

## **11 CONCLUSION**

### **11.1 Introduction**

The Environmental Impact Assessment (EIA) process for the proposed new wet ash disposal facilities at Hendrina Power Station has been undertaken in accordance with the requirements of sections 24 and 24D of the National Environmental Management Act (NEMA) (Act 107 of 1998), as read with Government Notices R 543, 544 and 545 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 718 of 3 July 2009.

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 have been 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 the result of comprehensive assessments. These assessments were based on issues identified through the EIA process and the parallel process of public participation. The public consultation process has been extensive, and every effort has been made to include representatives of all stakeholders within the process.

#### **11.1.1 Project Background**

Eskom's core business is the generation, ion 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 powerlines. This expansion includes not only the building of new power stations but also expanding and upgrading existing power stations to extend their life.

The Hendrina Power Station, in the Mpumalanga Province was designed to use a wet ashing system for the disposal of ash. Hendrina Power Station currently has five wet ash disposal facilities, of which two (Ash dam 3 and 5) are currently in operation, the other three (Ash dam 1, 2 & 4) are not in use for the following reasons:

- Having reached full capacity (Dam 1)
- Stability issues (Dam 2)
- Temporary decommissioning (Dam 4).

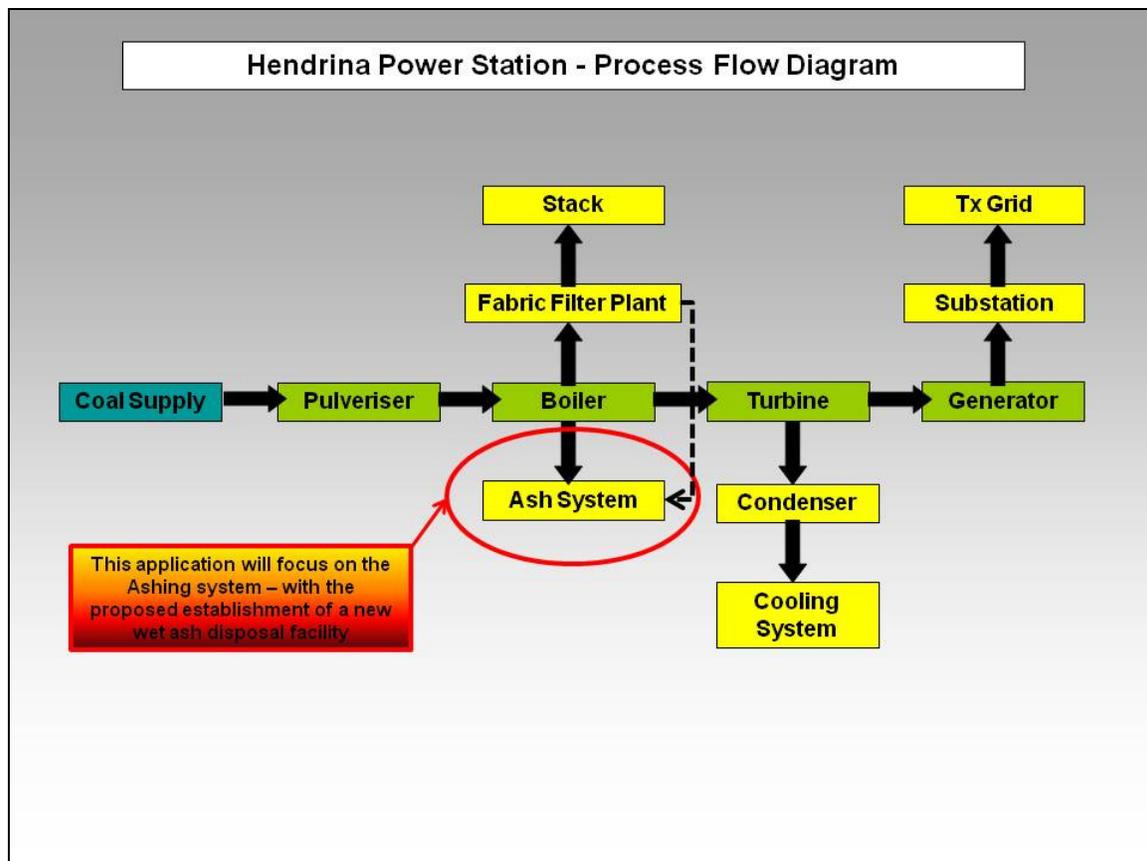
At the current rate of disposal on Dams 3 and 5, the rate-of-rise will exceed 4m/year in 2018, which is not acceptable in terms of structural stability. The Hendrina Power Station is anticipated to ash approximately 64.2 million m<sup>3</sup> until the end of its life span which is currently estimated to be 2035.

