

**PROPOSED ISUNDU 765/400 KV SUB-STATION AND TURN-IN TRANSMISSION  
LINES**

**DEA EIA REF: 14/12/16/3/3/2/745**

**DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT**

**EXECUTIVE SUMMARY**

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## DRAFT EIA REPORT DISTRIBUTION

The draft Environmental Impact Assessment (EIA) Report will be distributed to key stakeholders and will also be left at the following public places in the project area from **31 October 2016 to 15 December 2016**.

Area	Venue	Street	Contact Person and Number
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## EXECUTIVE SUMMARY

### Introduction

Eskom Holdings SOC Limited (Eskom) is the largest generator of electricity in South Africa. Since 2009, Eskom has been investigating options to bring a 765 kV transmission line from the Venus Sub-station, near Estcourt, to a new sub-station in the KwaZulu-Natal (KZN) Midlands, with two 400 kV transmission lines from the new sub-station linking into the existing Hector and Ariadne Sub-stations. This forms part of Eskom's KZN Strengthening Programme which aims to increase and strengthen the electricity transmission network to the KZN Midlands and southern KZN.

The Venus-Sigma-Hector-(Ariadne) (VSHA) 765/400 kV Transmission Line environmental authorisation process undertook extensive environmental investigations between 2009 and 2011. The outcome of this process was that the Sigma 1 Sub-station site, north-west of Wartburg, was identified as the preferred new sub-station site. However, since authorisation, more detailed geotechnical investigations have shown that the earthworks and foundations at this Sigma Sub-station site would be exorbitantly expensive.

Therefore, Eskom initiated further investigations to identify if alternative, more cost-effective sub-station sites were available without needing to significantly alter the authorised VSHA transmission line corridor. Sixteen alternative sites were investigated, all of which proved unsuitable except for the proposed Isundu site, located to the east of Ashburton.

The proposed Isundu 765/400 kV Sub-station is a replacement to the Sigma Sub-station previously authorised. If the Isundu Sub-station is authorised, the 765 kV transmission line from the Venus Sub-station will need to continue along the authorised transmission line corridor until the Isundu Sub-station. By implication, a single 765 kV transmission line rather than 2 x 400 kV transmission lines will be constructed in the corridor between the Sigma and Isundu sites, as currently authorised by the VSHA Environmental Authorisation.

In terms of the Environmental Impact Assessment Regulations, 2010, the proposed Isundu Sub-station and associated turn-in transmission lines trigger activities that may significantly affect the environment and, thus, require authorisation from the national Department of Environmental Affairs (DEA).

Two other applications are being undertaken concurrently with this Isundu Sub-station environmental authorisation process:

- ❑ Eskom is required to obtain a Water Use Licence for the proposed Isundu Sub-station (in terms of section 40(4) of the National Water Act (Act No. 36 of 1998)).
- ❑ An amendment to the existing VSHA authorisation for 2x400 kV transmission lines from the proposed Sigma Sub-station site to the existing Hector Sub-station. If the Isundu Sub-station is authorised then this line would need to change to a single 765 kV transmission line running from the original Sigma Sub-station site to the new Isundu Sub-station.

ACER (Africa) Environmental Consultants (ACER) is the Independent Environmental Assessment Practitioner (EAP) undertaking the application for environmental authorisation on behalf of Eskom.

Eskom has a number of legal obligations in terms of legislation, the pertinent obligations being: to supply electricity to the citizens of South Africa; to undertake the necessary environmental impact assessments for all listed activities; to obtain permits in terms of other relevant environmental legislation (for example, heritage, water and biodiversity); and to adhere to the principles of sustainability.

### **Need and Desirability**

The expansion and upgrade of the transmission network is required in order to attain a higher security of supply. The proposed 765 kV and 400 kV transmission lines will link to other new transmission lines entering northern KZN (from the main power generation facilities in Mpumalanga).

Sub-stations are an important component of the transmission network allowing voltages to be stepped-down to allow for distribution, and to allow transmission line sections to be de-energised for maintenance whilst still keeping the whole network supply system running.

