



**AN ADDENDUM TO THE ENVIRONMENTAL
IMPACT ASSESSMENT REPORT FOR THE
PROPOSED ESTABLISHMENT OF A NEW COAL-
FIRED POWER STATION IN THE LEPHALALE
AREA, LIMPOPO PROVINCE**

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Appendices:

Appendix A: Previous Correspondence

1. INTRODUCTION

In order to be able to adequately provide for the growing electricity demand, Eskom Holdings Ltd propose to construct a new power station with a maximum capacity of 4 800 MW in Lephalale (previously Ellisras) in the vicinity of the existing Matimba Power Station.

In terms of the Environmental Impact Assessment (EIA) Regulations, Eskom Holdings Ltd requires authorisation from the National Department of Environmental Affairs and Tourism (DEAT) for the undertaking of the proposed project. In order to obtain authorisation for this project, comprehensive, independent environmental studies must be undertaken in accordance with the EIA Regulations.

An Environmental Impact Assessment (EIA) is an effective planning and decision-making tool. It allows the environmental consequences of a proposed project to be identified and managed through the planning process. Eskom Holdings Ltd appointed Bohlweki Environmental, as independent consultants, to undertake the required environmental studies to identify and assess all potential environmental impacts associated with the proposed project. As part of these environmental studies, I&APs were actively involved through a public participation process throughout the EIA process. The environmental studies followed a two-phased approach:

- Phase 1: Environmental Scoping Study (ESS)
- Phase 2: Environmental Impact Assessment (EIA)

The ESS evaluated the identified terrace and ancillary infrastructure location alternatives, and recommended the most favourable options for further investigation in the Environmental Impact Assessment phase, namely the farms Naauwontkomen and Eenzaamheid (see figure 1.1). Comments and inputs from I&APs during the EIA process were encouraged in order to ensure that all potential impacts are being considered within the ambit of the study. The nominated preferred sites underwent further detailed studies during the EIA phase which once again included a comprehensive public participation process.

The project includes the establishment of a new coal-fired power station in the Lephalale area. The power station may ultimately have a maximum installed capacity of up to 4800 MW, but the first phase of the development will be approximately half that installed capacity. The exact output will depend on the specification of the equipment installed and the ambient operating conditions. The footprint of the proposed new power station is still to be determined through final engineering and design, but would be approximately 700 ha for the power plant and associated plant (terrace area), and an additional approximate 500 -

1000 ha for ashing facilities (ash disposal options are currently being investigated).

Through the public participation process, Bohlweki Environmental and the applicant were made aware of issues regarding two farms (i.e. Nooitgedacht and Vlakvallei), owned by Mr MW de Jager, via their attorneys GVD Inc Attorneys. These farms are situated to the south-west of the proposed sites for the construction of the power station (see Figure 1.1). The issues raised included the following:

- The breeding of rare / endangered species such as TB free buffalo and Roan antelope.
- The sensitivity of the Roan antelope. They are a sensitive species and this needs to be investigated.
- The tourism aspect of the farm, namely hunting, eco-tourism and safaris. GVD Inc Attorneys believe that from the hunters point of view they do not want to see the power station and therefore do not agree with the tourism specialist that the tourism industry in the area will be positively impacted by the power station as stated in the ESS and EIA reports.
- The land value of the farm will decrease.

Through correspondence via letter as well as a meeting between all parties it was agreed that Bohlweki Environmental would undertake to investigate, and compile a report on, the above issues and the impact on the farms and businesses in question. All correspondence and the minutes of the meeting with GVD Inc Attorneys are included in Appendix A.

Figure 1.1: Map showing the preferred sites investigated during the EIA phase

2. ENVIRONMENTAL STUDY TEAM

Table 2.1 outlines the project team and the fields of specialisation that undertook to compile the report in question. A site visit was undertaken to the farms in question, by the entire project team, on 2 June 2006.

Table 2.1: Proposed specialist team and their areas of expertise

Name and Organisation	Specialist study to be undertaken
Ashlea Strong of Bohlweki Environmental	Project Manager for the EIA process
Lourens du Plessis of MetroGIS	Visual Impact assessment and GIS mapping
Dr Chris Kingsley (BVSc (Pret.) BSc (Hons.) Zoology (Natal) Veterinary Surgeon)	Assessment of the impact on Game (including Roan antelope and Buffalo)
David Blair of SiVEST	Assessment of impacts on tourism potential and economic value

3. VISUAL IMPACT ASSESSMENT

3.1. Introduction

Eskom Holdings Limited deemed it necessary to commission an addendum to the Matimba B Visual Impact Assessment Report focusing specifically on the potential visual impact of the construction and operation of the proposed Matimba B power station on the farm Nooitgedacht 514 LQ. The intention of this report is to ascertain the site-specific visual impacts associated with the power station and ancillary infrastructure on the activities and visual quality of the aforementioned farm. It is not intended to replace the visual impact assessment, but rather to supplement it and to build forth on its findings at a site-specific scale.

3.2. Scope and Limitations

The scope of work includes:

- A visit to the potentially affected farm.
- An assessment of the activities and potentially affected observers on the property.
- The evaluation/verification of the findings of the visual impact assessment report.
- Identification of additional visual impacts not covered by the report.
- To make recommendations regarding impact mitigation and the envisaged effectiveness of the suggested mitigation measures.

The limitations related to the Nooitgedacht extension to the original visual impact assessment is primarily restricted to the availability of better contour data (5 m) with which a more detailed digital terrain model (DTM) could have been built. This would have aided in a more accurate model from which to analyse the visual exposure of the proposed power station. The original DTM includes a combination of 20 m contours for the larger study area and 5 m interval contours for the Grootegeluk mine and mining area. This limitation is however not seen as insurmountable, due to the fact that the physical evaluation of the visual exposure of the proposed facility on the property verified the validity of the existing viewshed analyses.