It has been determined, through studies, that the existing ashing facilities are not capable to provide sufficient ash disposal capacity for this amount of ash for the full life of the station. The existing facilities (Ash Dams 3 and 5) allow for the disposal of 20.9 million m<sup>3</sup>. Therefore, Hendrina Power Station proposes to extend its ashing facilities and associated infrastructure with the following development specifications:

- Additional airspace of 43.3 million m<sup>3</sup>
- Wet ash disposal facility ground footprint of 139 ha
- Ground footprint of associated infrastructure such as Ash Water Return Dams of 70 ha pump stations, drainage channels, access roads, switchgear room, ash lines etc

The need for this extension is to allow the Hendrina Power Station to continue ashing in an environmentally responsible way for the duration of the operating life of the power station. The need for the extension is related to the deteriorating coal quality, higher load factors, the installation of the Fabric filter plant (to meet requirements in terms of the National Environmental Management: Air Quality Act (Act 39 of 2004)) and the need to extend station life, among others.

The following diagram (**Figure 11.1**) provides an overview of the activities on site and where this project fits within the process.



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

### 11.1.2 Description of the Study Area

Hendrina Power Station is located in the Mpumalanga Province approximately 24 km south of Middleburg and 20 km North of the town of Hendrina. The power station and surrounds falls within the Steve Tshwete Local Municipality which forms part of the Nkangala District Municipality.

The greater part of the study area is made up of agricultural and mining activities (**Figure 11.2**). The proposed site for the proposed new wet ash disposal facility at Hendrina Power station is located directly adjacent to the existing wet ash disposal facilities and is currently utilised for agriculture (**Figure 11.3**).



**Figure 11.2:** The agricultural and mining activities that form the greater part of the study area



**Figure 11.3:** Proposed Site for the proposed new wet ash disposal facility

### **11.1.3 Process to Date**

The Environmental Impact Assessment (EIA) process for the proposed new wet ash disposal facility 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 Impact Assessment 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

More detail on the above is available in **Chapter 6**.

The revised Draft EIA Report was released for public review and comment from **21 February 2013** to **24 April 2013**. 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, where required. Issues raised by I&APs during the public participation process were documented and are included in the Issues and Response Report (IRR) of this Final EIA 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 and Sanitation (DWS), and the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET) are noted as key commenting authorities. For a comprehensive list of relevant authorities see **Chapter 2 and 6**.

The Impact Assessment Phase of an EIA serves to assess the 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 107 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;

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<sup>1</sup> DEAT (2005) *Guideline 3: General Guide to the Environmental Impact Assessment Regulations, 2005, Integrated Environmental Management Guideline Series*, Department of Environmental Affairs and Tourism (DEAT), Pretoria

- 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.

## 11.2 Potential Environmental Impacts Identified during Scoping

Environmental impacts identified during the scoping phase, which were considered to require further assessment, are listed below:

**Table 11.1.** List of environmental and socio-economic issues identified during Scoping

| <b>Environmental Issues Identified</b>   |
|--|
| <p><b>Geology</b></p> <ul style="list-style-type: none"> <li>• Impacts related to the construction-related earthworks as well as the pollution of geological features in case of spillage/leakage of hydrocarbon and other hazardous material from storage facilities have been identified as having a medium significance.</li> <li>• Mitigation measures are required to be identified.</li> </ul>   |
| <p><b>Topography</b></p> <ul style="list-style-type: none"> <li>• Change to drainage patterns due to construction-related earthworks and additional stormwater drainage patterns.</li> <li>• Mitigation measures are required to be identified.</li> </ul>   |
| <p><b>Soil</b></p> <ul style="list-style-type: none"> <li>• Pollution of soil due to handling, use and storage of hazardous substances during construction and operation.</li> <li>• The loss of available top soil.</li> <li>• Mitigation measures are required to be identified.</li> </ul>  |
| <p><b>Land Capability</b></p> <ul style="list-style-type: none"> <li>• 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 wet ash disposal facility.</li> <li>• The loss of viable agricultural land.</li> <li>• Mitigation measures are required to be identified.</li> </ul>   |
| <p><b>Avifauna</b></p> <p>The greatest predicted impact of the wet ash disposal facility on avifauna is the destruction of habitat and disturbance of birds during construction. During the construction phase, habitat destruction and alteration inevitably takes place. Habitat destruction is anticipated to be the most significant impact in this study area. However, this can be minimized and mitigated should the smallest alternative be chosen. Similarly, the above mentioned construction and maintenance activities impact on birds through disturbance, particularly during bird breeding activities. Disturbance of birds is anticipated to be of lower significance than habitat destruction. Leachate from fly wet ash disposal facilities can contain heavy metals (Theism and Marley, 1979) which could</p> |

