7. APPROACH TO SCOPING STUDY

This Environmental Scoping Study identifies the potential positive and negative environmental (biophysical, social and economic) impacts associated with the proposed establishment of a Combined Cycle Gas Turbine (CCGT) power plant and associated infrastructure in the Amersfoort area, Mpumalanga Province. 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 negative impacts).

The issues identified and potential environmental impacts of the CCGT power plant and additional infrastructure alternatives were considered in the selection of a preferred site/s for the construction of the CCGT power plant, 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 evaluated six alternative sites for the CCGT power plant. The footprint of the proposed CCGT power plant is anticipated be approximately 100 ha (i.e. 1 km^2). In order to establish the best possible site/s to evaluate in the EIA, a site specific evaluation was undertaken. The process involved a range of physical, biological and social criteria.

7.1. Site Evaluation – Field Studies

The six 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, social and economic) impacts
- Engage in interdisciplinary discussions
- Interview landowners

7.2. Specialist Studies

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

The studies undertaken covered the biophysical, social and economic aspects of the environment. Table 7.1 outlines the components or issues that were used in ranking the sites.

Table 7.1 Specialist studies and the components investigated during the Environmental Scoping Phase

Specialist Studies	Biophysical Variables
Groundwater Resources	Soil Characterisation (Permeability)
	Shallow aquifer conditions per unit area
	Presence of intrusive lithologies Presence of intrusive lithologies
	Groundwater contribution to river flow
	Ambient quality
	Unsaturated zone characteristics- aquifer vulnerability
	Borehole Yields
	Borehole density
	Groundwater Potential
	Aquifer classification
	Down stream users
	Distance to major water courses/discharge areas
Surface Water Resources	Flooding
	Slope (including runoff, erosion, waste and pollutant transport)
	Increased runoff due to new disturbed areas and infrastructure
	Generation and transport of industrial and domestic waste
	Availability of water to the CCGT plant
	Water supply demands to environment and other water users satisfied
	Drainage density (including erosion, waster and pollutant transport)
	Wetlands
	Denuded or natural land use vs more sophisticated land uses
Fauna and Flora	Destruction of threatened and protected species and habitat
	Destruction of sensitive habitat
	Destruction of pristine habitat types

	Changes to habitat and regional biodiversity
	Impacts on surrounding natural habitat and species
Specialist Studies	**Social Variables**
Air Quality	Wind
	Precipitation
	Temperature and humidity
	Sensitive receptors
	Other polluting sources in the area
Noise	Residual (existing) noise climate
	Predicted noise climate (pre-construction phase)
	The predicted noise climate (construction phase)
	The predicted noise climate (operational phase) - CCGT power plant and CCGT power plant generated traffic
Social	Demographic change processes: • Relocation of households and/or population segments • Influx of construction workers • Influx of job seekers • Outflow of labourers • Influx of maintenance workers
	Economic change processes: • Land acquisition (financial compensation) • Direct formal employment opportunities to local individuals • Indirect formal and/or informal employment opportunities to local individuals
	Empowerment and institutional change processes: • Attitude formation against the proposed project • Negotiation process • Additional demand on municipal services • Disaster Management Plan
	Socio-cultural change processes: • Integration of construction workers into local areas • Physical splintering • Traffic movement • Safety and security • Noise pollution • Sense of place • Movement of maintenance workers • Third party tampering (on pipelines)

	Geographical change processes: • Cultivated and grazing land • Maintenance of access roads • Spatial development (future land use) • Tourism potential
	Biophysical change processes: • Pollution and fire risk • Sanitation • Mining operations • The presence of the CCGT plant and pipelines
Visual	Visibility
	Viewer proximity
	Exposure
Heritage	Presence / absence of heritage objects / sites
Traffic	Existing road condition
	Existing traffic counts
	Available capacity on road network
Risk	
Technical Criteria	**Technical Variables**
Technical Criteria	Existing roads and their condition
	Existing transmission lines and electrical infrastructure
	Future planned transmission lines
	Water supply options
	Technical support infrastructure close by
	Coal Transport System
	Accommodation of the construction team close by

7.3. Rating Criteria

The evaluation and nomination of a potential site for the CCGT power plant involves an interdisciplinary approach. The approach undertaken has involved a wide range of specialist studies which examined a number of different issues. In order to evaluate sites and determine a preferred site/s, 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

One of the outcomes of each specialist study was to have a Site Preference Rating, 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 8 and 9).

The site preference results for each site from each specialist study were entered into a matrix and added together. The site with the highest value is then considered the most preferable.

The standard matrix as described above, gives equal importance to each variable. Therefore, a weighted matrix was also used. In a weighted matrix each variable is given a different importance weighting. Input from the project team and all specialists was utilised for the allocation of weightings to the different variables. Each member of the Project team was asked to rank each variable according to their significance:

- 1 – low significance
- 2 – medium significance
- 3 – high significance

Once the average weighting for each variable was obtained it was multiplied by the Site Preference Rating (SPR) to give a weighted SPR for each variable.

7.4. 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 – however the process will be adjusted to accommodate such new information.
  - The six 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.