

**ENVIRONMENTAL IMPACT ASSESSMENT  
FOR ESKOM'S NORTHERN KWAZULU-NATAL  
STRENGTHENING PROJECT**

**IPHIVA-DUMA 400 KV POWERLINE**

**SUMMARY DRAFT ENVIRONMENTAL IMPACT ASSESMENT REPORT –  
APRIL 2018**



# ESKOM'S NORTHERN KWAZULU-NATAL STRENGTHENING PROJECT: IPHIVA-DUMA 400 kV POWERLINE

## ENVIRONMENTAL IMPACT ASSESSMENT

### SUMMARY OF THE DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

#### **Background**

*ESKOM Holdings SOC Ltd (Eskom) has commissioned a project to strengthen the supply of electricity in northern KwaZulu-Natal (KZN). NAKO ILISO has been appointed to undertake an Environmental Impact Assessment (EIA) to support applications for Environmental Authorisation.*

*The project has been divided into the following four components, each of which has an application:*

- *Iphiva Substation;*
- *Normandie-Iphiva 400 kV Transmission Powerline;*
- *Iphiva-Duma 400 kV Transmission Powerline; and*
- *132 kV Distribution Powerlines.*

*This report documents the process and findings of the assessment of the Iphiva-Duma 400 kV Powerline. The Iphiva-Duma 400 kV Powerline will run from outside the town of Mkhuze in KwaZulu-Natal to the Duma Substation, south of the Hluhluwe Imfolozi National Park. Iphiva-Duma East traverses the Umkhanyakude and the King Cetshwayo (formerly Uthungulu) District Municipalities, while the Iphiva-Duma West 1 and West 2 traverse the Zululand and King Cetshwayo District Municipalities. Iphiva-Duma East runs parallel with the N2 road until close to the town of Hluhluwe where it changes direction to the Duma Substation.*

*This report will be subject to a public comment period after which it will be finalised and submitted to the competent authority for review.*

#### **Need for the project**

*The northern KZN network is currently fed at 132 kV by the Normandie and Impala Main Transmission Substations. The major load centres are Pongola and the Makhatini Flats. The*

*Normandie Substation is situated approximately 80 km north-west of Pongola and the Impala Substation is situated approximately 180 km south of Makhatini Flats. High voltage drops are experienced in the 132 kV network and the voltages are approaching unacceptable low voltage levels as the demand increases. Contingencies on the main 132 kV supplies also lead to thermal overloading of the remaining network.*

### **Project Description**

*In order to strengthen and alleviate current and future network constraints in northern KZN, it is proposed that the Iphiva 400/132 kV Substation be introduced in the area, which will de-load the main sub-transmission network and improve the voltage regulation in the area. The Iphiva Substation will be integrated with the existing electricity network by 400 kV Transmission powerlines to the Normandie and Duma Substations, and approximately 165 km of 132 kV Distribution powerlines.*

*Final tower types to be used will be determined by Eskom after final survey and profiling of the authorised corridor. Typical possible tower types include Cross Rope Towers, Self-Supporting Towers, and Guyed Vee Towers. Each powerline consists of three phases (three conductors). Towers usually support one powerline.*

*Most farming activities, except for sugar cane and commercial forestry, can be practiced under the conductors, provided that there is adherence to safe working clearances, crop height restrictions and building restrictions.*

*A 55 m servitude (27.5 m on either side of the centre line) is required to accommodate the towers on which the overhead line will be strung. The servitude is required to ensure safe construction, maintenance and operation of the powerline and Eskom will be entitled to unrestricted access. Where 400 kV powerlines are constructed in parallel, a minimum separation distance of 55 m between centre points is required. Minimum vertical clearance distance between the ground and powerline conductors is 8.1 m.*

*The minimum vertical clearance to any fixed structure that does not form part of the powerline is 5.6 m. The minimum distance from a powerline running parallel to a proclaimed public road is 90 m from the centreline of the road servitude. The maximum crop height within the servitude is 4.3 m. The maximum operation height under the conductors is 2 m.*

*The construction process consists of:*

- *Contractor site establishment;*

- *Survey and pegging of tower positions;*
- *Access road negotiation and construction;*
- *Gate installation and vegetation clearing;*
- *Foundation excavation and installation;*
- *Tower assembly and erection;*
- *Conductor stringing and tensioning, and*
- *Servitude clean-up and rehabilitation.*

### **Listed Activities**

*The proposed project triggers several activities listed in the National Environmental Management Act (No 107 of 1998) (NEMA), as amended, as requiring environmental authorisation before they can commence. The purpose of this study is to undertake an EIA process, with associated Public Participation Process (PPP) and specialist studies, to enable the competent authority to decide whether the project should go ahead or not, and if so, then on what conditions.*

