two Location alternatives were investigated for the proposed project:

- From a purely **ecological viewpoint**, **both locality alternatives** are viable for the construction of the project. Minimal clearing of natural vegetation is needed.
- In the **Bird Impact Assessment** report, both alternatives emerged with negative scores, indicating that the environment is not particularly sensitive. **Both alternatives would therefore be acceptable** from a bird impact perspective. Of the two alternatives, **alternative 2 emerged as the least sensitive alternative** from a bird impact perspective, and would therefore be the preferred alternative.
- From a **heritage point of view**, **both of the alternative routes are suitable**, for the construction of the project.
- In **summary**, however, due to close similarities of alternatives 1 and 2 it is imperative that the accumulative weight of other parameters such as feedback from public participation, land tenure issues, construction costs, technical constraints, etc. also be taken into account when deciding on the final alternative between Alternative 1 and Alternative 2. During consultation with landowners it emerged that Alternative 2 will impact on agricultural activities of certain landowners.
- **Subsequently, Alternative 1 is preferred and submitted as the final proposed route.** This Alternative (1) is preferred mainly due to the fact that it impacts less on landowners and their agricultural activities.

9. CONCLUSION OF PUBLIC PARTICIPATION PROGRAMME FOR THE DRAFT BASIC ASSESSMENT REPORT

The Environmental Impact Assessment included an extensive Public Participation Process. The project was advertised with onsite notices, newspaper notices and notification letters to facilitate informed decision. In addition an information meeting was conducted on 14 November 2011 to furnish the landowners and other interested parties with information regarding the extent of the project. The consultants endeavoured to facilitate a transparent and accommodating Public Participation Process.

A draft Basic Assessment Report – this document- was compiled with the main aim to identify issues, potential impacts and potential alternatives associated with this project. It includes proceedings of the PPP and communication with registered Interested & Affected Parties (IAPs). The Draft BAR was submitted to IAPs on 6 January 2012 with the due date for comment by 17 February 2012. Subsequently, a final Basic Assessment Report (BAR) will be compiled and submitted to DEA by April 2012. This report will include all concerns raised to the draft BAR and responses thereto. The Consultants (EAPs) will ensure that all concerns raised are addressed in appropriate detail in the final Basic Assessment Report.
