

## **11 CONCLUSION**

### **11.1 Introduction**

The Environmental Impact Assessment (EIA) process for the proposed continuous ash disposal facility for Tutuka Power Station was undertaken in accordance with the requirements of sections 24 and 24D of the National Environmental Management Act (NEMA) (Act 108 of 1998), as amended, and as read with Government Notices R 543, 544, 545 and 546 of NEMA, as well as with Section 19 of the National Environmental Management: Waste Act (Act 59 of 2008) (NEMWA) as read with Government Notice 921 of 29 November 2013.

The essence of any EIA process is aimed at ensuring informed decision-making and environmental accountability, and to assist in achieving environmentally sound and sustainable development. In terms of NEMA (Act No. 107 of 1998), the commitment to sustainable development is evident in the provision that “*development must be socially, environmentally and economically sustainable.... and requires the consideration of all relevant factors...*”. NEMA also imposes a duty of care, which places a positive obligation on any person who has caused, is causing, or is likely to cause damage to the environment to take *reasonable steps* to prevent such damage. In terms of NEMA’s preventative principle, potentially negative impacts on the environment and on people’s environmental rights (in terms of the Constitution of the Republic of South Africa, Act No. 108 of 1996) should be anticipated and prevented, and where they cannot be altogether prevented, they must be minimised and remedied in terms of “*reasonable measures*”.

In assessing the environmental feasibility of the proposed project, the requirements of all relevant legislation were considered. This relevant legislation has informed the identification and development of appropriate management and mitigation measures that should be implemented in order to minimise potentially significant impacts associated with the project.

The conclusions of this EIA are a result of comprehensive assessments, which were based on issues and impacts identified through the EIA process and the parallel process of public participation. The public consultation process was extensive, and every effort was made to include representatives of all stakeholders within the process.

### **11.1.1 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 poverty alleviation in the country.

If Eskom is to meet its mandate and commitment to supply the ever-increasing needs of end-users in South Africa, it has to continually expand its infrastructure of generation capacity and, transmission and distribution power lines.

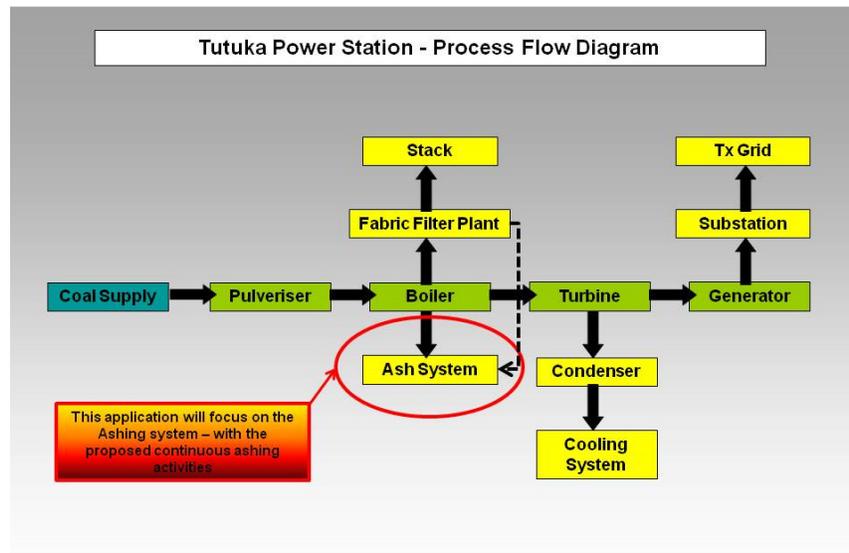
The coal-fired power generation process results in large quantities of ash, which are disposed of in a dry ash disposal facility (**Figure 11.1**). This process involves ash being transported from the power station by conveyors and disposed of on an ash disposal facility by means of a stacker and spreader.

The proposed development has the following specifications:

- Capacity of airspace of ~158 million m<sup>3</sup> ; and
- Ground footprint of approximately 800 Ha (Ash disposal facility & pollution control canals, channels and dams.)

This ash disposal facility will be able to accommodate the ashing requirements of the power station for the next 41 years, to 2055 (these timelines are based on an annual ash production rate of 4.20 million tonnes).

All land within an 8km radius of the power station was assessed to identify suitable alternatives for the proposed continuous ash disposal facility.



**Figure 11.1:** An overview of the activities on site and where this project fits within the process

## 11.2 Process to Date

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

The Draft EIA Report was released for public review and comment from **21 July 2014 to 25 September 2014**. 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 interactions. Issues raised by I&APs during the public participation process are documented and included in this Final EIA Report.

The relevant Key commenting authorities, DWA and MDEDET, required to review the proposed project and provide comment to enable the Competent Authority to make a decision were consulted from the outset of this study, and have been engaged throughout the project process. The competent authority for this project is the National DEA. The DWA and MDEDET are noted as the key commenting authorities. For a comprehensive list see **Chapter 2**.