A further limitation, as was encountered during the visual impact assessment phase, is the difficulty of incorporating the natural vegetation cover of the region into the DTM. This was once again supplemented by first-hand observations and is not seen as unnecessarily restricting on the successful outcome of this study.

3.3. Methodology

The methodology utilised in the assessment of the visual impact, as per the previous reports submitted, includes:

- The potential visual exposure of the proposed power station.
- Visual distance/observer proximity to the facility.
- Viewer incidence/viewer perception.
- Visual absorption capacity of the natural vegetation.

This was supplemented with valuable first-hand experience of the farm in question and interviews with potentially affected parties and subsequently led to the identification of site-specific issues related to the visual impact that would further refine the assessment of the impact from the property in question.

These issues include:

- The cumulative visual impact of the proposed power station, the existing power station and the mining activities in the region.
- The impact on the sense of place of the farm.

These and other related sub-issues will be addressed in greater detail later in the report.

3.4. Description of the affected environment (Farm Nooitgedacht 514 LQ)

The farm Nooitgedacht 514 LQ is located south-west of the proposed Matimba B power station at distances ranging from 7 km (at the closest) and 13 km (at the furthest). It is, on average, 15 km south-west of the existing Matimba power station and approximately 11 km from the Grootegeluk coal mine.

The farm (see Map 3.1) is accessed from Lephalale by means of approximately 20 km of dirt road from the Steenbokpan Road. The topography is relatively flat and is described as plains with scattered hills and undulating plains towards the south of the farm. The broad vegetation type is predominantly woodland and is relatively undisturbed for large parts of the farm. Exceptions occur near the entrance gate to the farm where the vegetation had been cleared for past farming and agricultural practises. Several transmission lines from the existing Matimba power station traverse the northern boundary of the farm where the natural vegetation has also been cleared to a large degree. Another transmission line across the south-eastern corner of the farm and the secondary road, providing access to the farm, dissect the farm into three units.

The farm is primarily utilised as a hunting and game breeding area, and include some rare species including buffalo and rhinoceros. Income is derived from overseas tourists who visit the farm for trophy hunting, game viewing and the general wild African bush experience. Accommodation is provided in the form of two luxury lodges situated alternately on the south-facing slope of a hill (on the western boundary of the farm) and a leafy bush lodge beneath the same hill, close to Sandloop River. The farm owner and his family also reside on the farm and manage the daily hunting, maintenance and catering activities themselves.

Map 3.1: Map showing the location of the farms Nooitgedacht and Vlakvallei in relation to the proposed new power station.

3.5. Issues related to the visual impact

3.5.1 Potential visual exposure

The viewshed analyses undertaken for the visual impact assessment report, indicated that the proposed power station would, due to its considerable dimensions and the relatively flat terrain, have the potential to be visible for large portions of the study area and from great distances. The site visit confirmed the results of the viewshed analysis, based on the fact that the existing power station with similar dimensions is visible. The extent of the mining operations and the transmission lines north of the farm were also clearly visible. **These sightings of the existing Matimba power station were however only possible from north-facing observation points elevated above the vegetation cover.**



Figure 3.1: Matimba power station from the farm Nooitgedacht (approximately 17.5 km).

3.5.2 Visual distance

Sightings of the proposed Matimba B power station from the farm Nooitgedacht will occur from distances ranging from 7 km (closest) to 13 km (furthest). This zone of visual influence is described, based on the facility's dimension and functional design, as falling within a medium to longer distance view where the power station would become part of the visual environment, but would still be visible and recognisable. This zone constitutes a high to medium visual prominence.

3.5.3. Viewer incidence/perception

The nature of the tourism practised at Nooitgedacht and the exclusive character of the lodge indicates a low density of potentially affected observers. The overseas tourists attracted to this farm are however primarily focused on a safari style experience, and the construction and operation of a large industrial structure such as the proposed Matimba B power station, will generate a predominantly negative (visual) perception.

3.5.4. Visual absorption capacity of the natural vegetation

This visual absorption capacity of the natural vegetation in this region, and on this farm, is considerable and is still the single most important mitigating element in the construction of the proposed power station and support infrastructure. Large areas are shielded from these activities due to the relative natural state of the woodland, thicket and shrubland found throughout the region.

3.6. Visual impact Assessment

3.6.1. Areas of visual impact

The directly affected areas of visual impact on the farm Nooitgedacht are restricted to the north-facing slopes and crests of hills and ridges where the observer is elevated above the vegetation cover. This does not imply that the visual impact does not influence the farm as a whole, but rather indicate the scattered nature of the sighting of the proposed power station. Large areas of the farm will be unaffected by the power station due to the enclosed nature of the woodland and the restricted field of view brought about by the bushveld vegetation.

The concentration points on the farm (mainly the two lodges), where visitors will relax after their hunting or game viewing activities, will not be affected. This applies to the hilltop lodge where the lodge is oriented in a southerly direction, away from the existing Matimba power station and the Grootegeluk mine and to the bush lodge where the field of view is severely restricted by trees.

Visual impacts will occur where tourists and hunters venture into the visually exposed areas as mentioned in the first paragraph. Specific facets of the visual impact, from these affected areas and from other potentially affected areas outside of the farm, will be discussed under the next few headings.

The severities and areas of visual impacts from the farm are reflected in the table below.

Table 3.1: Visual impact from Nooitgedacht 514 LQ - power station.

Area of Visual Impact	Nature	Extent	Duration	Intensity	Probability	Significance	Mitigation potential
Hilltop/bush lodge	Negative	Regional	Long term	Low	Improbable	Low	Low
Elevated viewpoints/ North-facing ridges and crests	Negative	Regional	Long term	High	Highly probable	High	Low
Other areas	Negative	Regional	Long term	Low	Improbable	Low	Low

3.6.2. Impact of ancillary infrastructure

This report focuses primarily on the impact of the proposed power station on the farm due to the large dimensions of the facility and the relatively long distance from the farm. The envisaged visual impact of the ancillary infrastructure (ash dump, coal stock pile and conveyor belts), from the identified areas of potential impact, would be considerably lower due to the low visual prominence of these elements over this distance (6 km).