The position of sub-stations in the network, as well as the distance between sub-stations, is determined by the peculiarities of electricity transmission at extra high voltage. In order to comply with the known and laid down safety limits, sub-stations must be about 400 km apart with an absolute maximum distance of 450 km, to prevent voltage increases along the line because of capacitance, known as the Ferranti Effect. Electricity needs to be delivered at high voltages as close as possible to the demand centres and, thus, it is not simply a matter of moving to a different area if suitable sub-station sites are difficult to find.

### **Project Alternatives**

Since 2008, Eskom has considered both the expansion of existing sub-stations and over 25 potential new sites in between Estcourt and Camperdown in order to achieve the overall project objective of having a suitable 765/400 kV sub-station in this region of KZN.

Transmission line corridors and the sub-station sites have been investigated taking into cognizance their potential impacts on surrounding forestry, sugar cane, tourism and other important land-uses within this area of KZN.

The VSHA environmental authorisation process investigated three of these sites in more detail, namely Sigma 1, 6 and 7. Sigma 1 was the preferred site. Unfortunately, since authorisation significant technical constraints were identified during further geotechnical investigations. It is estimated that the earthworks alone will cost in the region of R 500 to R 800 million more than typically incurred for a sub-station of this size. Eskom, as a public utility, is bound by the Public Finances Management Act and needs to declare and justify all costs. Furthermore, costs need to be recovered by way of tariff increases. In this context, large additional costs for earthworks alone cannot be justified, making the Sigma 1 site no longer feasible.

Further potential sites were then investigated that would still allow the new sub-station to feasibly fit in with the authorised VSHA corridor. Only the proposed Isundu site was found to merit further consideration.

Two layout alternatives for the Isundu Sub-station on the proposed 100 ha area have been considered during this assessment. Layout options are limited by needing to optimise the position of the infrastructure on the site to minimise earthworks, whilst also needing to ensure that the layout will be able to accommodate the required transmission lines and from which direction these lines enter and exit the sub-station.

The no-development option is also being assessed. However, it is not an attractive option given that the national grid is operating nearly at full capacity. Apart from this, due to the Ferranti Effect and the location of the load centres, it becomes increasingly difficult to identify suitable sites that still meet the overall objectives of the KZN Strengthening Programme.

### Project Description

The proposed Isundu Sub-station is being planned to accommodate the following transmission lines:

- 1 x 765 kV transmission line (the authorised VSHA transmission line).
- 2 x 400 kV double-circuit transmission lines from the sub-station to tie into the existing Hector-Ariadne 400 kV double-circuit transmission lines approximately 4 km away.
- 2 x 400 kV lines from the proposed Mbewu Sub-station near Empangeni.

In addition, the site and layout design allow sufficient space to accommodate additional transmission lines if required at some point into the future. The space allowed will potentially accommodate the following additional transmission lines:

- 1 x 765 kV or High Voltage Direct Current (HVDC) transmission line.
- 2 x 400 kV transmission lines.

The proposed sub-station will include the standard electrical components required, such as transformers, reactors, busbars, isolators etc.

Environmental authorisation has been applied for a 100 ha site. If fully developed into the future, the sub-station infrastructure footprint will be approximately 50-60 ha, whilst for the initial phase of development, the sub-station is likely to have a footprint in the region of 25 ha.

Other infrastructure will include a tarred access road, a microwave radio communication mast between 30 and 50 m high. Oil and fuel storage facilities will be bunded and there will be an oil bund to contain any transformer oil spills (capacity of  $\geq 30 \text{ m}^3$  but  $\leq 80 \text{ m}^3$ ).

This environmental application also includes the construction of two double-circuit 400 kV transmission lines from the proposed Isundu Sub-station to the existing Hector-Ariadne 400 kV double-circuit transmission line approximately 4 km away. The reason for proposing a double-circuit transmission line is that it will allow Eskom in the future to increase capacity at the sub-station without needing to secure an additional servitude to the immediate south of the sub-station. This will benefit surrounding stakeholders in this rapidly developing area.

