APPENDIX 13

SPECIALIST EXECUTIVE SUMMARIES

Endangered Wildlife Trust

Zeus – Mercury-Vredefort Dome 765kv

Extended Bird Impact Assessment Study

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OCTOBER 2007

Executive Summary

The study area encompasses three quarter degree squares (1:50 000 map units) namely 2627CA, 2627CB, 2627CC, all of which lies in the grassland biome. However, extensive transformation of the habitat has occurred. Whilst some of the distribution and abundance of the bird species in the study area can be linked to the grassland biome, it is even more important to examine the microhabitats available to birds, due to the extensive transformation that has happened in the study area. These are generally evident at a much smaller spatial scale than the vegetation types, and are determined by a host of factors such as vegetation type, topography, land use and man made infrastructure.

The microhabitats observed in this study area during the field visit are:

- Riparian
- Wetlands and earth dams
  Rivers
- Grassland
- Exotic stands
- Arable land

These microhabitats have varying importance for Red Data bird species, with the natural grassland being the most important. A total of 17 power line sensitive Red Data species and two species protected under the Bonn Convention on Migratory Species have been recorded in the quarter degree squares that are bisected by the various alignments.

However, these species were generally recorded in very low numbers, indicating that the study area as a whole has limited value for large terrestrial Red Data species when viewed from a national perspective. It is a habitat that has been rendered largely unsuitable for large terrestrial species, and every indication points to the very intensive cultivation of the area, and possibly the use of pesticides, as the major cause of this catastrophic decline.

The most significant impact that is foreseen is collisions with the earth wire of the proposed line. Quantifying this impact in terms of the likely number of birds that will be impacted, is very difficult because such a huge number of variables play a role in determining the risk, for example weather, rainfall, wind, age, flocking behaviour, power line height, light conditions, topography, population density and so forth. However, from detailed record keeping by the Endangered Wildlife Trust, it is possible to give a measure of what species are likely to be impacted upon, based on historical records. This only gives a measure of the general susceptibility of the species to power line collisions, and not an absolute measurement for this specific line.

One of the main objectives of this study is to arrive at a preferred alignment for the proposed power line. In order to arrive at a preferred alignment, the following factors were taken into account:

- The distance of line that bisects natural grassland. The reason why grassland was used as an indicator of sensitivity is because the vast majority of Red Data species prefers natural grassland to all other habitat types.
- The distance of line that runs parallel to an existing line. It is a proven fact that placing a new line next to an existing line reduces the risk of collisions to birds
- The number of significant wetlands and/or dams close to an alignment. Wetlands and dams are great draw-cards for many birds, and generally act as areas of high risk from a collision viewpoint.

These factors do not have an equal impact on the size of the risk, therefore a weighting was assigned to each factor. From the analysis of these factors it becomes evident that the **central alignment** seems to hold the least risk of bird interactions, and it is therefore recommended as the preferred alternative from a bird interaction perspective.

ZEUS - MERCURY - VREDEFORT DOME

EXTENDED STUDY PROJECT: SOILS, VEGETATION AND MAMMALS

October 2007

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EXECUTIVE SUMMARY

Minimal impact on the ecology can be achieved by taking into consideration the ecological alignment options as illustrated in the main report.

Ecologically the best route is the Central Alignment, second best is proposed closer to Potchefstroom, further away from the Vredefort Dome area. Specific route alignments are illustrated in the map/aerial photograph in the report.

The ecologically preferred options are therefore:

- 1) ZM (Central Alignment)
- 2) F2 (Ecological Alternative alignment 2)
- 3) F1 (Ecological alternative alignment 1)
- 4) W1 (Western alignment 1).

The impact of the development on biodiversity rich and sensitive soils of alternative routes is envisaged to be medium but with mitigation the long-term impact can be reduced significantly. Most of the unploughed red clay areas have high biodiversity potential associated with pristine grassland. These areas are dominated by Red Grass. The shallow soils on rocky outcrops may also be the habitat of threatened plant species and is known to be the habitat of a mite species that requires protection. Rocky outcrops require protection as these areas are often associated with Red Data species. Wetlands and riverine alluvial floodplains are also sensitive and should be avoided when choosing an ecological friendly alternative for the powerline route.

