Lidwala
Environmental & Planning Services

Eskom Holdings SOC Limited

Eskom

Environmental Impact Assessment for the Proposed Continuous Ashing at the Tutuka Power Station, Mpumalanga Province

FINAL SCOPING REPORT

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EXECUTIVE SUMMARY

1 INTRODUCTION

1.1 Project Background

Eskom's core business is the generation, transmission and distribution of electricity throughout South Africa. Electricity by its nature cannot be stored and must be used as it is generated. Therefore electricity is generated according to supply-demand requirements. The reliable provision of electricity by Eskom is critical to industrial development and other poverty alleviation initiatives in the country.

If Eskom is to meet its mandate and commitment to supply the ever-increasing needs of end-users in South Africa, one of Eskom's options is to extend the life of its infrastructure of generation capacity and transmission and distribution powerlines.

Tutuka Power Station, a coal fired power generation facility commissioned between 1985 – 1990, is located 25 km North of Standerton in the province of Mpumalanga. Tutuka Power Station currently disposes of ash in a dry (20% moisture content) form by means of conveyors, spreader and a stacker system from the station terrace to the Ash Disposal site. The ash disposal site covers an area of 2500 ha (Existing & Remaining ash disposal facility & pollution control canals) and is located approximately 4.5 km east of the station terrace.

Ideally, Tutuka Power Station, envisages the continuation of dry ash disposal over Eskom owned land, which was purchased before the commencement of environmental laws, the Environment Conservation Act, in particular. As part of its planning processes, Eskom developed designs which were approved internally, during this time. With the promulgation of the environmental laws, and the National Environmental Management Waste Act, Act 59 of 2008, in particular, Eskom would like to pro-actively align its continued ashing activities with the requirements of the waste licensing processes.

1.2 Description of the Study Area

Tutuka Power Station is located approximately 25 km northnortheast (NNE) of Standerton in the Mpumalanga Province. The power station falls within the Lekwa Local Municipality which falls within the Gert Sibande District Municipality.

The proposed study area, utilised in the screening study, is within an 8 km radius of the centre point of the Tutuka Power Station Site (**Figure 1. and 2**). A greater part of the study area is made up of agricultural, mining and power generation activities.

Figure 1: Tutuka Power Station forms the centre point of the study area, as the source of ash