result in contamination of surrounding water sources, used by water birds in the study area. Correct placing of the new dam, away from wetlands, dams and water bodies, will help to mitigate this impact.

In addition to the expansion of the wet ash disposal facilities the project will also include the expansion of the relevant infrastructure associated with the ashing system, such as pipelines, storm water trenches, seepage water collection systems, pump stations, seepage dams etc, and may also involve the relocation of certain infrastructure (e.g. power lines) depending on which alternative is chosen. The impacts of such associated infrastructure on avifauna are predicted to be minimal, so long as the infrastructure is within the proposed wet ash disposal facility footprint. Infrastructure outside of the proposed footprint (i.e. outside of the 5 proposed alternatives), will be assessed in the EIA phase of the project, upon determination of the preferred site.

### **Biodiversity**

Ten impacts were identified that are of relevance to any development in a natural environment. Impacts were placed in three categories, namely:

- Direct impacts:
  - Destruction of threatened and protected flora species;
  - Direct impacts on threatened fauna species;
  - Destruction of sensitive/ pristine habitat types;
  - Direct impacts on common fauna species;
- Indirect Impacts:
  - Floristic species changes subsequent to development;
  - Faunal interactions with structures, servitudes and personnel;
  - Impacts on surrounding habitat/ species;
- Cumulative Impacts:
  - Impacts on SA's conservation obligations & targets (VEGMAP vegetation types);
  - Increase in local and regional fragmentation/ isolation of habitat; and
  - Increase in environmental degradation.

Other, more subtle impacts on biological components, such as changes in local, regional and global climate, effects of noise pollution on fauna species, increase in acid rain and ground water deterioration are impacts that cannot be quantified to an acceptable level of certainty and is mostly subjective in nature as either little literature is available on the topic or contradictory information exist

### **Surface Water**

- Contamination of surface water from seepage and run off.
- Loss of aquatic biodiversity.
- Loss of runoff into the catchment.
- The detailed aquatic ecological impact assessment will quantify the significance of possible impacts associated with the preferred site

### **Groundwater**

|   |
|---|
| <ul style="list-style-type: none"> <li>• Contamination of ground water due to hydrocarbon spillage and seepage into groundwater reserves, affecting groundwater quality.</li> <li>• Mitigation measures are required to be identified.</li> <li>• Further construction of infrastructure and compaction of the area will further contribute to reduced water infiltration rates to replenish groundwater aquifers. Mitigation measures are required to be identified.</li> </ul>  |
| <p><b>Noise</b><br/>Change in ambient noise levels during both construction and operation</p>   |
| <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• Increase in dust generating activities during construction and operation including exceedances of PM10 concentrations and exceedances of dustfall rates.</li> <li>• Mitigation measures may be required to be identified if required.</li> </ul>   |
| <p><b>Socio-Economic Issue Identified</b></p>   |
| <ul style="list-style-type: none"> <li>• Visual impacts of preferred site</li> <li>• Disturbance of cultural or historical sites</li> <li>• Economic benefits through employment</li> <li>• Continued generation of Electricity over the long term at Hendrina Power Station</li> <li>• Health risks from elevated PM10 concentrations and dust fall rates</li> <li>• Loss of groundwater resource to local users (in terms of potential groundwater contamination)</li> <li>• Inflow of temporary workers.</li> <li>• Mitigation measures are required to be identified</li> </ul>   |
| <p><b>Potential Impacts associated with relocating the linear infrastructure at Alternative E</b></p>   |
| <ul style="list-style-type: none"> <li>• Visual impact of the new power line routes and proposed tower structures;</li> <li>• Loss of land capability if relocated over agricultural land and the loss of available top soil;</li> <li>• Loss of aquatic habitat and contamination of surface water ecosystems due to sedimentation;</li> <li>• Loss of biodiversity and habitats;</li> <li>• Potential groundwater contamination due to chemical spillage during construction;</li> <li>• Collisions and electrocutions of birds;</li> <li>• Disruption of land use and loss of economic potential; and</li> <li>• Increase in health risk to neighbouring residents due to EMF</li> </ul> |