The direct ecological impact envisaged is medium on most parts on the study area and the distribution of ecological sensitive areas is extensive, except at Central alignment where the impact is less. Highest impact envisaged on alternative routes is at the lower lying part of the catena including wetlands or river drainage systems and also on higher lying koppies and on sensitive clayey areas on the footslopes/plains.

The largest impact envisaged is the impact on fauna and flora associated with rocky outcrops and wetlands and the disturbance of topsoil at clayey foot slopes that are dominated by Red Grass and the loss of habitat of its associated flora and fauna.

ASSESSMENT OF PROPOSED ESKOM LINE ALTERNATIVES WITHIN THE ZEUS-MERCURY-VREDEFORT DOME EXTENDED STUDY AREA, IN TERMS OF ARCHAEOLOGICAL AND OTHER HERITAGE SITES

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October 2007

Report compiled for: PBA International

PROJECT TITLE: ZEUS-MERCURY-VREDEFORT DOME EXTENDED STUDY PROJECT
PROJECT NO: 326
SPECIALIST COMPONENT: HERITAGE

NATIONAL • NASIONALE MUSEUM MUSIAMO WA SETJHABA BLOEMFONTEIN
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1. EXECUTIVE SUMMARY

This study examines a portion of the proposed Eskom 765kV transmission line, and its alternatives, between the Zeus and Mercury substations. The study was necessitated after concerns were raised about the alignment of the proposed power line in the region of the Vredefort Dome area. The Vredefort Dome is a declared World Heritage site, and the proposed power line would skirt the northern edge of the buffer zone of the World Heritage site.

Three proposed alignment options were investigated, and the eastern option was preferred option. However an RoD was issued for the Western alignment. Several appeals were received with the result that all the options, as well as several smaller deviations, were re-examined. This specialist report examines the cultural heritage of the project area.

The specialist study commenced with a detailed examination of the area using Google Earth. Numerous Iron Age stone walling sites were located in the study area in this way, although the resolution of the satellite images of the southern half of the area was not sufficient to examine it for sites. The Iron Age sites located are confined to the undisturbed areas on the hills and ridges of the study area.

Several of the sites were also checked in the field, and areas, such as the Rooikraal Spruit, were also spot checked for lithic artefacts and quaternary fossils. The survey was not exhaustive, but sufficient for certain recommendations to be made.

The proposed Eastern Alignment would be the recommended route from a cultural heritage perspective. Alternative alignments 1, 3 and 4 are all options which can be recommended, as the cultural heritage sites located near these options would not be affected.

The proposed Central Alignment, Western Alignment 2, and Alternative Alignment 2 options can also be considered, as sites located near these lines are sparsely scattered, and could be easily avoided or mitigated.

Western Alignment 1 is not recommended as there are numerous Iron Age and Historical sites along its length, and in places the density is quite high.

All archaeological, palaeontological, historical (older than 60 years) and grave sites (older than 60 years) are generally protected under the National Heritage Resources Act no. 25 of 1999 (NHRA). They form part of the National Estate, and need to be recorded as such.

A detailed Phase 1 survey would have to be carried out along the preferred option before construction takes place, with Phase 2 mitigation if sites are to be disturbed. Should Phase 2 mitigation need to take place, it would probably be sufficient to record all the sites in detail, with minimum, if any excavation necessary. Permits (according to the NHRA) would, however, be required for any destruction of the identified sites.

Sites next to either pylons, access roads or construction camps need to be recorded and a protocol agreed upon so that no unwitting destruction of the sites take place in the future. On no account may any rocks or other artefacts be removed from the sites at any time.