### **Alternatives**

*The two end points of the proposed powerline, the proposed Iphiva and authorised Duma Substations are known. Eskom and the EAP, in consultation with specialists and I&APs identified technically possible 2 km wide corridors within which a 55 m servitude to construct the 400 kV powerline could be acquired. In the Scoping phase of the project, two (2) of these corridors, referred to as Iphiva-Duma West (with slight deviations called West 1 and West 2) and Iphiva-Duma East were recommended for further assessment.*

### **Iphiva-Duma West Deviation**

*After the acceptance of the Scoping Report by the DEA, the EKZNW expressed concerns about the potential impacts of all of the Iphiva-Duma 400 kV corridors on the conservation of biodiversity in the region, specifically on vultures, black rhino and the potentially affected Biodiversity Economy Node. The EAP and Eskom, therefore, in consultation with the EKZNW and other avi-fauna interest groups (EWT and Birdlife Africa) identified a Deviation to the Iphiva-Duma West corridor that is technically feasible and avoids the planned conservation Expansion Areas, Threatened Eco-systems, and areas of most dense vulture population, based on the data provided. The Deviation corridor was also placed directly adjacent to existing powerlines to reduce cumulative impacts for as long as a section as is possible.*

## **Receiving Environment**

*The project is located in the KZN Province. The area has warm to hot summers, high evaporation, dry warm winters and a mean annual rainfall between 495 and 1 560 mm. Average rainfall is higher in the west and decreases gradually to the east. The dominant landscape features are valley slopes to undulating hills and flat.*

*The Iphiva Substation is located close to the town of Mkuze. The study area consists of settlements in areas under traditional leadership, commercial farms and game reserves. The land under traditional management belongs to the Ingonyama Trust. Settlement patterns are scattered. Dwellings consist mostly of brick structures or traditional structures. Most people have isiZulu as their home language.*

*The Iphiva-Duma 400 kV powerlines do not impact on any forestry or much sugar cane. The corridors are all in close proximity to areas protected for conservation either by government or privately. Private Game Reserves rely on eco-tourism for their existence.*

*The region is well known for its large wetlands, river systems, grassland hills, bushveld and diverse micro-habitats. Iphiva-Duma West 1, West2, East and Iphiva-Duma West (1 or 2) with the Deviation all traverse Critical Biodiversity Areas 1 (KZN C-Plan) with the Iphiva-Duma East impacting on the largest section of Critical Biodiversity areas 1 and Biodiversity areas. All of the corridors are within the buffer zone of officially protected areas, more specifically the Hluhluwe–iMfolozi National Park is affected by the western corridors and the Manyoni Private Game Reserve, Thanda Private Game Reserve, Mduna Royal Game Reserve and Hluhluwe–iMfolozi National Park are impacted by the Eastern option.*

*This is exasperated by the possible impact the Iphiva-Duma East will have on the Black Rhino Range expansion (BREP) and the Ophathe-HiP-Fundimvelo link. Both of these initiatives are planned to be located east of the Duma substation and the eastern corridor crosses over these.*

*South African Hunters and Game Conservation Association and Ezemvelo KZN Wildlife initiated a process to develop the Umfolozi Biodiversity Economy Node in 2014. It consists of the Hluhluwe iMfolozi protected areas and the eMhakosini-Ophathe Heritage Park as the core conservation areas. All of the corridors are within this economy node. The Economy Node core conservation areas are linked with private protected areas, stewardships sites, private game farms and communal land in the southern reaches of Ulundi in KwaZulu Natal, the region has the potential to create a conservation area in excess of 150 000ha.*

*Iphiva-Duma East affects a large portion of the Black Rhino range and Iphiva-Duma West 1 and West 2 traverses the Imfolozi Savanna and Sourveld vegetation types, which are designated as threatened ecosystems.*

*The Hlulhuwe–Umfoloji IBA lies 20 km north-west of the town Mtubatuba, at the junction of the coastal plain and the foothills of the KwaZulu-Natal interior. The local vegetation is classified as Zululand Lowveld and Northern Zululand Thornveld (Mucina and Rutherford, 2006). This region to the south of the proposed project area is known to support more than 400 bird species, about 46% of the species found in the southern African sub-region (birdlife.org.za). The bird diversity within the region can be attributed to the variety of habitats in this area. This diversity includes a number of important populations of large, widespread birds that have suffered outside extensive protected areas.*

*Large terrestrial species found here and are susceptible to power line collisions include Black Stork (*Ciconia nigra*), Woolly-necked Stork (*C. episcopus*), African Openbill (*Anastomus lamelligerus*) and Saddle-billed Stork (*Ephippiorhynchus senegalensis*). Several endangered vulture species that are rare outside South Africa's large parks are locally common here.*