### 11.3 Impact Assessment

#### 11.3.1 Construction phase impacts

During the construction phase, the majority of impacts identified were considered to be of low significance in the event that the appropriate mitigation measures are implemented.

The following impacts were assessed to be of High significance in the event that mitigation measures are not implemented as required:

- Wet Ash Disposal Facility
  - Agricultural land
    - Loss of agricultural land
  - Surface water
    - Loss of wetland function
    - Altered Hydrology
    - Loss of water resources down stream
  - Heritage
    - Destruction of Heritage sites and features

A total of five (5) impacts related to the construction of the wet ash disposal facility were assessed as having a high significance before the implementation of mitigation measures. After the implementation of mitigation measures the intensity levels of all impacts reduced significantly.

With regards to the construction of the powerlines and pipeline there where no impacts that were considered to be of a high significance, the majority where considered either medium or low before the implementation of mitigation measures. Power line corridor 3 has been identified as the preferred alternative by all the specialists.

### **11.3.2 Operational phase impacts**

The majority of the impacts identified, associated with the operational phase were considered to be of low significance in the event that the appropriate mitigation measures are implemented.

The following impacts were assessed to be of high significance in the event that mitigation measures are not implemented as required:

- Wet Ash Disposal Facility
  - Surface Water
    - Loss of water resources down stream
    - Changes in natural surface water flow patterns
  - Social
    - Continued generation of electricity for the national grid

With regards to the wet ash disposal facility a total of Two (2) impacts were assessed as having a high significance before the implementation of mitigation measures. After the implementation of mitigation measures the intensity levels of all impacts dropped, except for the social impact in terms of continued electricity generation, which is considered to be a positive impact.

With regards to the operational phase for the powerlines and pipeline there where no impacts that were considered to be of a high significance, the majority where considered either medium or low before the implementation of mitigation measures.

### **11.3.3 Decommissioning phase impacts**

As with the construction and operational phases, the majority of impacts identified associated with the de-commissioning phase were considered to be of low significance in the event that the appropriate mitigation measures are implemented.

No impacts were assessed as having a high significance before the implementation of mitigation measures.

Socio-Economic impacts were not assessed for the de-commissioning phase. 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.

### **11.3.4 Cumulative Impacts**

The majority of cumulative impacts identified associated with the project were considered to be of low significance in the event that the appropriate mitigation measures are implemented.

The following impacts were assessed to be of High significance in the even that mitigation measures are not implemented as required:

- Wet Ash Disposal Facility
  - Surface water
    - Loss of wetland function
    - Deterioration of water quality
  - Biodiversity
    - Impacts on SA's conservation obligations and targets
    - Increase in local and regional fragmentation / isolation of habitat

With regards to the wet ash disposal facility a total of four (4) cumulative impacts were assessed as having a high significance before the implementation of mitigation measures. After the implementation of mitigation measures the intensity levels of all impacts dropped.

## **11.4 Final Conclusions**

### **11.4.1 Air Quality**

There is a probability for unacceptably high ground level PM10 concentrations from the proposed wet ash disposal facility operations at the farm nearest to the wet ash disposal facility (800 m to the south). This will be mainly due to the windblown dust incidences from the wet ash disposal facility. PM10 concentrations are likely to exceed the NAAQS 2015 limit of 75 µg/m<sup>3</sup> for more than 3 km from the source. Impacts from the wet ash disposal facility may be high but with water sprays in place and functioning properly, these impacts will reduce significantly. The potential for impacts at the sensitive receptors will also depend on the wind direction and speed.