PROPOSED ZEUS-MERCURY 765kV TRANSMISSION POWER LINE

EXTENDED STUDY

as part of the

ENVIRONMENTAL IMPACT ASSESMENT

OCTOBER 2007

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SUMMARY

This report serves to supplement the Social Impact Assessment Reports which were submitted as part of the Environmental Impact Assessments for the Zeus-Mercury proposed 400kV Transmission power line. Additional assessment of the area just west of the Vredefort Dome was necessary to identify a final route corridor for the proposed Transmission power line through this area.
For this extended study, specialist input was required as follows:

- Undertake the necessary site visit of the four alignments as proposed. Assess the alignments and alternatives and if necessary, recommend local deviations.
- Determine levels of significance for potential impacts along the routes.
- Recommend mitigation and/or management measures to address the impacts identified. Provide levels of significance before and after mitigation.
- Identify a preferred alignment. Recommend appropriate mitigation of potential impacts associated with the construction of the 400kV Transmission power line.

To inform the study, the area was visited, interviews were conducted, a desktop study was done, and maps and satellite images were studied.

The study area falls in Ward 1 of the Potchefstroom Local Municipality (PLM), which is part of the Southern District Municipality in the North West Province. The study area is rural in nature. The main activity in the area is commercial farming, and includes cattle, chicken, and crop farms.

Four potential alignments through the study area were identified for assessment. These are called the Central Alignment, Western Alignment 1, Western Alignment 2, and Eastern Alignment. Four additional alignments to the Eastern Alignment were added for assessment.
From the bottom left hand corner of the study area, the Central Alignment follows the existing line along a dirt road. It then crosses a tarred road, to follow the existing 400kV Transmission power line through the middle of a game farm. It then crosses cattle farms, cultivated land as well as a farm utilised for breakaways and adventure camps.
The Western Alignments 1 and 2 go through the western part of the study area. These proposed alignments do not follow existing infrastructure, but they do follow farm boundaries for most of the route. These alignments cross cattle farms and cultivated land, and are in close proximity of tourism facilities and smallholdings.
The Eastern Alignment goes southwards, and having crossed the tarred road, the proposed alignment follows a dirt road to finally join up with the existing line. It crosses cattle farms, cultivated land and a horse stud farm. It passes in close vicinity of chicken houses of Chubby Chick.

In order to assess the alternatives in respect of its anticipated social impacts, a distinction was made between the following impacts:

- Category 1: Impacts that are not expected to differ between the proposed alternatives, e.g. the number of employment opportunities that might be created by the proposed project are expected to remain the same, irrespective of the chosen alternative. These impacts were assessed in detail in the main Social Impact Assessment Report, and are not again discussed in this report. The assessment therefore did not consider the potential impacts as a result of
    - institutional and legal processes (changes in the role, efficiency and operation of governments and other organizations) together with empowerment processes (changes in the ability of people to get involved in and can influence decision making processes);
    - economic change processes were considered similar for all the alternatives. These include employment opportunities and compensation.

- Category 2: Impacts that are expected to be different between the proposed alternatives, e.g. the need to resettle certain households increases proportionately if the development traverses densely populated areas as opposed to skirting sparsely populated areas. The information gathered indicted that the main category 2 differentiators in choosing a final alignment would be in changes to demographic, land use, and socio-cultural processes during the operation of the 400kV Transmission power line. These change processes are defined as follows:
    - demographic change processes are the changes in the number and composition of people;
    - land use change processes are changes in land use patterns; and,
    - socio-cultural change processes are the changes in the way in which humans behave, interact and relate to each other and their environment and the belief and value systems which guide these interactions.

The approach and methodologies that were applied to fulfil the objectives of this report included a field visit, interviews with eight I&APs, a desktop study, maps and satellite images were studied, and finally the potential impacts were rated and a quantitative comparative assessment was done.

The sub sections that follow discuss the current and future demographic, land use, and socio-cultural change processes without the line, followed by discussions on how the proposed 400kV Transmission power line might change these, and the impacts that might be expected as a result.