The required servitude for these 400 kV double circuit lines is 55 m for a single line and 110 m where the lines run in parallel.

The bulk earthworks and civil construction phase for the sub-station will take approximately 21 months. The installation phase of the equipment along with stringing, cabling, earthing and commissioning will take approximately 20 months. In total, the construction of the sub-station is estimated to take three years with these phases overlapping.

During construction when the civil works are being carried out (foundations, storm water drainage, buildings, etc), there should not be more than approximately 80 people present on the site at any one time. Construction staff will not be housed on site but transported to site each day.

No people will be housed on site on a permanent basis during the operational life of the sub-station. However, there will be ongoing monitoring and control of operations as well as planned and other maintenance work done on an *ad hoc* basis.

Water will be obtained from the existing municipal supply. During construction, sewage will be managed through the use of portable toilets. During operation, sewage flows will be minimal and sewage will be directed into a sealed conservancy tank of less 10,000 m<sup>3</sup>. When full, a sewage truck will pump it empty and dispose of the waste at a licensed sewage treatment plant.

The exact number of local people that will be employed during construction is unknown at this stage and will vary according to the construction activities taking place at any given time. Much of the construction will involve specialised tasks.

The construction of the transmission lines has a number of steps which include: surveys of technically feasible alignments within the authorised corridor, a walk down by environmental specialists to assess specific tower locations; and negotiations on the final servitude with the landowner; followed by construction activities, stringing and commissioning.

The registration of servitudes can be a lengthy process requiring contractual negotiations with each affected landowner and the lodging of an application for registration of the servitude with the Provincial Deeds Office against the property title deed.

Maintenance is carried out at regular intervals, and is often done by helicopter in inaccessible areas.

### **Public Participation**

The public participation process has been designed to comply with the requirements of the EIA Regulations. Public participation activities have included background information letters, public meetings, key stakeholder meetings between the EAP, specialists and Eskom with specific stakeholders and the opportunity for stakeholders to comment and review draft and final reports.

All comments submitted are recorded and responded to in Appendix 3.

### **Strategic Electrical Infrastructure**

A common and almost universal response, to any proposed electrical infrastructure project, is for the majority of surrounding stakeholders to object to having any project affect part of their own environment, own neighbourhood, own property or plans, etc. Many concerns raised are valid and assist the EAP to correctly assess the impacts. However, many objections can simply be because they personally do not want a particular project near them or are concerned about apparent or perceived facts concerning electrical infrastructure.

The environmental impact assessment process is scientific; thus, it falls to the assessing EAP and the specialists to evaluate the legitimacy of the issues and concerns raised by stakeholders.

Importantly, an objection, no matter how carefully worded or supported by petitions, etc. still needs to be evaluated and examined as objections do not necessarily constitute a fatal flaw to a proposed project. Indeed, if the latter was the case, then there would be no electricity coverage in South Africa as no stakeholders wish to reside next to either sub-stations or transmission lines. Yet, due to lack of generation capacity over the past decade, all South African's now recognise clearly the need and economic importance of reliable electricity supplies.

The KZN Midlands is a relatively unique area of KZN in that there is a range of land-uses, economic sectors and stakeholders all situated in close proximity. This has made the identification of suitable transmission line routes and sub-stations sites since 2008 challenging.

With the current Isundu Sub-station proposal, the nature of the comments is again one of various stakeholders presenting facts and figures as to why this site and area should not be considered for the sub-station. Part of this assessment process has been to investigate these claims and figures. One of the key overarching issues, which both the EAP and stakeholders, need to keep in mind is that this infrastructure is aimed at benefiting the whole of KZN over the long-term.

A unique challenge of this particular Ashburton site is that some of the local objections are based on the possible future impacts on planned or proposed projects. This assessment needs to consider possible future impacts but also the reality that some of the proposed projects may never materialise as envisaged, either because of overstated expectations or other economic, investment or socio-political issues.

### **Description of the Receiving Environment**

The topography of the proposed Isundu Sub-station site is undulating with local high points along the south-east and north-west borders. The site is underlain at a relatively shallow depth by Diamictite sedimentary rock layers and boulder shales belonging to the Dwyka Formation within the Karoo Sequence.