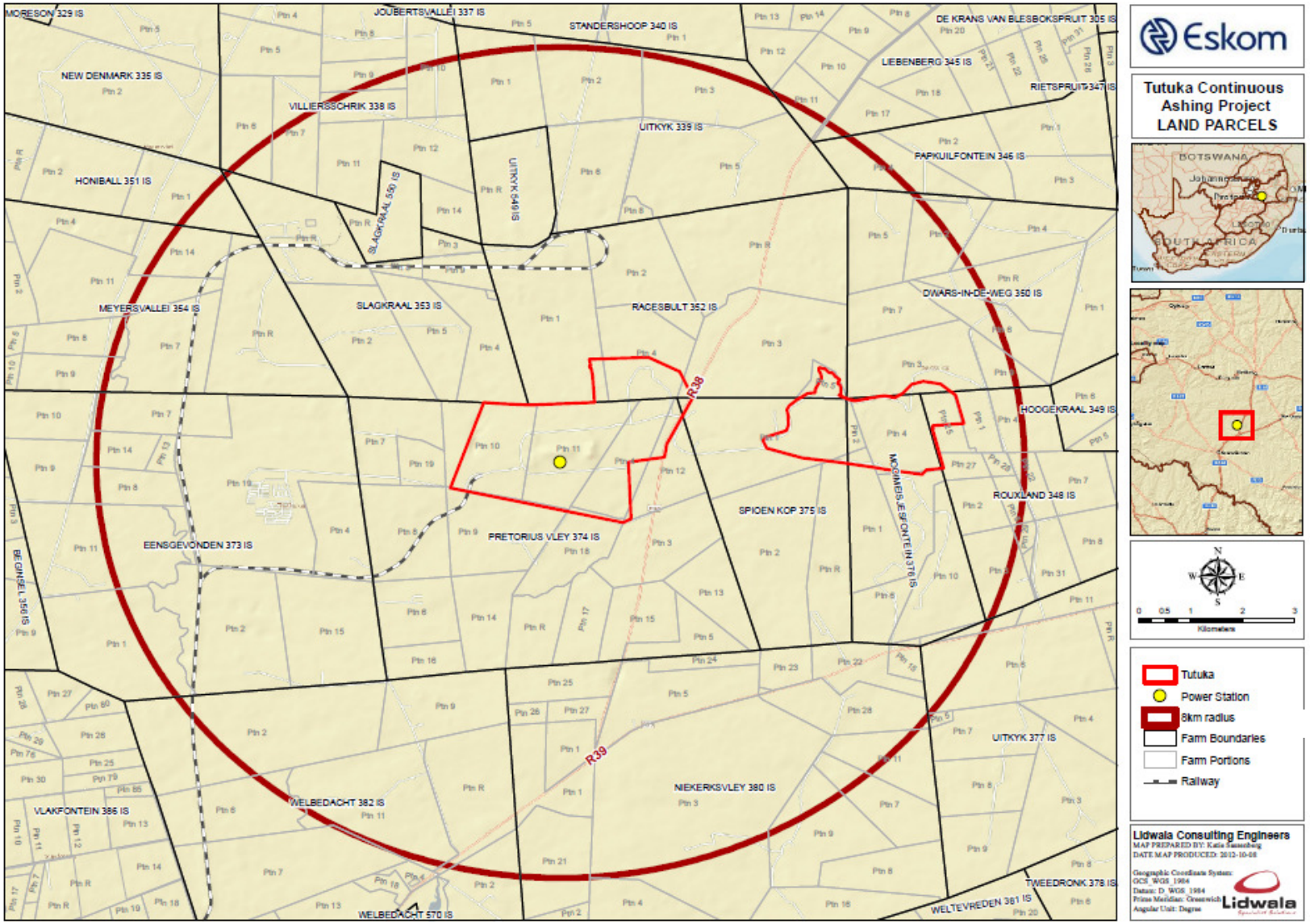

Figure 2: The greater study area

2 PROCESS TO DATE

The Environmental Impact Assessment (EIA) process for the proposed continuous ashing project is comprised of two main phases, namely the Scoping phase and Impact Assessment phase. This report documents the tasks which have been undertaken as part of the Scoping phase of the EIA. These tasks include the public participation process and the documentation of the issues which have been identified as a result of these activities.

To date, tasks that have commenced include the:

- Identification of stakeholders or I&APs;
- Notification and advertisements;
- Background Information Documents; and
- Ongoing consultation and engagement

The Draft Scoping Report was released for public review and comment from **8 November 2012** to **7 December 2012**. During the review period a public participation process (PPP) was undertaken, allowing Interested and Affected Parties (I&APs) to engage with the project proponents and independent environmental consultants. The PPP consisted of a public meeting as well as one-on-one and Focus Group interactions where required. Issues raised by I&APs during the public participation process have been documented and included in the Final Scoping Report.

The relevant authorities required to review the proposed project and provide an Environmental Authorisation were consulted from the outset of this study, and have been engaged throughout the project process. The National Department of Environmental Affairs (DEA) is the competent authority for this Project. The Department of Water Affairs (DWA), and the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET) are noted as key commenting authorities.

The Scoping Phase of an EIA serves to define the scope of the detailed assessment of the potential impacts of a proposed project. The Environmental Scoping Phase has been undertaken in accordance with the requirements of sections 24 and 24D of the National Environmental Management Act (NEMA) (Act 108 of 1998), as read with Government Notices R 543 of the 2010 EIA Regulations. The objectives of the Scoping Phase are to:

- Ensure that the process is open and transparent and involves the Authorities, proponent and stakeholders;
- Identify the important characteristics of the affected environment;
- Ensure that feasible alternatives are identified and selected for further assessment;
- Assess and determine possible impacts of the proposed project on the biophysical and socio-economic environment and associated mitigation measures; and
- Ensure compliance with the relevant legislation.

3 SUMMARY OF THE LEGISLATION CONTEXT

The legislative framework applicable to this project is diverse and consists of a number of Acts, Regulations and Treaties which must be complied with. A summary of the key legislation is provided hereunder.