Table 3.2: Visual impact from Nooitgedacht 514 LQ - ancillary infrastructure.

Area of Visual Impact	Nature	Extent	Duration	Intensity	Probability	Significance	Mitigation potential
Hilltop/bush lodge	Negative	Regional	Long term	Low	Improbable	Low	Low
Elevated viewpoints/ North-facing ridges and crests	Negative	Regional	Long term	Medium - Low	Improbable	Medium - Low	Low
Other areas	Negative	Regional	Long term	Low	Improbable	Low	Low

3.6.3. Lighting impact

The impact of lighting of the proposed power station at night (security, operational and aircraft warning lights) would have a similar area of visual influence as mentioned above. This would be especially true for the lighting impacts associated with the glare (the action of staring directly into a light fixture) from floodlights and, to a lesser degree, the aircraft warning lights

perched on top of the smoke stacks. This visual impact will have a cumulative effect, as the proposed power stations lights will be additional to the lighting from the Matimba power station and the Grootegeluk mine. The careful design, fitment, shielding and placement of lighting by a qualified lighting engineer can mitigate the visual impacts associated with glare and spill light (light trespass) to a large degree.

Another impact of lighting, which also emanates from the addition of new light sources in a relatively remote area, is the effect of sky glow where light reflects of moisture and dust particles in the atmosphere during certain climatic conditions. This impact is, due to its cumulative nature, difficult to quantify and cannot be addressed in isolation.

Table 3.3: Visual impact of lighting (glare) from Nooitgedacht 514 LQ.

Area of Visual Impact	Nature	Extent	Duration	Intensity	Probability	Significance	Mitigation potential
Hilltop/bush lodge	Negative	Regional	Long term	Low	Improbable	Low	N.A
Elevated viewpoints/ North-facing ridges and crests	Negative	Regional	Long term	High	Highly probable	High	Medium - High
Other areas	Negative	Regional	Long term	Low	Improbable	Low	N.A.

3.6.4. Impact on sense of place

Visual impacts can occur through the mere negative perception or disillusioned expectations of the potential observer. Sense of place can be described as a "feeling of belonging" or "a happiness to be somewhere" brought about mainly by the fact that the particular location meets your expectations. These expectations are formed and influenced by a myriad of factors and is obviously subjective and dependent on the purpose of the visit, cultural background, state of mind, etc.

Some of these factors include the physical appearance (natural features, landscape, man-made structures, etc.) whilst other factors relate to the social or cultural experience of the area. This area of influence would typically include issues such as the dominant land use activities, the perception of safety, security and health.

Foreign visitors to South Africa often expect an African wilderness experience portrayed in the film media. Expectations include wild, untouched landscapes and

vistas, roaming wild animals and rustic five star accommodation. These outside factors and the marketing of the farm as a wilderness area shape the visitor's expectations and any deviation from this expectation, such as the presence of a power station, mining activities and other developments can lead to disappointment and ultimately an impact on the perceived sense of place.

The farm in question obviously aspires, through the activities and accommodation offered to visitors, to market and continue marketing itself as such a destination. It has up to the present been able, it seems, to weather the fact that it is not as remote (approximately 50 km from Lephalale) as it would like to be. It is not untouched by development and already contains a certain level of visual clutter in the form of the transmission line infrastructure and the existing mining and power generating activities in the area. The construction and operation of another power station, coupled with the future expansion of the Grootegeluk mine and other industrial activities earmarked for the remainder of the Grootestryd farm will encroach and continue to cumulatively impact on the tourism activities. The photo below indicates the potential compound visual impact of another power station in the region, from one of the specifically affected areas on the farm.

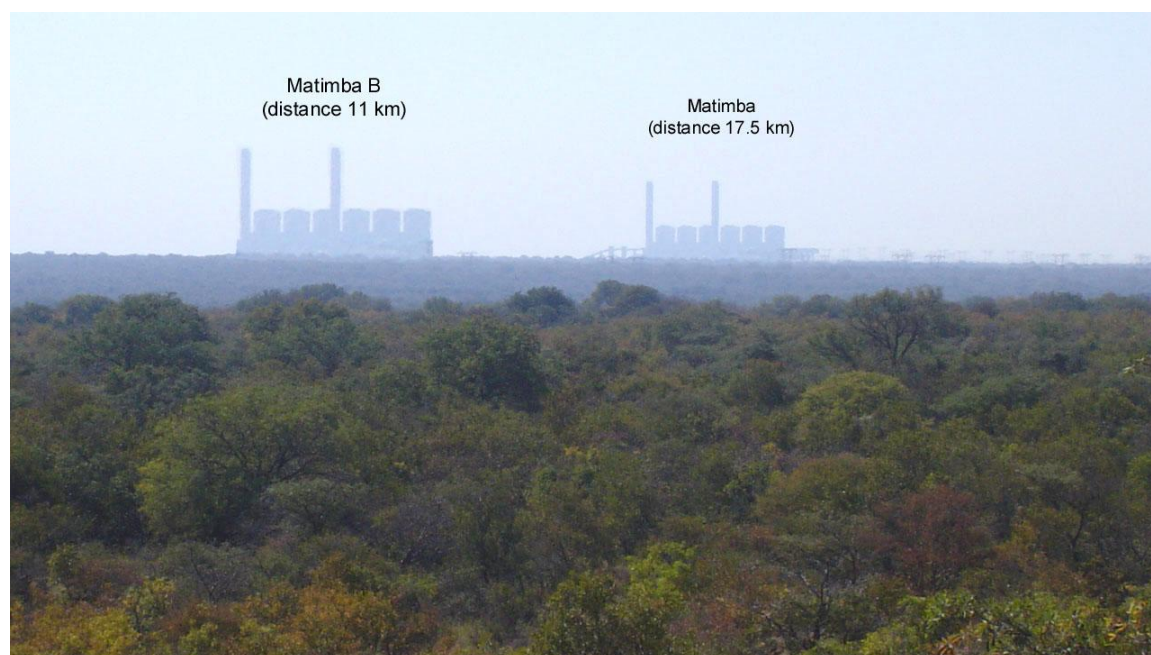


Figure 3.2: Simulated view of the two Matimba power stations, indicating the approximate position and scale of the proposed facility.

