ADDENDUM TO
PRELIMINARY ECOLOGICAL REVIEW OF CORRIDOR ROUTES
132kV POWERLINE – CANDOVER TO PONGOLA
(March 2013)

Compiled By : S C Bundy (BSc MSc Pr Sci Nat)
Checked By: S C Bundy

Compiled for : Zitholele Consulting (Pty) Ltd

1. Introduction

Zitholele Consulting (Pty) Ltd have been undertaking a basic environmental assessment process for the proposed establishment of a 132kV powerline between Candover and Pongola and also serving the Golela border post, on the Swaziland- South African border. The proponent is Eskom Eastern Region.

An initial review of possible corridor routes was undertaken by Zitholele Consulting (Pty) Ltd, with a preliminary ecological report on possible route options being compiled by Sustainable Development Projects cc for incorporation and consideration by the environmental assessment practitioners (EAP) and Eskom Eastern Region. This assessment identified the northern line route, with a southern and central line route option being suggested for comparative purposes, as being the most applicable and "optimal" route for establishment of the powerline.

While there was generally consensus amongst the various technical specialists and Eskom on the selection of the "optimal" route, there was a request for additional ecological information from Eskom relating to specific routes identified by the power utility. Such information was requested in order to substantiate and defend the final route selection and recommendation. This assessment is still ongoing.

Due to delays in evaluation and technical requirements for urgent implementation, the EAP has requested an "impact assessment evaluation" based upon existing data to be compiled. The following report and decision matrix table provides such evaluation based upon the March 2012 report, for incorporation by the EAP into a draft impact assessment document. As such the impact matrix presented below is subject to change, particularly given the methodologies being adopted in the ecological assessment presently underway.

2. Background

Three proposed line routes were identified at a preliminary level by the EAP and Eskom personnel. These line routes were based on technical, land legal and land use information as well as other aspects of significance. The three line routes proposed are considered to be the ;

- **Northern line route**, which is routed parallel to an existing 132kV powerline serving between Mkuze and Pongola

- **Central line route**, which intersects with the R69 before proceeding northwards parallel to the R 66 regional roadways.

- **Southern line route**, which follows existing fencelines and lies in close proximity to the Mkuze River. Upon intersecting with the R 66, this line route would run northwards towards the Pongola sub station.

(See Preliminary Assessment)

Subsequent to the identification of these line routes, the proponent has identified permutations to the above routes based upon, primarily, existing fencelines and farm roads. These routes are the subject of further investigation and review.

Table 2 below, however indicates a broad based evaluation framework of negative ecological impacts that have been identified as arising from the implementation of the powerline in either the northern, central or southern routes. The parameters selected for consideration include habitat transformation (i.e the degree to which naturally occurring habitat or vegetation cover, will be removed or altered) ; terrestrial faunal impacts (i.e the degree to which terrestrial fauna will be affected by either transformation of habitat or variation in the landscape through establishment of the powerline). Such impacts may be manifest in ousting of species, changes in population or changes in ethology of species. The impact of the powerlines on avifauna is also considered with such impacts relating to collisions of birds with powerlines, changes in behavior as well as ousting of species through changes in landscape.

These impacts are rated according to the following
Scale : the extent to which the impact will arise
Duration : a temporal estimate as to the timeframe of the impact
Magnitude : a qualitative evaluation of the severity of the impact.

Such impacts are measures according to the following

Table 1. Quantiative parameters utilized in identifying degree of significance of impact

Value	Scale	Value	Magnitude	Value	Duration
5	International	10	Very high / don't know	5	Permanent
4	National	8	High	4	Long term (ceases at closure)
3	Regional (>5km)	6	Moderate	3	Medium term (5-15yrs)
2	Local (<5km)	4	Low	2	Short term (<5yrs)
1	Site	2	Minor	1	Immediate
0	None				

Impacts are adjudged using the above quantitative values in order to identify the cumulative level of impact and this outcome, together with the product of its probability is used to arrive at a "level" of impact. Probability is adjudged according to a further qualitative derived scale using the following values

Probability values

5 - definite

4 – high probability

3 – medium probability

2. – low probability

1- improbable

0 - none

Thus : the level of impact significance = [scale + magnitude + duration] x probability

In order to distinguish on a comparative basis, the products of the above function, an arbitrary scale of significance indicates that products >60 are considered "high", products between 30 – 60 are considered "moderate" and products below 30 are considered "low".

Table 2 below identifies the scale and level of impacts as ascribed to the assessment at hand.

Table 2 . Qualitative evaluation of negative impacts using prescribed methodology of comparative assessment.