In conclusion, if unmitigated, the windblown dust from the wet ash disposal facility may result in significant PM10 ground level concentrations. As the background ambient PM10 ground level concentrations may also be elevated in the area (based on measured PM10 concentrations at Hendrina) it is recommended that the wet ash disposal facility be mitigated where possible in order to minimise the impacts from this source on the surrounding environment.

Fugitive dust can easily be mitigated. It is recommended that the dust management measures as stipulated in the EMP be applied to ensure the proposed activities have an insignificant impact on the surrounding environment and human health. It is also recommended that single dust fallout buckets be installed downwind of the tailings dam in order to monitor the impacts from this source.

### **11.4.2 Ground Water**

The main impact on groundwater of the proposed ash disposal facility is likely to be a reduction in water quality beneath the site, and in the vicinity (most likely within a few hundred metres) of the site. The numerical model results suggest that the movement of leachate away from the ash disposal facility should take place relatively slowly, with the surface water receiver being the drainage to the north west of the proposed ash disposal facility site. Less serious is the anticipated water table mounding beneath the site and the potential alteration of local groundwater flow directions (modelling has been conducted without the consideration of any mitigation such as the liner to obtain a worst case scenario).

The main way to mitigate all of these impacts is to maintain the ash disposal facility in good condition (especially the drainage system) and to ensure that only ash slurry is disposed of. Once the ash disposal facility is decommissioned, it should be re-vegetated (as stipulated in the operational procedure) and the drainage system maintained to reduce downward movement of leachate. The construction of a (Class C) liner system should greatly reduce the downward movement of leachate into the subsurface, if managed

together with the under drain system. The impact of the construction of the water pipeline diversion or the electricity powerlines on groundwater is expected to be minimal, unless spills occur during construction or waste is disposed into the trenches or pits during the construction phase.

It is recommended that the ash disposal facility and leachate control system continue to be maintained after ash disposal has ceased. If possible a layer of top soil should be added to the ash disposal facility on closure to encourage re-vegetation. Monitoring and management of groundwater levels and quality in the vicinity of the ash disposal facility, or as agreed with authorities, should be continued after ash facility closure, and if required the numerical model updated with the new data.

#### **11.4.3 Surface Water**

Ash management inherently carries environmental risk, particularly to surface and ground water systems. The extent of the proposed development in relation to the extent of other uses in the water management area adds to cumulative impacts on the Olifants system. The Olifants system is compromised and any additional strain on surface water ecology should be considered in this light. Thus, the remaining ecological integrity associated with the Woest-Alleenspruit is of particular importance on a catchment scale. However, the surface water study carried out in July 2011 indicated that wetlands associated with the study area are in a modified to largely modified state. In light of the PES, retained functionality, EIS and environmental least cost associated with Alternative E, it is the opinion of the specialist that the project can be executed without further impeding ecological integrity of wetlands located outside of the primary study area.

#### **11.4.4 Biodiversity**

It is evident that direct impacts associated with the various phases of the project are mostly restricted to the physical activities associated with construction activities and, to some extent, activities associated with the decommissioning phase (rehabilitation). Indirect as well as direct impacts are mostly restricted to the site and immediate surrounds.

The implementation of generic mitigation measures are expected to ameliorate impacts to an acceptable significance. In selected areas, mostly associated with wetland related habitat, will the success of mitigation measures be of a moderate nature.

#### **11.4.5 Avifauna**

From an avifaunal perspective, the overhead power-line poses the greatest threat to the majority of the red-listed focal species identified. Furthermore the following conclusions and recommendations are made:

- Habitat destruction and disturbance are impacts that are associated with all activities of the proposed project, however they are not expected to be highly significant, and should they be mitigated for as per this report and the use of the Construction EMP.
- Collisions are expected to be the largest impact of this project and thorough line marking is required to mitigate for this, regardless of which line option (3 or 4) is chosen.
- Over-head power-line alternative 3, appears to pass through less sensitive areas, and is more preferred.
- An “avifaunal walk through” is recommended in order to identify the exact spans of line for marking to mitigate for bird collisions.
- Provided that the high risk sections of line are mitigated in the form of marking, the impact should be contained. The EWT, through its partnership with Eskom and ongoing international networking, is well aware of the room for improvement on the effectiveness of line marking devices. However, it is our view that currently available devices, although not 100 % effective, would provide an acceptable level of mitigation for this project.
- Provided that a bird-friendly monopole structure or similar, is used for all new pylon structures in the project, as discussed elsewhere in the report, the impact of electrocution should be contained.