- National Environmental Management: Waste Act No 59 of 2008
- The National Environmental Management: Air Quality Act No 39 of 2004;
- National Water Act No 36 of 1998;
- GN R1179 (GG 16536 of 25 August 1995) – Hazardous Chemical Substances Regulations promulgated in terms of the Occupational Health and Safety Act No 85 of 1993;
- Hazardous Substances Act No 15 of 1973
- Constitution of South Africa, Act 108 of 1996 (with reference to noise)
- Explosives Act No 26 of 1956 and Regulation 1604 of 8 September 1972;
- National Environmental Management Act No 107 of 1998 (with reference to noise and prevention of pollution)
- National Environmental Management: Biodiversity Act No 10 of 2004 (in respect of Fauna, Flora and National Heritage Resources)
- Conservation of Agricultural Resources Act No 43 of 1989 (in respect of Fauna, Flora and National Heritage Resources)
- National Forest Act No 84 of 1998 (in respect of protected trees)
- National Veld and Forest Fire Act No 101 of 1998
- National Heritage Resources Act No 25 of 1999
- Promotion of Access to Information Act No 2 of 2000 (in respect of record-keeping and interested and affected parties and monitoring of environmental impacts)

A full legal review will be undertaken during the EIA phase of the project.

4 DESCRIPTION OF THE BASELINE ENVIRONMENT

The particular area required for the continuous ashing facility is approximately 759 ha, which is located on the eastern and southern portion of the existing Tutuka Power Station ash disposal facility. However, in order to allow for a robust environmental process, all land within a radius of 8 km was assessed in order to identify potential alternatives sites should sensitive environmental aspects limit the suitability of this particular portion of land. The Tutuka Continuous Ashing EIA study area is therefore located within an eight (8) kilometre radius around a centre point which is the Tutuka Power Station. The study area is approximately 200 square kilometres in size and includes a total of 24 different farms divided into 128 farm portions.

The study area is characterised by the strong undulating character typical of the Mpumalanga province with low ridges east of the study area. The natural topography of

the area has been disturbed as a result of various agricultural and power generation activities.

The climate in the study area can be described as typical highveld conditions with summers that are moderate and wet, while winters are cold and dry. Severe frost and snow are sometimes experienced. The area also falls within the mist belt. The mean annual precipitation is approximately 580 mm/year, with rain experienced predominantly in the summer months (October to April). Annual average maximum, minimum and mean temperatures for the site are given as 31.5°C, 0.9°C and 15.3°C, respectively. The prevailing wind direction is recorded as being eastsoutheaserly winds.

Tutuka Power Station and surrounding area (8km radius) is underlain by rocks of Permian to Jurassic age. More specifically:

- Permian Ecca Group - Vryheid Formation;
- Karoo Supergroup – Karoo Dolerite.

The study site corresponds to the Grassland Biome as defined by Mucina & Rutherford (VegMap, 2006). This unit is found in the eastern, precipitation-rich regions of the Highveld. Grasslands of these parts are regarded 'sour grasslands'. The vegetation of the study area corresponds to an ecological type known as Soweto Highveld Grassland.

The study area considered in the screening and scoping phases encompasses an 8 km radius around the current infrastructure, and falls over three quaternary catchments in the Upper Vaal Water Management Area (WMA), with the Tutuka Power Station located in the C11K quaternary catchment, draining southwards towards the Grootdraai Dam via the Leeuspruit. The study area is located in an Upstream Management Catchment (NFEPA – Nel et al., 2011). According to the MBCP (Ferrar & Lötter, 2007) the study area is located in an 'Ecosystem Maintenance' sub-catchment. The main rivers in the 8 km radius of the Tutuka Power Station include a tributary of the Leeuspruit and a tributary of the Vaal River.

The DWA 1:500 000 scale hydrogeology map of the area (Sheet 2526 Johannesburg) shows that the area within an 8 km radius of the Tutuka site is entirely classified as "D2", suggesting the underlying aquifer is inter-granular and fractured and the average borehole yield ranges between 0.1 and 0.5 litres per second (L/s). There are no major groundwater abstractions shown on the hydrogeological map within 8 km of the site.

