



MERCURY - PERSEUS 400 kV TRANSMISSION LINE
Supplementary Report No 2: Alignment No. 4

Prepared by:

CHRIS VAN ROOYEN
ENDANGERED WILDLIFE TRUST
PRIVATE BAG X11
PARKVIEW
2122

Prepared for:

STRATEGIC ENVIRONMENTAL FOCUS
P.O. Box 74785
Lynnwood Ridge
0040

NOVEMBER 2003

EXECUTIVE SUMMARY

This powerline will undoubtedly have an impact on the bird species in the area. However, by selecting the proposed servitude and implementing the mitigation measures discussed in this study, this impact can be reduced to an acceptable level. The corridor with the lowest bird sensitivity score is corridor 4. From a bird perspective it is suggested that corridor 4 is selected as it will have less impact on the birds present than the other three corridors.

Collisions

- On all sections of line passing through Grassland, the earth wire should be fitted with Bird Flappers
- Every effort must be made to avoid Wetlands and Ephemeral pans. If that is not feasible, all sections of line passing through or within 500 metres of Wetlands and Ephemeral pans should be fitted with Bird Flappers on the earthwire.
- All sections of line crossing rivers and the adjacent Riparian habitat should be fitted with Bird Flappers on the earthwire.
- All sections of line passing through or within 500 metres of lucerne fields should be fitted with Bird Flappers on the earthwire.
- If alignment 4 is used, the section of line next to the Bloemhof Dam (about 10km) should be monitored once a year for at least five year through physical inspection to determine if collisions are taking place.

Habitat destruction

- Destruction of grassland during construction and operation should be kept to a minimum.
- No destruction of Wetlands and Ephemeral pans during construction and operation should be allowed. In particular no vehicles should be allowed to drive through or across wetlands or pans.
- If alignment 4 is used, destruction of sensitive shoreline or the adjacent Kalahari Thornveld corridor must be avoided.

Disturbance

- The activities of the construction and operations staff must be restricted to the servitude and immediate surrounds. Under no circumstances must birds be exposed to more disturbance than is inevitably brought about by construction and operations activities. Potential trapping and hunting of wild birds by construction crews must be strictly forbidden.

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1. INTRODUCTION

This report should be read as a supplement to the main Bird Impact Assessment Report (dated 10 March 2003) and the Supplementary Report (dated September 2003). It deals with an additional alignment, alignment 4, which was later added as an alternative.

2. BACKGROUND AND BRIEF

See the previous reports. In this instance the brief was to specifically concentrate on the potential impacts where the alignment comes in close proximity to the Vaal River near the inflow of the Bloemhof Dam.

3. STUDY APPROACH

3.1 Information base (source)

See previous reports. Information on the micro-habitat level was obtained through visiting part of the alignment, and obtaining a first hand perspective. **Specific attention was given to the areas in close proximity to the Vaal River (Bloemhof Dam) and Vet River (see appendix A).**

3.2 Assumptions

Please see the previous reports.

3.3 Limitations

Please see the previous reports.

3.4 Glossary of terms

Study area: Refers mostly to half degree squares transacted by alignment 4, with specific emphasis on the areas in close proximity to the Vaal River. Where necessary, the term is expanded to include other alignments.

Corridor: Refers to a specific alignment as numbered on the study area map (1 – 4)

Alternative alignment: Refers to a specific alignment (1 – 4) with one of the variations (a-b)

Proposed servitude: Refers to the proposed final alignment that the transmission line should follow.

Transmission line: Pylons supporting the 400 kV transmission line consisting of two steel support structures (supported by guy wires). Transmission lines area suspended between the supports.

Half degree square: A grid cell of 30'x30' (approximately 2 500km²)

3.5 Methodology

Please see previous reports. In this instance, the field trip was limited to 2627C, especially the areas adjacent to the Vaal River at the Bloemhof Dam, as this is the only important aspect that is not present with the other alignments (see appendix A).

4. STUDY AREA

See the previous reports for a detailed description of the study area.

