

7.3.3 Geology

The Hendrina power station and surrounds are located on coal-bearing rocks of the Vryheid Formation, part of the lower Karoo Supergroup. These rocks are principally deltaic and fluvial siltstones and mudstones, with subordinate sandstones (Johnson et al, 2006). The coal seams originated as peat swamps, or similar environments. Where the Dwyka Group is absent (suspected in the study area), the Vryheid Formation has been deposited directly onto rugged pre-Karoo topography, and the thickness of the Formation can be quite variable as a result. The Vryheid Formation rocks are well lithified (hard) and have little primary porosity. All five Alternatives have the same underlying geology. The geology of the study area is shown in **Figure 7.4**.

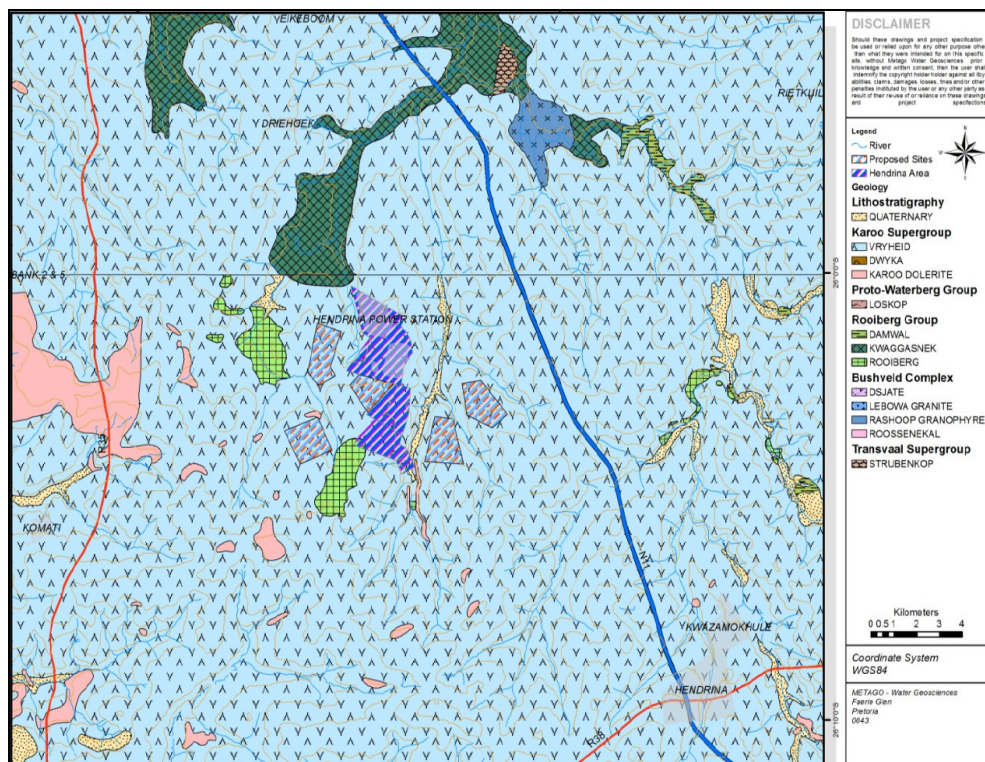


Figure 7.4: Geology of the Study area

7.3.4 Land Cover and Land Use

Land cover categories are presented in **Figure 7.5**. For the purpose of this assessment, land cover are loosely categorised into classes that represent natural habitat and land use categories that contribute to habitat degradation and transformation on a local or regional scale. Areas that are characterised by high levels of transformation and habitat degradation is generally accepted as being suitable for development purposes as it is unlikely that biodiversity attributes of sensitivities will be present or affected by development. Conversely, areas that are characterised by extensive untransformed and pristine habitat are generally not regarded suitable options for development purposes. The status of natural habitat does however have bearing on the suitability of a site.

The region comprises extensive transformed habitat that resulted from agriculture and mining, rendering remaining habitat fragmented and isolated and ultimately relatively sensitive. Little natural grassland habitat remains in the area, the majority being around streams and rivers where ploughing is not possible or soils are poor in nutrients. One of the shortfalls of the Environmental Potential Atlas database (ENPAT) is that it does not reflect the current status of natural habitat within the study area. At this stage of the process it is therefore assumed that all areas indicated to comprise of natural grassland is representative of the regional vegetation types and are in a good condition. While this assumption is unlikely to hold true for most of the study area, an assessment of the actual ecological status of grasslands within the study area is beyond the scope of this report and will only be compiled during the EIA phase.

