4. APPROACH TO SITE EVALUATION

This Environmental Scoping Study identifies the potential positive and negative environmental (biophysical and social) impacts associated with the proposed new coal-fired power station and ancillary infrastructure. A number of issues for consideration were identified by the environmental team and/or raised by I&APs during the consultation process. This section serves to outline the approach utilised to evaluate the identified potential environmental impacts associated with the proposed project alternatives prior to the implementation of mitigation measures (i.e. measures to reduce or avoid impacts).

The issues identified and potential environmental impacts on the power station and ancillary infrastructure alternatives were considered in the selection of a preferred site for the construction of the power station and ancillary infrastructure, as well as in determining what further studies would be required in the Environmental Impact Assessment (EIA) phase. All issues which are anticipated to have a moderate to high impact on the preferred sites will be investigated further by specialists and detailed within the EIA phase of the study.

The scoping process evaluates four alternative sites for the power station and eight alternatives for the ancillary infrastructure. The footprint of the proposed power plant and associated plant (terrace area) would be approximately 700 ha and approximately 500 – 1000 ha for ancillary infrastructure (such as ashing facilities). In order to establish the best possible site to evaluate in the EIA, a site specific evaluation was undertaken. The process involved a range of physical, biological and social criteria.

4.1. Site Evaluation – Field Studies

The eight alternative sites were inspected by the specialists in order to:

- Investigate the study area
- Gather baseline information for the sites
- Assess the current situation
- Identify any potential environmental (biophysical and social) impacts
- Engage in interdisciplinary discussions
- Interview Landowners

4.2. Specialist Studies

The choice of specialist studies was influenced by the need to cover all aspects of the environment namely, physical, biological and social.

The studies undertaken covered the physical, biological and social aspects of the environment. Table 4.1 outlines the components or issues that were used in ranking the sites. Over 78 components were reviewed by the specialists through 11 studies.

Table 4.1: Specialist studies and the components investigated during the Environmental Scoping Phase

Physical Variables		
Water Resources	Poor quality water stored on site recharging the groundwater	
	Artificial recharge impacting on groundwater	
	Poor quality surface water on site	
	Surface water drainage	
	Seepage below the ash dump	
Geology, Soils and Agricultural Potential	Geotechnical	
	Soil	
	Agricultural potential	
Biological Variables		
Fauna and Flora	Destruction of pristine floristic and faunal habitat within development area	
	Destruction of Red Data flora and fauna species and suitable Red Data habitat	
	Destruction of protected tree species and associated habitat	
	Destruction of sensitive ecological habitat types (outcrops, riparian fringes, non-perennial streams, etc.)	
Social Variables		
Visual	Power Station	Potential visual exposure
		Proximity and exposure to the R510 and R33

		Proximity and exposure to secondary roads
		Proximity and exposure to residential areas
		Proximity and exposure to game farms and lodges
		Compound visual impact
		The effect of lighting
		Strategic placement of the proposed power station near the existing ash dump
		Strategic placement of the proposed power station near the Grootegeluk Mine pit
		Destruction of natural vegetation
	Ancillary Infrastructure	Visual exposure and proximity to secondary roads
		Visual exposure and proximity to residential areas
		Visual exposure and proximity to game farms and lodges
		The effect of lighting
		Strategic placement of infrastructure
		Destruction of natural vegetation
Tourism	Noise impact	
	Visual impact	
	Corporate demand	
Land Use	Towns and Settlements	Functional division
		Possible restriction of access
		Possible restriction of development
		Visual impact
		Possible resettlement of households
		Possible impact on planning policies and future development
		Possible safety risks
	Agriculture	Functional division