5 PROJECT ALTERNATIVES

- *No-Go Alternative*

Ideally, Tutuka Power Station envisages the continuation of dry ash disposal over Eskom owned land, which was purchased before the commencement of environmental laws, the

Environment Conservation Act, in particular. As part of its planning processes, Eskom developed designs which were approved internally, during this time. With the promulgation of the environmental laws, and the National Environmental Management Waste Act, Act 59 of 2008, in particular, Eskom would like to align its continued ashing activities with the requirements of the waste licensing processes.

The need for this project is to allow the Tutuka Power Station to continue ashing in an environmentally responsible and legally compliant manner for the duration of the operating life of the Power Station.

In the event that the continuous ashing project does not proceed either the power station will run out of land to legally dispose of its ash and the power station will ultimately be required to close down, which would contribute negatively to the provision of reliable base load power to the national grid or the power station will be required to dispose of its ash in a non-compliant manner which is contrary to Eskom's policies.

Even though the no-go alternative is considered to be unfeasible, the 'no go' alternative will, still be investigated further in the EIA phase as an alternative as required by the EIA Regulations.

- *Technical Alternatives*

Due to the fact that Tutuka Power Station utilises a dry ashing disposal method, it stands to reason that in order to continue ashing a dry ashing method should still be utilised.

A further technical alternative to limit the need for ash disposal facilities includes the use of higher grade coal which would reduce the amount of ash produced in the power generation process. The power station was originally designed for 35 years and now its life time is extended to 60 years. The boilers are designed to use a specific grade of coal and the boiler plant would require a redesign for higher grade coal. In order for this alternative to be implemented would require the complete redesign and reconstruction of the power station. The combination of the costs involved in the reconstruction of the power station as well as the higher price of the higher grade coal would have a knock on effect in terms of the country's electricity prices. Therefore, this alternative is therefore not considered feasible.

- *Location Alternatives*

A screening study was initiated in order to assess where potential alternative sites are located within the study area that would be suitable for use for the proposed continuous ashing project. The study area was demarcated using an 8 km radius around the Tutuka Power Station.

In order to ensure that sites are identified in the most objective manner possible, a sensitivity mapping exercise was undertaken for the study area. The purpose of such an exercise was to identify suitable areas within the study area that could accommodate the proposed ash disposal facility and associated infrastructure and to pro-actively identify sensitive areas (i.e. fatal flaws) that should be avoided.

Figure 3 shows the final sensitivity map that was utilised to identify the alternative sites (**Figure 4**) that require more detailed studies.