Part of the problem is that awareness of the proposed power station will occur *en route* to the farm as access is afforded via the Steenbokpan Road where the construction of the facility is planned.

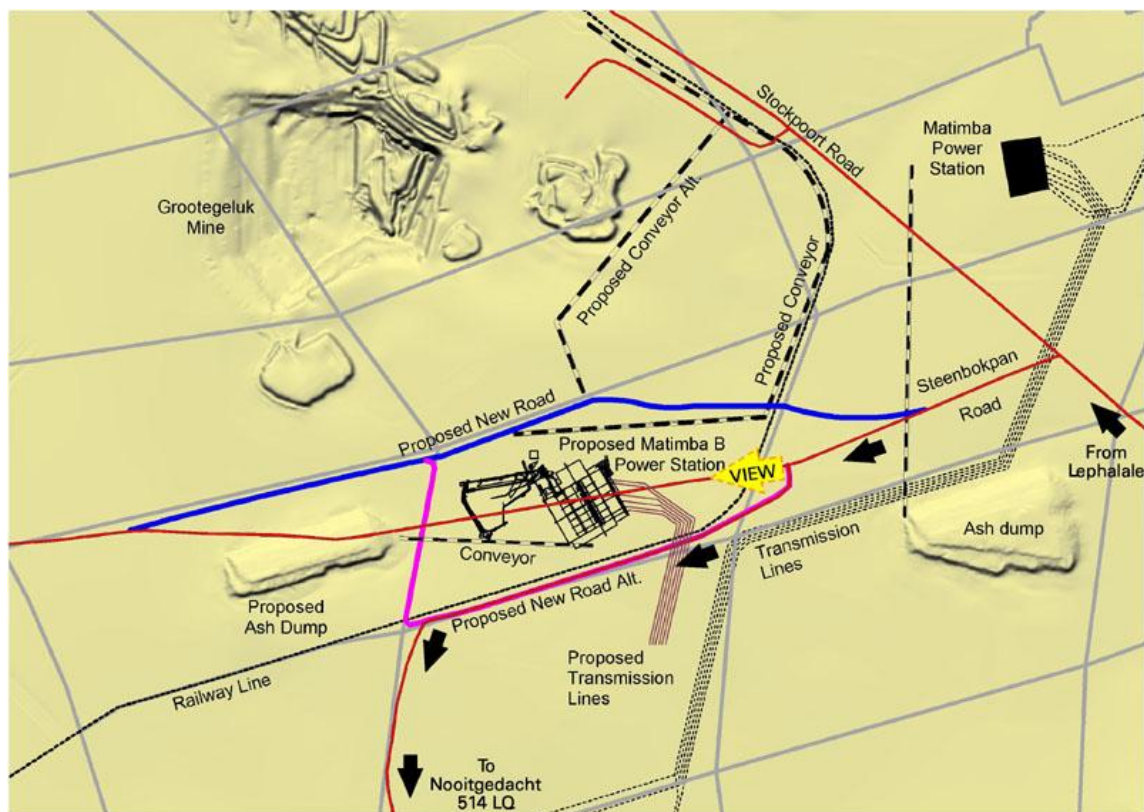


Figure 3.3: Line of sight visibility of the proposed Matimba B power station.

Visitors will have a forced line of site visibility of the facility along this road (from approximately 2.3 km) before turning south along the gravel road leading to the farm. This awareness, together with sightings of the facility from the exposed areas on the farm, will culminate in the realisation that the area is not pristine and not that far removed from civilisation.

Table 3.4: Impact on sense of place (incorporating the cumulative visual impact).

Nature	Extent	Duration	Intensity	Probability	Significance	Mitigation potential
Negative	Regional	Long term	High	Highly probable	High	Low

3.6.5. Potential future visual impacts

Another potential visual impact, not addressed, as a part of the visual impact assessment report, is the construction of additional transmission lines to integrate the proposed power station with the national grid for distribution of electricity. The proposed alignments for these transmission lines are not yet known but may place an additional visual burden within the region in general and the farm Nooitgedacht in particular.

3.7. Mitigation

Mitigation of the visual impacts, as mentioned in the Visual Impact report, for a facility of these dimension in a relatively flat topographical area, is primarily aimed at ensuring that the general appearance of the power station is maintained throughout the operational phase. The potential to effectively hide the facility, or shield the observer from the power station, is very low. This is especially true when viewed from the specifically effected areas on the farm Nooitgedacht 514 LQ. The only effective, yet absurd, way of mitigating the visual impacts from these areas would be to avoid them altogether. This would imply steering hunters and visitors to the farm (and future developments) away from the affected areas and thereby effectively sterilising areas of land on the farm.

The importance of maintaining vegetation cover, especially along the Steenbokpan Road (next to the railway line) is once again stressed as the single most important mitigating measure. Detailed plant design and landscaping, for the entrance road to the power station from the Steenbokpan Road (see Figure 3.3 above), should attempt to create a green barrier obstructing line of sight views of the facility. Alternatives to a straight road into the power station should be investigated in order to avoid a forced sighting of the facility.