The annual rainfall in this area is approximately 860 mm and there are small seasonal streams on the north and north-east side of the Isundu site with associated riparian vegetation. There is a range of small farm dams on and surrounding the proposed site. Four depression wetlands and three hillslope seepage wetlands occur on site.

The vegetation type is KwaZulu-Natal Hinterland Thornveld, which supports a low to moderate diversity of fauna primarily as a result of the vegetation type being predominately disturbed grassland. The grass is cut and sold for hay.

The proposed site is on land zoned in the Mkhambathini SDF as Agricultural Eco-tourism and falls within a rural/urban fringe area that has a mixture of agricultural enterprises and rural farmland. There are a number of existing and planned tourism activities surrounding the site, including existing enterprises such as the African Bird of Prey Sanctuary and Raptor Rescue, and the Natal Zoological Gardens and Natal Lion Park. Planned and developing land-uses include the Mayibuye Game Reserve and Wild Aloe Estate. Agricultural activities are predominated by RCL Foods (formerly Rainbow Chickens) which has seven of its KZN chicken laying farms to the north and north-west of the site.

### **Assessment and Specialist Studies**

A total of 15 specialist studies have been conducted as part of this assessment. It is important to recognise that each specialist study is primarily a short-term study providing input only on what can be a relatively specific component of the project. Thereafter, it is the role of the EAP, with assistance from the specialists, to collate, evaluate and integrate the various potential impacts and the relationships between them.

The assessment process has included a joint site visit with a group of specialists. This site visit was to the Isundu site as well as surrounding sub-stations for comparison in both the day-time and night-time to discuss potential impacts and take measurements. In addition, a number of specialists have liaised and met directly with stakeholders to discuss specific concerns.

A summary of the specialist findings is provided in Chapter 10 and the reports are contained in Appendix 5.

### **Summary of Environmental Issues and Potential Impacts**

An issue is a point of concern around which debate can be held, whilst an impact is how the natural, social or economic environment will be affected by a specific intervention. The key issues identified during Scoping and carried through to the Impact Assessment are outlined below along with a summary of the impacts (and significance) associated with the issue.

#### ***What are the potential economic and socio-economic impacts associated with the construction and operation of the proposed sub-station?***

The positive economic benefits of the proposed project include a significant injection of investment into the local, regional and national economy during construction and increased reliability of electricity supply, along with associated economic benefits, during operation.

However, some potential negative impacts are also possible on some of the surrounding enterprises such as RCL Farms, as well as the existing and planned tourism centres which may conceivably have their planned economic potential curtailed by negative impressions or views of electrical infrastructure.

Potential negative economic impacts on surrounding local enterprises are discussed under the various sections dealing with the key issues and concerns related to each enterprise.

The no-development option is not considered attractive when it comes to service infrastructure such as electricity; indeed, the no-development option is really the option of simply relocating the impacts elsewhere.

The positive economic benefits were found to be highly significant whilst the potential localised negative impacts can vary from not being significant to being significant, and are addressed under the various sections dealing with the key issues and concerns related to each enterprise.

#### ***What impacts will the construction and operation of Isundu Sub-station have on the natural environment (flora and fauna) of the site?***

The sub-station will not transform the entire property (100 ha); rather it will transform an area of approximately 40-45 ha.

The predominant vegetation type is natural grasslands which are mowed regularly for hay production. Although a large portion of the area is disturbed grasslands, four wetland pans and three hillslope seepage wetlands were identified on site and rated largely natural and unmodified. Some may contain species of conservation concern and/or protected species.

Regardless of the degraded nature of the surrounding grassland, the wetlands were considered valuable because of their unmodified hydrological and geomorphological condition, and because they are well covered with hydrophilic vegetation.

Due to the grassland disturbance, the site supports a low to moderate diversity of fauna with few species of conservation importance; however, it is the aquatic habitats (including the several small farm dams) that provide suitable habitat for diversity. These sites may include two frog species, viz. the Natal Leaf-folding Frog (*Afrivalus spinifrons*) and Spotted Shovel-nosed Frog (*Hemisus guttatus*) currently listed as Near Threatened and Vulnerable, respectively.