### **Public Participation in the Scoping Phase**

*Public participation is an important aspect of any EIA, with the objective to assist stakeholders to table issues of concern, suggestions for enhanced benefits and to comment on the findings of the EIA. The Public Participation Process (PPP) is designed to provide sufficient and accessible information to Interested and Affected Parties (I&APs) in an objective manner.*

*An I&AP database has been established to record the details of stakeholders that wish to register for the project. Key stakeholders have been identified and notified of the project and their opportunities to participate. A Background Information Document was compiled and distributed to all registered I&APs and at meetings. Newspaper advertisements were placed in four newspapers in English and isiZulu. Onsite notices were erected at 23 locations in the study area. Meetings were held with Key Stakeholder and Authorities at four venues in the study area, in order to present the proposed project to them, and give them an opportunity to raise any concerns that they might have. Similar meetings, in isiZulu, took place with each of the 31 Traditional Councils in the study area. Focus Group Meetings with Ezemvelo KZN Wildlife, organisations concerned about impacts on birds, Farmers Organisations and the landowners of the substation site alternatives also took place.*

*The draft Scoping Report was available for public comment. All comments made at meetings or submitted by other means have been captured in a Comments and Report, and were incorporated into a Final Scoping Report that was submitted to the competent authority for review. The competent authority has accepted the Final Scoping Report and this EIA phase of the project has been undertaken according to the Plan of Study in the Scoping Report.*

*This draft EIA Report is now available for a 30-day public comment period. All comments received will be considered and the EIA Report will be finalised for submission to the competent authority.*

### **Key Issues**

*The following key issues have been identified:*

- *Impacts on areas protected by National and Provincial legislation resulting in loss of plants and animals of conservation value and a loss in the income from and value of the facilities, primarily due to visual impacts;*
- *Impacts on the rich and diverse fauna and flora (specifically large birds);*
- *Impacts on landuse, particularly for sugar cane farmers and forestry;*
- *Impacts on Heritage Resources;*
- *Social impacts;*
- *Economic,*
- *Impacts on the biophysical environment resulting from access roads;*
- *Construction Impacts; and*
- *Cumulative impacts.*

### **Specialist Studies**

*This EIA Report uses input from specialists to assess the key impacts, determine their significance, and recommend appropriate measures to mitigate negative impacts and enhance benefits. The specialist studies that have been undertaken are summarised below. Mitigation measures recommended have been included in the Draft Environmental Management Programme (EMPr).*

*An assessment of the local **flora and fauna** communities associated with the proposed powerlines was undertaken. This study predicted that:*

- *The direct loss of floral species/vegetation types and biodiversity will have a moderate significance after mitigations;*

- *The loss of species of special concern (protected species) would have a minor impact after mitigation; and*
- *The impact of alien vegetation establishment will be negligible after mitigation.*

*The fauna and flora specialist recommended that the project be authorised with the Iphiva-Duma West 1 with Deviation corridor being the Best Practical Environmental Option.*

*The following recommendations/mitigations were suggested:*

- *A walk through of the servitudes should be conducted by suitably qualified ecologist, once the tower positions have been determined, in order to ascertain the presence of any threatened, protected, or endemic plant or animal species, animal burrows (including spiders and scorpions);*
- *Search and Rescue of species of special concern;*
- *Removal of plants should be restricted to only those trees that pose a risk to the powerline;*
- *Protected trees within the servitude will necessitate that appropriate permits are applied for before these trees are damaged or removed;*
- *Avoid any physical damage to natural vegetation on the periphery of the servitude, in all riparian areas and areas with steep slopes;*
- *Water Use Licences/Registrations must be obtained for any construction in an area regulated by the National Water Act (below 1:100 year floodline or 100 m from a watercourse and 500 m from a wetland); and*
- *No hunting permitted by Eskom employees or contractors.*

*Impacts on **birds** that could be associated with a project of this nature include collision of birds with the overhead conductors; electrocution; destruction of habitat; and disturbance of birds. Collisions are the biggest potential risk to avifauna, while habitat destruction is also expected to be an important impact of this project.*

*The consideration of alternative corridors from an avifaunal perspective, was primarily determined by the ecological sensitivity present based on:*

- *Presence or absence of Red Data or protected bird species;*
- *Presence or absence of exceptional Avifaunal species diversity;*
- *Extent of intact habitat in good ecological condition in the absence of disturbance; and*
- *Presence or absence of important ecosystems protected areas, such as Important Bird Areas, Protected Areas, areas demarcated for future protected area status (NPAES) and wetlands.*