Southern Route	Magnitude	Duration	Scale	Sum of parameters	Probability	Product of Impacts
Habitat Transformation	8	4	2	14	4	56
Terrestrial faunal impacts	8	4	2	14	3	42
Avifaunal impacts	8	4	3	15	4	60
SIGNIFICANCE RATING						52.66666667
Central Route						
Habitat Transformation	8	4	2	14	4	56
Terrestrial faunal impacts	8	4	2	14	3	42
Avifaunal impacts	8	4	3	15	4	60
SIGNIFICANCE RATING						52.66666667
Northern Route						
Habitat Transformation	6	4	2	12	4	48
Terrestrial faunal impacts	6	4	2	12	3	36
Avifaunal impacts	6	4	3	13	4	52
SIGNIFICANCE RATING						45.33333333

4. Results

From Table 2, it is evident that all routes show a "moderate" level of impact across the ecological spectrum. However, notably the northern route is indicated as having a lower level of negative impact when compared to the southern and central routes.

The primary factors that contribute to such a significance rating along the northern route are;

- The presence of an existing powerline of similar structure and impact as that associated with the proposed powerline. As such, an additional powerline running adjacent to the existing structure would, (comparatively), amount to the concentrating of negative ecological impacts at a spatial level, rather than introducing new and impacts on previously unencumbered points within the study area, namely the southern and central route options. Impacts that may arise from the new line being established along the northern corridor relate, not only to avian impacts through such effects as avian collisions with the line (bird strikes), but include more latent ecological impacts, such as the establishment of an additional physical strata which alters predator – prey relationships in respect of terrestrial faunal behavior and populations. Such impacts, both identifiable and, by extension, latent, are already present along the northern line route, but are absent from the other routes.

- That vehicular access is a significant qualitative aspect that supports the northern line route as the preferred route option. The establishment of the line along the southern and central route options would necessitate significant improvements to roadways, including river and dam crossings, pruning and removal of vegetation, as well as import of earth and stabilizing materials. The northern route offers generally well established and relatively well maintained road access points, a factor not found in the other routes.

- While the Northern line route traverses the Pongola Game Reserve and related areas of land managed for "conservation and conservation related purposes", other portions of the line route show significant transformation to commercial agricultural lands. This factor is not noted along the southern and central route options, where commercial agricultural activities have ceased and seral processes have reverted to a

secondary vegetative community, while only sporadic settlement and "shifting agricultural activities" are evident at points.

While a detailed quantitative, ecological analysis is underway in order to confirm the above evaluation, it is expected that the factors identified above will be confirmed in this evaluation. The evaluation will consider comparative ecological data in respect of each route according to similarity and structure as well as age and conformity.

5. Mitigation Measures to be Employed

The selection of the Northern line route as that route associated with the least (comparative) ecological impact, requires that a number of mitigation measures be undertaken to ensure that the identified impacts are avoided or mitigated. Such impact mitigation measures are proposed below.

1. Routing. The proposed line route should lie to the west of the existing 132kV line. By lying to the west of the existing line, the placement of towers on the scarp of the elevated points will be avoided, particularly in the northern sections of the route. This has ramifications for impacts upon avian behavior.

2. Tower construction. The tower structures associated with the new line route should be established, where possible, in tandem or close proximity to the existing towers. In this manner, disturbance at edaphic, ground and aerial levels, will be consolidated from a spatial perspective.

3. Bird flight diverters (BFDs). BFDs should be established across the entire line route, with application to either the new or existing powerlines.

4. Vegetation clearance along the line route should be undertaken within and restricted to an 8m vegetation clearance path. Where appropriate and acceptable, the maintenance of identified specimens of significance (e.g large specimens of *Erythrina latissima*, found within the sourveld vegetation form) should be avoided and where required, subject to pruning, rather than felling, in order to establish towers and lines

5. Post construction management of cleared areas should ensue, whereby the invasion of the cleared servitude by exotic vegetation, as well as species such as *Dicrostachys cinerea* is addressed on an ongoing basis.

6. Identification of the upper flood terrace of the Pongola River should be established and the towers associated with the traversing of this river must be placed outside of these points.

Conclusion

This addendum follows the provision of the preliminary ecological assessment of the subject area in order to identify three possible line routes for a proposed 132kV powerline between Candover and Pongola. The recommended powerline option has been selected based upon field observations, statistical analysis of aerial imagery and collated field data, as well as rational consideration of various ecological factors associated with the selection of a preferred line route.

While the applicant has requested additional information on vegetation form and community structure, this addendum to the preliminary report identifies the most applicable line route, given the information at hand and in order to provide the EAP with ecological advice to enable the selection of an optimal route based upon the diverse parameters of the environmental spectrum associated with the area in question.