Demographic Change Processes

It is not expected that the rural population will show a significant change in population numbers. The land owners interviewed seemed to have settled in the area, and future plans do not include subdivision of land. Future plans that were mentioned were tourism related. Five of the eight land owners interviewed mentioned that they planned to develop/further develop tourism establishments on their land. An increase in tourist numbers to the area might therefore be expected, also in light of the presence of the Vredefort Dome on the eastern border of the ward. The tourism numbers will fluctuate, and will not be constant as it is dependent on seasons and holidays/weekends/long weekends. The majority of those who planned future tourism development felt that the line would detract from the experience they wanted to give their visitors, and they might have to adapt their plans as a result of the presence of the line. This is discussed in more detail under socio-cultural change processes.

The presence of the line will not significantly impact on current population numbers. It does not seem likely that people will move out of the area because of the presence of the 400kV Transmission power line. None of the landowners interviewed mentioned that they were considering leaving the area.

In terms of demographic processes, of concern are the potential health and safety **impacts** on people as a result of the proposed Transmission power line. Physical and mental health in the context of a power line is related to Electro and Magnetic Fields (EMFs), electrocution, fire and collapse of pylons. It is therefore preferable that an operational 765kV Transmission power line skirts settlements and goes through less densely populated areas to mitigate potential health and safety impacts. The added benefit is that this mitigation measure will also result in more effectively mitigating impacts arising during construction. Construction activities, construction vehicles and the movement patterns of these vehicles and equipment might temporarily prohibit access to properties and other amenities in the area as well as increase noise levels, giving raise to an increase in

frustration levels and the safety concerns of the residents. By impacting on as few people as possible, it will be possible to better manage potential construction impacts on people.

Land use Change Processes

In the study area, land was allocated to families in the late 1800's to early 1900's to cultivate the land. Over time the land was subdivided to accommodate the expanding families, and land was also sold to other families and newcomers to the area. The landuse has diversified somewhat over the years. Land use in the study area include cattle farming for meat and milk, cultivation of maize and sunflowers, a number chicken farms (Chubby Chick), buffalo breeding (Copperfield), tourism and a game farms. There are approximately two Lodges/Bed and Breakfasts in the study area, and an adventure camp. There are approximately four game areas in the study area, of which two are part of a tourist offering (Copperfield and Oude Waenhuis).

The study area borders the Vredefort Dome. According to the Mail and Guardian Online (14 July 2005), the Vredefort Dome was proclaimed a World Heritage Site at the 29th World Heritage Committee meeting. The committee then had to establish management structures, and comply with requirements of the Unesco (United Nations Educational, Scientific and Cultural Organisation) - all of which is in the process of being set up.

The most preferred alternative would be one that crosses grazing land, followed by cultivated land, and finally trees for browsers. Where the line does cross areas with centre pivots, the line should preferable follow boundary lines of farms or land parcels. The reasons for this order of preference are as a result of the potential **socio-economic impacts** of the line as a result of land use change processes.

Socio-cultural Change Processes

Socio-cultural change processes are the way in which humans behave, interact and relate to each other and their environment and the belief and value systems which guide these interactions. The Transmission power line will not significantly affect the way in which people interact during operation. Inhabitants will still be able to move freely under the power line. All with the existing power line crossing their property, except the game farm owner of Copperfield, mentioned that they got used to it and that it did not bother them. However, it seemed as if the placement of the new line will impact on the way in which people relate to their environment. It seemed as if the placement of the line through an area untouched by a power line would impact negatively on the sense of place.

Considering the comments from interviewed affected parties, the proposed line will impact on the sense of place of inhabitants as well as tourists. The proposed line should therefore impact on the sense of place of as few people and tourist establishments as possible, as well as fit in with the current sense of place as much as possible. Displacement and relocation should be avoided to impact as little as possible on people's sense of place.