*The avi-fauna specialist accepts the economic need of the Eskom expansion and is in support of this strategy. The proposed powerline is could have very high impacts on the Avifauna Species of Special Concern in the area. A walkdown of the servitude once the tower positions have been determined, prior to any construction activities, must be undertaken by suitably qualified bird specialist. The specialist should recommend feasible design changes (i.e. moving tower positions within the approved corridor, preferably within the servitude if already negotiated) to further reduce impacts and identify the sections of the powerlines that require bird diverters and towers that require bird guards. These findings must be documented on powerline profiles and incorporated into the EMPr. With the historic success that the mitigation measure has had on previous projects, the main issues can be mitigated to an acceptable level. In this case the project can go ahead. The avi-fauna specialist recommended that Iphiva-Duma West 1 with deviation be implemented.*

*A desktop assessment of **wetlands** associated with the powerlines was undertaken. The following baseline and background information was researched and used to understand the study area:*

- The Ramsar Convention;*
- National Freshwater Ecosystem Priority Areas (NFEPA) (Nel et al., 2011);*
- Water Management Areas (WMA) and Quaternary Catchments; and*
- The KwaZulu-Natal 2012 Critical Biodiversity Areas Map.*

*Desktop delineations based on the available contour and topographic data, as well as detailed aerial imagery were applied to the proposed powerline corridors to provide an indication of the potential extent of the wetland areas likely to be present. Limited in-field verification of these systems took place.*

*Eskom avoids placing towers in wetlands for technical reasons. Most of the wetlands are narrow enough for the conductors to be strung over them. Direct loss of wetlands, increased sedimentation, compaction of wetland soils, altered wetland hydrology, onset of erosion, and the establishment of alien invasive plant species is expected to result from the clearing of vegetation for the construction of access roads and towers foundations, as well as the increased vehicular activity associated with the stringing of the powerlines.*

*During the operational phase, no direct impacts to wetlands are expected to occur, however, potential risks include hydrocarbon spills and indirect risk of poaching and fires.*

*The significance of the impacts of site access and disturbance and clearing after mitigation was assessed to be negligible for both the construction and operational phases.*

*The wetlands specialist recommended implementation of the Iphiva-Duma West 1 corridor with the Deviation.*

*The investigation of **agricultural potential** involved the collation of climate, geology, topography information and determining the broad soil groups of the area as background for further interpretation. Properties of the soil groups, soil depth, clay content, soil restrictions as well as land capability classes were considered. The soil investigation was based on a field investigation and additional available information from the Land Type Survey of the Institute of Soil Climate and Water, as well as other relevant information.*

*The soils in the project area were then classed in four land capability/potential classes, namely:*

- Soils of intermediate suitability for arable agriculture;*
- Soils not suitable for arable agriculture, but suitable for forestry or grazing;*
- Soils of poor suitability for arable agriculture; and*
- No dominant class.*

*Properties like clay content and susceptibility to erosion is highly dependent on the parent material. The mudstone underlying this area can give rise to soils severely susceptible to erosion when exposed. Exposed surfaces should therefore be limited or prevented. It should be covered with any vegetation even for short periods.*

*Arable crop production is not restricted by the climate of the area but may become risky in the areas with lower and irregular rainfall patterns.*

*No areas with a high potential agricultural value were identified in the proposed corridors. Approximately 48% of the Iphiva-Duma Corridors have soils not suitable for arable agriculture, but suitable for forestry or grazing covers. The Iphiva-Duma West 1 Corridor has less impact on game farms and agricultural cultivated land than Iphiva-Duma East. Soils in the west in this corridor are shallow and of low agricultural potential. These soils have rock or weathered rock as underlying material. Soils in the Iphiva-Duma East Corridor are clayey and difficult to manage when wet and may have a larger impact on if not handled with care. The soils are very similar in Iphiva-Duma Deviation.*

*The specialist has no objections to the project from the agricultural and soil potential standpoint and expressed no preference for any particular corridor.*

*The **Heritage Impact Assessment** complies in part with the KwaZulu-Natal Heritage Act, (No 4 of 2008) (KZNHA) and National Heritage Resources Act, (No 25 of 1999) (NHRA). The greater cultural landscape is expected to contain heritage resources spanning from palaeontological through to contemporary living heritage resources. Various resource types are anticipated to occur. These include but are not limited to archaeological resources from various time periods; and burial grounds and graves.*

*Earth moving activities, such as vegetation and surface clearing, or excavation for the relevant infrastructures, construction and/or upgrading of access roads and stringing of conductors have the greatest likelihood of direct impacts on heritage resources.*

*Various resource types are anticipated to occur within the proposed corridors. These include but are not limited to:*

- Archaeological resources from various time periods;*
- Historic battlefield(s);*
- Burial grounds and graves; and*
- Heritage places and/or living heritage sites.*