The visual impact of lighting of the facility at night should be addressed as mentioned in the visual impact report. The services of a qualified lighting engineer should be acquired from the outset of the project and should assist in the planning, placement and maintenance of the fitment of light fixtures and shield covers during both the construction and operational phases of the power station. These measures should be implemented for both the core power station facility and the ancillary infrastructure. .

3.8. Conclusion

The construction and operation of the Matimba B power station will place an additional visual burden on the farm Nooitgedacht 514 LQ. It will further impact on the sense of place of the region in general and the farm in particular. It is however not the first industrial/mining related development in the area and does not constitute a primary visual impact in a pristine wilderness area. It will contribute to an increase in industrial activities in the Lephalale area and will, together with the existing power station and the mining activities, set the trend for possible continued development and expansion (and ultimately visual encroachment) on the farm.

It is debatable whether the construction of the facility would ultimately lead to an irreconcilable conflict between the tourism and hunting activities on the farm and the industrial activities in the region. The bushveld character will come under

more visual pressure from the development and will make it increasingly difficult to maintain the wild African appearance and feeling of the farm in the long term.

4. IMPACT ON WILDLIFE

4.1. Introduction

The preferred site for the construction of the Matimba B Power Station in the Lephalale district is on the farm Naauwontkomen. Approximately 11km from the proposed construction site is a game farm, Nooitgedacht, on which a number of valuable game animal species including disease free Buffalo, White Rhino, Roan, and Sable antelope are bred. The possible impact of the new power station on game animals on the farm is assessed below.

4.2. Types of Possible Impact

- Short term impact resulting from disturbance during the construction phase of the power station, and associated transmission lines.
- Long term effects resulting from increased levels of airborne pollutants.
- Disturbance resulting from noise pollution emanating from new power station and associated activities.

4.3. Methodology

The farm was visited to assess the proximity of sources of pollution to areas where game animals are kept.

Air pollution levels expected to be experienced on the farm were compared to international air quality standards. These standards are accepted as being safe for humans experiencing long term exposure to the levels of pollution laid down.

Human air pollution tolerance has been compared to that of the game animals on the farm.

4.4. Discussion

During the construction of the power station large numbers of temporary workers will be required to be on-site. This will almost certainly increase the risk of poaching of game animals in the whole district (this issue though has been addressed as part of the Social Impact Assessment).

The construction of transmission lines across the farm will require that workers and vehicles have access to the farm. There is a definite risk of disturbance of breeding animals. Fires made by workers to prepare food, or for warmth, pose a

serious risk of runaway fires during the dry season. Allowing vehicles uncontrolled access to the farm increases the risk of gates being left open and possible escape of valuable animals.

Extensive studies have been undertaken by Airshed Planning Professionals Pty (Ltd), and reported in a document, Air Quality Impact Assessment (1). The document provides detailed estimates of expected levels of airborne pollutants that will emanate from the new power station, and from related activities. The combined levels of air pollution resulting from the two power stations, as well as from other sources in the area have been thoroughly assessed in the complete environmental impact study. Appropriate pollution abatement equipment will be installed to reduce emission levels, prior to their liberation from the smokestacks, in order that levels of air pollution, as well as the potential fallout of toxic trace elements is kept below the levels suggested in international standards for human health.

It is common knowledge that the longer the exposure time to toxic agents, the greater is the risk of ill health resulting. Humans are long lived, and have the potential to be exposed to toxins in their environments for upwards of 70 years. Because of this, the international standards set for safe levels of toxins in the environment tend to be considerably lower than would be the case if shorter exposure times were expected.

The data available on levels of toxins likely to cause disease in the game animal species in question is very limited. Necropsies carried out on animals in captivity that have lived for long periods in inner city areas, where they have been exposed to high levels of air pollution generally display only anthracosis (2). Anthracosis is a non-pathogenic condition of the lungs and bronchial lymph nodes due to the deposition of particles of carbon, soot etc., from inspired air (3). The data that is available suggests that the levels of pollution that will result from the new power station will not pose a significant risk to the health and well-being of the game animals on the farm in question. Various reports on the deterioration in the health of farm animals in the vicinity of industrial operations have been published (4). Sulphur dioxide pollution resulting in respiratory disease, and acid rain, causing damage to vegetation have been reported. Trace metals such as mercury and lead, and high levels of environmental fluoride have also been implicated in causing animal ill health (5). Without exception the environmental levels of these pollutants in the reported cases has been far higher than will be the case in the areas surrounding the Matimba Power Stations.

Game animals on the farm Naauwontkomen, which is situated 4 km from the existing Matimba Power Station have shown no ill effects from pollutants emanating from that source.

Animals very rapidly adapt to low intensity sound in their environments. The very low levels of noise that will reach the farm, and the fact that it will be constant, will in no way cause any disturbance to the animals on the game farm (Personal observation).

4.5. Conclusion

A new power station 11km from a game farm will not constitute a significant risk to the health and well-being of any of the game animals on the farm. The construction phase has the potential to cause the loss of animals as outlined.

The impact on the utilization of the game on the farm by overseas hunting clients, and by sightseeing tourists, will be significantly affected, but falls outside the ambit of this discussion.

4.6. References

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- (3) West, G.P. ed. Blacks Veterinary Dictionary. Adam & Charles Black, London. 1978
- (4) Blood, D.C. Henderson, J.A. and Radostits, O. M. Veterinary Medicine, A Textbook of Diseases of Cattle, Sheep, Pigs and Horses. Bailliere Tindall. London. 1979.
- (5) Butler, E. J. et al J. comp. Path. 67, 378. 1957.