Conclusions

The study area was assessed considering Category 2 impacts in terms of demographic, land use, and socio-cultural changes which might occur as a result of the presence of the proposed line. The impact assessment is summarised ahead:

Table 9: Summary of the Significance of Potential Impacts

Before mitigation	***Eastern Alignment***		***Western Alignment 2***		***Western Alignment 1***		***Central Alignment***	
Health and safety Significance	**Low -**	**18**	**Low-**	**18**	**Low -**	**22**	**Low-**	**18**
Socio-economic (land use) Significance	**Medium -**	**36**	**Medium -**	**44**	**Medium -**	**44**	**Medium -**	**36**
Displacement Significance	**High -**	**44**	**Medium-**	**44**	**Medium -**	**44**	**Medium -**	**44**
After mitigation	***Eastern Alignment***		***Western Alignment 2***		***Western Alignment 1***		***Central Alignment***	
Health and safety Significance	**Low -**	**18**	**Low -**	**22**	**Low-**	**18**	**Low-**	**18**
Socio-economic (land use) Significance	**Medium -**	**36**	**Medium -**	**44**	**Medium -**	**44**	**Medium -**	**36**
Displacement Significance	**Low –**	**22**	**Medium -**	**44**	**Medium -**	**44**	**Medium-**	**44**

Without and with mitigation, the Central and Eastern Alignments are preferred when considering potential health and safety impacts, and potential land use changes in isolation. In terms of the potential number of people to be displaced, the Eastern Alignment along Alternatives 1 and 2 are preferred. However, considering these alternatives holistically and not in isolation, the following can be said:

- In terms of sense of place for the majority of those interviewed, the Central Alignment emerges as the preferred alternative because it follows an existing line. Landowners are already used to this line, and those affected by it have planned their activities and developments around this line. The owner of Coppertone, a tourist destination, does not prefer this alternative because of the potential impact on his game farm. This land owner has buried his distribution lines to minimise the impact on sense of place.
- In terms of existing tourist destinations in the area, the Eastern Alignment emerges as a preferred alternative. This alternative does not affect Oude Waenhuis and Coppertone, as

well as have the least significant impact on the adventure farm – where the Eastern Alignment joins op with the Central Alignment. However, the tourism activities are not the only income of these owners, and it is not a given that a Transmission power lines will result in the closure of tourism destinations. The Central and Western Alignments are therefore not "no-go" areas because of tourism activities and are still possibilities despite the fact that these alignments are in the backyards of tourism establishments.

- In terms of potential health and safety impacts as well as potential future development, the Western Alignment 2 is the least preferred when considering the potential number of people that might be impacted on in case of potential health and safety impacts. According to the social specialist these are the potential impacts that should carry more weight in comparison to other potential impacts. Although the argument might be that it is improbable that the presence of the line might affect the health and safety of people, the potential impact (should it happen) might have a significant physical and mental health impact on people (e.g. injuries and death of important others). This will also mitigate impacts arising during construction. Construction activities, construction vehicles and the movement patterns of these vehicles and equipment might temporarily prohibit access to properties and other amenities in the area, giving raise to an increase in frustration levels and the safety concerns of the residents. Western Alignment 1 is the second least preferred alternative, because this is the next line closest to denser populations and potential future developments.
- Eastern Alignment following Alternatives 1 and 2 is preferred in terms of avoiding the potential displacement of people, and Alternative 1 does not follow existing roads and/or power lines. Following Alternative 1 might necessitate the construction of access roads. In this case, this alternative will interfere with less people's daily movement patterns during construction, as it does not follow the road that is used by more people.
- For the Central Alignment, access roads already exist, and this alternative will also interfere with less people's daily movement patterns during construction as it does not follow a road that is used by more people.
- Many of the farms will be affected by the proposed line should Western Alignment 1, the Central Alignment or the Eastern Alignment be followed. These landowners have planned their activities to accommodate the existing line along the Central Alignment. It is recommended that a second line on their properties follow the existing line or follow along the borders of their properties in order not to further "dissect" their properties, impacting on land use and sense of place.
- The assessment of the potential impact of the proposed Transmission power line on the sense of place of the Vredefort Dome visitors will have to be informed by the Visual Impacts Assessment. The social specialist argues that the health and safety of people carry the most weight, and Western Alignments 1 and 2 are therefore not preferred. The social specialist also argues that the potential impacts on the directly affected parties carry more weight than the potential impact on visitors to the Vredefort Dome. Directly affected parties live in the area from day to day. Most of the directly affected parties are farmers who do not leave their home environment during the day to work elsewhere, and are therefore intensely involved with their home and surrounds. In terms of the preferred alignment considering the Vredefort Dome, the preferred alignment should be informed by the Heritage and Visual Impact Assessments.