Overall, whilst the proposed site is relatively low value agricultural land consisting of generally disturbed grassland, there are some micro-environments on the site which have been created over time that have biodiversity value. The loss of these was found to be sufficiently significant to propose mitigation through re-creation off-site.

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To minimise impacts associated with the 2 x 400 kV double-circuit lines from the sub-station to the existing Hector-Ariadne 400 kV double-circuit transmission line, it is recommended that the lines follow the alignment previously agreed to with affected stakeholders along the existing 275 kV Georgedale-Mersey transmission lines.

***How will the development of the Isundu Sub-station impact on existing and developing tourism land-use plans and other town planning initiatives?***

The proposed sub-station site falls within an area zoned by the local municipality for agriculture and eco-tourism. The existing surrounding enterprises are either agricultural or tourism related activities and future development plans in the area are also based around eco-tourism initiatives. Thus, the construction of a large sub-station within this area, along with at least the five currently planned transmission lines is likely to have direct and indirect impacts upon existing and future plans.

From both a visual and noise perspective the site falls within two landscape characters, one being the urban fringe corridor that runs beside the N3 and the other the more rural settlement that starts to occur as one travels away from the N3.

The agricultural value of the area is moderate with the main agricultural activities being those associated with poultry, which create an agric-industrial feel to the area. The dominant views along parts of the P477 are already visually degraded due to the existing RCL chicken houses whilst across the valley, the quarry and industry of Camperdown are clearly visible during the day and also at night.

The future development of this area is currently in a balance between developing around tourism and low density residential activities or developing along a higher density residential and/or light industrial trajectory.

The impact upon planning and land-use was found to be of medium significance, because even if the development pathway is more towards tourism developments into the future, these developments will themselves visually change the views along the P477. The existing poultry farms also create a distinct built up urbanised feel when travelling along this road.

The curtailment of future tourism potential of the Mayibuye Game Reserve was also found to be of medium significance because the predominant views from the Reserve will be across the valley. In addition, from within the valley the sub-station will be largely out of sight.

***How will the construction and operation of the Isundu Sub-station impact upon surrounding enterprises dealing with sensitive animals and birds?***

Three existing enterprises surrounding the proposed sub-station have raised concerns regarding the impact of the proposed project upon their animals and birds.

The EMF levels calculated at all three enterprises were found to be not significant and will not present any harm to birds or humans.

The Natal Zoological Gardens is the enterprise located furthest away from the proposed sub-station site and the wild animals and birds, as well as the breeding parrots, will not be significantly impacted by the proposed sub-station.

The Africa Bird of Prey Sanctuary and Raptor Rescue (ABOPS) have a range of different activities and species. There will be few direct impacts upon the Sanctuary. However, noise from trucks passing on the nearby road was found to be a potential noise disturbance.

Based on Eskom's estimates and data from similar construction sites, construction activities could generate 36-80 vehicle trips (two way trips) daily, which, at times, could peak at 300 vehicle trips per day. The noise specialist stated that this construction traffic would have a significant effect on the noise climate alongside the P477 and calculated the sound of a loaded truck at these distances at 67 dBA.

Whilst this may not be significant for injured display birds, the ABOPS has been nominated as the centre in which to establish a captive breeding programme for the Bearded Vulture. This species is critically endangered and the breeding programme is the subject of a Government Gazetted Biodiversity Plan. The traffic noise from construction was found to add a significant variable into the success of what is a long-term breeding programme. Bearded Vultures take seven years to reach sexual maturity and are highly sensitive and, thus, all variables need to be controlled as far as possible in order to ensure success. The proposed timing of the sub-station construction is also likely to coincide with the critical breeding period of the first birds of the programme. Thus, if negative impacts occur and breeding is affected, it may be too late for the species to start a new breeding programme elsewhere.