5. TOURISM AND LAND VALUE ASSESSMENT

5.1. Introduction

SiVEST Selatile Moloi was appointed to undertake an addendum report to the Tourism Scoping Report and Tourism Impact Assessment for the proposed Matimba B power station which Eskom is proposing to construct. This report addresses both the qualitative issues (sense of place) and quantitative issues (economic) related to the tourism activities. The economic issues have been addressed by African Development Economic Consultants (ADEC), whose report is incorporated into the text of this report. SiVEST Selatile Moloi gratefully acknowledges Randall Gross's and Golden Chalunda's input in this regard.

5.2. Background

This addendum report has been compiled as a result of a concern raised by a landowner on the western boundary of the farm Nooitgedacht, who owns a game farm (Landelani Game Lodge). The farms owned by Mr de Jager are Nooitgedacht and Vlakvallei. These farms are jointly from hereon referred to as 'Landelani'. These farms are each just over 2 000 hectares (ha), with a joint surface area of 4 477 ha. The sweetveld characteristics of this area enable relatively high carrying capacities and therefore good stocking rates for game.

This concern primarily referred to the anticipated negative impact that the proposed development (power station and related activities) would have on the existing tourism and hunting activities at "Landelani".

This report, in addition to the Scoping Tourism Study and the Tourism Impact Study, provide a relevant assessment of, and address, this concern.

5.3. Tourism Facilities And Activities On "Landelani"

Landelani Game Farm is a destination tourist-oriented game facility that attracts visitors for both hunting and viewing. The facility is owned by Mr. M.W. de Jager who acquired the property in 1997, established tourist-oriented facilities and introduced game stock in 1998.

Landelani Game Farm is set in a predominantly game hunting / cattle breeding area. The farm is surrounded by 7 farms (game hunting / cattle breeding) lying within a 5-kilometre radius, namely: Vlakvallei, Pretoriuskloof and Fancy (to the east), Grootvallei and Kuipersbult (to the northeast), Kroomdraai (to the north), and Geelhoutskloof and Rietfontein (to the west). According to the proprietor, three quarters of these farms located to the east and northeast are cattle farms while the others situated to the north and west are game hunting farms.

5.3.1. Facility Inventory

The game farm has a total of 750 square metres in improvements (building space) and other facilities, as follows:

Six-room (12 bed) lodge	450 m ²
House/office with two visitor rooms (4 beds)	300 m ²
Air strip – 1,600 metres length	
5 boreholes and dams	

The game farm currently offers eight species of game stock for hunting or viewing, including the following:

Roan Antelope	17 head
Buffalo	70
White Rhino	17
Sable	42
Tsessebe	25
Giraffe, Leopard, and Brown Hyenas	

The farm has just introduced 19 head of buffalo, which are currently held in quarantine.

Information has been gathered on the basis of an interview while on site with the land owner, Mr MW de Jager, and a tour operator, Mr Jim Hackiewicz. Mr Hackiewicz has spent many years promoting Landelani as a tourism destination, primarily to the US market. It is also understood that the French market makes up a large percentage of the tourists to the farm. The local market was regarded as "small" by Mr de Jager, reportedly making up about 10% of the client base.

Both hunting and ecotourism are offered on the farm, with hunting only taking place in hunting season (winter) and ecotourism in summer. Occupancy rates were reported as averaging 60% to 70 %, being higher in hunting season. International tourists access Landelani via minibus after entering South Africa at Johannesburg International Airport (JIA). A small percentage flies directly to an airstrip at Landelani or utilize the South African National Defence Force (SANDF) airstrip at Lephalale. It was noted that most tourists to Landelani would have a broader itinerary, which would include the other tourism hotspots in South Africa (for example Cape Town and the Garden Route).

Landelani is clearly a success as a tourism destination with high occupancies (reported at 60%-70%) and relative stability in visitor numbers throughout the year.

Foreign visitors typically stay for a period of 7 to 14 days, while local visitors stay for shorter periods. Landelani's rates are US\$350 to US\$400 per person, per day. Additional fees are paid for game hunting, for example a Kudu will cost US\$1,500 per head and fees vary by type of game. The fee for local visitors is R800 (game viewing only) per person per night.

Assuming an average of 65% on all rooms, Landelani sells approximately 3 800 beds (1 900 room nights) per year. This performance is on par for lodging

facilities to achieve normal profit margins and may be relatively healthy for small game farms.

5.4. Expansion Plans

The Landelani Game Farm has proposed expansion plans that will add to the extent of the farms and increase and diversify the herds. The expansion would include a 1 250 ha portion of the Vlakvallei farm plus an additional 1 000 ha (which is part of the family's property). This would bring the total area under game farming to approximately 6 750 ha. Game would include lions and elephants, added to the existing big three (leopard, rhino and buffalo).

The planned introduction of lions and elephants necessitates the erection of a 55-kilometre perimeter game fence at a cost of R20 000 per kilometre, plus additional full galvanized fencing. Investment in additional game stock and increased security measures is proceeding irrespective of the planned Matimba B power station. According to the proprietor, the transition to big five game farming would create excellent marketing opportunities for the farm.

Landelani has also submitted plans for approval to develop 30 plots of 1 000 square metres each that would be sold to individuals who would then build their own housing and/or lodging facilities. The plots had been tentatively priced at R600 000 to R800 000 each. However, the owner is now concerned about the impact of the proposed Matimba B plant on these prices and on the feasibility of the development project.

5.5. Financial Review

An abbreviated financial analysis was conducted as an input to the valuation assessment. Capital investment and operating income were both analysed and considered as they relate to the valuation of the property.

5.5.1. Capital Investment

The initial investment made in 1997 for the Landelani Game Farm totalled R9.7 million and included the following:

Land	R 4.5 million
Fencing	R 1.2 million
Lodge	R 2.0 million
House/office	R 1.5 million
Sheds	R0.5 million
TOTAL	R 9.7 million

The existing game herds were valued in 2005 at R 15.0 to R 16.0 million. Therefore, the total investment in capital and herd is estimated at approximately R 25 to R 26 million.