*Anthropogenic disturbances including rural settlements, subsistence and commercial agricultural fields, and municipal infrastructures impact all of the corridors. Iphiva-Duma West 2 has the least anthropogenic disturbances and is therefore the least suitable alternative from a heritage perspective based on the available information. The heritage specialist did not indicate any preferences between Iphiva-Duma West 1 (with or without the Deviation) or Iphiva-Duma East.*

*Direct impacts to archaeological resources with a high or medium Cultural Significance and direct impacts to burials, monuments and memorials with a high Cultural Significance have a negligible positive significance after mitigation. Direct impact to battlefields and living heritage sites with high Cultural Significance have a negligible significance after mitigation.*

*The **visual** specialist study is based on the Oberholzer (2005) guideline that draws on best practice in EIA and provides guidance applicable to visual specialist assessments. Projects-*

*specific receptor (viewer) sensitivity is based on accepted international practice, previous experience of the visual specialists, social specialist and the economic specialist.*

*Guest houses, game lodges and nature-based tourism in protected areas dependent upon a pristine visual resource for tourism value are considered to have a High viewer sensitivity. rural (commercial farming) homesteads a Moderate viewer sensitivity, and National / provincial road users where other infrastructure is present and transformation has already taken place, Formal settlements (such as Pongola / Mkuze / Ulundi) and informal settlements / villages (likely considers transmission lines as a sign of progress) a Low viewer sensitivity.*

*The greatest factor that influenced visual impact for this project was the presence of conservation areas, due to their dependence upon the landscape as visual resource as income generator for tourism-related activities. The avoidance and minimisation of the visual impact was mostly focused around reducing impact on these areas.*

*Impacts were identified for each of the viewer groups against each of the infrastructure components. Visibility and visual exposure were combined in the GIS viewsheds generated. These aspects and visual intrusion were combined to calculate the intensity / magnitude of each impact. The visual intensity was then combined with pre-defined impact assessment aspects such as the nature, duration, extent to determine the significance of each impact before and after mitigation.*

*The visual specialist found that the Iphiva-Duma Western alignment (either West 1 or West 2) has a lower visual sensitivity than Iphiva-Duma East. The deviation has an even lower visual sensitivity, as it is further from the park than the original corridor. Iphiva-Duma West (1 or 2) with the deviation is therefore recommended.*

*The potential visual impacts associated with powerlines and associated infrastructure are related to alignment close to sensitive areas such as elevated ridges, koppies and wetlands that could be conserved as visual assets for tourist related activities. This was considered in the route selection process, where visual sensitivity was considered as a constraint to route alignment, thereby meeting the first step in the mitigation hierarchy, namely that of avoidance of the impact. Visual impacts are best mitigated in the planning and design phase, and to a lesser extent the construction phase*

*With regards the possibility of burying Iphiva-Duma East along the P-234, although will reduce the visual impact, at the Integration meeting with the other specialists it was agreed that the*

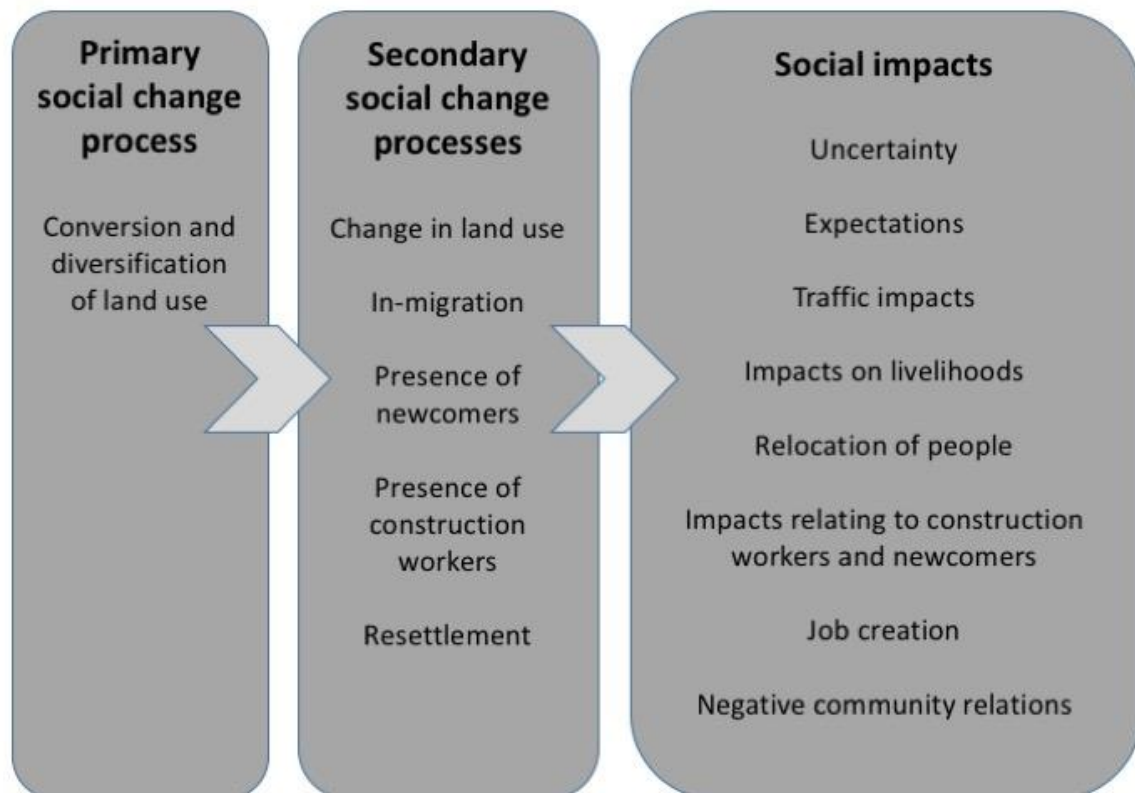
overall impacts of burying the powerline are greater than the overall impacts of above-ground powerline. The impact ratings have therefore been done for above-ground powerlines.