One of the key income generating activities of the Sanctuary is the flying demonstration. Transmission lines present a threat to flying raptors. Although the ABOPS established itself approximately 750 m from the existing 2 x 275 kV Geogedale-Mersey transmission line, the sub-station and the five currently planned transmission lines will all be larger and closer, and will be on different sides of the ABOPS. These will present an increased risk to flying birds. Importantly, all raptors are flown with tracking devices so that if lost they can be tracked and retrieved. Electrical transmission lines interfere with these receivers and, therefore, with more transmission and electrical infrastructure surrounding the Sanctuary, the risk of losing protected permitted raptors increases.

These two impacts were found to be highly significant for the ongoing success of the ABOPS and the conservation of raptors. The only feasible mitigation measure is the complete relocation of the ABOPS to an alternative site.

RCL Foods raised a large number of issues, concerns and objections to the proposed project. Through stakeholder meetings, discussions and input from a poultry specialist, the key risks were focussed to the following three areas of potential impact: light, dust and noise.

Due to the nature and strategic importance of the sub-station, it will have lighting. This will include fencing with security lights mounted on 4 m poles at approximately 20 m intervals and floodlights in the HV Yard mounted on 36 m high masts. These lights will turn on when staff enter the HV yard at night. The perimeter fencing lighting will turn on during security patrols of the fence.

There is a risk that if lighting is poorly designed, glare from the tall mast lighting or light spill from the security fencing could enter the nearest RCL laying houses and disrupt their controlled lighting programme. However, RCL itself has lights on the outside of its laying houses and during the night-time visit it was the RCL chicken houses which were the main source of light in the area.

No lighting impacts or disturbance of significance were identified provided Eskom follows the lighting designs recommended by the visual impact specialist. Eskom also has new lighting designs that minimise light dispersion. Nevertheless, mitigation has also recommended that monitoring be undertaken in conjunction with RCL to ensure no light from the infrastructure is entering the laying houses. If light is found to be entering the houses, then suitable mitigation screening measures should be devised on the houses or at the source.

Dust and noise are similar in some respects, because unlike light which affects the active and resting times of the birds, dust and noise can affect stress levels of the birds and increase their susceptibility to infections. However, because these birds are biological entities, there is a wide range of tolerance. Birds of different breeds, flocks and age groups may respond differently, with some being more tolerant than others to either dust or noise stress factors. Tolerance to one aspect, for example, dust, can change for individual birds if they have been stressed by ammonia, heat, noise or other disease agents.

Thus, this assessment found it a challenge to predict with precision how significant dust and noise impacts may be on a particular farm and flock at RCL within a particular year or part of the laying cycle.

Increased dust levels can result in physical damage to the bird's respiratory tract and/or the entry of infectious agents. These aspects again increase susceptibility to disease and stress within the birds. The creation of dust is a common occurrence on construction sites and, in this instance, the prevailing wind direction is towards the RCL farms.

Dust models using various limits and assumptions were used to make predictions. However, these predictions are challenging as there are no data on current average dust levels or recommended dust levels. In addition, the risk could be more due to the nature of inorganic dust damaging the bird's respiratory tracts or potentially being abrasive to fans and their operation, thereby, increasing ammonia levels in the chicken houses.

This assessment has found that dust levels are certainly likely to be increased around the RCL houses during at least the initial 8-12 month construction period. Whilst the significance of these risks could be very low depending on all the uncertain variables, there is also the possibility that it could significantly increase disease and mortality in either one or all three of the nearest laying houses. If the latter occurred, these impacts would be highly significant for RCL's production throughout KZN.

Based on the recommendations of the poultry specialist that effects will most likely be on the closest house in the direct path of a 'dust storm', and the modelling which shows L14 to be most significantly affected, this assessment concludes that L14 is the farm at most risk. This is also the only farm with open houses which would allow more dust to enter.

Chickens are extremely sensitive to unusual activities and disturbances. Incidences such as sudden loud noises can startle the birds, which can result in panic and piling with some deaths resulting. This assessment found that operational noise and general construction noise will not affect the chickens due to the existing noise within the laying houses.