The Impact Assessment Phase of an EIA serves to assess the issues and impacts identified during the scoping phase. The EIA 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 purpose of the Impact Assessment Phase of an EIA is as follows<sup>1</sup>:

- Ensure that the process is open and transparent and involves the Authorities, proponent and stakeholders;
- Address issues that have been raised during the preceding Scoping Phase;
- Assess alternatives to the proposed activity in a comparative manner;
- Assess all identified impacts and determine the significance of each impact; and
- Formulate mitigation measures.

It is the opinion of the EAP that the above objectives have been achieved during this Environmental Impact Assessment.

### **11.3 Potential Environmental Impacts Identified during Scoping**

#### **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
- Topography
  - Change to drainage patterns due to construction-related earthworks and additional stormwater drainage patterns.
  - Mitigation measures are required to be identified.
- 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.
- Avifauna
  - Ash disposal facility
    - Destruction of habitat and disturbance of birds
  - Associated Infrastructure
    - Habitat destruction

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<sup>1</sup> DEAT (2010) *Guideline 5: Companion to the NEMA EIA Regulations of 2010, Integrated Environmental Management Guideline Series*, Department of Environmental Affairs and Tourism (DEAT), Pretoria

- 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.
- 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.
- 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,
- Noise
  - Change in ambient noise levels during both construction and operation

- Heritage
  - Impacts on heritage sites within the study area
- Socio-Economic
  - Impact on the current visual landscape.
  - Impact on sensitive receptors,
  - Perceptions and fears associated with the proposed project; and
  - Local, site-specific issues.

## **11.4 Impact Assessment**

### ***Construction phase impacts***

Some significant impacts have been assessed that will occur during the construction phase. This is especially applicable to the Biodiversity study and Agricultural studies. All the impacts on Biodiversity could be reduced to Medium with the appropriate and recommended mitigation measures. Significant impacts on biodiversity are applicable to all the site alternatives that have been identified without much distinction with regard to preference between alternatives.

With this in mind it is important to realise that the alternatives themselves have been identified as areas with the minimum impact on the Environment in relation to the study area. This has been done by integrating the results from all the different specialist studies.

This means that although there will be significant biodiversity impacts by using Alternative C, the cumulative impacts on all aspects studied will most probably be less than for any other area within the 8 km radius.

### ***Operational phase impacts***

A number of residual impacts have been identified between Surface water and Biodiversity with high significance as part of the operational phase at Alternatives A&B. Although these impacts remain High following mitigation they have not been identified as Fatal Flaws.

The only residual impacts at Alternative B with high significance during the operational phase, is the irreversible loss of agricultural soil and the impacts on Hydrology (only applicable to Alternative B). The former will be relevant to any area identified for disposal

and the impact has been minimised as far as possible by selecting the lowest possible potential soils.

### ***Decommissioning phase impacts***

No new impacts will be introduced during the decommissioning phase with high significance. By aligning operations with all mitigations proposed in the Environmental Management Programme (EMPr) impacts will be minimised as far as possible. After De-commissioning these impacts are expected to decrease in severity.

The only impact identified with high significance during this phase across all the alternatives are the loss of agricultural soil with medium to low potential across all the alternatives. It is also anticipated that all environmental impacts will be revisited at power station closure in order to update the impact analysis to take all new information and plans into account. This re-visit will be aligned to existing environmental legislation at the time of decommissioning.

### ***Cumulative Impacts***

Cumulative impacts on conservation objectives and targets have been identified as the most important biodiversity impact. This together with the loss of agricultural land can be raised as the most important cumulative impacts of the Tutuka Continuous Ash Disposal Facility project.

Taking into account the post mitigation impacts of the proposed Alternative C as well as the preference rankings from the various specialists it is clear that **Alternative C (Figure 11.2)**, is the preferred Environmental alternative for the project. It is important to realise that as with all the other alternatives some wetlands will be affected by using this area.

## **11.5 Special Motivation**

From the Site preference rankings it is evident that there is really not much to differentiate between the various alternatives assessed as part of this study. None of the alternatives has been identified as presenting a fatal flaw.



Figure 11.2: Alternative C - Proposed (EIA) footprint for the Tutuka Power Station Continuous Ash Disposal facility.



**Figure 11.3:** Alternative A - Proposed (Technical) footprint for the Tutuka Power Station Continuous Ash Disposal facility.

Recommendations have been made by some specialists to utilise less sensitive areas within alternatives by combining some of the alternatives such as Alternative A and Alternative C (Preferred combination based on Environmental considerations). Taking the above into account, as well as the significant financial and technical implications that needs to be considered when Alternative C are used, the EAP supports the motivation as presented from Eskom Engineers (**Appendix X**). Although Alternative A is presented as the second preferred (EIA) alternative the Economical and Technical impacts far out-way the few additional Environmental impacts of going with Alternative C. The dams visible within the footprint area (**Figure 11.3**) are the pollution control dams for the existing ashing facility.