Demographic, economic, geographic, institutional, legal, emancipatory, empowerment, and socio-cultural processes were investigated in the **Social Impact Assessment**: The social specialist identified the following key stakeholder groups potentially impacted by the project:

- Communities under traditional authority;
- Commercial farming;
- Tourism establishments; and
- Surrounding urban areas.

The proposed project activities set into motion certain social change processes, and these change processes can lead to the experience of social impacts. Social impacts are context specific and may be experienced differently by different groups in the area. The social environment is very dynamic and is constantly changing.

The following change processes and impacts have been identified for the proposed project:



The social specialist concluded that the project will make an important contribution to the supply of electricity in northern KZN and will be of service to many previously disadvantaged

communities. She therefore recommends that the project as a whole should proceed, but in the process attempt to minimise negative social impacts to the immediate environment, keeping in mind the current economic climate and broader societal picture in terms of expenditure.

The social specialist recommends that the Iphiva-Duma West (1 or 2) Corridor be implemented. The social impacts of the Deviation have the same significance as the original corridor.

One of the key issues that landowners affected by the proposed project have raised is the impact on the eco-tourism activities and knock-on effects including decline in property values, loss of jobs, and reduced budgets for conservation of animals. The socio-economic specialist study only allowed for this to be assessed on a qualitative level. Interaction with the landowners has highlighted that the project could be opposed should this aspect not be adequately addressed. The inclusion of a more detailed **economic** assessment was therefore commissioned.

Tourism is not an economic sector in its own right but is a complex and composite sector comprising mainly of accommodation, transportation, food and beverages, cultural and recreational activities. The activities undertaken by the tourist relate with the travel, destination, and entertainment activities and expenditure that tourists make. The tourism sector contributes approximately 6 % to the value of economic activity for all goods and services produced within the area. This is slightly higher than the national average. The total number of people employed in tourism amounts to approximately 4.6 % of all employment within the regional economy. The tourism value of the region is estimated at R 1.9 billion for the geographical area for 2016, and employment amounts to approximately 9 831 for the corresponding year.

The development of the powerlines will be a significant investment for and have a positive impact on the economy. This is related to the construction and maintenance of the infrastructure as well as positive spin-off impact due to increased electricity supply.

The economic specialist found that the agglomeration of eco- and nature-based tourism is high within this region and a large share of these establishments cater for the international tourism market and even state their tariffs in Euro and Dollar instead of South African Rand. The intensity of the economic impact for tourism activity will be different for each property/activity and depends on inter alia the:

- *Land use type – property with tourism activity, such as game farming, lodges, protected areas and nature reserves should, as far possible, be eliminated from the preferred alignment.*
- *Powerline route – The route should be on the boundary of farms and not transcend properties diagonally or through the middle.*
- *Size of the property – A powerline that transcend properties diagonally or through the middle, for property smaller than 200 ha – tips an argument for expropriation*
- *Existing infrastructure – Do not place powerlines over or in close proximity to tourism infrastructure.*
- *Visibility of the new structure - Place the powerlines / pylons and the substation in areas where it is not visible from tourism areas/hides/etc.*
- *Market related compensation for the affected property should be provided where the powerline is developed.*
- *Landowners should be consulted about their preferred configuration if their property is affected.*

*Once a servitude for the powerlines is finalised it will be possible to quantify the impact on individual property values. A registered property valuer should assess each individual affected property to determine the value impact, if any.*

*The impact on tourism activity is in most cases higher than other land uses and varies between -5% and -30% of the existing property value and production level. The tourism value for game reserves/lodges/private game reserves within the regional economy is estimated to be approximately R6 303 per hectare for final sales. The alternatives where the negative economic impact is lowest is preferred.*