However, geotechnical investigations have shown that blasting will be required as part of the earthworks. The duration of blasting activities could range anywhere from between two and a half to four months with approximately two blasts per week. The blasting specialist has shown that the vibration and air blast pressures expected from the blasting are significantly low and are not anticipated to affect the birds. However, the modelled noise calculations indicate that at L14, the audible noise could range from anywhere between 51.5 dBA to 92.1 dBA.

This range is significant and difficult to model or predict. Thus, if noise is on the low side of the scale, it is quite possible to conduct this blasting, based on the design provided, so that the birds will not be disturbed or distressed at all. However, if as some calculations indicate, the audible noise from blasting could possibly range up to around 90 dBA (similar to being 7.5 m from a passing motorbike or truck) and will occur twice a week for 4 months, then it is likely to increase the stress levels of the birds and affect their production levels.

Audible noise is also affected by vegetation, buildings and other structures and, thus, there is the possibility that even if blasting noises are modelled or heard outside the buildings at the high end of the decibel scale, within particular houses, depending on their exact topography or orientation, the experience could be far less. This is particularly the case for farms L1 and L2 which are closed farms further away. Alternatively, a poorly drilled or overcharged blast hole on a cloudy day could result in louder noise levels than predicted in the model.

Due to its proximity to the site, L14 is again the farm that is most likely to be affected by audible noises that may potentially result in production losses.

The challenge of mitigation is that it is difficult to predict with certainty exactly how either blasting noise or dust may affect RCL's chickens. The significance of any impact can also range as there are too many variables and assumptions involved in the calculations making it difficult to predict how accurate the models are compared to how actual impacts will be experienced on the ground, especially by biological entities that have a range of tolerances. It is possible these initial earthworks will have no significant impact at all. However, they could have significant financial and production impacts for RCL.

However, considering that no impacts of significance have been identified during the operational phase and the only major impacts, occur during the initial phase of the construction period, on-site solutions need to be found, particularly as these impacts are not certain and may not have any impact on RCL.

For this reason, this assessment has not recommended the no-development option, but has proposed a mitigation approach that will better define and address any possible negative impacts. This mitigation measure includes conducting a test blast, as per the design, along with various monitoring requirements. Thereafter, the EAP believes it will be quite feasible to design the blasting and earthworks programme, with layer house modifications, to address the uncertainties around noise and dust. An important part of the proposed mitigation is to undertake this test blast sufficiently before construction commences, but once Eskom has bought the property. This will allow Eskom and RCL to negotiate and/or programme contract activities to best reduce any impacts. If after mitigation financial losses are still incurred as a result of construction activities, Eskom may need to compensate RCL for such losses.

***Can the construction and operation of the Isundu Sub-station be detrimental to the health and safety of local communities?***

No significant health impacts from electromagnetic fields were identified. Large construction projects will typically result in an increase in vehicle and pedestrian traffic, and the temporary migration of people either to work or to seek work. The health and safety issues associated with this increased traffic and movement in the area are common to many large construction projects and can be acceptably managed to be of low significance.

***What effects will the construction of Isundu Sub-station have on cultural heritage resources?***

No cultural heritage resources of significance will be impacted by the proposed project. However, the farm buildings are over 60 years old and permission from Amafa will be required to destroy these buildings.

***How will earthworks during construction, and stormwater during and after construction, affect the surrounding water courses and environment?***

The proposed Isundu Sub-station, when fully developed, will have an infrastructure footprint of approximately 45 - 60 ha, whilst for the initial phase of development the sub-station is likely to have a footprint in the region of 30 ha.

This assessment found that there will be no significant risk of pollution to the surrounding water courses or groundwater. Also, run-off from the site will be controlled as per the Storm Water Management Plan to address any potential erosion hazards.

***What cumulative effects will the proposed Isundu Sub-station contribute, considered in association with impacts arising from other activities in the region?***

Two key cumulative impacts were identified, viz.

- The impact and alignment of future transmission lines on surrounding enterprises.
- The location of the sub-station will alter the development trajectory of this local area more towards industrialisation rather than eco-tourism.