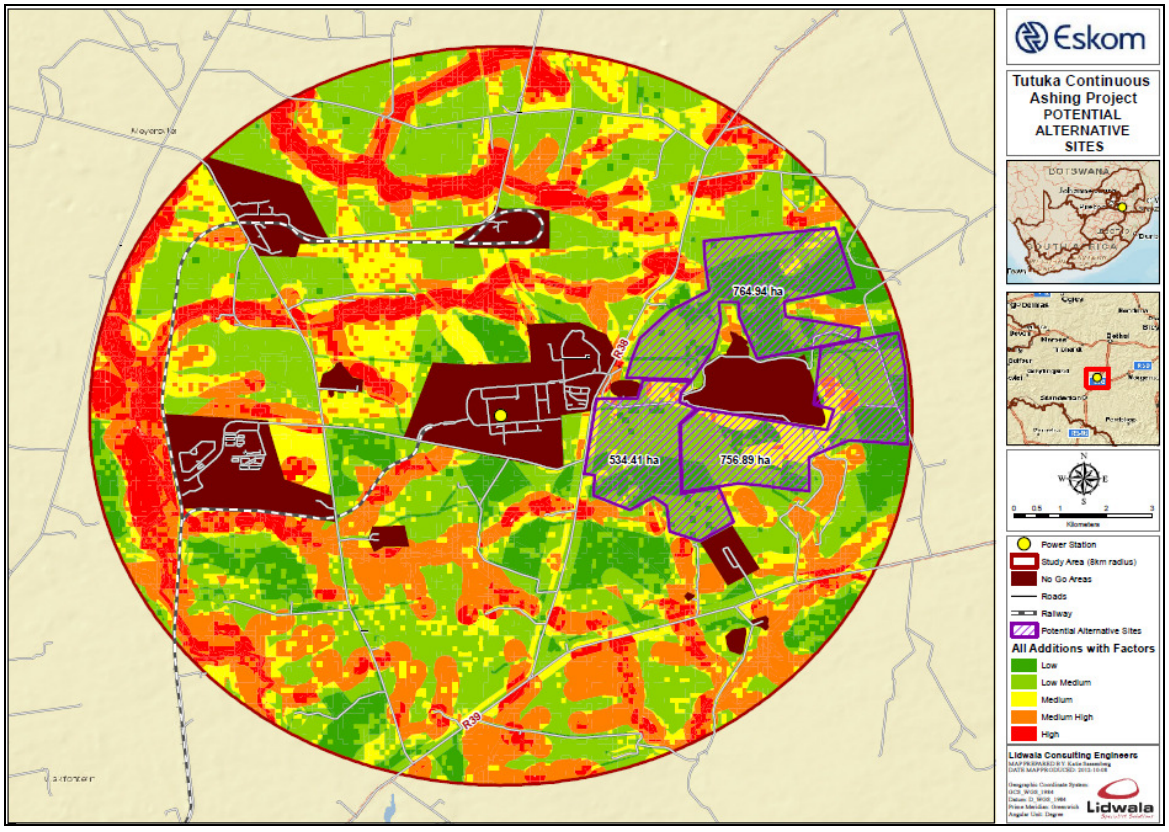

Figure 3: Potential alternative sites available for the ash disposal facility

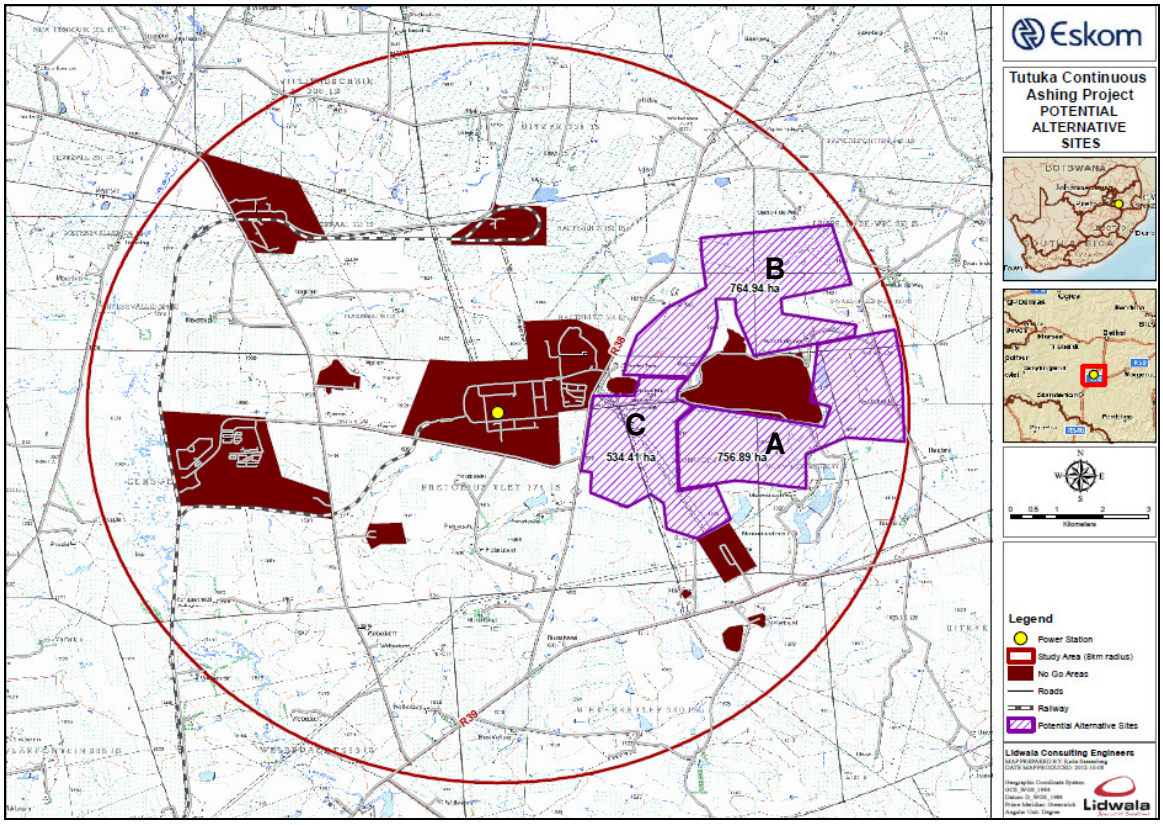

Figure 4: The Alternative sites for further consideration during the EIA Phase

6 FINDINGS OF THE IDENTIFICATION OF IMPACTS

The following impacts have been identified for additional study during the EIA phase and are deemed to be issues of potentially **medium to high significance** or those anticipated to require specific mitigation measures:

- **Biophysical Impacts**
  - *Geology*
    - Impacts related to the construction-related earthworks
    - Impacts related to the pollution in case of spillage/leakage of hydrocarbon and other hazardous material from storage facilities
  - *Groundwater*
    - Contamination of ground water due to hydrocarbon spillage and seepage into groundwater reserves, affecting groundwater quality.
    - Further construction of infrastructure and compaction of the area will further contribute to reduced water infiltration rates to replenish groundwater aquifers.
  - *Soil and agricultural potential*
    - Pollution of soil due to handling, use and storage of hazardous substances during construction and operation.
    - The loss of available top soil.

        - Key variables that determine the land capability of the study area such as soil fertility reduced and disturbed due to the potential activities related to the ash disposal facility.
        - The loss of viable agricultural land.
    - *Avifauna*
        - Ash disposal facility
            - Destruction of habitat and disturbance of birds
        - Associated Infrastructure such as powerlines
            - Electrocutions
            - Collisions
            - Habitat destruction
            - Disturbance
    - *Surface Water*
        - Impacts on surface water quality;
        - Impacts on hydrology;
        - Impacts related to erosion and sedimentation;
        - Impacts on aquatic biota; and
        - Impacts on aquatic ecosystem services.
    - *Biodiversity*
        - Direct impacts on threatened flora species;
        - Direct impacts on protected flora species;
        - Direct impacts on threatened faunal taxa;