*Impacts (Table below) are measured in terms of:*

- *Production: refers to the value of output generated in the economy as a result of the existing tourism activity.*
- *Employment: reflects the number of jobs created by the tourism activity.*
- *Household Income: refers to the income by households as a result of their involvement in the activity and downstream beneficiation production.*

**Summary of economy wide economic impact**

<b>Project Component</b>	<b>Total hectare within reserve/ lodge/ game farm</b>	<b>Economy-Wide Economic Value</b>	<b>Employment</b>	<b>Household Income</b>
<i>Iphiva-Duma West (excluding P 234 corridor)</i>	178	R 2.1 million	8 jobs	R 1 million
<i>Iphiva-Duma East</i>	6 969	R 82 million	321 jobs	R 39 million
<i>P234 Corridor</i>	948	R11.2 million	44 jobs	R 5.3 million
<i>Deviation</i>	0	0	0	0

*The economic specialist found that the construction and operation of the Iphiva-Duma 400 kV powerline will have a medium-high significant impact after mitigation on property value for the affected properties. Loss in tourism employment; impact on property values of adjacent properties and the reduction in the economic value of the regional economy as a result of a reduction in tourism activities and future expansion/investment in tourism activity may also be impacted due to the loss in productive land are all predicted to be low.*

*The economic specialist recommended Iphiva-Duma West (either 1 or 2) with the deviation.*

**Conclusion and Recommendation**

*The EAP recommends that the Iphiva-Duma West 1 corridor with deviation within which servitudes for the construction and operation of the 400 kV powerline be authorised.*

*The powerlines should be constructed on farm boundaries as far as possible. Towers should be placed outside of wetland/riparian areas and their associated 32 m zones of regulation as far as is possible. Where powerlines are constructed in parallel, towers should preferably be positioned so as to alternate with those of the existing power line (i.e. out-of-step) and not be placed opposite one another (in-step). This mitigation will increase the visibility of both sets of power lines to flying large raptors and the birds may then be in a better position to take timely collision avoidance action. Lattice towers with visually intrusive footing designs should be avoided to reduce visual impacts, except for situations where strain towers are required or stability/geotechnical aspects play a role. Servitudes should avoid ridge, follow existing infrastructure corridors and avoid visually sensitive areas and receptors where practical.*



*Water Use Licences/Registrations must be obtained for any construction in an area regulated by the National Water Act (below 1:100 year floodline or 100 m from a watercourse and 500 m from a wetland).*

*A walk-down of the servitude once the tower positions have been determined, prior to any construction activities, must be undertaken by suitably qualified heritage, ecology and bird specialists. The specialist should recommend feasible design changes (i.e. moving tower positions within the approved corridor, preferably within the servitude if already negotiated) to further reduce impacts and identify any heritage resources that may be impacted upon, plants or animals that require rescue and sections of the powerlines that require bird diverters and towers that require bird guards. Areas with a high ecological sensitivity, wetlands and watercourses should be designated as “No-Go” areas and be off limits to all unauthorised vehicles and personnel. These findings must be documented on powerline profiles and incorporated into the EMPr.*

*Reflectors with LED lights are recommended as bird diverters particularly close to nesting sites and in areas in relatively close proximity to water or wetlands.*

*The footprint area of towers must be limited to what is essential in order to minimise impacts as a result of vegetation clearing and compaction of soils. Removal of plants should be restricted to only those trees that pose a risk to the power line. Protected trees within the servitude will necessitate that appropriate permits are applied for before these trees are damaged or removed. Physical damage to natural vegetation on the periphery of the servitude, in all riparian areas and areas with steep slopes must be avoided. No hunting is permitted by Eskom employees or contractors. No incision and canalisation of the wetland features should take place. No material may be dumped or stockpiled in any “No-Go areas. All vehicles must remain on demarcated roads and within the project area footprint. All land disturbed by Eskom should be vegetated and left in the condition it was before the construction of the powerlines and no disturbed areas should be left uncovered during construction to prevent erosion.*