The area of 2627C through which alignment 4 runs is classified mainly as Kalahari thornveld and shrub bushveld. However this has been largely transformed and now consists predominantly of cultivated land with some small areas of cultivated grassland (please see previous reports for a detailed description of transformed habitat). Significant patches of the original veld type that is still in a reasonable condition exists in the Sandveld Nature Reserve and the Bloemhof Dam Nature Reserve, but both fall outside 2627C. The area where the alignment comes close to the Vaal River at the inflow of the Bloemhof Dam is also extensively transformed by agriculture; with only a narrow belt on both banks of the river that still contain remnants of the original veld types. This belt is characterised by stands of acacia of varying density (see appendix B). This corridor is of importance to several species, as it forms an extension of the relatively undisturbed habitat in the Bloemhof Dam and Sandveld Nature Reserve, and is likely to have similar species occurring there. It is therefore of importance to have a closer look at the species occurring in these two reserves, as they both are classified as Important Bird Areas (Barnes 1998).

The Bloemhof Dam regularly supports more than 5 000 waterfowl. At times it holds important numbers of powerline sensitive species including Greater Flamingo, Lesser Flamingo, Great Crested Grebe, Whitebreasted Cormorant, Darter, Goliath Heron, Cattle Egret, Spoonbill, Yellowbilled Stork, Egyptian Goose, South African Shelduck, Yellowbilled Duck, Cape Shoveler, Knobilled Duck, Spurwinged Goose, Redknobbed Coot, Avocet, and a few pairs of African Marsh Harrier. Saddlebilled Stork is an occasional vagrant. The Kalahari Thornveld surrounding the dam supports several large raptors and terrestrial birds, including Tawny Eagle, African Whitebacked Vultures, Kori Bustard and the occasional Cape Vulture, Lappetfaced Vulture, Pallid Harrier, Martial Eagle and Marabou Stork. The bushveld surrounding the dam holds Redcrested Korhaan and Doublebanded Courser (Barnes 1998).

5. IDENTIFICATION OF RISK SOURCES

Please see previous reports for a description of the risk sources. As far as alignment 4 is concerned, the main concern is related to the possibility of collision impacts of waterbirds where the line runs adjacent to the Bloemhof Dam, as well as potential impacts on breeding raptors in the adjacent Kalahari Thornveld.

5.4 Particulars of line design

Please see previous reports

5.5 Summary of potential risks

The following two tables provide a summary of the potential risks posed to birds by the proposed powerline.

Table 1: Identified potential risks during construction phase

Possible Risks	Source of the risk
Destruction of habitat	Clearing of servitudes, construction of access roads,

	contractor camps
Disturbance of sensitive species	Construction activities, contractor camps

Table 4: Identified potential risks during operation phase

Possible Risks	Source of the risk
Mortality of birds	Collision with earth wire
Destruction of habitat	Maintenance of servitudes, maintenance of roads
Disturbance of sensitive species	Maintenance activities

6. IMPACT DESCRIPTION AND ASSESSMENT

For a detailed assessment of expected impacts please see previous reports, particularly appendix E and F of the main report. These impacts will now be discussed within the context of alignment 4. **Please note that electrocutions are not foreseen as an impact due to the size and design of the line.**

Red Data species (Barnes 2000)

- Habitat destruction: Any destruction of Wetland/ephemeral pan habitat along the route during construction and maintenance will have a negative impact on the species present, including the following species: Bittern, Greater and Lesser Flamingo, Pinkbacked Pelican, White Pelican, Black Harrier and African Marsh Harrier. The ephemeral pans are of particular concern as they represent 'bird rich' areas in this landscape, during periods of high rainfall. These pans are most prevalent in 2825B. It is unlikely that the construction activities will impact on the sensitive shoreline along the Bloemhof Dam in 2627C, as long as activities are restricted to a narrow corridor. The closest the alignment will come to the dam is 750m and 850 metres respectively in two spots.
- Habitat Destruction: Any destruction of Grassland and thornveld habitat along the route during construction and maintenance will have a negative impact on the resident species, including the following species: Blue Crane, Kori Bustard, Secretarybird, Blue Korhaan, Melodious Lark, and Shortclawed Lark. As far as the thornveld corridor next to the Bloemhof Dam is concerned, it may be construction activities could impact on that through potential construction of access roads. It is however doubtful if this will have a major impact on birds occurring in that habitat, as the important species e.g. the vultures, large eagles and bustards are likely to occur within the nature reserves and not on the adjoining farmland where the alignment is situated.
- Disturbance: Disturbance of sensitive species may occur during construction and maintenance activities in any of the habitats along the powerline route. The majority of the more sensitive species are associated with water and so disturbance around pans and wetlands is of particular concern. Generally speaking, disturbance is a short term, temporary impact. The one exception in this case is the Bittern that has been marginally recorded in the area. The secretive nature of the bird make the assessment of impacts difficult, and the species could be underreported as well for the same reason.