		Sterilisation of agricultural land
		Impact on production
	Exemption Farms	Decreased in property value
		Visual impact
	Mineral Potential Areas	Possible restriction of future mining operations
Heritage	Presence or absence of heritage site	
Air Quality	Impacts on human health due to gaseous and particulate emissions	
	Impacts on vegetation / landuse potential (land not currently under mining or industry)	
	Non-compliance with air quality limits	
Noise	Power Station	Impact of Matimba B on Marapong Township
		Impact of Matimba B on Lephalale (Onvewacht Township)
		Impact of Matimba B on farmhouses/other rural residences
		Impact of Matimba B traffic on Nelson Mandela Drive area
		Impact of Matimba B traffic on Nelson Mandela Dr Ext area
		Impact of Matimba B traffic on Sterkpoort Road area
		Impact of Matimba B traffic on Steenbokpan Road area
		Impact of Matimba B traffic on Afguns Road area
		Impact of conveyor belt systems
		Site location related to already degraded noise condition
		Wind mitigating factor
		Cumulative effect of existing Matimba Power Station

	Ancillary Infrastructure	Impact of ash dump on Marapong
		Impact of ash dump on Lephalale (Onvewacht Township)
		Impact of ash dump on farmhouses/other rural residences
		Impact of conveyor belt systems
		Site location related to already degraded noise condition
		Wind mitigating factor
		Cumulative effect of existing Matimba Power Station
Traffic	Employee transport	
	Ash transport	
	Coal supply	
	Infrastructure Changes	Conveyor crossings
		Road re-alignment
	Construction traffic	
Social Impact Assessment	Social problems arising from contact between local residents and newcomers (conflict and sexually transmitted diseases)	
	Change in local infrastructure requirements (to supply construction camp and power station)	
	Impact on development	
	Relocation of populations	
	Impacts on surrounding farm owners and residents	

4.3. Rating Criteria

The evaluation and nomination of a potential site for a proposed power station and ancillary infrastructure involves a highly interdisciplinary approach. The approach undertaken has involved a wide range of specialist studies which examine a number of different issues. In order to evaluate sites and determine a preferred site, the studies need to be comparative and therefore a site rating matrix was developed. The site preference rating system is applied to each discipline, and the rating of each site was conducted according to the following system:

- 1 = Not suitable for development (impact of very high significance - negative)
- 2 = not preferred (impact of high significance - negative)
- 3 = acceptable (impact of moderate significance - negative)
- 4 = preferred (impact of low or negligible significance - negative)
- 5 = Ideal site for development, or positive impact

While each specialist study was required to have the Site Preference as an outcome, how they evaluated each site varied from discipline to discipline and the description of their specific approaches are outlined in each specialist report (refer Chapters 6 to 16).

4.4. Site Rating Matrix

In order to confirm the result of the environmental evaluation, the identified alternative sites were weighted against one another using a comparative mathematical model. The objective of the model is to calculate a comparative percentage-based score, built on mathematical formulas reliant on a set of environmental issues (characteristics) which have been identified for a hypothesis test. The mathematical formulas have been set-up to ensure that the existence of more potential impacts for one alternative than the other is not biased in favour of the option which contains more variables. To ensure a uniform score between the alternative site models, the model assumes a defined set of environmental issues that apply to all options subjected to the model. These environmental issues are ranked in order of importance, relevant to the project. Potential impacts are defined for each of the environmental issues. However, in some instances, one alternative may have more potential impacts than the other options for a particular environmental issue. It is in these situations that the model calculates a comparative percentage score as one site cannot be unfairly biased if it has less impact than another site. The end result produces a percentage score that is used to rank various site alternatives. The option with the highest percentage score is considered to be the most favourable alternative. The score does not reflect the environmental acceptability of the development, i.e. there is no pass or fail percentage. The scores are required to be read in relation to one another.

4.5. Assumptions and Limitations

The assumptions and limitations on which this study has been based include:

- *Assumptions:*
  - All information provided by Eskom and I&APs to the Environmental Team was correct and valid at the time it was provided. The consultants and specialist investigators do not accept any responsibility in the event that additional information comes to light at a later stage of the process.

- The four power station alternatives and the eight ancillary infrastructure alternative sites selected by Eskom are technically and economically viable.
- All data from unpublished research is valid and accurate.
- It is not always possible to involve all interested and affected parties individually. Every effort was, however, made to involve as many broad based representatives of the stakeholders in the nominated area. The assumption has, therefore, been made that those representatives with whom there has been consultation, are acting on behalf of the parties which they represent.

- *Limitations:*
  - This report and its investigations are project-specific, and consequently the environmental team did not evaluate any other power source alternatives.