In light of the results of this study,

- To the north of the R53, the central route is the preferred route. This section does not cut in between houses, but skirt the houses to the west; it follows and existing line with existing access roads; it passes to the east of the tourist adventure establishment; it affects less land for grazing and cultivation.
- This section of the central route (north of the R53) should be preferred should the Western Alignment 1 or the Eastern Alignment be the preferred alignments. Alignment Alternative 2 should therefore be given preference for the Eastern Alignment, and a similar connection should be considered from Western Alignment 1 to the Central Alignment.
- For the section south of the R53, the central alignment is preferred. Although the central alignment will in all likelihood result in the displacement and relocation of labourers, these labourers have complained about the noise of the exisiting line, and the impacts as a result may therefore not be as significant.
- Western Alignment 1 should avoid the Sandnek (next to Copperfield).

Based on the findings of this report, it can be concluded that the social environment in general pose no fatal flaws to the development of the proposed Transmission power line, under the condition that the identified mitigation measures as recommended in this document and the main SIA are implemented and adhered to.

The final route corridor should result in the displacement of a minimum number of people, and should have the least potentially significant negative impact on the health and safety of people as well as their sense of place. This will also mitigate impacts arising during construction.

Construction activities, construction vehicles and the movement patterns of these vehicles and equipment might temporarily prohibit access to properties and other amenities in the area, giving raise to an increase in frustration levels and the safety concerns of the residents.

In light of these conclusions, the Central Alignment followed by the Eastern Alignment Alternative 4 is preferred, followed by the Western Alignment 1. The final selection of the preferred alignment in the context of the Vredefort Dome should be informed by the Heritage and Visual specialists.

The probability of social mobilisation against the project is highly probable. Social mobilisation is attitude formation and refers to the perception that people in the local community might form on the proposed project, which in turn would influence their attitude towards the project. Different members of the local community in the study area is unsupportive of different alignments, because of the potential impact on their land and plans, as well as the negative experience by some of the landowners of the negotiation process for the eastern alignment. Other landowners distrust the reason for the extended study.

The risk for social mobilisation is therefore high because the project proponent is perceived as dishonest. To ensure support of the project and reduce the risk of social mobilisation, the project

proponent should at all times be seen to care about the local community. Transparent information should be supplied to the community from the outset of the project.

- The local community should play an active participatory role in the planning process, especially landowners of neighbouring properties.

The undertakings in the EMP should also be implemented effectively and with due diligence.

ESKOM
TRANSMISSION

ZEUS-PERSEUS AND ZEUS-MERCURY 765 kV TRANSMISSION LINE

VISUAL IMPACT ASSESSMENT ADDENDUM

REVIEW OF SEVERAL ALTERNATIVE ALIGNMENTS OF A SECTION OF THE ZEUS - MERCURY 765kV TRANSMISSION LINE IN THE POTCHEFSTROOM - VREDEFORT DOME AREA

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ALTERNATIVE ALIGNMENTS OF A SECTION OF THE ESKOM ZEUS-MERCURY 765 KV TRANSMISSION LINE IN THE POTCHEFSTROOM – VREDEFORT DOME AREA

VISUAL IMPACT ASSESSMENT

EXECUTIVE SUMMARY

INTRODUCTION

A specialist study was undertaken by Cave Klapwijk and Associates (CKA) of a proposed 765 kV transmission line from the Zeus Substation near Secunda / Charl Cilliers to the Mercury Substation near Orkney / Klerksdorp.