        - Direct impacts on common fauna species/ faunal assemblages (including migration patterns, corridors, etc.);
        - Human - Animal conflicts;
        - Loss or degradation of natural vegetation/ pristine habitat (including ecosystem functioning);
        - Loss/ degradation of surrounding habitat;
        - Impacts on SA's conservation obligations & targets;
        - Increase in local and regional fragmentation/ isolation of habitat; and
        - Increase in environmental degradation, pollution (air, soils, surface water)..

- **Social Impacts**
    - *Air Quality*
        - Increase in dust generating activities during construction and operation including exceedances of PM10 concentrations and exceedances of dustfall rates.
    - *Visual*
        - Impact on the current visual landscape.
        - Impact on sensitive receptors,
    - *Heritage*
        - identify the potential heritage sites within the study area

- identify any impacts (if any) that may occur on these sites as a result of the continuous ashing project

- *Socio-Economic*
  - Perceptions and fears associated with the proposed project; and
  - Local, site-specific issues.

The above mentioned impacts will be investigated in more detail during the EIA phase of the project.

7 CONCLUSIONS AND RECOMMENDATIONS

A number of potentially significance environmental impacts have been identified as requiring some more in-depth investigation and the identification of detailed mitigation measures. Although the impacts identified are of a potentially significant nature they would not prohibit the project from continuing at this stage of the process

Therefore, a detailed Environmental Impact Assessment is required to be undertaken in order to provide an assessment of these potential impacts and recommend appropriate mitigation measures, where required.

The recommendation of this report is that detailed specialist studies are undertaken on the three identified alternative sites and the no-go alternative

Eskom Holdings SOC Limited

Environmental Impact Assessment for the Proposed Continuous Ashing at the Tutuka Power Station, Mpumalanga Province

Final Scoping Report

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