Taking all the various factors and studies into account, the client proposed a layout as indicated in the conceptual design report **Appendix C**. This design incorporates all the environmental sensitivities to achieve a “least environmental cost” solution that is still practical and financially feasible. It is therefore recommended by the Environmental Assessment Practitioner (EAP) that the proposed option (indicated in **Appendix C**) is approved subjected to the implementation and monitoring of all the mitigation measures as listed in the specialist studies and carried over to the Environmental Management Programme (EMPr).

### **11.6 Environmental Impact Statement**

The impact assessment phase of this project identified and assessed the potential impacts that the proposed continuous ash disposal facility and associated infrastructure may have on the proposed site and on the surrounding areas, as well as the impacts of increasing the footprint of Tutuka’s Emergency Ashing area (TT02). Through this assessment, mitigation measures have been suggested in order to reduce or eliminate any impacts that were identified.

The EIA has concluded that the legislative requirement (NEMA EIA Regulations 2010), to consider alternatives during the EIA process is focussed strongly on feasible and reasonable alternatives that meet the requirements of the proposed project. The specialist studies demonstrated that from an Environmental perspective Alternative C has a slight preference. As a result of similar Environmental impacts that has been identified on all the proposed alternatives and challenges with the technical feasibility of **Alternative C, Alternative A is recommended** (Please refer to Eskom motivation **Appendix X**).

In terms of the 'no go' option, it was concluded that if the proposed continuous ash disposal facility was not established it would contribute negatively to the provision of reliable base load power to the national grid. It will result in the need to shut down the power station due to the lack of area for ash disposal, causing a long term reduction in electricity supply. It is important to note that the additional power output from Tutuka Power Station is still required to meet the national demand.

A more detailed discussion of the alternatives applicable to this project is included in **Chapter 7**.

Most of the impacts with high significance during the construction phase can be mitigated to medium and low during the operational and de-commissioning phase. It is critical that the proposed mitigation measures be included in any possible authorisation.

All identified impacts have been based on normal operation conditions and all impacts identified were analysed according the following criteria, a summary of which is included in **Chapter 9**:

- Nature of the impact;
- Extent of the impact;
- Intensity of the impact;
- Duration of the impact;
- Probability of the impact occurring;
- Impact non-reversibility;
- Cumulative impacts;
- Impact on irreplaceable resources; and
- Confidence level.

In the view of the EAP the information contained in this report is final and the documentation attached thereto should be sufficient for the National DEA to make a decision in respect of the activities applied for with respect to the proposed continuous Ash Disposal Facility for the Tutuka Power Station, and the extension of the TT02.

**This EIA provides an assessment of both the benefits and potential negative impacts anticipated as a result of the proposed continuous ashing facilities for the Tutuka Power Station. The findings of the assessment conclude that identified significant impacts can be addressed with relevant mitigation measures,**

**therefore, in the view of the EAP, no environmental fatal flaws should prevent the proposed project from proceeding on any of the studied alternatives.**

In order to achieve appropriate environmental management standards and ensure that the mitigation from the environmental studies are implemented through practical measures, the recommendations from this EIA have been included within an Environmental Management Programme (EMPr) which is included in **Appendix D**. This EMPr must form part of the contract with the contractors appointed to construct and maintain the proposed infrastructure. The EMPr would be used to ensure compliance with environmental specifications and management measures. The implementation of this EMPr for key life cycle phases (i.e. construction and operation) of the proposed project is considered to be fundamental in achieving the appropriate environmental management standards as detailed for this project. In addition to this, it is imperative that an approved stormwater management plan is reviewed prior to the start of construction.

It is also recommended that the process of communication and consultation with the community representatives is maintained after the closure of this EIA process, during the construction and operational phases associated with the proposed project. This continued communication channels can also be aligned with Tutuka's ISO 14001 (EMS) certification requirements and commitments.

### **11.7 Transitional arrangements for Class C barrier system on ash disposal facility**

As a result of the Engineering process (Conceptual and Final Design) that needs to be completed following the Authorisation, and the timeframes associated with construction, Eskom motivated for a transitional period to be granted as far as the implementation of the **Class C** barrier system are concerned, until 31 December 2020. The detailed motivation for this request as well as the implementation plan are included as (**Appendix X**).

The transitional arrangements application is the only practical means to ensure that the Tutuka power station will remain in operation while the relevant internal processes are followed, until the barrier system is installed.

The EAP supports this motivation based on the available information and following a discussion with the Surface and Groundwater specialists. The Groundwater specialist indicated that according to the modelling conducted the effects of the liner are not significant enough to alter the model in any drastic manner if this transition is granted. The migration

of the plume and the quality of water in the aquifer are very similar when the existing situation (without liner) are compared to the predicted situation (with liner) which is due to the nature of soils and rock in the area as well as the fact that a dry method of ash disposal are used.

It is therefore recommended that the Environmental Authorisation make provision for the allowance of this Six year transitional period.

This allowance, if granted, should place so much more emphasis on the importance of the monitoring programme. Close monitoring needs to be conducted especially during this transition period. Should any exceedance of standards be detected, the ECO would have to report it to the relevant departments, and this arrangement and the conditions in the Environmental Authorisation might have to be revised.