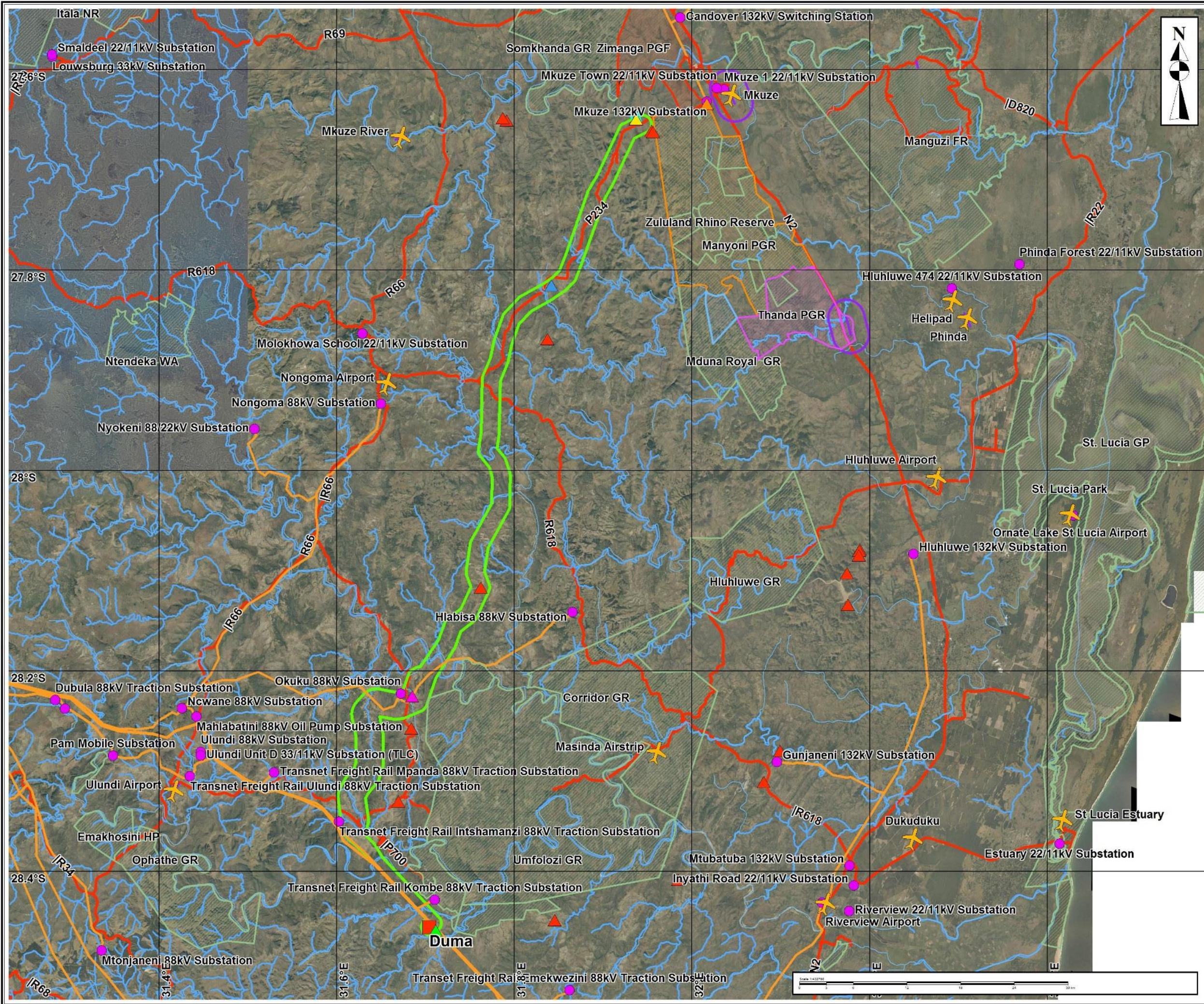
*Exemption from further palaeontological assessment is recommended. A Fossil Chance Find Procedure must be included in the EMPr.*

*The social mitigation and management measures include appointing a Community Liaison Officer, compiling and implementing policies for employment, conduct of employees and contractors, road use, access control specifically for protected and game reserve areas, a relocation and compensation in accordance with international best practice, strategies for*

*community relations, communication, Corporate Social Investment, safety and security, HIV and life skills, and a grievance mechanism. A relocation specialist should be appointed should relocation be required. Construction camps should be established in accordance with international best practice, and Eskom must join local fire protection agencies and have and implement a fire fighting strategy.*

**ENVIRONMENTAL IMPACT ASSESSMENT FOR ESKOM'S NORTHERN KZN STRENGTHENING PROJECT**

**EMP- Iphiva-Duma 400kV**



**Legend**

- Roads
- Rivers
- Proposed Iphiva-Duma Corridors West 1 with Deviation
- Substations
- Substation Site
- HV\_Substations
- Existing TX\_HV\_Lines
- ✈ Airport
- Airfield
- Airfield Buffer
- Conservation**
- Nature Reserves
- Manyoni Nature Reserve
- Thanda Nature Reserve
- Zimanga Nature Reserve
- Royal Land
- Heritage Resources**
- ▲ Archaeological - MSA
- ▲ Archaeological - Undefined
- ▲ Battlefield
- ▲ Burial Grounds & Graves
- ▲ Historical Built Environment
- ▲ Intangible / Living



Date : 4/5/2018  
 System : Hartebeesthoek94  
 Map by : Ilze Gouws  
 Revision : R02