A Record of Decision (ROD) was issued for an alternative west of the central route along the existing 400 kV transmission line. This decision has been appealed against by several Interested and Affected Parties (I&APs).

Eskom, however, have decided to re-assess this area and, if necessary, look at an alternative route of the currently approved route. The routes in this report are described as:

- Eastern Alignment
- Western Alignment 1 and 2
- Central Alignment
- Alternative Alignments 1-4

This study is a review of the visual impact of sections of alternative routes for a 765 kV transmission line that are located between Potchefstroom and the Vredefort Dome. These form part of the 765 kV Eskom Zeus-Mercury Transmission Line from near Charl Cillers in Mpumalanga to near Orkney in the Free State.

In order to address the objectives of the study a site visit was undertaken during October 2007 to determine the setting, visual character and land uses of the areas. Analytical maps to determine the extent of the potential impact were developed using Geographic Information System (GIS) algorithms, available in the Arcview Software Suite. 1:50 000 maps and route alignment maps supplied by the Client were used together with information gathered in the field to determine the setting, visual character and land use of the area surrounding the route, the *Genius Loci* (sense of place), the extent of the affected visual environment, the viewing distance and the critical views.

LIMITATIONS, CONSTRAINTS AND ASSUMPTIONS

Determining a visual resource and the impact thereon in absolute terms is not achievable. Subjectivity cannot be excluded in the assessment procedure.

The assessment is based on assumed demographic data. No detailed study was done to determine accurate data on potential viewers of the project components.

FINDINGS

The impact assessment was undertaken for only the Transmission Power lines as per the Terms of Reference and the selected alternatives. This study evaluated the visual impact of the Zeus-Mercury 765kV Transmission Power line alternatives with a view to assessing its severity based on the author's experience, expert opinion and accepted techniques.

The description of the visual impacts of the phases of erection and decommissioning are not considered as significant visual impacts since the period of activity is of short duration and of a primary impact (localized, of short duration and easily mitigated at the end of the phase). The fact that disturbed areas, e.g. camps / laydown areas will be rehabilitated also reduces the impacts of these phases.

It is the operational phase that presents the most significant long term visual impact. This is due primarily to the scale, form and number of transmission towers and to a lesser extent the transmission cables. Views of the towers and line recede more effectively at distances perpendicular to the line that if viewed from an oblique angle. This means that the transmission line slowly disappears into the distance if viewed at a right angle to the line that if viewed at an oblique angle. The visibility of the towers and line also recedes if viewed against a topographical backdrop rather than against the sky.

The Transmission Power line alternatives will exert a negative influence on the visual environment. This is largely due to the:

- high visibility of the transmission line;
- impact on the visual quality and sense of place;
- impact on selected critical views;
- height of the pylons / towers that could be dominant in the landscape;
- high visibility of construction and operation activity within areas of uniform visual pattern such as timber plantations and sugar cane fields;
- low Visual Absorption Capacity through areas of uniform visual pattern.

The significance, however, of the visual impact during operation for the various alternatives is as follows:

- Western Alignment 1 is medium
- Western Alignment 2 is low
- Central Alignment is medium to high
- Eastern Alignment varies from medium to high in sections to medium and low
- Alignment Alternative 1 is medium to low
- Alignment Alternative 2 is medium to high
- Alignment Alternative 3 is medium
- Alignment Alternative 4 is low

In conclusion, based on the field observations and the studies herein, from a visual point of view, the corridor that exhibits the lesser negative significant impacts is the Western Alignment 2.

It is therefore recommended that Western Alignment 2 be the preferred alignment based on the visual criteria. It is further recommended that this alignment be modified and be adjusted further west where it crosses over the R57.