The land cover and land use descriptions for the various alternatives are as follows:

- **Alternative A:** Comprises mostly transformed habitat (agricultural) with a small portion of remaining natural grassland
- **Alternative B:** Comprises mostly agricultural fields with a small portion of remaining natural grassland
- **Alternative C:** Comprised of agricultural fields with no remaining natural grassland
- **Alternative D:** Comprises mostly agricultural fields in addition to mining areas and small portions of remaining natural grassland.
- **Alternative E:** Comprised entirely of transformed habitat (agricultural, mining and residential areas).

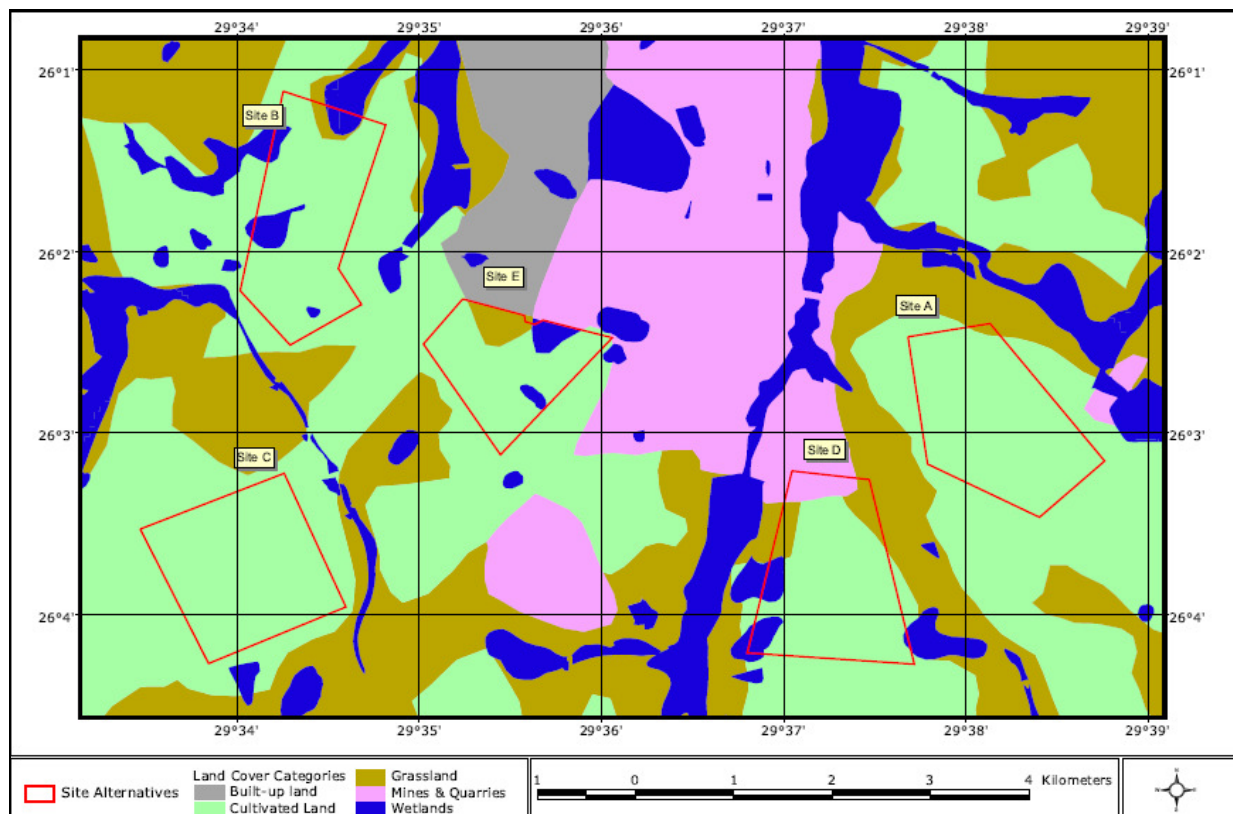


Figure 7.5: Land cover categories for the study area

7.3.5 Natural Vegetation

- **Regional Vegetation - VEGMAP**

Terrestrial grassland patches that are captured within the respective site alternatives represent the Eastern Highveld Grassland. This vegetation type is Endangered and only small fractions are conserved in statutory reserves. Some 44% is transformed by cultivation, plantations, mines, urbanisation and by building of dams. Cultivation may have had a more extensive impact than which is currently indicated by land cover data. The vegetation is short dense grassland dominated by *Aristida*, *Digitaria*, *Eragrostis*, *Themeda* and *Tristachya* species. Small rocky outcrops are scattered across the landscape. Wiry grasses and woody species are associated with these outcrops. These include species such as *Acacia caffra*, *Celtis africana*, *Diospyros lycioides*, *Parinari capensis*, *Protea caffra* and *Searsia magalismsontanum* (Mucina & Rutherford, 2006). The Endangered status of this vegetation type warrants a medium-high environmental sensitivity. Small portions of the Eastern Temperate Freshwater Wetlands vegetation type are located within the study area.

- **MBCP Categories**

Classification of the Terrestrial Biodiversity Classification categories (**Figure 7.6**) in the study area is as follows:

- **Highly Significant areas** - protection needed, very limited choice for meeting targets;
- **Important and Necessary areas** - protection needed, greater choice in meeting targets;
- **Areas of Least Concern** - natural areas with most choices, including for development;
- **Areas with No Natural Habitat Remaining** - transformed areas that make no contribution to meeting targets.

Figure 7.6 shows the MBCP categories as they relate to the five alternative sites.

The only category of note within the site alternatives is 'Least Concern, generally conforming to the remaining natural grassland, as depicted in the land cover database as well as wetland and surface water habitats. These areas are generally regarded as moderately sensitive, mainly as a result of the extensive habitat transformation of the general region and the small portions of remaining natural habitat.

No area of restriction is identified within any of the proposed site alternatives in terms of the MBCP classification database.