#### **11.4.6 Visual**

The construction and operation of the proposed wet ash disposal facility and its associated infrastructure will have an impact on the visual environment especially within, 1km of the proposed site, but also within the greater region.

The wet ash disposal facility would be visible within an area that incorporates certain sensitive visual receptors. Such visual receptors include people travelling along roads, residents of homesteads and settlements and tourists visiting the region.

It is noteworthy that a high level of industrial, mining and electrical infrastructure is already present in close proximity to the proposed site. The Hendrina Power Station and the existing wet ash disposal facilities south east of the proposed site are of particular relevance in this regard, as they render the immediate visual environment already impacted upon. As a result, the visual prominence of the proposed wet ash disposal facility is expected to be absorbed somewhat

#### **11.4.7 Heritage**

The aim of the survey was to locate, identify, evaluate and document sites, objects and structures of cultural significance found within the area in which it is proposed to develop the wet ash disposal facility and the rerouting of existing infrastructure.

The cultural landscape qualities of the region essentially consist of one component. The first is a rural area in which the human occupation is made up of a pre-colonial element (Iron Age) as well as a much later colonial (farmer and industrial) component.

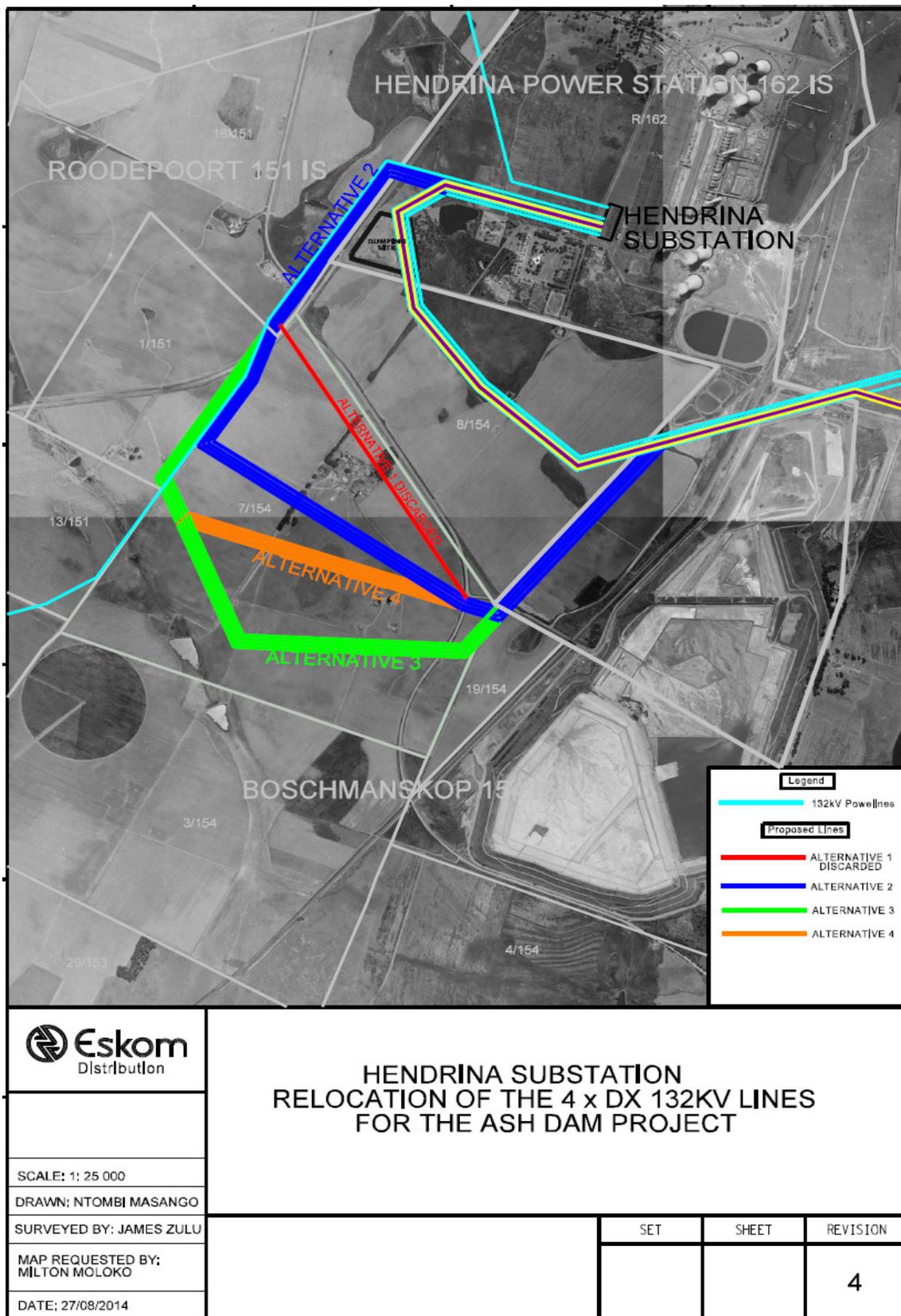
Two cemeteries were identified, one of which would be impacted on by the proposed development.