5.5.2. Operating Income

Based on occupancy and estimated room night demand, total day fees are estimated at about R 8.6 million per year, including R 8.3 million from foreign visitors and R 300 000 generated from domestic visitors. Including hunting fees (estimated based on rate schedules, bagging rates, and other factors), gross income is estimated at R 21.1 million per year.

Landelani has a staff complement of 9 people, plus another 4 to 5 professional hunters who are called upon on as needed basis. Based on various unconfirmed assumptions regarding salaries and other operating expenses plus debt service, net operating income (NOI) is estimated at R 6.1 million per year.

5.6. Existing Impacts Of the Matimba Power Station At Landelani

The average visitor to Landelani is from Europe or the USA and has a great deal of choice of destination for either ecotourism or hunting. The client would have a choice of any southern African country and once South Africa is chosen as the preferred destination, then hundreds of lodges could be chosen. The relatively high occupancies at Landelani show that not only are the marketing agents 'doing their job' but Landelani is obviously offering the tourist what they want.

It was mentioned by one agent (from the USA) that there was increasing pressure on the existing success of Landelani in that tourists appeared to be more discerning when requesting a 'wilderness experience' be it for hunting or ecotourism. The perception of the nearby industrial activities (mining and power generation) was being regarded as negatives in the market place. It is widely accepted though that the ecotourism motivated visitor is likely to be more discerning than a hunting tourist whose primary goal is to get a trophy, the wilderness experience is likely to be a secondary goal. The perception of the tourist is a key factor in the tourism business, and word of mouth/references are critical to either the success or failure of a business.

Landelani is currently located approximately 17 km from the existing power station. The existing power station negatively impacts the sense of place of Landelani, but only from high points on the farm. The lodge does not have views of the existing power station. Day-time long distance views of the existing power station are possible from high points only. Existing powerlines on the northern boundary of Nooitgedacht are visible as short distance views. The sense of place

for the average tourist however is heavily compromised by the Steenbokpan road which bisects the farm Nooitgedacht. This road is a wide gravel road which is a source of noise and visual (vehicles and resultant dust plumes). Guests having to cross this road, through gates, will most certainly lose that 'wilderness feeling'. In summary, the existing sense of place is currently compromised at Landelani, and increasing choice of destination, as well as increasingly discerning tourists, could lead to increasing pressure on occupancy rates.

Noise associated with the power station and its ancillary activities, as well as that generated on roads leading into and out of the area, was also assessed as it relates to the game farm.

The proprietor of Landelani did not offer any specific indications of noise quality or resulting impacts on the visitor experience. With hunting, which requires concentration, there would clearly be significant concern if anything beyond ambient noise from the existing plant has interfered with the sport. Noise rating matrices suggest that the existing power station and associated activity have only a marginal impact on the game farm at this stage. Certainly under normal weather conditions, the existing power station has no negative noise impacts at Landelani.

Wildlife impacts associated with the power plant were determined to be nil, based on the wildlife health assessments completed for the site. The greatest risks to the wildlife on site were identified as being related to the construction phase due to potential poaching by workers. The Landelani proprietor has not provided an indication that the existing power plant has had any noticeable effect on game, and has not suggested explicitly to the consultant that the new plant would have any deleterious impact on his herds.

5.7. Anticipated Impacts Of The Proposed Power Station At Landelani

The key issue for Landelani is related to the cumulative impact of the proposed power station and related activities both during the construction and operation phases. The cumulative impact on the sense of place is probably the most important factor for consideration.

The Visual Impact Assessment concludes that the cumulative visual impact on the sense of place is negative with high significance. From a tourism perspective, we suggest that the sense of place is already compromised (as detailed in the previous section), and that key reasons for tourists visiting Landelani would therefore relate to good hunting, and good hospitality rather than a wilderness experience. This said, the new power station will certainly exacerbate the loss of sense of place, in spite of the other strong points of Landelani.

The proposed power station will not however lead to a decreased hunting experience (see wildlife report) through decreasing carrying capacities or skittishness of animals, but the experience of tracking the animal could be compromised if views from high areas are obtained during the hunt. The greatest risk to the game itself is likely to be related to possible increases in snaring or poaching by workers during the construction phase.

The impacts relevant to Landelani would be summarised as follows:

“Noise Sensitive Areas: i.e., farmhouses and labourers within about 5 500 metres of the new facility will experience ambient noise levels higher than considered acceptable.”

Landelani is located approximately 5 000 metres to 11 000 metres from the preferred power station site. Thus, the Noise Sensitive Area may marginally affect the farm, in the absence of noise mitigating measures.

The Tourism Scoping Report and EIA report highlight the likely impacts of the proposed development on the tourism industry. The tourism activities on Landelani could be impacted in the following ways:

5.7.1. Construction Phase

- General construction impacts
- Increased worker numbers and increased chance of snaring
- Potential increase in crime
- Noise impacts from construction activities

5.7.2. Operation Phase

- Increased visual impact from high points
- Increased loss of sense of place due to access past proposed Matimba B power station
- Increased lighting impacts at night
- Noise impacts

5.8. Valuation and Impacts

The current valuation of the land at Landelani has been established by the Municipal valuer at a total R 4 820 000. The land valuation has been based on a comparable market value (as determined by property sales). The value of improvements is R2 870 000, based on replacement cost for improvements less depreciation at 2.0% over 50 years. Thus, total current value is estimated at R 7 690 000.

Land value impacts resulting from the development of the Matimba B Power station and ancillary facilities were determined based on an assessment of the environmental impacts on the tourist experience. This "experiential" impact was measured in terms of direct attendance/occupancy and translated into income impacts. These "occupancy effects" were also supplemented by a contour modelling assessment that assigned an impact on land utilisation, resulting in a direct impact on land value.

Based on this analysis, the following chart summarises findings regarding the impacts on land value for Landelani.