It is not possible to predict or determine with any certainty what lines would in the future be required and from which direction they may come. This is dependent on the location and size of future power demands, and the location of power generation. However, for this sub-station it is possible to give a relatively good prediction of what future lines may be required and their possible alignment. These are illustrated in Figure 28. However, when or if these transmission lines may be required is not certain.

The Mkhambathini Local Municipality, in particular, is concerned that the location of the sub-station will stop the further development of the area for eco-tourism as planned. Although this development falls within two landscape character areas, the urban fringe corridor and traditional rural settlement, the presence of the sub-station is certainly likely to have some influence on development planning and designs on the farms surrounding the sub-station which run along the P477.

The proposed sub-station and transmission line configuration would not necessarily prevent or change all eco-tourism possibilities within this area of the municipality. However, it is also important to consider the balance of cumulative impacts. Whilst there may be some potentially negative set-backs to this localised area in terms of tourism planning, there may be far more significant cumulative economic set-backs to KZN if strategically important infrastructure such as the KZN electricity grid is not improved and enhanced in line with demand predictions.

In regard to this balance, the Mkhambathini Local Municipality is the second smallest municipality within the Umgungundlovu District Municipality and some of the key proposed tourism developments are still to be developed. Considering that some of these development plans appear to be based on exaggerated returns, it is quite possible their full development and the anticipated economic/employment benefits to be generated may be significantly delayed or less than anticipated.

Importantly, the manufacturing sector together with the agriculture sector, are the dominant employment creators in the Mkhambathini Local Municipality, and the sub-station would not impact the further development of these sectors.

The EAP found that the possible cumulative impact of the sub-station on tourism ventures still to be developed in an urban-fringe environment, is not sufficiently significant to warrant consideration of the no-development option.

**Environmental Impact Statement**

By its nature, the construction and operation of a large sub-station and associated transmission lines will have a negative impact upon the local environment, both biophysical and socio-economic. However, due to the strategic national and provincial need to maintain and improve the electrical infrastructure network, the no-development option is not considered feasible.

However, in considering the authorisation of the proposed sub-station and associated transmission lines, there are a number of the pre-construction mitigation measures, where timing is important, if negative impacts are to be avoided. These relate specifically to the following:

- ❑ Eskom needs to relocate the Africa Bird of Prey Sanctuary entirely. A partial relocation will result in staff, funding and other resources being divided which will have a negative impact upon other conservation activities. This relocation needs to be timed and planned taking cognizance of the fact that impacts from noise and traffic during the initial earthworks stage of construction can potentially put at risk the success of the Bearded Vulture Breeding programme.
- ❑ Eskom should programme a test blast on the site at a suitable time prior to construction to ensure the mitigation measures, programme and timing are optimised to reduce impacts upon RCL.
- ❑ Eskom should negotiate with RCL the closing up of RCL's L14 laying farm to make it light tight and establish suitable dust mitigation screens around the ventilation fans and openings of farms L14, L1 and L2. Necessary monitoring equipment as agreed on between RCL and Eskom should also be installed prior to the commencement of site clearing, earthworks and blasting.
- ❑ There is also the need to develop the required wetland mitigation areas and undertake surveys for any protected frog and vegetation species prior to the commencement of site clearing, earthworks and blasting.
- ❑ Eskom should also commence procuring servitudes, where necessary, to plant the line of visual screening trees at the same time as construction commences.

#### **Opinion on Activity Authorisation and Conditions**

It is the opinion of the EAP that the proposed Isundu sub-station and turn-in transmission line can be authorised based on the findings of this assessment and the conditions outlined in Chapter 13.

This draft EIAR has been prepared after a long process involving stakeholder consultation and participation, and obtaining a range of specialist input. The unique challenges associated with this project arise due to:

- ❑ The strategic importance of the infrastructure and the limitations outlined in terms of feasible alternative sites.
- ❑ The wide range of different land-use concerns surrounding the proposed site.

The EAP believes that this draft report and the proposed mitigation measures have suitably balanced these different objectives to ensure that the positive benefits of the project are realised whilst the negative impacts are suitably mitigated.