- Based on current information regarding sites in the surrounding area, all sites known to occur in the study region are judged to have Grade III significance and therefore would not prevent the proposed development for continuing after the implementation of the proposed mitigation measures and its acceptance by SAHRA.

Therefore, from a heritage point of view the proposed development can continue. However, if archaeological sites or graves are exposed during construction work, it should immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

#### **11.4.8      *Powerline Alternative corridors***

Corridors were assessed for the relocation of the three power lines that currently traverse the site. **Figure 11.4** provides a map of the alternatives that were identified and assessed. Through the assessment it is clear that on the whole the impacts associated with corridor 3 have a lower significance and is thus considered more preferred. It is recommended that Eskom consider this alternative as the preferred, however it is essential to take the health and safety risks related to working in close proximity to the power lines into account.



**Figure 11.4:** Map showing the corridor alternatives for the relocation of the powerlines.

As of 7 February 2013, the project team was made aware of the existence of a new powerline alignment that is to traverse Alternative E (preferred EIA site). The project team is aware that an Environmental Authorisation has been granted and a servitude negotiated with the landowner, however, the project team still await the specific project details in terms of exact location of this powerline. It is proposed that this powerline should be relocated together with the powerlines mentioned above within the same new proposed alignments.

### **11.5 Environmental Impact Statement**

The impact assessment phase of this project identified and assessed the potential impacts that the wet ash disposal facility and associated infrastructure may have on the proposed site and on the surrounding areas. The process also included diversion of power lines and a water supply pipeline. Through this assessment mitigation measures have been recommended in order to reduce or eliminate any impacts that were identified.

The EIA has concluded that the legislative requirement to consider alternatives during the EIA process is focussed strongly on feasible and reasonable alternatives that meet the requirements of the proposed project.

In terms of the 'no go' option, it was concluded that if the new wet 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 close down the power station due to the lack of ash disposal facilities, causing a long term reduction in electricity supply. It is important to note that the additional power output from Hendrina Power Station is still required to meet the national demand irrespective of the new-build activities.

A more detailed discussion of the alternatives relative to this project is included in **Chapter 4**.

During the construction phase, the majority of impacts identified were considered to be of low significance in the event that the appropriate mitigation measures are implemented.

As with the construction phase, the majority of impacts identified associated with the operational and decommissioning phases are considered to be of low significance in the event that the appropriate mitigation measures are implemented.

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.

## **11.6 Conclusions and Recommendations**

In the view of the environmental assessment practitioner the information contained in this report and the documentation attached thereto will be sufficient for the National DEA to make a decision in respect of the activities applied for with respect to the proposed new Wet Ash Disposal Facility at the Hendrina Power Station.

This EIA provides an assessment of both the benefits and potential negative impacts anticipated as a result of the proposed new ashing facility at the Hendrina 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.

The surface water study carried out in July 2011 indicated that the wetlands associated with the study area are in a modified to largely modified state. In light of the PES, retained functionality, EIS and environmental least cost associated with Alternative E, it is the opinion of the specialist that the project can be executed without further impeding ecological integrity of wetlands located outside of the primary study area. This statement and opinion is support by the EAP.

In order to achieve appropriate environmental management standards and ensure that the findings of the environmental studies are implemented through practical measures, the recommendations from this EIA have been included within an Environmental Management Programme (EMPr) which has been included in **Appendix E**. This EMPr will 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.