<u>SUMMARY OF VALUATION IMPACTS</u>		
	LAND	IMPROVEMENTS
1) Occupancy Impact Model (based on lost income)		
Viewing	(R 477,620)	(R 284,400)
Hunting	(598,300)	(356,250)
OCCUPANCY VALUE IMPACT	(R1,075,920)	(R 640,650)
2) Environmental Contour Impacts (based on lost utilisation)		
Nooitgedacht		(R 314,200)
Vlakvallei		(280,600)
DIRECT UTILISATION IMPACT		(R 594,800)
TOTAL IMPACT ON LAND		(R1,670,720)
<i>Total Impact on land & improvements</i>		<i>(R2,311,370)</i>

The assessment disaggregates the impact into two categories. First, there is an impact of the power station on the lost tourism-generated income from lodging and hunting fees. The environmental impacts will be most severe on the game viewing or eco-tourist component of the game farm's market, and there will be a loss of potential revenue from eco-tourist visitors.

Income from hunting (including both overnight fees as well as hunting fees) forms a larger share of overall revenue. However, the impact on hunting will be less pronounced because there is less elasticity in demand for hunting due to a

more limited supply and a higher threshold level for aesthetic degradation. As a result, the overall occupancy impact is ameliorated somewhat.

The environmental contour impacts relate directly to loss potential for direct utilisation of land that falls within the most severe visual and noise contours. The utility of land in these contours is lowered by the heightened impacts and, as such, the value is reduced.

5.9. Mitigation Measures

The strongest mitigation measure is likely to be related to reducing the visual impact of the proposed power station (see Visual Impact Report). From a tourism perspective, the following measures are suggested:

- Location of the proposed power station and ancillary activities as far north on the preferred farms as possible.
- Consideration of researching a new marketing strategy as well as consideration of a new market where the discerning 'wilderness visitor' is not a critical issue
- Other options include: conferencing, team building, timeshare/low density residential
- Greater co-ordination with Lephalale Municipality and Eskom to take advantage of their marketing facilities
- Eskom to liaise closely with South African Police Service to minimise crime during construction
- Avoid placing the potential construction camp, if needed, outside the urban edge, preferably to the east of the existing power station

5.10. Conclusions

Altogether, the impact on land would total approximately R 1.67 million, while the value on land and improvements would total R 2.31 million. Thus, the overall impact results in a net loss of about one-third in value based on lost income and land utilisation. However, this impact assumes that no steps would be taken to mitigate any of the environmental impacts of the new power station. This analysis also assumes opportunity costs associated with the development of new components of the game farm with the exception of the housing property development scheme. There is insufficient information to determine the power station impact on this scheme. However, some impacts can be ameliorated if the scheme is located on Vlakvallei, further south of the existing facilities.

The proposed development will result in an increased negative impact to the sense of place of Landelani. While the existing sense of place is already compromised, it is the contention of the tourism specialist that the proposed power station will exacerbate this perceived weakness to tourists who are in

search of a wilderness experience. The profile of the tourist visiting Landelani could therefore change which may not be to benefit of the land owner and operator of Landelani.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1. Visual Impact

The construction and operation of the proposed Matimba B power station will place an additional visual burden on the farm Nooitgedacht 514 LQ. It will further impact on the sense of place of the region in general and the farm in particular. It is however not the first industrial/mining related development in the area and do not constitute a primary visual impact in a pristine wilderness area. It will contribute to an increase in industrial activities in the Lephalale area and will, together with the existing power station and the mining activities, set the trend for possible continued development and expansion (and ultimately visual encroachment) on the farm.

It is debatable whether the construction of the facility would ultimately lead to an irreconcilable conflict between the tourism and hunting activities on the farm and the industrial activities in the region. The bushveld character will come under more visual pressure from the development and will make it increasingly difficult to maintain the wild African appearance and feeling of the farm in the long term.

6.2. Wildlife Impact

A new power station 11km from a game farm will not constitute a significant risk to the health and well-being of any of the game animals on the farm. The construction phase has the potential to cause the loss of animals as outlined.

The impact on the utilization of the game on the farm by overseas hunting clients, and by sightseeing tourists, will be significantly affected, but falls outside the ambit of this discussion.

6.3. Tourism and Land Value Impact

Altogether, the impact on land would total approximately R1.67 million, while the value on land and improvements would total R2.31 million. Thus, the overall impact results in a net loss of about one-third in value based on lost income and land utilisation. However, this impact assumes that no steps would be taken to mitigate any of the environmental impacts of the new power station. This analysis also assumes opportunity costs associated with the development of new components of the game farm with the exception of the housing property development scheme. There is insufficient information to determine the power

station impact on this scheme. However, some impacts can be ameliorated if the scheme is located on Vlakvallei, further south of the existing facilities.

The proposed development will result in an increased negative impact to the sense of place of Landelani. While the existing sense of place is already compromised, it is our contention that the proposed power station will exacerbate this perceived weakness to tourists who are in search of a wilderness experience. The profile of the tourist visiting Landelani could therefore change which may not be to benefit of the land owner and operator of Landelani.

6.4. General Recommendations

In general the conclusion of the specialist studies stated that there will be a significant impact on the tourism related activities and businesses that are currently operational on the farms in question. However, the impact is not solely caused by the construction of the power station in isolation but also due to the future construction of related infrastructure such as transmission lines. The visual assessment concluded that the sense of place will be affected, however it is not a primary visual impact, due to the existing industrial and mining activity in the area. The wildlife specialist stated that there will be no significant impact or effect on the wildlife present on the farm or the breeding programmes currently operating on the farms. Taking the above broad conclusions into account the following is recommended:

- The landowner should investigate the mitigation measures recommended by the above specialist studies that may be applicable to his circumstances; and

APPENIDX A

PREVIOUS CORRESPONDENCE