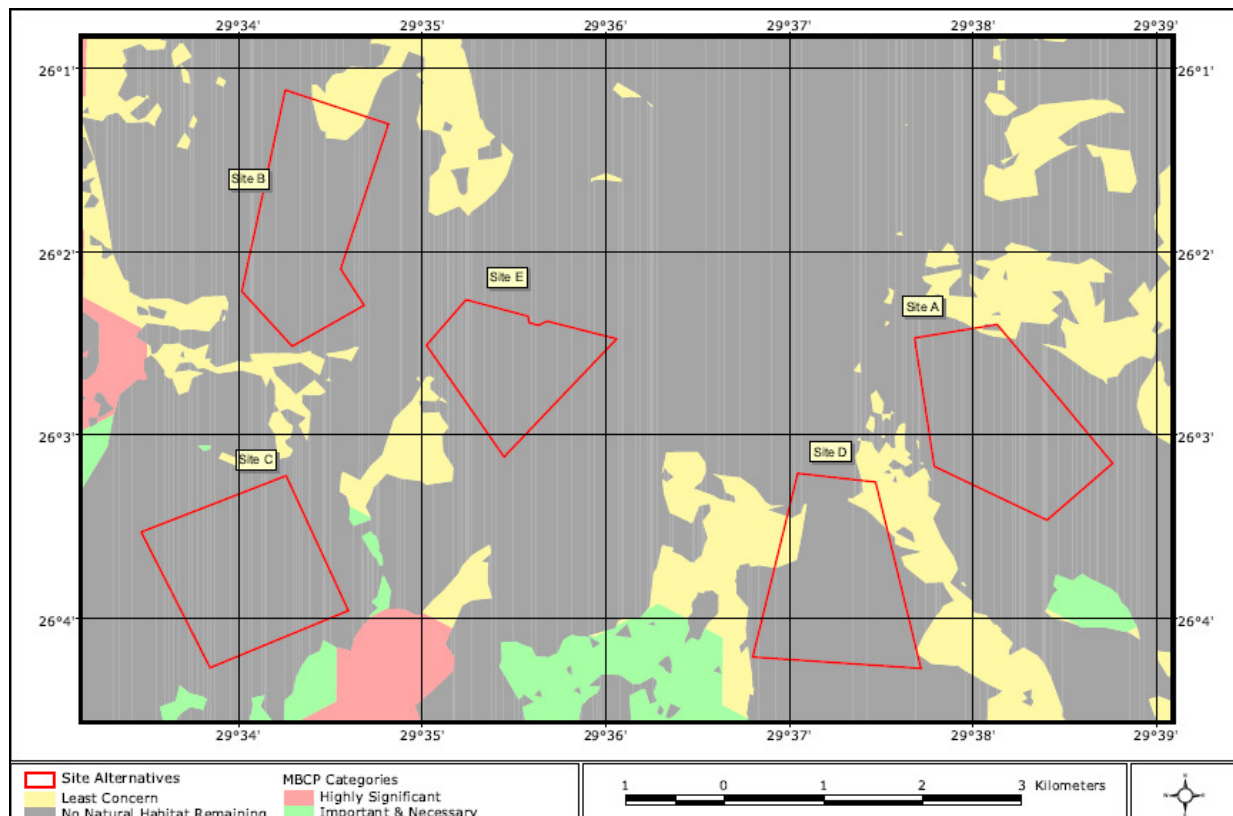


Figure 7.6: The MBCP categories as they relate to the five alternative sites.

The SANBI database indicates the known presence of only 38 plant species within this particular ¼ degree grid (2629BA). This low diversity is the result of poor floristic knowledge of the area and is not a reflection of a poor habitat and floristic diversity.

No floristic species of conservation importance is known to occur in this region, according to the SANBI database. However, all areas of natural grassland habitat and wetland habitat, in particular, are regarded suitable for the potential presence of flora species of conservation importance

Further detail can be obtained from the Biodiversity Specialist Report in **Appendix K**.

7.3.6 Animal Life

A total of 11 Red Data fauna species exhibit a moderate likelihood of occurring in the region, considering the type and distribution of habitat types. In particular, wetland related habitat is regarded significant for the potential presence of Red Data fauna species and most of the moderately likely species utilises wetland habitat extensively

The study area is ultimately characterised by a matrix of transformed faunal habitat (maize field etc.) with scattered portions of untransformed grassland and wetland habitats, but little of the original ecological characteristics remain within the larger region.

Further detail can be obtained from the Biodiversity Specialist Report in **Appendix K**.

7.3.7 Macro Habitats

- **Preliminary Macro Habitat Types**

Habitat types that were identified within the proposed site alternatives include the following:

- **Agricultural fields** – comprises areas that are currently actively cultivated (mainly maize). Edges are generally characterised by a composition of weeds, invasive forbs and poor quality grasses and herbs. The faunal component of these areas might be relative diverse, but mostly comprises animals that utilises these areas on an infrequent basis or because of the unnatural food source that is presented by agriculture during parts of the year. The composition of animals in these areas are entirely different to that of natural grassland habitat;