This highly sensitive species could permanently abandon suitable habitat if it is disturbed. As far as the thornveld corridor next to the Bloemhof Dam is concerned, it may be construction activities could impact on that through disturbance (vehicles, noise, pedestrians). Again it is doubtful if this will have a major impact on birds occurring in that habitat, as the important Red Data species e.g. the vultures, large eagles and bustards are likely to occur within the nature reserves and not on the adjoining farmland where the alignment is situated.

- Collisions: Several species occurring particularly in the Grassland and Wetland habitats are vulnerable to collision with the earth wire. The areas surrounding Ephemeral pans (2825B) are of particular concern as this is where waterbirds may congregate when conditions are favourable. This could include the following species: Pinkbacked Pelican, Greater and Lesser Flamingos. These species, as well as Grassland species such as Blue Cranes use the pans as roosts; hence much flying takes place at low light intensities at dawn and dusk, making collision with earth wire an even greater potential threat. Extensive local movement between pans are likely when conditions are good. Potential collision impact on waterbirds occurring on the Bloemhof Dam is to some extent neutralised by one factor, namely that the proposed alignment runs *parallel* to the dam. The expected flight movement of waterbirds are likely to be up and down the river, as there is little attraction for them in the surrounding intensively cultivated areas, with the exception of common species such as Egyptian Geese, Spurwinged Geese and Blackheaded Herons (Young *et.al* 2003). This means they will rarely cross the alignment, but this could change if good rains cause ephemeral pans to form in the adjacent farmland. In such a case there could be limited movement across the line between pans and the dam. It is also not known whether birds undertake longer range movement between the extensive waterbodies near Welkom and the Bloemhof Dam, but it is highly likely that it happens, particularly with the two flamingo species. In such a case, there could be a collision potential. Another potential waterbirds collision spot is where the alignment crosses the Vet River, close to Hoopstad.

Non Red Data species

- Collisions: The only impact of concern is that of collision with the earth wire. This will probably involve predominantly the storks, ibises and spoonbills, waterbirds and Black Korhaans. This will be particularly pronounced around the Ephemeral pans and wetlands in the area, but may also occur in the arable lands (particularly Black Korhaan), grasslands and riparian habitat depending on the time of year and food availability. The White Stork is a species for concern as it has a relatively high reporting rate for the study area and will feed wherever its food source (insects) is plentiful. It is known to be particularly attracted to lucerne fields (Barkhuizen 2002). However, the latest information suggests that the species prefer wetland and pasture in the Northwestern Free State (Young *et.al* 2003).

7. RECOMMENDED MITIGATION / MANAGEMENT MEASURES

7.1 Collisions

- On all sections of line passing through Grassland, the earth wire should be fitted with Bird Flappers.
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7.2 Habitat destruction

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7.3 Disturbance

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8. ALTERNATIVES

In order to determine which of the three corridors would pass through areas least sensitive in terms of powerline sensitive Red Data species, Table 2 below was created. Each corridor is assigned the Red Data species sensitivity score (see table Table 2 in the main report) for each square that contains a substantial portion of the route (marginal overlap was ignored). These scores are then totalled to give an overall sensitivity score for each corridor. The corridor with the lowest overall score should have the least impact on powerline sensitive Red Data species. From Table 2 it can be seen that the corridor with the lowest score is corridor 4. From a bird perspective then, it is suggested that corridor 4 is selected as it will have less impact on the birds present than the other three corridors.

Table 2: Sensitivity of corridors 1 to 4 in terms of Red Data species

	Corridor 1	Corridor 2	Corridor 3	Corridor 4
2825D	1.31	1.31	1.31	1.31
2826A	1.6	1.6	-	-
2726C	0.46	0.46	0.46	0.46
2726B	0.55	0.55	0.55	0.55
2825B	-	-	0.95	0.95
2726D	-	1.21	1.21	-
TOTAL SCORE	3.92	5.13	4.48	3.27

9. CONCLUSION

This powerline will undoubtedly have an impact on the bird species in the area. However, by selecting the proposed servitude and implementing the mitigation measures discussed in this study, this impact can be reduced to an acceptable level.

10. REFERENCES

BARKHUYZEN, A. 2002. The Effects Of Agriculture-Based Habitat Transformation On Prey Availability For Birds Vulnerable To Powerline-Related Mortalities. Eskom TSI Project: 7RE – 000009. Eskom TSI, Johannesburg.

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