- **Natural grasslands** – Fragmented and isolated areas of natural grassland comprise grassland attributes of moderate sensitivity. These areas are frequently also associated with wetland habitat of the region. The species composition of these areas provides indication of the natural status of the grassland remnants. A diverse composition that is typical of the Eastern Highveld Grassland vegetation type comprises an admixture of forbs (particularly geophytes) and grasses. It should be noted that, at this stage of the process, no distinction is yet made between prime grassland and areas where a poor quality is prevalent;
- **Wetlands** – all areas of wetland related habitat. For a detailed delineation and description, the reader is referred to the relevant document that is compiled for this aspect; and
- **Transformed habitat** – all areas where development has resulted in the decimation of natural habitat. Species generally associated with these areas comprises plants that are used for garden purposes, windbreaks or species associated with habitat transformation.

- **Macro Habitat Sensitivities**

- **Agricultural fields** – No attributes of natural habitat remains within these areas and a low ecological sensitivity is ascribed to these parts. It is also unlikely that these areas will recover to a natural state;
- **Natural grasslands** – A moderate to high sensitivity (depending on the actual status) is normally ascribed to these parts, mainly as a result of the severe fragmentation and isolation of remaining fragments;
- **Wetlands** – A high sensitivity is ascribed to these parts; and
- **Transformed habitat** – No attributes of natural habitat remains within these areas and a low ecological sensitivity is ascribed to these parts. It is also unlikely that these areas will recover to a natural state.